



PROJECT SPECIFICATIONS MANUAL

PROPOSED MINOR
INTERIOR REMODEL FOR:



STORE NO. D-711

7084 MILLER RD
SWARTZ CREEK, MI 48473

JSA JOB #23086

BIDS & PERMITS 03/06/2024
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32316 grand river avenue, suite 200
farmington, michigan 48336-3261
(248) 476-8800 fax (248) 476-8833

Project Manual



Kroger D-711 Ypsilanti, MI

**7084 Miller Rd.
Swartz Creek, MI 48473**

Prepared for:

**The Kroger Co.,
Its Subsidiaries and Affiliates**

**The Kroger Company
Michigan Division
40393 Grand River Ave, Novi, MI 48375**

by:

**Jeffery A. Scott Architects P.C.
32316 Grand River Ave., Suite 200
Farmington, Michigan 48336
(248) 476-8800**

Issue Date: Bids & Permits 03/06/2024

SECTION 00 01 01 - TITLE



**Kroger
D-711
Swartz Creek, MI**

**7084 Miller Rd.
Swartz Creek, MI 48473**

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Issue Date: **Bids & Permits 03/06/2024**

END OF SECTION 00 01 01

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SECTION 00 01 05 - CERTIFICATIONS

1.1 TITLE AND LOCATION OF THE WORK

Kroger Store D-711
Swartz Creek, MI
Jurisdiction of City of Swartz Creek
7084 Miller Rd.
Swartz Creek, MI 48473

1.2 NAME AND ADDRESS OF OWNER

The Kroger Co., its Subsidiaries and Affiliates
Michigan Division
40393 Grand River Ave
Novi, MI 48375

1.3 NAME AND ADDRESS OF ARCHITECT

Jeffery A. Scott Architects P.C.
32316 Grand River Ave., Suite 200
Farmington, MI 48336

I hereby certify that the Project Drawings and the Project Manual were prepared by me or under my direct supervision and that I am a duly registered Architect under the Laws of the State of Michigan.

Jeffery A. Scott

Licensed Architect

State of Michigan

Registration No. 1301038645

END OF SECTION 00 01 05

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SECTION 00 01 11 - PROJECT DATES

The following is a list of the critical dates for this project as referred to in the Project Specifications Manual. All dates and times are subject to change per the Kroger Project Manager.

1.1 PROJECT ISSUE DATE

- A. Issued for: **Bids and Permits**
- B. Dated: **Wednesday, March 06, 2024.**

1.2 ANTICIPATED DATE OF COMMENCEMENT AND DATE OF COMPLETION

- A. The anticipated date of commencement of the awarded contractor's Work is **TBD by Kroger**. The anticipated date of completion of the contractor's Work is **TBD by Kroger**. The anticipated duration of the contractor's Work is **TBD by Kroger**. If a Notice to Proceed is issued, at the Owner's sole discretion, actual dates may vary dependent on date issued.

1.3 PRE-BID REQUIREMENTS

- A. Mandatory Pre-Bid Walk-Thru Meeting, **TBD by Kroger**.
 - 1. The pre-bid walk-thru is **mandatory** and if you do not attend your bid will **not be accepted**, without prior approval from Kroger.

1.4 SUBMISSION OF PROPOSALS (BIDDING PROCEDURES)

- A. All Bids shall be submitted on **TBD by Kroger** (unless otherwise directed by Kroger) in accordance with the e-mail invitation for the on-line negotiation process Kroger e-Sourcing. Any additional questions or comments regarding the use of Kroger e-Sourcing may be addressed with those individuals identified in the invitation to bid issued to each invited Bidder.

END OF PROJECT DATES

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SECTION 00 21 13 - INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.1 DEFINITIONS

- A. Definitions set forth in Division 00 Section "General Conditions" or in other Contract Documents are applicable to the Procurement Requirements.
- B. **Owner: The Kroger Company of Michigan (Michigan Division);** a subsidiary of the Kroger Co.
- C. **Contract Documents:** The Contract Documents describe the proposed construction and consist of the Procurement Requirements, Agreement Between Owner and Contractor, General Conditions, Jobsite Safety Rules, Drawings, Specifications, and all Addenda to the Contract Documents issued prior to execution of the Contract and any Change Orders that may be entered into.
- D. **Procurement Requirements:** Consist of the Invitation to Bid, Instructions to Bidders, the Trade Proposal, and other sample bidding and contract forms.
- E. **RFC:** Request for Clarification.

1.2 MBE, WBE, AND DBE PARTICIPATION

- A. It is the policy of The Kroger Co. that certified Minority-Owned Business Enterprises (MBEs), Women-Owned Business Enterprises (WBEs) and other Diverse-Owned Business Enterprises (e.g., Veteran-Owned Business Enterprises; Service Disabled Veteran-Owned Business Enterprises; Lesbian, Gay, Bisexual & Transgender-Owned Business Enterprises) (DBEs) have the opportunity to participate in the performance of Kroger contracts. In support of the policy, Kroger encourages all our suppliers to provide meaningful contracting and sub-contracting opportunities to M/W/DBEs. Utilization of M/W/DBE suppliers and/or service providers throughout the course of the contract is one of the non-pricing factors that Kroger evaluates during the bid award selection process. Upon request, vendors will be required to track and report their expenditures with diverse-owned companies as it relates to the products and/or services provided to Kroger.
 - 1. MBE, WBE, and DBE Registration: At the time the a Bid is submitted, an MBE, WBE, and/or DBE Business is required to register with the Owner online at <http://www.thekrogerco.com/vendors-suppliers/supplier-diversity> and register by clicking the link indicated in the registration section.

1.3 ANTICIPATED DATE OF COMMENCEMENT AND DATE OF COMPLETION

- A. The anticipated date of commencement of the awarded contractor's Work is (**See Section 00 01 11 for dates**). The anticipated date of completion of the contractor's Work is (**See Section 00 01 11 for dates**). The anticipated duration of the contractor's Work is is (**See Section 00 01 11 for duration**) calendar days. If a Notice to Proceed is issued, at the Owner's sole discretion, actual dates may vary dependent on date issued.

- B. Liquidated Damages: The Contractor shall be liable to the Owner \$1,000.00 as stipulated in the Agreement Between Owner and Contractor for each day that the Completion Date is exceeded in the completion of the Project. The sum is fixed and agreed as liquidated damages and not as a penalty; it being understood that the damages which the Owner will suffer in such an event are not subject to accurate calculation. The Owner shall be entitled to deduct any liquidated damages due from the Contract Sum. Should the liquidated damages exceed that portion of the Contract Sum owed to the Contractor, the Contractor shall promptly pay the Owner the difference.

1.4 BIDDER'S REPRESENTATIONS

- A. The Bidder by making a Bid represents that:

1. The Bidder has read and understands the Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.
2. The Bid is made in compliance with the Contract Documents.
3. The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.
4. The Bid is based on the items and brands of materials, equipment and systems required by the Contract Documents including all Addenda without exception.
 - a. Where there is a conflict in or between the Drawings and Specifications or any other discrepancy in the Contract Documents, and no request for information is submitted or no response is provided by the Architect or Owner, the Bidder shall be deemed to have estimated on the most expensive way of doing the Work. The final decision of the conflict or discrepancy shall be determined by the Owner and will be included in the contractor's Scope of Work.

1.5 CONTRACT DOCUMENTS FOR BIDDING

- A. Available Drawings

1. Proposed Contract Documents are available to invited bidders on the Owner's Project Management Website (PMW). All copies of drawings and specifications downloaded from the Owner's Project Management Website (PMW) or furnished from a reproduction company are the property of the Owner and shall not be used on any other work.
2. The cost of Drawings and/or Specifications from a reproduction company shall be paid to the reproduction company by the Bidder at the cost established by the reproduction company.

- B. Addenda To Contract Documents

1. During the progress of bidding, Bidders may be furnished Addenda covering additions, deductions, or alterations to the Contract Documents. Such Addenda shall be included in the Work covered by the proposal and shall become a part of the Contract Documents.
2. The last addenda, as required, shall be issued no later than 7 calendar days prior to the date for receipt of Bids. The last clarification letter for RFCs (Request for Clarification), as required, will be issued no later than 3 calendar days prior to the date for receipt of

Bids, but no RFC issued after 7 days prior to date for receipt of Bids will result in an addenda.

C. Electronic Forms

1. Certain forms required for Bidding shall be completed in electronic format. Those forms and other forms required after award of contract may be found at the Owner's Project Website. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for procedures to download the forms from the Owner's Project Website.

1.6 SUBMISSION OF PROPOSALS (BIDDING PROCEDURES)

- A. In order to complete the Kroger e-Sourcing on-line bidding process, Bidders shall upload to the Owner's on-line bidding web site, by the date and time specified in the Invitation to Bid, a completed electronic copy of the Trade Proposal that matches (in total) the final project dollar amount bid on Kroger e-Sourcing. If the uploaded Trade Proposal does not match the amount bid on-line, or if the uploaded Trade Proposal is rejected for some other reason, the Bidder will have no more than 24 hours to make corrections to the Trade Proposal and re-upload the revised Trade Proposal to the Owner's bidding website. Bidder's pricing, as totaled in the Trade Proposal, must remain consistent with that submitted during the on-line Kroger e-Sourcing bid event.
- B. All columns of the Trade Proposal must be completely filled in including the dollar amount rounded to the nearest whole dollar, subcontractors names and percent total contract of MBE/WBE/DBE participation. All blanks shall be filled in or the Bid may not be accepted, at Owner's sole discretion
- C. The Base Bid must include all items and scope of work indicted in the Contract Documents. The Owner may disqualify any Base Bid that contains exclusions, substitutions, alternates not directed by the Owner, or other qualifications to the Bidding Documents. Voluntary substitutions or value engineering suggestions may be submitted separately from the base bid amount for the Owner's consideration. Bidders shall submit questions regarding the bidding documents to the Architect during the specified bidding period, prior to the release of the last addenda, and prior to submission of their bid.
- D. The Bidder's proposal shall include permit fees except for the general building permit as described in Division 00 Section "General Conditions" and the cost of all state or local sales or use taxes and charges or duties of any nature applicable to the Work incorporated under the Contract.
 1. The Owner will provide the general building permit.
- E. Direct Buy Material Bid Takeoff Forms
 1. Invited Bidders shall complete the material bid takeoff forms and submit with their Bids.
 2. Go to the Owner's Project Management Website (PMW), site|folio, at <https://www.sitefolio.net/Kroger/Login.aspx> and log-in. Then go to *files>Capital>Building & Site Specifications>Kroger Master Building & Site Specifications>Procurement and Contracting Requirements>Working Forms-open to retrieve excel files*. The following Direct Buy Material Bid Takeoff Forms can then be downloaded:

- a. 00 43 26 Electrical Wire Bid Takeoff Form
 - b. 00 43 26 Electrical Wire Cuts Form
 - c. 00 43 27 Direct Buy Refrigeration Copper Pipe Bidding
3. Contact the Owner if experiencing any difficulty downloading forms.

F. Direct Buy Wire Bidding Procedure

1. The successful electrical bid shall be determined by the combination of the lowest electrical bid and lowest cost for electrical wire supplied by the Owner.
2. Invited Bidders shall have all their proposed electrical subcontractors complete the Electrical Wire Bid Takeoff Form and submit with their bids.
 - a. A hard copy sample of the Wire Bid Takeoff Form is included in Division 00 Section "Direct Buy Wire Bidding." Download the electronic version of the form from the Owner's PMW as described above.
3. Invited Bidders shall submit along with the Trade Proposal the names of their two lowest proposed electrical subcontractors and proposed associated bid amounts (excluding wire) to the Owner.
4. Invited Bidders shall have their two lowest proposed electrical subcontractors complete the Electrical Wire Bid Takeoff Form and email (be sure to note Electrical Wire Bid Takeoff and the store number in the email subject line) to the Direct Buy Wire Supplier:

Graybar Electric
CIOHKroger@graybar.com

5. The Direct Buy Wire Supplier will apply pricing to the submitted Electrical Wire Bid Takeoff Forms and calculate the total wire price and email the completed forms back to the Owner. The Owner will determine the apparent successful electrical subcontractor based on the lowest dollar amount of both factors and advise the invited Bidder without disclosing the cost associated with the electrical wire.
6. The successful Bidder will complete the Electrical Wire (Cuts) Order Form and submit to the Direct Buy Wire Supplier as specified in Division 26 Sections "Low Voltage Electrical Power Conductors and Cables" and "Grounding And Bonding For Electrical Systems."

G. Direct Buy Refrigeration Copper Pipes Bidding Procedure (If Bid is through a Contractor)

1. The successful refrigeration copper piping bid shall be determined by the combination of the lowest refrigeration bid and lowest cost for refrigeration copper piping supplied by the Owner.
2. Invited Bidders shall have their proposed refrigeration subcontractors complete the Copper Pipe Takeoff Form and submit with their bids.
 - a. A hard copy sample of the Copper Pipe Takeoff Form is included in Division 00 Section "Direct Buy Refrigeration Copper Pipes Bidding." Download the electronic version of the form from the Owner's PMW as described above.

3. Invited Bidders shall submit along with the Trade Proposal the names of their two lowest proposed refrigeration subcontractors and proposed associated bid amounts (excluding copper pipes) to the Owner.
4. Invited Bidders shall have their two lowest proposed refrigeration subcontractors complete the Copper Pipe Takeoff Form and email (be sure to note "Copper Pipe Takeoff" and the store number in the email subject line) to the Direct Buy Copper Pipe Supplier:

United Refrigeration
info@uri.com
Attention: Ken Ford

5. The Direct Buy Copper Pipe Supplier will apply pricing to the submitted Copper Pipe Bid Takeoff Forms and calculate the total copper pipe price and email completed forms back to the Owner. The Owner will determine the apparent successful refrigeration subcontractor based on the lowest dollar amount of both factors and advise the invited Bidder without disclosing the cost associated with the copper pipe.

1.7 CONSIDERATION OF BIDS

A. The Owner's Reservations

1. The Owner reserves the unrestricted privilege to reject any, part of any, or all of the bids received and to waive any informality in the bidding. Contracts will be awarded on the basis of the best value as determined solely by the Owner.

B. Accelerated Construction Schedule & Planning

1. It is the intent of the Owner to award a Contract to the lowest qualified Bidder. Early completion of the Work is of utmost importance, and the Owner will base its decision not only on the lowest Bid dollar value but also on the duration of the project and may award the Contract to the Bidder whose Bid, in dollar amount and number of construction days, is to the Owner's overall advantage at the Owner's sole discretion. The Bidder shall thoroughly investigate all possible methods of scheduling (working the necessary weekends and/or evenings) and employing work forces to achieve the earliest completion date.

1.8 PAYMENT PROTECTION

A. Bondability: Each Bidder must be bondable through a qualified Surety Company.

1. If requested by Owner, the Bidder must furnish at no cost to the Owner, a Letter of Bondability from a qualified Surety Company which states the surety unconditionally offers to guarantee to the extent of 100 percent of the contract sum. The Letter of Bondability must state that the Surety Company is willing to guarantee the Bidder's performance in all respects of the terms and conditions and provisions of the agreement. The Letter of Bondability must be submitted on Surety Company's official letterhead.

B. To cover the faithful performance of their Work and the payment of all legitimate claims arising thereunder, the Bidder may select from the following options to guarantee payment to subcontractors and material suppliers. The Bidder shall furnish the Owner one of the forms of

Payment Protection they have selected along with the associated cost. The Bidder shall use the alternate section to identify costs associated with the other forms of Payment Protection:

1. Contractor Financing – Within ten (10) calendar days after notice to award the successful Bidder shall submit to the Owner financial information to verify successful Bidder is solvent and can meet the obligations of conducting business during project construction. Owner reserves the right to require the successful Bidder to obtain a Letter of Credit or Performance Bond and Labor and Material Payment Bond by accepting the alternate any time prior to the start of physical start of construction. Successful Bidder is responsible for submitting unconditional waiver and release forms along with request for payment to the Owner. Refer to General Conditions, Article 9 “Payments and Completion” for table outlining conditional and unconditional waiver and release schedule requirements for this option.
 2. Letter of Credit –If Bidder selects this option when submitting the Trade Proposal, the successful Bidder has within ten (10) calendar days after notification of award to submit a Letter of Credit equal to the highest scheduled request for payment of the Project. At the Owners sole discretion, the value of the Letter of Credit may be amended based on the progress of the Work. The Letter of Credit shall be submitted to the Owner on the form entitled “Letter of Credit” which will be supplied by the Owner, a sample of which is herein included. Successful Bidder may submit a request for payment to the Owner prior to securing unconditional waiver and release forms. Refer to General Conditions, Article 9 “Payments and Completion” for table outlining conditional and unconditional waiver and release schedule requirements for this option.
 3. Performance Bond and Labor & Material Payment Bond - If Bidder selects this option when submitting the Trade Proposal, the successful Bidder has within ten (10) calendar days after notification of award to submit a Performance Bond and a Labor & Material Payment Bond each equal to 100 percent of the contract sum. Refer to General Conditions, Article 9 “Payments and Completion” for table outlining conditional and unconditional waiver and release schedule requirements for this option.
- C. The surety company providing the Performance Bond and Labor & Material Payment Bond must be rated A VII or better by AM Best and must be listed in the current U.S. Treasury Department’s Listing of Approved Sureties (Department Circular 570) with an underwriting limitation at least equal to the amount of the bond. The Listing of Approved Sureties (Department Circular 570) can be found at www.fms.treas.gov/c570.
- D. All Bidders shall provide in the Trade Proposal, the cost associated with providing either a Contractor Financing, Letter of Credit or a Performance Bond and Labor and Material Payment Bond.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 21 13

SECTION 00 22 19 - BIDDERS INSTRUCTIONS FOR ELECTRONIC FORM RETRIEVAL

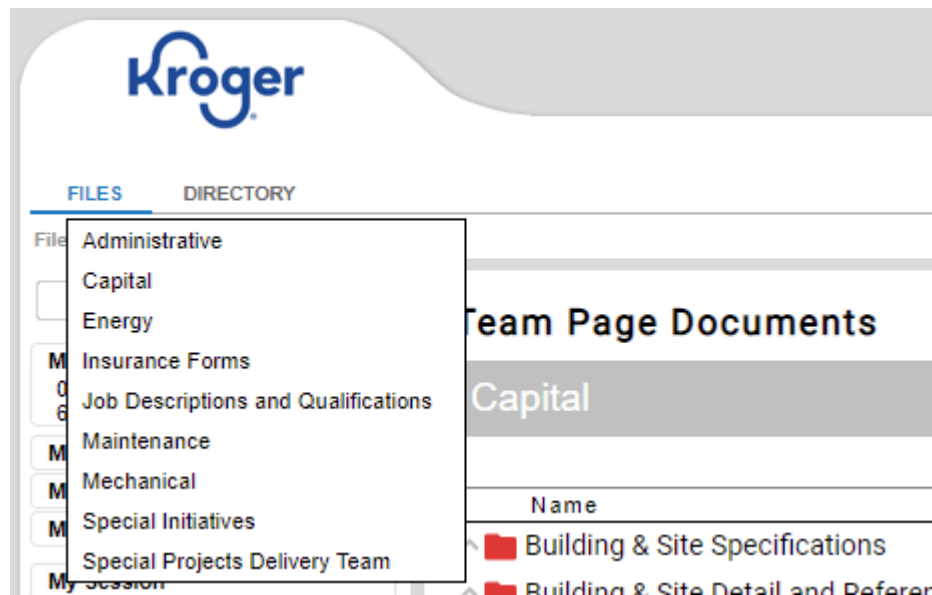
PART 1 - GENERAL

1.1 DEFINITIONS

- A. **Working Forms:** Electronic forms in Microsoft® Excel® format to be completed electronically by the Bidder.
- B. **sitefolio:** Administrators of the Owner's Project Management Website.

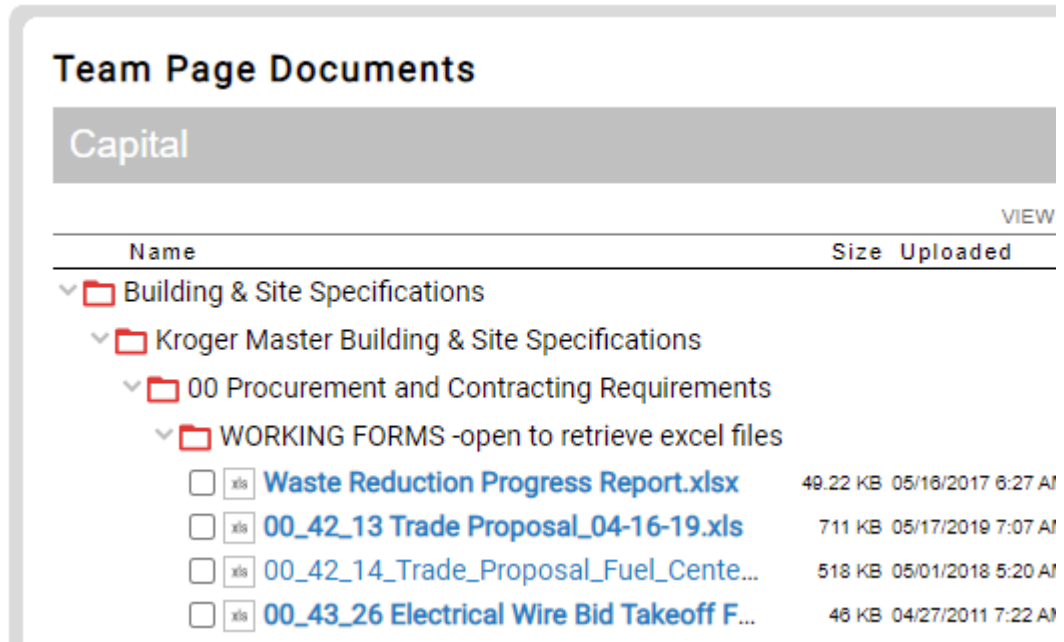
1.2 INSTRUCTIONS

- A. The Bidders shall download the Working Forms by accessing the Owner's Project Management Website, sitefolio. Download the file and follow the instructions to complete.
 - 1. Upon logging onto SiteFolio, left click "**FILES**"
 - 2. A submenu will appear, left click "**Capital**"

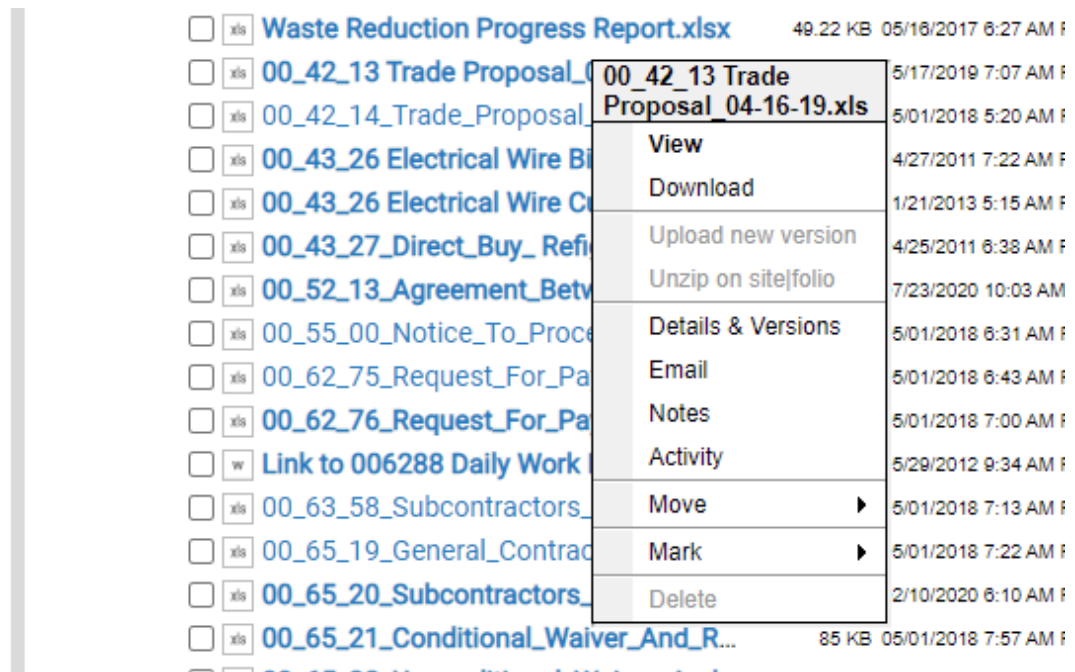


(Continued on next page)

3. Under Capital, left click “**Building & Site Specifications**”
4. Left click “**Kroger Master Building Specifications**”
5. Left click “**00 Procurement and Contracting Requirements**”
6. Left click “**Working Forms-open to retrieve excel files**”



7. Right click on the source file and select “**Download**”



PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 22 19



Pre-Bid Meeting Sign-in Sheet

Kroger – Swartz Creek D-711
Store Name Store Number

Date

This sign-in acknowledges your attendance to this meeting and your commitment to adhere to the plans and specifications as they are drawn/written.

We appreciate your attendance at this important session. Some of the attendees at this meeting may be competitors or potential competitors. Whenever competitors meet there is the potential for unlawful activity or the appearance of unlawful activity. Kroger will not permit this forum to be used in furtherance of any illegal or improper conduct.

Kroger strongly believes in free competition and it is Kroger's policy to comply in all respects with the antitrust laws. Agreements regarding prices, markets, or with whom parties will deal, can violate the antitrust laws and as such no discussions along these lines, whether during the formal meetings or during meals, outings or other breaks, are permitted.

If at any time during this meeting you feel the discussion has drifted into inappropriate areas, you should immediately bring this to the attention of the person chairing the meeting.

As part of the Billion Dollar Roundtable, Kroger has been recognized as a leader in promoting diversity through the development and engagement of women- ,minority-, and diverse-owned businesses. It is Kroger's goal to have at least one M/W/DBE firm participate in every construction project.

Name	Company	Phone	E-Mail

Jeffery A. Scott Architects, P.C.
JSA Project No. 23086

Kroger Store No. D-711
Swartz Creek, Michigan

Name	Company	Phone	E-Mail

Jeffery A. Scott Architects, P.C.
JSA Project No. 23086

Kroger Store No. D-711
Swartz Creek, Michigan

Name	Company	Phone	E-Mail

Jeffery A. Scott Architects, P.C.
JSA Project No. 23086

Kroger Store No. D-711
Swartz Creek, Michigan

Name	Company	Phone	E-Mail

SECTION 00 42 13 - TRADE PROPOSAL

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Trade Proposal is located on the Owner's Project Management Website in Microsoft® Excel® format.
1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
 2. Download the following Working Form and follow the instructions to complete:

00_42_13_Trade_Proposal.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 42 13

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SECTION 00 43 26 - DIRECT BUY WIRE BIDDING

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Direct Buy Wire Bidding forms are located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Forms and follow the instructions to complete:

00_43_26_Electrical_Wire_Bid_Takeof_Form.xls
00_43_26_Electrical_Wire_Cuts_Forms.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 43 26

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SECTION 00 43 27 - DIRECT BUY REFRIGERATION COPPER PIPE BIDDING

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Copper Pipe and Fittings Takeoff Form is located on the Owner's Project Management Website in Microsoft® Excel® format.
1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
 2. Download the following Working Form and follow the instructions to complete:

00_43_27_Direct_Buy_Refrigeration_Copper_Pipe_Bidding.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 43 27

BLANK SHEET

SECTION 00 52 13 - AGREEMENT BETWEEN OWNER AND CONTRACTOR

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Agreement between Owner and Contractor is located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Form and follow the instructions to complete:

00_52_13_Agreement_Between_Owner_And_Contractor.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 52 13

BLANK SHEET

SECTION 00 55 00 - NOTICE TO PROCEED

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Notice to Proceed is located on the Owner's Project Management Website in Microsoft® Excel® format.
1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
 2. Download the following Working Form and follow the instructions to complete:

00_55_00_Notice_To_Proceed.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 55 00

BLANK SHEET

SECTION 00 61 15 - LETTER OF CREDIT

[Bank's Letterhead]

[Clean, Unconditional, Standby Irrevocable Credit Number]

[Date]

BENEFICIARY

The Kroger Co. (its Subsidiaries and Affiliates)
<Region Street Address>
<Region City, State, Zip>

Attn:

Gentlemen:

For account of <Contractor's Legal Name> we hereby establish our Clean, Unconditional, Standby Irrevocable Credit ("Letter of Credit") in your favor for drawings up to the aggregate amount of <Insert dollar amount> effective immediately and expiring at <Insert Bank Address> with our close of business on <Insert Date>.

The term "Beneficiary" includes any successor by operation of law of the named Beneficiary including, without limitation, any liquidator, rehabilitator, receiver or conservator.

We hereby undertake to promptly honor each of your sight draft(s) drawn on us in substantially the form of Exhibit "A" attached hereto, indicating our Credit No. <Insert Number>, for all or any part of this credit if presented at <Insert Bank Address> on or before the expiry date or any automatically extended expiry date. If you so choose, you will be able to draw on this Letter of Credit more than once, without amendment, provided that the sum of the amounts that you have drawn does not exceed the full amount of this Letter of Credit.

Except as stated herein, this undertaking is not subject to any condition or qualification. Our obligation under this Letter of Credit shall be our individual obligation, in no way contingent upon reimbursement with respect thereto.

This Letter of Credit shall be automatically extended without amendment for one year from the expiry date thereof, or any future expiration date, unless at least forty-five days prior to any expiration date we shall notify you by registered mail or courier service that we elect not to consider this Letter of Credit renewed for any such additional period.

The following documents must be presented at our office in person or by mail on or before the expiry date in accordance with the terms and conditions of this Letter of Credit:

1. Original of this Letter of Credit.
2. A certificate signed or purporting to be signed by an officer of Beneficiary substantially in the form of Exhibit "B" attached hereto stating as follows: "The amount is due".

We will accept such statement as binding and correct without having to investigate or having to be responsible for the accuracy, truthfulness, conclusory correctness or validity thereof or any part thereof and notwithstanding the claim of any person to the contrary.

Should you have occasion to communicate with us regarding this Credit, kindly direct your communication to the attention of our Letter of Credit Department, making specific reference to our Irrevocable Credit. No. <Insert Number>.

This Letter of Credit is subject to and governed by the laws of the state or commonwealth in which the Project is located, <Insert site location, address and state where Project is located>, and the <Insert current revision> Revision of the Uniform Customs and Practice for Documentary Credits of the International Chamber of Commerce and Practice for Documentary Credits of the International Chamber of Commerce (Publication <Insert publication number>) and, in the event of any conflict, the laws of the state or commonwealth in which the Project is located will control. If this Credit expires during an interruption of business as described in Article <Insert Article number> of said Publication <Insert publication number>, we hereby specifically agree to effect payment if this Credit is drawn against within 30 days after the resumption of business.

Very Truly Yours,

(Issuing Bank)

EXHIBIT "A"

SIGHT DRAFT

_____, _____(DATE)

Letter of Credit #

(ISSUING BANK)

AT SIGHT

PAY TO THE ORDER OF THE KROGER CO. (ITS SUBSIDIARIES AND AFFILIATES) THE SUM
OF _____ AND 00/100 DOLLARS (US\$_____).

“DRAW UNDER (ISSUING BANK) CLEAN, UNCONDITIONAL, STANDBY, IRREVOCABLE
LETTER OF CREDIT NUMBER (L/C NUMBER) DATED (DATE).”

THE KROGER CO., an Ohio corporation

BY: _____

NAME: _____

TITLE: _____

EXHIBIT "B"

_____, _____(DATE)

(ISSUING BANK)

Letter of Credit Operations

Attention:

RE: Clean, Unconditional, Irrevocable Standby Letter of Credit No. _____.

Gentleman:

In accordance with the terms of the referenced Letter of Credit, in my capacity as _____ of The Kroger Co., a duly authorized officer of said corporation. I hereby certify that:

"THE AMOUNT IS DUE"

You are further directed to wire to The Kroger Co. the full sum of _____ Dollars (US\$ _____) on this date as follows:

ABA No.
Attention:

The sight draft payable to The Kroger Co. is attached hereto as the following page.

Original Standby Irrevocable Letter of Credit No. _____ [with amendments, if any] is enclosed.

Sincerely,

The Kroger Co., an Ohio Corporation

BY:
Name:
Its:

END OF SECTION 00 61 15

SECTION 00 62 13 - SUBMITTAL CHECKLIST

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Submittal Checklist.

1.2 SUBMITTALS

- A. Submittal Checklist: Submit the completed Submittal Checklist with the Submittal Schedule.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SUBMITTAL CHECKLIST

- A. Submittal Checklist includes all submittals for a Kroger retail store project. All of the submittals in the list may not be required for this Project. Review the Drawings and Specifications and check the submittals required in the checkbox in the left hand column. Submit the Submittal Checklist with the Submittal Schedule.
- B. Legend
 - 1. "X" = Contractor to Owner submittals.
 - 2. "O" = Owner to Contractor submittals (Direct Buy Program).

(See Submittals List on Next Page)

SUBMITTAL CHECKLIST																
Required Submittals	Section Number	Section Name/Submittal Item	Submittal Type									Review Responsibility				
			Product Data	Design/Design Mixes	Shop Drawings	Samples	Schedules/Lists/Forms	Qualification Data	Certificates/Letters	Reports/Records	O & M Data/Warranty	Contractor	Owner	A/E Team	Testing Agency	
ADMINISTRATIVE SUBMITTALS																
X	00 72 14	(3.1) Substitution Request					X							X	X	
X	00 72 14	(3.2) Warranty Meeting Report										X		X	X	
X	00 72 14	(3.2) Request for Information (RFI)										X		X	X	
X	00 72 14	(3.3) Construction Progress Schedule					X							X		
X	00 72 14	(3.3) Submittals Schedule and Checklist					X							X	X	X
X	00 72 14	(3.5) Construction Sign			X									X	X	
X	00 72 14	(3.11) Electronic Drawing Request					X							X	X	X
X	00 72 14	(3.14) Daily Work Report										X		X	X	
X	00 72 14	(5.1) Subcontractor Substitution Request					X							X	X	X
X	00 72 14	(7.1) Estimate for Owner Proposed Change											X	X	X	
X	00 72 14	(7.1) Request for Change										X		X	X	
X	00 72 14	(7.1) Invoice for Construction Change Directive										X		X	X	
X	00 72 14	(7.3) Change Order Costs										X		X	X	
X	00 72 14	(8.1) Request for Time Extension										X		X	X	
X	00 72 14	(9.0) Progress Payment Request										X		X	X	
X	00 72 14	(9.0) Final Payment Request										X		X	X	
FINAL COMPLETION/CLOSEOUT SUBMITTALS																
X	00 72 14	(9.8) Final Statement										X		X	X	
X	00 72 14	(9.8) Insurance Coverage										X		X	X	
X	00 72 14	(9.8) Warranties											X	X	X	

SUBMITTAL CHECKLIST														
Required Submittals	Section Number	Section Name/Submittal Item	Submittal Type								Review Responsibility			
			Product Data	Design/Design Mixes	Shop Drawings	Samples	Schedules/Lists/Forms	Qualification Data	Certificates/Letters	Reports/Records	O & M Data/Warranty	Contractor	Owner	A/E Team
X	00 72 14	(9.8) Occupancy Releases									X		X	
X	00 72 14	(9.8) Startup Testing Records								X		X	X	X
X	00 72 14	(9.8) Test/Adjust Balance Records								X		X	X	X
X	00 72 14	(9.8) Temporary Facilities								X			X	
X	00 72 14	(9.8) Operation and Maintenance Data									X	X	X	
X	00 72 14	(9.8) Transfer of Utilities								X		X	X	
X	00 72 14	(9.8) Project Record Documents									X		X	X
	00 72 14	(9.8) SWPPP Documents								X		X	X	
GENERAL REQUIREMENTS														
X	01 74 19	Construction Waste Management and Disposal						X		X		X	X	
EXISTING CONDITIONS														
X	02 41 10	Selective Structure Demolition					X					X		
CONCRETE														
X	03 01 80	Cast-In-Place Concrete Slab Cutting and Patching	X	X						X		X		X
	03 31 00	Cast-In-Place Structural Concrete	X	X	X					X		X		X
X	03 31 05	Cast-In-Place Concrete Slabs	X	X	X			X	X	X		X		X
	03 31 06	Polished gray cast-in place concrete slabs	X	X	X			X		X		X		X
	03 31 10	Polished Integral colored cast-in place concrete slabs	X	X	X			X		X	X	X	X	X
	03 35 43	Concrete Polishing-New Stores	X		X			X		X	X	X	X	
X	03 35 43.15	Burnished To Polished Concrete Conversion	X		X			X		X	X	X	X	
	03 35 43.17	Dyed Polished Concrete Conversion	X		X			X		X	X	X	X	

SUBMITTAL CHECKLIST																
Required Submittals	Section Number	Section Name/Submittal Item	Submittal Type								Review Responsibility					
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MASONRY																
	04 05 00	Common Work Results For Masonry		X						X			X		X	
	04 21 13	Clay Brick Unit Masonry				X				X	X		X		X	
	04 22 00	Standard Concrete Unit Masonry								X	X		X		X	
	04 22 23	Decorative Concrete Block Unit Masonry				X				X	X		X		X	
	04 22 24	Decorative Concrete Brick Unit Masonry				X				X	X		X		X	
	04 22 25	Precast Concrete Unit Masonry								X	X		X		X	
	04 72 00	Cast Stone Unit Masonry			X	X				X	X		X		X	
	04 73 00	Manufactured Stone Veneer	X			X							X		X	
METALS																
	05 12 00	Structural Steel Framing			X								X		X	X
	05 21 00	Steel Joist Framing			O								X		X	X
	05 31 00	Steel Decking	O		O						O		X		X	X
X	05 50 00	Metal Fabrications			X								X		X	
	05 40 00	Cold-Formed Metal Framing			X								X		X	
	05 51 00	Metal Stairs			X								X		X	
	05 52 13	Pipe and Tube Railings			X								X		X	
WOODS, PLASTICS, AND COMPOSITES																
X	06 10 53	Miscellaneous Carpentry	X			X							X		X	
X	06 46 00	Interior Décor Package			O								X		X	
X	06 64 00	Pre Finished Paneling	X			X							X		X	

SUBMITTAL CHECKLIST															
Required Submittals	Section Number	Section Name/Submittal Item	Submittal Type									Review Responsibility			
			Product Data	Design/Design Mixes	Shop Drawings	Samples	Schedules/Lists/Forms	Qualification Data	Certificates/Letters	Reports/Records	O & M Data/Warranty	Contractor	Owner	A/E Team	Testing Agency
THERMAL AND MOISTURE PROTECTION															
X	07 01 50	Roofing Demolition and Repair							X			X		X	
	07 10 00	Waterproofing	X									X		X	
	07 19 00	Water Repellents	X						X	X	X	X		X	
	07 21 00	Thermal Insulation	X								X			X	
	07 24 19	Exterior Insulation and Finish Systems	X		X	X		X	X	X		X		X	X
	07 25 00	Weather Barriers	X									X		X	
	07 32 13	Clay Roof Tiles	X			X						X		X	
	07 32 16	Concrete Roof Tiles	X			X						X		X	
	07 40 00	Metal Roof and Wall Panels	X		X	X					X	X		X	
	07 43 00	Soffit Panels	X			X						X		X	
	07 46 46	Fiber Cement Siding	X			X			X			X		X	
	07 53 23	EPDM Membrane Roofing	X		X			X	X	X	X	X		X	
	07 54 23	TPO Membrane Roofing	X		X			X	X	X	X	X		X	
	07 62 00	Sheet Metal Flashing and Trim	X		X	X					X	X		X	
X	07 72 13	Manufactured Curbs			X							X		X	
	07 72 00	Roof Accessories	X		X							X		X	
	07 84 13	Penetration Firestopping	X				X			X		X		X	
X	07 92 00	Joint Sealants	X			X						X		X	

SUBMITTAL CHECKLIST																
Required Submittals	Section Number	Section Name/Submittal Item	Submittal Type									Review Responsibility				
			Product Data	Design/Design Mixes	Shop Drawings	Samples	Schedules/Lists/Forms	Qualification Data	Certificates/Letters	Reports/Records	O & M Data/Warranty	Contractor	Owner	A/E Team	Testing Agency	
OPENINGS																
X	08 11 13	Hollow Metal Doors and Frames	X		X								X		X	
	08 31 13	Access Doors and Frames	X										X		X	
	08 33 23	Overhead Coiling Doors	X		X								X		X	
	08 33 26	Overhead Coiling Grilles	X		X								X		X	
	08 33 36	Side Sliding Grilles	X		X								X		X	
	08 35 16	Folding Grilles	X		X								X		X	
	08 36 13	Sectional Doors	X		X		X						X		X	
	08 36 14	Bascart Sectional Doors	X		X		X						X		X	
X	08 38 00	Traffic Doors	O		O								X	X		
	08 41 13	Aluminum Framed Entrances and Store-fronts	X		X	X						X	X	X	X	
	08 42 29	Automatic Entrances	X		X							X	X	X	X	
	08 56 59	Pharmacy Service Window Unit	O		O							O	X	X	X	
	08 62 00	Unit Skylights	O		O								X			
	08 71 00	Door Hardware	X		X		X					X	X		X	
	08 80 00	Glazing	X									X	X		X	
	08 90 00	Louvers and Vents	X		X	X						X	X		X	
FINISHES																
	09 01 50	Acoustical Tile Restoration	X									X	X		X	
X	09 22 16	Non-Structural Metal Framing	X										X			
	09 24 23	Portland Cement Synthetic Stucco	X		X	X							X		X	
X	09 30 00	Tiling	X			X							X		X	

SUBMITTAL CHECKLIST															
Required Submittals	Section Number	Section Name/Submittal Item	Submittal Type								Review Responsibility				
			Product Data	Design/Design Mixes	Shop Drawings	Samples	Schedules/Lists/Forms	Qualification Data	Certificates/Letters	Reports/Records	O & M Data/Warranty	Contractor	Owner	A/E Team	Testing Agency
X	09 65 13	Resilient Base and Accessories	X			X						X		X	
	09 65 16	Resilient Sheet Flooring	X			X						X		X	
X	09 65 19	Resilient Tile Flooring	X			X					X	X		X	
X	09 67 23	Resinous Flooring	X			X		X		X	X	X	X	X	
X	09 68 13	Tile Carpeting	X									X	X	X	
	09 72 16	Vinyl-Coated Fabric Wallcovering	X									X	X	X	
X	09 91 00	Painting	X			X						X	X	X	
SPECIALTIES															
	10 14 43	Photoluminescent Exit Signage	X		X				X			X		X	
	10 21 13	Toilet Compartments	O		O							X	X	X	
X	10 26 00	Wall, Door, and Fixture Protection	X									X	X		
X	10 28 13	Toilet Accessories	O X		O X							X	X	X	
	10 31 00.01	Manufactured Gas Fireplaces	X		X	X						X	X		
	10 31 00.02	Manufactured Electric Fireplaces	X		X	X						X	X		
	10 73 16	Manufactured Canopies	X	X	X	X						X	X		
	10 82 13	Equipment Screens	X		X	X						X	X	X	
	10 82 33	Post and Glass Partitions	X		X	X						X		X	
EQUIPMENT															
X	11 13 00	Loading Dock Equipment	X		X			X				X	X	X	
X	11 41 03	Prefabricated Insulated Wall Panels	O		O							X	X	X	
X	11 41 13	General Store Fixture Installation	O		O		O				O	X	X		
X	11 41 22	Refrigerated Fixture Installation	O		O						O	X	X		

SUBMITTAL CHECKLIST																
Required Submittals	Section Number	Section Name/Submittal Item	Submittal Type								Review Responsibility					
			Product Data	Design/Design Mixes	Shop Drawings	Samples	Schedules/Lists/Forms	Qualification Data	Certificates/Letters	Reports/Records	O & M Data/Warranty	Contractor	Owner	A/E Team	Testing Agency	
X	11 41 33	Fixture and Equipment Plumbing Connections	O		O							O	X	X		
X	11 41 34	Fixtures and Equipment Condensate Drain Connections	O		O							O	X	X		
X	11 41 43	Refrigeration System Installation	O		O X		X				X	O X	X	X		
X	11 41 46	EMS Controls Installation	O		O							O X	X	X		
X	11 41 63	Fixture and Equipment Electrical Installation	O		O			X				O X	X	X		
FURNISHINGS																
	12 21 13	Horizontal Louver Blinds	X		X								X		X	
	12 24 13	Roller Window Shades	X									X	X		X	
SPECIAL CONSTRUCTION																
	13 34 13	Greenhouse and Outside Sales Area	O		O								X		X	
CONVEYING EQUIPMENT																
	14 20 13	Freight Elevators	X		X			X	X		X		X		X	
	14 20 23	Passenger Elevators	X		X			X	X		X		X		X	
	14 20 43	Service Elevators	X		X			X	X		X		X		X	
	14 26 00	Limited Use Limited Application Elevators	X		X			X	X		X		X		X	
	14 43 19	Vertical Reciprocating Conveyor	X		X								X		X	
COMMON WORK RESULTS FOR FACILITY SERVICES																
X	20 05 29	Hangers And Supports For Facility Services	X										X		X	
	20 05 48	Vibration And Seismic Control For Facility Services	X		X				X	X			X		X	
FIRE SUPPRESSION																
X	21 10 00	Water Based Fire Suppression Systems	X	X	X						X	X	X	X	X	

SUBMITTAL CHECKLIST															
Required Submittals	Section Number	Section Name/Submittal Item	Submittal Type									Review Responsibility			
			Product Data	Design/Design Mixes	Shop Drawings	Samples	Schedules/Lists/Forms	Qualification Data	Certificates/Letters	Reports/Records	O & M Data/Warranty	Contractor	Owner	A/E Team	Testing Agency
PLUMBING															
X	22 05 00	Common Work Results for Plumbing	X					X				X	X	X	
	22 05 33	Heat Tracing	X							X	X	X		X	
	22 05 80	Plumbing Connections to Vendor Kiosk			O							X		X	
X	22 07 00	Plumbing Insulation	X									X	X	X	
X	22 11 00	Facility Water Distribution	X O							X	X O	X		X	
X	22 13 00	Facility Sanitary Sewerage			X					X		X		X	
	22 14 00	Facility Storm Drainage								X		X		X	
	22 14 29	Sump Pumps	X		X						X	X		X	
	22 30 00	Plumbing Equipment	X								X	X		X	
X	22 42 00	Commercial Plumbing Fixtures	O X								O	X	X	X	
HVAC															
X	23 05 00	Common Work Results for HVAC	X					X				X	X	X	
	23 07 00	HVAC Insulation	X							X		X		X	
X	23 09 13	Instrumentation and Control Devices for HVAC	O		O							X	X		
	23 31 13	Metal Ducts	X		X							X		X	
	23 31 16	Nonmetal Ducts	X		X							X		X	
	23 33 00	Air Duct Accessories	X		X							X		X	
	23 34 23	Power and Gravity Ventilators	O		O							X		X	
	23 37 00	Air Outlets and Inlets	X				X					X		X	
	23 28 13	Commercial Kitchen Hoods	O		O							X	X	X	
	23 55 13	Duct Heaters	X		X							X		X	

SUBMITTAL CHECKLIST															
Required Submittals	Section Number	Section Name/Submittal Item	Submittal Type								Review Responsibility				
			Product Data	Design/Design Mixes	Shop Drawings	Samples	Schedules/Lists/Forms	Qualification Data	Certificates/Letters	Reports/Records	O & M Data/Warranty	Contractor	Owner	A/E Team	Testing Agency
	23 55 23	Fuel Fired Unit Heaters	X		X							X		X	
X	23 74 13	Air Conditioning/Air Handling Units	O		O						O	X	X	X	
ELECTRICAL															
X	26 05 00	Common Work Results for Electrical	X					X				X	X	X	
X	26 05 19	Low Voltage Electrical Power Conductors And Cables	O X				X				X	X	X		
X	26 05 26	Grounding and Bonding for Electrical Sys-tems	O X				X				X	X	X		
X	26 05 33	Raceways and Boxes for Electrical Sys-tems	O X		X							X	X	X	
	26 05 80	Electrical Connections to Vendor Kiosk			O							X	X	X	
	26 22 00	Low Voltage Transformers	O		O							X	X	X	
	26 24 13	Switchboards	O		O							X	X	X	
X	26 24 16	Panelboards	O		O							X	X	X	
X	26 27 26	Wiring Devices	O X		O X							X	X		
X	26 28 00	Low Voltage Circuit Protective Devices	O X	X							O X	X	X		
X	26 28 16	Enclosed Switches and Circuit Breakers	O		O							X	X	X	
X	26 29 00	Low Voltage Controllers	O		O							X	X		
	26 32 13	Engine Generators	O		O					O		X	X	X	
X	26 50 00	Lighting	O		O				O	X		X	X		
ELECTRONIC SAFETY AND SECURITY															
X	28 10 00	Security and Access Control System	X		X		X		X			X	X	X	
X	28 31 00	Fire Detection and Alarm System	X		X		X		X			X	X	X	

SUBMITTAL CHECKLIST															
Required Submittals	Section Number	Section Name/Submittal Item	Submittal Type									Review Responsibility			
			Product Data	Design/Design Mixes	Shop Drawings	Samples	Schedules/Lists/Forms	Qualification Data	Certificates/Letters	Reports/Records	O & M Data/Warranty	Contractor	Owner	A/E Team	Testing Agency
EARTHWORK															
	31 20 00	Earth Moving							X			X	X	X	X
	31 25 00	Erosion and Sedimentation Control					X					X	X		X
EXTERIOR IMPROVEMENTS															
	32 12 16	Asphalt Paving		X					X		X	X	X		X
	32 13 13	Concrete Paving	X	X								X	X		X
	32 13 73	Paving Joint Sealants	X			X						X	X		X
	32 14 00	Unit Paving	X			X						X	X		X
	32 17 00	Paving Specialties	X			X						X	X		
	32 31 13	Chain Link Fences and Gates			X							X	X		
	32 31 19	Decorative Metal Fences and Gates	X		X	X						X	X	X	
	32 32 23	Segmental Retaining Walls	X	X		X						X		X	X
	32 84 00	Planting Irrigation	X		X						X	X	X	X	
	32 90 00	Planting		X		X			X		X	X	X	X	
UTILITIES															
	33 11 00	Water Utility Distribution Piping	X									X	X	X	X
	33 31 00	Sanitary Utility Sewerage Piping	X								X	X	X	X	X
	33 41 00	Storm Utility Drainage Piping	X		X							X	X	X	X
	33 52 00	Liquid Fuel Distribution	O X						X	X	O X	X	X	X	

END OF SECTION 00 62 13

BLANK SHEET

SECTION 00 62 75 - REQUEST FOR PAYMENT

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Request for Payment form is located on the Owner's Project Management Website in Microsoft® Excel® format.
1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
 2. Download the following Working Form and follow the instructions to complete:

00_62_75_Request_For_Payment.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 62 75

BLANK SHEET

SECTION 00 62 88 - DAILY WORK REPORT

DAILY WORK REPORT

LOCATION _____

WEEK OF _____ NO. _____

BY TRADES	MON	TUE	WED	THURS	FRI	SAT	SUN
Office Force							
Laborers							
Carpenters							
Iron Workers (rein.)							
Iron Workers (struc.)							
Equipment Operators							
Brick Masons							
Brick Masons' Helpers							
Plumbers							
Pipe Fitters							
Electricians							
Sheet Metal (Htg & Vent)							
Painters							
Cement Finishers							
Truck Drivers							
Roofers							
Sheet Metal							
Total Count							

Report to be filled in daily and uploaded to the Owner's Project Website (site|folio). Keep accurate records and indicate on reverse side work accomplished each day.

Weather Temperature Controls							
	MON	TUE	WED	THURS	FRI	SAT	SUN
Weather							
Temperature Hi-Lo							

Superintendent _____

DAILY WORK REPORT	
Description of work performed today by General Contractor and by subcontractors	
MONDAY	
TUESDAY	
WEDNESDAY	
THURSDAY	
FRIDAY	
SATURDAY	
SUNDAY	

END OF SECTION 00 62 88

SECTION 00 63 58 - SUBCONTRACTORS CHANGE ORDER PROPOSAL

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Subcontractor's Change Order Proposal form is located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Form and follow the instructions to complete:

00_63_58_Subcontractors_Change_Order_Proposal.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 63 58

BLANK SHEET

SECTION 00 65 19 - GENERAL CONTRACTOR'S PROGRESS AFFIDAVIT

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The General Contractor's Progress Affidavit is located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Form and follow the instructions to complete:

00_65_19_General_Contractors_Progress_Affidavit.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 65 19

BLANK SHEET

SECTION 00 65 20 - SUBCONTRACTOR'S PROGRESS AFFIDAVIT

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Subcontractor's Progress Affidavit is located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Form and follow the instructions to complete:

00_65_20_Subcontractors_Progress_Affidavit.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 65 20

BLANK SHEET

SECTION 00 65 21 - CONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Conditional Waiver and Release Upon Progress Payment is located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Form and follow the instructions to complete:

00_65_21_Conditional_Waiver_And_Release_Upon_Progress_Payment.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 65 21

BLANK SHEET

SECTION 00 65 22 - UNCONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Unconditional Waiver and Release upon Progress Payment is located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Form and follow the instructions to complete:

00_65_22_Unconditional_Waiver_And_Release_Upon_Progress_Payment.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 65 22

BLANK SHEET

SECTION 00 65 25 - GENERAL CONTRACTOR'S FINAL AFFIDAVIT

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The General Contractor's Final Affidavit is located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Form and follow the instructions to complete:

00_65_25_General_Contractors_Final_Affidavit.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 65 25

BLANK SHEET

SECTION 00 65 26 - SUBCONTRACTOR'S FINAL AFFIDAVIT

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Subcontractor's Final Affidavit is located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Form and follow the instructions to complete:

00_65_26_Subcontractors_Finals_Affidavit.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 65 26

BLANK SHEET

SECTION 00 65 27 - CONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Conditional Waiver and Release upon Final Payment is located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Form and follow the instructions to complete:

00_65_27_Conditional_Waiver_And_Release_Upon_Final_Payment.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 65 27

BLANK SHEET

SECTION 00 65 28 - UNCONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT

PART 1 - GENERAL

1.1 LOCATION OF FORMS

- A. The Unconditional Waiver and Release upon Final Payment is located on the Owner's Project Management Website in Microsoft® Excel® format.

1. See Division 00 Section "Bidders Instructions for Electronic Form Retrieval" for downloading instructions.
2. Download the following Working Form and follow the instructions to complete:

00_65_28_Unconditional_Waiver_And_Release_Upon_Final_Payment.xls

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 65 28

BLANK SHEET

SECTION 00 65 36 - WARRANTY FORMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. The following warranty forms:
 - a. Building Warranty
- B. Warranty forms are included on the following pages.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

(See the following pages for warranty forms)

KROGER BUILDING WARRANTY

Date: _____ 20 ____

TO: THE KROGER CO., ITS SUBSIDIARIES AND AFFILIATES

The undersigned, _____

having heretofore entered into a contract with The Kroger Co., its subsidiaries and affiliates, dated

_____ 20 ____ for the construction of a _____

located at _____

according to certain plans and specifications prepared by _____

and in accordance with the terms of said contract do hereby guarantee that all the labor and material furnished and work performed by us under said contract is in conformity with such plans and specifications and authorized alterations thereto and that such building and equipment installed pursuant to said contract is free from imperfect workmanship and materials, and we agree to repair at our own cost and expense all of the work covered under said contract and change orders which may prove to be defective for a period of one year from the date hereof. Furthermore, we agree to repair at our sole cost any work, which we may affect or disturb in making the repairs herein contemplated.

By: _____

Title: _____

Warranty period begins at Contract completion date.

SECTION 00 72 14 - GENERAL CONDITIONS - SMALL PROJECT

TABLE OF ARTICLES

Article 1	General Provisions
Article 2	Owner
Article 3	Contractor
Article 4	Administration of the Contract
Article 5	Subcontractors and Material Suppliers
Article 6	Construction by Owner or by Separate Contractors
Article 7	Changes in the Work
Article 8	Time
Article 9	Payment and Completion
Article 10	Protection of Persons and Property
Article 11	Insurance and Bonds
Article 12	Uncovering and Correction of Work
Article 13	Miscellaneous Provisions
Article 14	Termination or Suspension of the Contract
Article 15	Claims and Disputes
Article 16	Submittals

ARTICLE 1 GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 Certain terms and words used throughout these Contract Documents shall be defined as follows:

1.1.1.1 **Procurement Requirements:** Consist of the Invitation to Bid, Instructions to Bidders, the Trade Proposal Form, and other sample bidding and contract forms.

1.1.1.2 **Agreement:** A legal instrument executed by the Owner and the Contractor binding the parties to the terms of the Contract. The Agreement defines the relationships and obligations between the Owner and Contractor. It incorporates all other Contract Documents by reference.

1.1.1.3 **Contract Documents:** Consist of the Procurement Requirements, the Agreement between Owner and Contractor (hereinafter the Agreement), General Conditions, Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract.

- 1.1.1.4 **Contract:** The Contract Documents form the Contract for Construction. The Contract for Construction or Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral.
- 1.1.1.5 **Project Management Website (PMW):** Owner's project administration, coordination, and communication website, hosted by Site|folio, for submitting projects documents and other information for exchange and approval and final storage.
- 1.1.1.6 **Work:** The construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.
- 1.1.1.7 **Project:** The total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.
- 1.1.1.8 **Drawings:** The graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.
- 1.1.1.9 **Specifications:** The portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.
- 1.1.1.10 **Project Manual:** The Project Manual is a volume assembled for the Work which may include the Procurement Requirements, sample forms, Conditions of the Contract and Specifications.
- 1.1.1.11 **Owner:** The person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's Project Manager.
- 1.1.1.12 **Contractor:** The person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative.
- 1.1.1.13 **Subcontractor:** The person or entity contracted with the Contractor, either directly or indirectly, to provide Work to the Project.
- 1.1.1.14 **Material Supplier:** Material supplier who is to furnish materials for the Project.
- 1.1.1.15 **Architect:** The person lawfully licensed to practice architecture or an entity lawfully practicing architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The

term "Architect" means the Architect, the Architect's consultants, or the Architect's representative.

- 1.1.1.16 **Owner's Milestones:** Dates the Owner has identified that certain items must be completed by which are essential to the completion of the project. Dates are indicated on schedule agreed to by the Contractor and Owner.
- 1.1.1.17 **MBE:** Minority-Owned Business Enterprise: Fifty-one percent ownership of business by a minority group member (African Americans, Hispanic Americans, Asian-Pacific Americans, Asian-Indians, Native Americans). If publicly owned business, at least 51 percent of the stock is owned by one or more minority group member; and management and daily operation of the business are controlled by those minority group members; and business must be located in the United States or its trust territories; and the minority group members must be U.S. citizens.
- 1.1.1.18 **WBE:** Women-Owned Business Enterprise: Fifty-one percent ownership of business by a woman or women. If publicly owned business, at least 51 percent of the stock is owned by one or more women; and management and daily operation of the business are controlled by women; and business must be located in the United States or its trust territories; and the female ownership/management must be U.S. citizens.
- 1.1.1.19 **DBE:** Diverse-Owned Business Enterprise: Fifty-one percent ownership of business by a veteran, service disabled veteran, lesbian, gay, bisexual, or transgender. If publicly owned business, at least 51 percent of the stock is owned by one or more minority group members; and management and daily operation of the business are controlled by those minority group members; and business must be located in the United States or its trust territories; and the minority group members must be U.S. citizens.

1.2 REFERENCES

- 1.2.1 Reference to the printed codes, guides, or standard specifications of any Institute, Society or other organization or to any manufacturer's installation directions, shall be the latest edition thereof, unless laws, ordinances, rules or regulations require compliance with a specific edition, in which case the reference shall be to such edition.

1.3 DRAWINGS AND SPECIFICATIONS

- 1.3.1 Drawings and Specifications are complementary and what is called for by one shall be as binding as if called for by both. Should the drawings, specifications and/or other instructions be contradictory in any particular, or should there be apparent errors in either, or should there be any doubt as to the meaning of either, the Contractor shall refer the matter to the Owner whose decision thereon shall be conclusive.
- 1.3.2 Figures shall have precedence over scaled measurements and details over general drawings.
- 1.3.3 For convenience of reference, the specifications are separated in sections each bearing a title. Other sections and titles may appear throughout the Contract Documents. Such

facts shall not be deemed to be nor shall they be the basis for any request that the Owner make a designation as to the limits of any phase of the Project, or as to what trade shall perform any part thereof. The Contractor shall keep one copy of all drawings and specifications at the site, in good order, available to the Owner.

- 1.3.4 Contract Documents are available to the Contractor on the Owner's Project Management Website (PMW). All copies of drawings and specifications downloaded from the Owner's Project Management Website (PMW) or furnished from a reproduction company are the property of the Owner and shall not be used on any other work.

1.4 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

- 1.4.1 The intent of the Contract Documents is to provide a complete functioning structure or installation as indicated.
- 1.4.2 The transportation, unloading, storing, erection or installation, testing as indicated, and making operable of all parts of the Project shall be included under this Contract, at times appropriate thereto.

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

- 1.5.1 The Drawings, Specifications and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants are instruments of service through which the Work to be executed by the Contractor is described. The Contractor may retain one record set. Neither the Contractor nor any Subcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications and other documents prepared by the Architect or the Architect's consultants. All copies of instruments of service, except the Contractor's record set, shall be returned or suitably accounted for to the Owner, on request, upon completion of the Work. The Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants, and copies thereof furnished to the Contractor, are for use solely by the Owner. They are not to be used by the Contractor or any Subcontractor or material or equipment supplier on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner. The Owner authorizes the Contractor, Subcontractors and material or equipment suppliers to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of copyrights or other reserved rights.

ARTICLE 2 OWNER

2.1 OWNER'S STORAGE OF MATERIALS OR INSTALLATION OF EQUIPMENT

- 2.1.1 The Owner reserves the right to store materials or install fixtures or equipment in any or all Project buildings before acceptance of the Project and without implying thereby any acceptance of the Project.

2.2 WAIVERS

- 2.2.1 The Owner shall be entitled to waive, in writing, any obligation of the Contractor provided herein; however, any such waiver shall not constitute a future waiver of same or any other obligation.

ARTICLE 3 CONTRACTOR

3.1 SUBSTITUTIONS

- 3.1.1 No substitutions or variations from the Specifications and Drawings, other than those which are approved in writing by the Owner from the official substitution sheet and incorporated into the Agreement, will be permitted after the Agreement is signed. The Contractor shall have the right, after entering into the Agreement, to request the Owner's approval of a substitute material generally considered to be equal to that named in the Contract Documents. Requests for approval of any substitute must be submitted in writing to the Owner, together with all necessary supporting data, within 15 days after the signing of the Agreement. The Owner shall be the sole judge of the suitability, acceptability and equality of the substitute material and may accept or reject the same. No material, not accepted by the Owner in writing, may be substituted for a specified material. If the substitution of any material or equipment increases costs in any way, these costs shall be borne by the Contractor.
- 3.1.2 If the individual specification sections state that no substitutions are allowed, the Contractor shall not propose any substitutions for that product on the Official Substitution Sheet.

3.2 PROJECT MANAGEMENT

3.2.1 Project Management Website (PMW)

- 3.2.1.1 The Contractor shall use the Owner's PMW for purposes of managing project communication and documentation until Final Completion. The PMW will include the following:
 - 3.2.1.1.1 Project directory. – Owner's listing of the key project team members.
 - 3.2.1.1.2 Project correspondence. – ASIs, RFIs, and PRs.
 - 3.2.1.1.3 Meeting minutes. - Uploaded to the appropriate project file folder.
 - 3.2.1.1.4 Contract modifications forms and logs. - i.e., COP's and CO's.
 - 3.2.1.1.5 RFI forms and logs.

- 3.2.1.1.6 Photo documentation. - Upload to the appropriate project "Photos" page.
- 3.2.1.1.7 Schedule. - Upload to the appropriate project file folder.
- 3.2.1.1.8 Submittals, forms, and logs. - Upload to the appropriate project file folder.
- 3.2.1.1.9 Payment application forms. - Upload to the appropriate project file folder.
- 3.2.1.1.10 Drawing and specification document hosting, viewing, and updating.
- 3.2.1.1.11 Reminder and tracking functions.
- 3.2.1.1.12 Archiving functions. - Such as the Contractor's employees who are no longer employed by the Contractor.
- 3.2.2 Project Correspondence: All correspondence shall be communicated in the form of RFI's- and transmitted via the PMW.
- 3.2.3 Preconstruction Meeting:
 - 3.2.3.1 The Contractor shall schedule a preconstruction meeting before starting construction no later than 7 days after execution of the Agreement. The meeting shall be held at Project site or another convenient location. The Contractor shall conduct the meeting to review responsibilities and personnel assignments.
 - 3.2.3.2 Attendees: Authorized representatives of the Owner, the Architect, and its consultants; the Contractor and its superintendent; Subcontractors; Material Suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
- 3.2.4 SWPPP (Storm Water Pollution Prevention Plan) Preconstruction Meeting:
 - 3.2.4.1 The Contractor shall schedule a preconstruction meeting before earth disturbing activities commence. The meeting shall be held at the Project site. The Contractor shall conduct and document the meeting per the Contract Documents and the Owner's Storm Water Pollution Prevention Plan.
- 3.2.5 Progress Meetings:
 - 3.2.5.1 The Contractor shall conduct progress meetings at weekly intervals and shall coordinate dates of meetings with preparation of payment requests.
 - 3.2.5.2 Attendees: In addition to representatives of the Owner, Contractor, Subcontractor, Material Supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting

shall be familiar with the Project and authorized to conclude matters relating to the Work.

- 3.2.5.3 Minutes: Contractor will record and electronically distribute meeting minutes to designated representatives within 24 hours of the completion of the meeting.

3.2.6 Post Construction Meeting:

- 3.2.6.1 When requested by the Owner, the Contractor shall conduct a post construction meeting at Project site two weeks after fixturing begins to discuss any activities remaining and to evaluate success of the Project.

- 3.2.6.2 The Contractor shall submit Record Drawings (red-lined as-built drawings) to Owner prior to meeting transmitted via the PMW.

- 3.2.6.3 Attendees: Authorized representatives of the Owner, the Architect, and their consultants; the Contractor and its superintendent; major Subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.

3.2.7 Warranty Meeting:

- 3.2.7.1 The Contractor shall conduct a warranty meeting at the Project site one year after completion of the Work including a walk-through to identify and discuss any issues and problems that arose during the one-year warranty period.

- 3.2.7.2 The Contractor shall provide a detailed report of the meeting identifying items to be corrected, transmitted via the PMW.

- 3.2.7.3 Attendees: Authorized representatives of the Owner, the Contractor, and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

3.2.8 Requests For Information (RFIs)

- 3.2.8.1 Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI to the Owner, transmitted via the PMW. Submit RFIs in sequential order. Complete the request portion and include drawings or additional information as PDF attachments. The "Need Response By" date must be entered to validate request. A properly executed new RFI will be distributed to Architect and Owner, and the RFI log will be updated.

- 3.2.8.1.1 Only the Contractor may submit an RFI. Architect or Owner will return RFIs submitted by other entities.

- 3.2.8.1.2 The need for an RFI does not necessarily constitute grounds for a Change Order.

- 3.2.8.2 Architect will review each RFI, determine action required, and respond. Allow 72 hours for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 - 3.2.8.2.1 The following types of RFIs are considered unnecessary and will be returned without action:
 - 3.2.8.2.1.1 Requests for approval of submittals.
 - 3.2.8.2.1.2 Requests for approval of substitutions.
 - 3.2.8.2.1.3 Requests for information already indicated in the Contract Documents.
 - 3.2.8.2.1.4 Requests for adjustments in the Contract Time or the Contract Sum.
 - 3.2.8.2.1.5 Requests for interpretation of Architect's actions on submittals.
 - 3.2.8.2.1.6 Incomplete RFIs or inaccurately prepared RFIs.
 - 3.2.8.2.2 Architect and Owner may claim compensation for the cost of their time and materials as a result of unnecessary RFIs. Compensation will be assessed from the Contractor in accordance with the General Conditions.
- 3.2.8.3 Upon receipt of Architect's and/or Owner's action, immediately distribute the RFI response to affected parties transmitted via the PMW.
 - 3.2.8.3.1 Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 - 3.2.8.3.2 Notify Architect and Owner within three days if Contractor disagrees with response.
- 3.2.8.4 Notify Architect and Owner within five days if Contractor believes response in RFI involves additional construction cost or time.

3.3 CONSTRUCTION PROGRESS DOCUMENTATION

- 3.3.1 Construction Progress Schedule: Two days after award of the Contract, the Contractor shall furnish the Owner with a "Construction Progress Schedule" that indicates the proposed progress with the total number of days agreeing with the "Time for Completion" days listed in the Agreement Between Owner and Contractor.
 - 3.3.1.1 The Construction Progress Schedule shall include delivery and installation dates for all Owner Direct Buy items.
 - 3.3.1.2 All dates in the Construction Progress Schedule must be accepted in writing by both the Owner and the Contractor.

- 3.3.1.3 The Contractor shall begin Work within one week after award of the Contract and progress substantially with the "Construction Progress Schedule" and complete all Work within the time shown thereon, unless delayed by jurisdictional or general strikes beyond the control of the Contractor, Act of God, or national emergency.
- 3.3.2 Submittals Schedule: The Contractor shall provide a submittals schedule with the Construction Progress Schedule arranged in chronological order by dates including time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery.
 - 3.3.2.1 Submittal Checklist: The Contractor shall include the completed Submittal Checklist (Division 00 Section "Submittals Checklist") with the Submittals Schedule.
- 3.3.3 Construction Photographs: Contractor shall take a minimum of ten photographs weekly documenting the construction progress.
 - 3.3.3.1 Upload Construction Photographs to the PMW exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 3.3.3.2 Include date and time in file name for each image.
 - 3.3.3.3 When utilizing unmanned aircraft systems (UAS), Contractor must comply with the Kroger Unmanned Aircraft Systems Best Practices Manual and complete the application attached within. Request Manual from Owner.
 - 3.3.3.4 Contractor shall obtain Unmanned Aerial Systems (UAS) Liability Insurance as described in Article 11.
- 3.4 LABOR AND MATERIALS
 - 3.4.1 Unless otherwise specified, all materials and equipment items shall be new. When required by the Owner, the Contractor shall provide certificates of conformance for materials specified.
 - 3.4.2 The Contractor's employees, Subcontractors and other persons carrying out the work shall be properly attired and shall not wear any attire that is deemed inappropriate or offensive to the public or Owner.
 - 3.4.3 Existing Materials: The Owner reserves the right to retain ownership of existing fixtures, equipment, and other items (assets). The Contractor shall remove and handle existing assets deemed sold or retained by Owner in such a manner that will prevent damage and loss including but not limited to safeguarding the assets from theft.
 - 3.4.3.1 Existing Owner assets will not be deemed abandoned unless Owner notifies Contractor of such in writing.
 - 3.4.4 Product Delivery, Storage, and Handling: The Contractor shall deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including but not limited to theft, and shall comply with manufacturer's written

instructions. The Contractor shall provide a secure location and enclosure at Project site for storage of materials and equipment by the Owner's construction forces and shall coordinate location with the Owner.

- 3.4.5 Product Warranties: Warranties specified in the Contract Documents shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of any obligations of the Contract Documents.

3.4.6 Product Selection Procedures:

3.4.6.1 Manufacturer: Where Specifications name a single manufacturer, the Contractor shall provide a product by the named manufacturer that complies with requirements. No substitutions are allowed.

3.4.6.2 Product: Where Specifications name a single product, the Contractor shall provide the named product. No substitutions are allowed.

3.4.6.3 Manufacturers: Where Specifications include a list of manufacturers' names, the Contractor shall provide a product by one of the manufacturers listed that complies with requirements or a substitution approved by the Owner that complies with requirements.

3.4.6.4 Products: Where Specifications include a list of names of both products and manufacturers, the Contractor shall provide one of the products listed that complies with requirements or a substitution approved by the Owner that complies with requirements.

3.4.6.5 Basis-of-Design Product: There are certain "Basis of Design" products listed in the specifications that the Owner has investigated as an appropriate product for the Project. Where Specifications name a product as "Basis-of-Design," provide one of the following:

3.4.6.5.1 The specified product

3.4.6.5.2 A substitution approved by the Owner of a product comparable to the specified product of one of the other named manufacturers. Furnish the proposed product's actual samples, data sheets, and certificates of performance along with the "Basis of Design" product's actual samples, data sheets, and certificates of performance as a comparison.

3.4.6.5.3 A substitution approved by the Owner of a product comparable to the specified product of any manufacturer if no other manufacturers listed. Furnish the proposed product's actual samples, data sheets, and certificates of performance along with the "Basis of Design" product's actual samples, data sheets, and certificates of performance as a comparison.

3.4.6.6 Comply with provisions in Paragraph 3.1 for consideration of an unnamed product by the other named manufacturers or a product by another manufacturer.

3.4.7 Owner's National Account Agreement: Certain material, equipment, and labor costs have been negotiated with the Owner through various suppliers. The Contractor shall utilize these materials, equipment, and labor on the Project and include the National Account Agreement costs for material, equipment, and labor in their Bids. No substitutions are allowed.

3.4.7.1 The Contractor shall provide all other items and labor not included in the National Account Agreement necessary for a complete installation.

3.5 TEMPORARY FACILITIES

3.5.1 The Contractor shall provide, at the Contractor's expense, all temporary facilities and utilities (adequate for the Contractor, all Subcontractors, and the Owner's other contractors) from the commencement of the Project until acceptance by the Owner. The Owner shall be the sole judge of the adequacy thereof. Specifically, the Contractor shall provide not less than the following:

3.5.1.1 A temporary building (jobsite trailer), adequately lighted, air conditioned, and heated, for use as a field office. Temporary building (jobsite trailer) may be deleted if approved by Owner.

3.5.1.2 A computer in the field office with a high-speed internet connection to access email and the Owner's PMW and a router (ethernet or wireless) to allow Owner to access the website while Contractor's computer is in use. Include a printer, copier, and scanner.

3.5.1.3 Safety Cabinet: Metal or plastic cabinet of sufficient size to store the following OSHA approved safety gear for Owner and guests at the Project Site. Maintain safety gear in good and clean condition at all times in jobsite trailer.

3.5.1.3.1 Four hard hats.

3.5.1.3.2 Four safety vests.

3.5.1.3.3 Four safety glasses.

3.5.1.4 Temporary waterproof sheds with raised floors for storing materials.

3.5.1.5 Temporary water service with a minimum 1-inch water line available within 50 feet of the building. Temporary water service may be deleted if approved by Owner.

3.5.1.6 Temporary power, 120 volt single phase service.

3.5.1.7 Toilet facilities for all workers at the Project, located where approved by the Owner and complying with local laws, ordinances, rules and regulations. Toilet facilities may be deleted if approved by Owner.

- 3.5.1.8 Minimum temporary heating, cooling, and ventilation and humidity control required by construction activities and material manufacturers' instructions for curing or drying of completed installations, protecting installed construction from adverse effects of low temperatures, providing protection and comfort for installers, and delivering high quality workmanship of all trades throughout the Project. Select equipment that will not have a harmful effect on completed installations or elements being installed. The Contractor may elect to use owners heating and cooling equipment for temporary use if approved in writing by the Owner prior to operating.
- 3.5.1.9 Runways, ladders, guards, etc. leading from lower level to all upper levels and the roof, conveniently serving each level and complying with local laws, ordinances, rules and regulations.
- 3.5.1.10 Temporary Enclosures: When required, provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 3.5.1.10.1 Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.
- 3.5.1.11 Temporary Partitions: Provide and install where indicated on Drawings or as indicated by Owner.
- 3.5.1.12 Air-Handling Equipment Protection: The Contractor shall be responsible for protecting the air handling equipment and any associated ductwork from physical damage and infiltration of dust and dirt into the system. The Contractor shall also be responsible for replacing dirty air filters during the course of construction and providing new air filters in units at the time of the building turnover.
- 3.5.1.13 Temporary roadways, staging areas, and construction parking with positive drainage carrying water away from these areas, when the Contractor is responsible for the sitework. All temporary roadways shall be suitable to support all construction vehicles, tractor-trailers, and construction equipment from the public road access to the building, staging area, and construction personnel parking.
- 3.5.1.14 Waste-collection containers (dumpsters) in sizes adequate to handle waste from construction operations and complying with requirements of authorities having jurisdiction.
- 3.5.2 Construction Sign: The Owner may elect to install a construction sign on the Project Site at the Owner's option. If the Owner does not elect to install a construction sign on the Project Site, the Contractor may install a construction sign on the Project Site at the Contractor's option meeting the following criteria:
 - 3.5.2.1 Shall be 4-feet by 8-feet, or size as directed by Owner or local jurisdiction.

- 3.5.2.2 Sign graphics shall contain the Owner's name (most prominent), Project name, General Contractor's name, Architect's name and Architect's consultants' names.
- 3.5.2.3 Constructed of painted plywood or vinyl membrane similar to banner sign material, and securely fastened to plywood.
- 3.5.2.4 Shall be adequately supported and braced as required.
- 3.5.2.5 Top of sign shall be eight feet above grade, with the four feet board dimension vertical or as required by local authority having jurisdiction.
- 3.5.2.6 May be reused as long as they appear to be in good condition as determined by the Owner.
- 3.5.2.7 Must be maintained in good condition through the duration of the Project.
- 3.5.2.8 Shall be submitted and approved by the Owner and the Architect prior to ordering.
- 3.5.2.9 Shall be constructed and installed at Contractor's expense.
- 3.5.3 The Contractor shall pay for all water, power, fuel, etc. used during the execution of the Project, whether from temporary or permanent facilities. Before acceptance of the Project by the Owner, the Contractor shall remove all temporary utilities and restore to pre-existing conditions any area disturbed by the same.
- 3.5.4 All damage to the building, streets, sidewalks, lawns or other features of the site resulting from any operation connected with any of the Work shall be repaired by Contractor at its expense and to the satisfaction of the Owner.
- 3.5.5 Environmental Protection: The Contractor shall provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution, or other undesirable effects. The Contractor shall avoid using tools and equipment that produce harmful noise and shall restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near the Project site.
- 3.5.6 Storm Water Control: The Contractor shall operate temporary construction facilities in compliance with all federal, state, and local authorities having jurisdiction over the Project. The Contractor shall comply with the Contract Documents and the Owner's Storm Water Pollution Prevention Plan (SWPPP).
 - 3.5.6.1 The Contractor shall provide positive flowing temporary drainage conducting storm water away from the building and all temporary and permanent roadways, parking lots, and storage areas.
- 3.5.7 Security Enclosure and Lockup: The Contractor shall install substantial temporary enclosures around partially completed areas of construction as indicated on the Drawings or as required by local authorities having jurisdiction including securing all openings in

the building. The Contractor shall provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

3.5.8 Temporary Fencing and Screening:

3.5.8.1 Fencing: The Contractor shall furnish and install in locations as indicated on the Drawings, galvanized-steel, chain-link fabric fencing, minimum **6 feet (1.8 m)** high with galvanized-steel pipe posts and top rail, and tension wire. The Contractor shall provide bases, bracing, and reinforcement to support posts and to prevent turnover by wind.

3.5.8.2 Screening: The Contractor shall furnish and install on fencing in locations as indicated on the Drawings, knitted HDPE high density green polyethylene screening full height of fence. The Contractor shall install screening in locations as indicated on the Drawings to screen unsightly exterior demolition and construction areas.

3.5.9 Building Security: For projects not currently under operation by the Owner, the Contractor shall be responsible to lock up and secure the building or building addition at the end of each workday until the building is substantially complete as described in Article 8.2. Upon Substantial Completion, the Contractor may submit a written request to transfer the responsibility of the building security to the Owner or Owner's appointed contractor.

3.5.10 Barricades, Warning Signs, and Lights: The Contractor shall comply with standards and code requirements for erecting structurally adequate barricades.

3.5.11 Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, the Contractor shall install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. The Contractor shall comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," as well as all OSHA requirements.

3.5.12 Termination and Removal: The Contractor shall remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion, and restore to pre-existing conditions any area disturbed by the same.

3.6 LAYOUT AND VERIFYING MEASUREMENTS

3.6.1 Verification: Before proceeding to lay out the Work, the Contractor shall verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, the Owner shall be notified promptly. The Contractor shall engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.

3.6.2 Field Measurements: The Contractor shall take field measurements as required to fit the Work properly and shall verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.6.3 The Contractor shall lay out the exact location of all partitions.

3.6.4 The Contractor shall provide and maintain well-built, adequate batter boards at all corners.

3.7 EXECUTION REQUIREMENTS

3.7.1 Existing Conditions:

3.7.1.1 The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, the Contractor shall investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work. Before construction, the Contractor shall verify the location and points of connection of utility services.

3.7.1.2 The Contractor shall not interrupt utilities serving facilities occupied by the Owner (if any) or adjacent owners unless approved by the Owner and then only after arranging to provide temporary utility services according to requirements indicated. The Contractor shall notify the Owner not less than two days in advance of proposed utility interruptions.

3.7.2 Examination and Acceptance of Conditions: Before proceeding with each component of the Work, the Contractor shall examine substrates, areas, and conditions, with installer or applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. The Contractor shall record observations and immediately report any condition detrimental to performance of the Work. The Contractor shall proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.7.3 Installation: The Contractor shall locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

3.7.3.1 The Contractor shall comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

3.7.4 Anchors and Fasteners: The Contractor shall provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

3.7.5 Starting And Adjusting: The Contractor shall start equipment and operating components to confirm proper operation. Malfunctioning units shall be removed, replaced with new units, and retested. The Contractor shall adjust operating components for proper operation without binding and shall adjust equipment for proper operation. Each piece of equipment shall be tested by the Contractor to verify proper operation including controls and safeties. The Contractor shall replace damaged and malfunctioning controls and equipment.

3.7.6 Correction Of The Work: The Contractor shall repair or remove and replace defective construction and restore damaged substrates and finishes.

3.8 WARRANTY

3.8.1 No payments made to the Contractor, nor partial or entire use of the Project by the Owner, shall be an acceptance of any work not done or made in accordance with the Agreement. The Contractor shall furnish a written warranty of all work done under the Agreement for a period of one year or as otherwise provided for longer or shorter periods of time. Such warranty shall be in the form prescribed by the Owner. The Contractor shall also furnish to the Owner all manufacturers' warranties for all equipment, appliances and fixtures specified or required and installed as a part of the Project. The Contractor, at its sole cost, shall remedy any defects due to faulty materials or workmanship and pay for any damage to other work resulting from such defects and/or the remedying thereof, which shall appear within the warranty period. Neither the foregoing nor any other provision in the Contract Documents, nor the time limit of any special warranty shall limit the Contractor's liability for defects or installations resulting from deliberate or other deviations from the Contract Documents to less than the legal limit of liability under the law of the place of building. The Owner shall give notice of observed defects with reasonable promptness. All warranties and bonds shall be delivered to the Owner before final payment is made.

3.8.2 Fixture and Equipment Installation Warranty: Contractor shall furnish a written special installation warranty for the following fixture and equipment installations when they are part of the Contractor's Contract. Warranty requirements and periods shall be as specified in Division 11 Sections for fixtures and equipment:

3.8.2.1 General fixture installation.

3.8.2.2 Refrigerated fixture installation.

3.8.2.3 Fixture and equipment plumbing connections.

3.8.2.4 Fixture and equipment condensate drain connections.

3.8.2.5 Refrigeration system installation.

3.8.2.6 Refrigeration controls installation.

3.8.2.7 Fixture and equipment electrical installation.

3.8.3

3.9 PERMITS, FEES, LAWS, ORDINANCES, RULES AND REGULATIONS

3.9.1 The Owner shall secure and pay for the Building Permit and any other fees including but not limited to tap fees, impact fees, or special development fees. The Owner may elect to have the Contractor secure and pay for these permits and fees, on the Owners behalf, the cost of which will be passed on to the Owner without Contractor's mark-up.

3.9.2 The Owner shall secure and pay for permits, fees, licenses, and inspections by government agencies for work performed by the Owner.

- 3.9.3 The Contractor shall secure and pay for all other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work performed by the Contractor or the Contractor's Subcontractors. The Contractor shall also secure and pay for all certificates of inspection and occupancy in connection with the Work. The Contractor shall post all bonds, secure and pay for all permits, and pay all fees for work on or in connection with public property.
- 3.9.4 The Contractor shall comply with all laws, ordinances, rules and regulations bearing on the Project. If the Contractor observes that the Contract Documents are at variance therewith, the Contractor shall promptly notify the Owner in writing. If the Contractor furnishes any work that is not in conformance with such laws, ordinances, rules and regulations, and without written notice to the Owner, the Contractor shall bear all costs arising from the correction thereof.
- 3.9.5 The Contractor shall maintain physical conditions and employee performance on the jobsite during the course of construction to conform with all local, state, and federal laws, rules and regulations including those covered by the Occupational Safety and Health Act of 1970.
- 3.9.6 Storm Water Discharge/Pollution Control: The Contractor shall apply for and obtain all permits and certifications required by federal, state, or local authorities having jurisdiction over the Project. All required inspections, reports, sampling, and documentation are the Contractor's responsibility under the laws and regulations of the governing authorities and in coordination with the Contract Documents and the Owner's Storm Water Pollution Prevention Plan (SWPPP). The Contractor acknowledges that government regulations, at a minimum, will apply to any land disturbance greater than one acre or part of a larger overall development. Even if the Contractor is not performing the sitework, the Contractor must comply with all responsibilities under the law and the Agreement.

3.10 ALTERNATES

- 3.10.1 Prices submitted by the Contractor shall include all alternates specified in the Contract Documents, as well as expenses, overhead and profit. The Owner may select any or all of the alternatives shown therein in writing. Upon selection thereof the Contract Sum shall be adjusted accordingly. The Contractor shall purchase the materials covered by such alternates from such suppliers, and shall have the work done by such Subcontractors according to the agreed upon schedule.

3.11 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES (SUBMITTALS)

- 3.11.1 The Contractor shall prepare and submit submittals in electronic form required by individual Specification Sections and as indicated in Article 16, Submittals and submit via the PMW.
- 3.11.2 The Contractor shall thoroughly review and approve submittals for Owner-supplied and Contractor-supplied items to insure that they match the requirements of the Contract Documents in all aspects including intent and required dimensions.
- 3.11.3 Electronic Copies of Architects Drawings: At Contractor's written request, copies of Architect's CAD files in .dwg, .dxf, or .rvt format may be provided to Contractor for

distribution to Material Suppliers or Subcontractors for development of Shop Drawings, or for the Contractor's own use in connection with Project. The Contractor shall submit company name, address, contact name, phone, and fax numbers on company letterhead, along with a written request for specific sheets required. The Architect will respond with a Waiver of Liability and an invoice for the requested files, both of which must be completed prior to issuance of the computer files. The Contractor should allow three days for processing of the initial request and two days after receipt by Architect of signed waiver and payment for requested files.

- 3.11.4 The Owner and/or the Architect will review and approve or take other action upon the Contractor's submittals, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents.

3.12 USE OF SITE

- 3.12.1 The Contractor shall confine equipment and tools, materials, and the operations of the workmen to limits by law, ordinances, rules, regulations, or directions of the Owner and shall not unreasonably occupy the jobsite with equipment, tools or materials. The Contractor shall abide by and enforce the Owner's instructions regarding signs, advertisements, fires and smoking at the jobsite. In performing interior work, the Contractor shall obtain prior approval from the Owner before using equipment (diesel, gasoline, etc.) or performing any work that may emit or cause potential noxious fumes, strong odors, or excessive dust. It is essential for the Contractor to coordinate work to prevent unnecessary impacts to Owner's employees and customers.
- 3.12.2 The Contractor shall limit use of premises to work in areas indicated. The Contractor shall not disturb portions of site beyond areas in which the Work is indicated and shall keep driveways and entrances serving the premises clear and available to emergency vehicles at all times.
- 3.12.3 Partial Owner Occupancy: The Owner reserves the right to place and install equipment in completed areas of building, before Substantial Completion is achieved. Partial occupancy shall not constitute acceptance of the total Work. The Contractor shall obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.

3.13 ROYALTIES, PATENTS AND COPYRIGHTS

- 3.13.1 Unless otherwise expressly stipulated in the Contract, the Contractor shall pay all royalties and license fees. The Contractor shall be notified of, and defend with counsel acceptable to the Owner, any suit or proceeding brought against the Owner based on the claim that any thing, or part thereof, or any process or method involved in the Project, constitutes an infringement on any patent or an unauthorized use of any copyrighted material. The Contractor shall be given full information and assistance for the defense of such suit or proceeding. The Contractor shall bear all costs thereof. In case it is held in such suit or proceeding that an infringement occurred or if an injunction is issued, the Contractor shall, at the Contractor's own expense, either:

3.13.1.1 Procure for the Owner the right to continue using said thing, part thereof, process or method, or

3.13.1.2 Replace or modify same so as to avoid infringement in a manner acceptable to the Owner and without any expense to the Owner.

3.14 SUPERINTENDENT

3.14.1 The Contractor shall provide effective supervision of the Project through a full-time resident superintendent and any necessary assistants. The superintendent shall not be changed during performance of this Agreement without the Owner's written consent, unless such superintendent ceases to be in Contractor's employ. The Superintendent or another person agreed to by the Owner in writing shall be present anytime work is being performed on the Project regardless if the work is being performed by the Contractor or a subcontractor. The superintendent shall represent the Contractor in the Contractor's absence and all directions given to the superintendent shall be as binding as if given to the Contractor. No instructions in conflict with the Contract Documents shall be binding unless confirmed in writing by the Owner.

3.14.2 The Contractor shall submit daily, a complete Daily Work Report signed by the superintendent.

3.15 CUTTING AND PATCHING

3.15.1 The Contractor shall do all cutting, fitting and/or patching necessary for the complete installation of the Work. The Contractor shall not endanger any Work by the Contractor's operations. The Contractor shall not cut or alter the Work of any other contractor without the Owner's consent.

3.15.2 The Contractor shall not cut and patch any item in a manner that would change its load-carrying capacity or load-deflection ratio, capacity to perform as intended or that results in increased maintenance or decreased operational life or safety, or reduce the building's aesthetic qualities.

3.15.3 The Contractor shall protect existing construction during cutting and patching to prevent damage and shall provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

3.16 CLEANING UP

3.16.1 The Contractor shall at all times maintain the Project in an orderly, workmanlike condition, reasonably clean and free of accumulations of dirt and debris. If the Contractor fails so to maintain the Project, the Owner shall have the right to engage others to do so at the Contractor's expense. The Project shall, in general, be turned over to the Owner in a thoroughly clean and workmanlike condition ready for the Owner's use in every respect.

3.16.2 Progress Cleaning: The Contractor shall clean the Project site and work areas daily, including common areas. The Contractor shall dispose of materials lawfully. During handling and installation, the Contractor shall clean and protect construction in progress and adjoining materials already in place. Protective covering shall be applied by the

Contractor where required and as specified in the Contract Documents to ensure protection from damage or deterioration at Substantial Completion.

- 3.16.3 Waste Disposal: Burying or burning waste materials on-site shall not be permitted. Washing waste materials down sewers or into waterways shall not be permitted. The Contractor shall recycle wastes as noted in Article "Construction Waste Management Payments" and dispose of remaining solid and hazardous waste generated by the Project in compliance with federal, state and local regulations. Compliance with the Contract Documents and the Owner's Storm Water Pollution Prevention Plan will be strictly enforced by the Owner.

3.17 INDEMNIFICATION

- 3.17.1 The Contractor shall defend and indemnify the Owner and hold the Owner fully and completely safe and harmless from all loss, claims, suits, damages, fines, penalties, expenses and attorney's fees arising out of bodily injury, sickness, disease or death or damage to or destruction of property arising out of or encountered in connection with the construction of the Project or its use thereafter regardless of whether such injury to or sickness, disease, or death of persons or damage to or destruction of property is due in part or claimed to be due in whole or part to any negligence or active negligence or fault of the Owner or its employees, agents or invitees other than when such injury, sickness, disease, death, damage or destruction has been proven in a court of law to have arisen from the Owner's negligence. The Contractor shall also defend and indemnify the Owner and hold the Owner fully and completely safe and harmless from all loss, claims, suits, damages, expenses and attorney's fees arising out of the recording of any mechanic's lien or the assertion of any stop notice against the Owner, construction lender, tenant or the holder of any master lease. These indemnities survive the completion or earlier termination of the Contract.

ARTICLE 4 ADMINISTRATION OF THE CONTRACT

4.1 CLAIMS FOR DAMAGES

- 4.1.1 Claims by either the Contractor or the Owner for damages caused by any wrongful act or neglect of the other, shall be made in writing within a reasonable time after the first knowledge of such damage.

ARTICLE 5 SUBCONTRACTORS AND MATERIAL SUPPLIERS

5.1 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

- 5.1.1 The Owner, in the Owner's sole judgment, shall be entitled to reject any Subcontractor and Material Supplier proposed to perform labor or furnish materials in conjunction with the Project listed in the Trade Proposal. In such an event, the Bid amount may be adjusted by the difference in cost caused by substitution of a new Subcontractor or Material Supplier for the one removed.

5.1.1.1 The names of Subcontractors and Material Suppliers proposed to perform labor or furnish materials in conjunction with the Project are submitted on the Trade Proposal within the time outlined in the Kroger e-sourcing Invitation to Bid.

5.1.2 The Contractor may substitute a different Subcontractor or Material Supplier from any listed in the Trade Proposal and may adjust the Contract Sum, only if approved, in writing, by the Owner.

5.2 SUBCONTRACTURAL RELATIONS

5.2.1 The Contractor shall be as fully responsible for the acts and omissions of the Contractor's Subcontractors, and of persons either directly or indirectly employed by them, as the Contractor is for the acts and omissions of persons employed directly by the Contractor. Nothing contained in the Contract Documents shall create any direct contractual relation between any Subcontractor and the Owner. Every subcontract shall include provisions whereby the Subcontractor agrees to be bound by the terms of the Contract Documents as far as applicable to the Subcontractor's portion of the Project and to indemnify, defend, and save harmless the Owner from all loss, claims, suits, damages, fines, penalties, expenses and attorney's fees arising out of the labor performed or materials supplied by the Subcontractor for the Project.

ARTICLE 6 CONSTRUCTION BY THE OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 The Owner reserves the right to let other contracts in connection with this Project. The Contractor shall properly coordinate the Contractor's work with that of the Owner's other contractors. If any part of the Work under this Contract depends, for proper results, upon the work under any other contracts, the failure of the Contractor to report defects shall constitute an acceptance of such other work as fit and proper for coordination with the Work, except as to defects which may develop in such other work after the execution of the Work under the Contract.

6.1.2 Owner Direct Buy Program: Certain material and equipment items are regularly and usually furnished and/or furnished and installed by Owner.

6.1.2.1 Owner Responsibilities:

6.1.2.1.1 Delivery of Shop Drawings, Product Data, and Samples.

6.1.2.1.2 Delivery of Owner-furnished products; inspection of delivered products; replacement of damaged products.

6.1.2.2 Contractor Responsibilities for Owner Furnished/Contractor Installed Products:

6.1.2.2.1 Review and approval of all submittals.

6.1.2.2.2 Coordinate delivery dates for all Owner Direct Buy items with the Construction Progress Schedule.

- 6.1.2.2.3 Coordinate any changes in delivery date with the Direct Buy item supplier and notify the Owner in writing.
- 6.1.2.2.4 Resolve warranty claims (prior to store opening) directly with the Direct Buy item supplier.
- 6.1.2.2.5 Receive Owner-furnished products, provide inspection, and notify the Direct Buy item supplier and Owner of missing and/or damaged materials within 48 hours after delivery (20 days for concealed damage)
- 6.1.2.2.6 Provide safe harboring, installation, and removal of any salvage materials.
- 6.1.2.2.7 Provide equipment as necessary for placement of Owner furnished products.
- 6.1.2.2.8 Provide first year of labor warranty.
- 6.1.2.3 Contractor Responsibilities for Owner Furnished/Owner Installed Products:
 - 6.1.2.3.1 Review and approval of all submittals.
 - 6.1.2.3.2 Coordinate delivery dates for all Owner Direct Buy items with the Construction Progress Schedule.
 - 6.1.2.3.3 Coordinate any changes in delivery date with the Direct Buy item supplier and notify the Owner in writing.
 - 6.1.2.3.4 Within two weeks of construction (footings), advise the Owner of the desired install date. Before 30 days from the install date, confirm a final date with the installer. Ensure that the Owner supplied and installed items are not damaged during the construction process.
 - 6.1.2.3.5 Obtain approval of any delivery date changes from Owner and coordinate with the Direct Buy item supplier.
 - 6.1.2.3.6 Resolve warranty claims (prior to store opening) directly with the Direct Buy item supplier.
 - 6.1.2.3.7 Provide safe harboring, installation, and removal of any salvage materials.
 - 6.1.2.3.8 Receive Owner-furnished products, provide inspection, and notify the Direct Buy item supplier and Owner of missing and damaged materials within 48 hours after delivery (20 days for concealed damage).

6.2 MUTUAL RESPONSIBILITY

- 6.2.1 If any of the Owner's other contractors and/or any Subcontractor shall make any claim against the Owner for any damage alleged to have been caused by the Contractor, the Contractor agrees to settle such dispute promptly after notice thereof. If such other contractor and/or Subcontractor sues the Owner on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor who shall defend such proceedings at the Contractor's own expense with counsel reasonably acceptable to the Owner and, if any judgment against the Owner arises there from, the Contractor shall pay or satisfy it and pay all costs and expenses incurred by the Owner.

ARTICLE 7 CHANGES IN THE WORK

7.1 GENERAL

- 7.1.1 Minor Changes In The Work: The Owner will issue, via the PMW, supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract time.
- 7.1.2 Change Order Proposal Requests: The Owner may, at any time before completion of the Project, order additions to, deletions from, or alterations in the Work. All terms and conditions of the original contract shall become a part of each Change Order.
- 7.1.2.1 Owner-Initiated Proposal Requests: Before any change is made or work done, the Owner will issue a detailed written description of proposed changes in the Work. Proposal requests issued by the Owner are for information only. The Contractor shall not consider them instructions either to stop Work in progress or to execute the proposed change. Promptly after receipt of such instructions, the Contractor shall submit to the Owner, within 10 days, a proposal with a detailed estimate showing the cost of the proposed change in the Work, including a detailed breakdown of costs for the additional work as well as the credit for the original Work, and a revised schedule showing the extension of time, if any. The revised schedule showing any time extension shall be submitted in writing under separate cover and approved by Owner. The Owner shall promptly notify the Contractor in writing whether the estimate is acceptable and, if it is, in writing authorize the change to be made or Work to be done. The Owner reserves the right to reject any such proposal and to have the work done by others.
- 7.1.2.2 Contractor-Initiated Proposals: If the Contractor contends that it has encountered conditions, changes or occurrences entitling it to a change in the Contract or an adjustment in the contract schedule or price, the Contractor shall propose changes by submitting a written request for a change to the Owner. The proposal shall include a statement outlining reasons for the change and the effect of the change on the Work, the effect of the proposed change on the Contract Sum including a detailed breakdown of costs for the additional work as well as the credit for the original Work, list of quantities of products required or eliminated applicable taxes, delivery charges, equipment rental, and amounts of trade discounts and a revised schedule showing any time extension. The proposal shall be submitted to the Owner within 10 days of the discovery of the condition, changes, or occurrences for review and approval. The failure of the Contractor to provide the written proposal as provided herein within such time

period shall constitute a waiver by the Contractor of any claim for compensation or time extension, notwithstanding any purported knowledge or lack of prejudice of the Owner. This written proposal requirement may not be waived, except explicitly and in writing by the Owner.

7.1.2.3 On Owner's approval of a Change Order Proposal, Owner will issue a Purchase Order for the Work to be performed.

7.1.3 Construction Change Directive: The Contractor shall proceed with the change in the Work when indicated in writing by Owner, for subsequent inclusion in a Change Order. The Contractor shall maintain detailed records on a time and material basis. Upon completion of the change, the Contractor shall submit within 30 days an itemized invoice and supporting documentation necessary to substantiate cost and time adjustments to the Contract. If the change has not been invoiced within 30 days of its completion, the owner will not be obligated to pay for the charge and the failure of the Contractor to provide an invoice as provided herein shall constitute a waiver by the Contractor of any claim for compensation.

7.2 DETERMINATION OF COST OR CREDIT

7.2.1 The cost or credit shall be determined by one of the following methods:

7.2.1.1 Work Done by Subcontractor:

7.2.1.1.1 For Added Work: The agreed cost noted in the change order proposal to the Subcontractor of such added Work, plus 15 percent representing the Subcontractor's overhead and profit, plus five 5 percent for the Contractor's overhead and profit. Overhead and profit markup shall not be applied to any incremental bond or insurance costs incurred as a result of the added Work.

7.2.1.1.2 For Deleted Work: The agreed cost of such omitted Work.

7.2.1.2 Work Done by Contractor

7.2.1.2.1 For Added Work: The agreed cost to the Contractor of such added Work, plus 15 percent thereof representing the Contractor's overhead and profit. Overhead and profit markup shall not be applied to any incremental bond or insurance costs incurred as a result of the added Work.

7.2.1.2.2 For Deleted Work: The agreed cost of such omitted Work.

7.2.1.3 By Unit Prices

7.2.1.3.1 For those items where unit prices have been established in the Trade Proposal Form or otherwise agreed upon, these unit prices shall be used.

7.2.2 As used herein "Agreed Cost" shall mean the cost of direct labor, materials, equipment, incremental bonds, insurance, and taxes required under the General Conditions, as

disclosed by Contractor's records, which shall be in form satisfactory to the Owner. Superintendence shall be deemed to be included in "Overhead."

7.3 DOCUMENTATION OF COST

- 7.3.1 The Contractor shall submit, in such form as the Owner may prescribe, an itemized accounting together with appropriate supporting data of all costs associated with the change.
- 7.3.2 The Contractor's books, records, correspondence, accounting procedures related to overhead assessments and any other supporting evidence relating to the Contractor's change order costs shall be open to inspection and subject to audit by the Owner. The audit may include verification that all costs submitted on change orders to the Owner pertained to Subcontractor, Material Supplier or Contractor self-performed costs, including applicable fees, and that credits processed by the Contractor that reduce Subcontractor costs or material vendor costs based on deleted work have been processed as deductive change orders with the Owner.

ARTICLE 8 TIME

8.1 DELAYS

- 8.1.1 In the event the Contractor is delayed in the commencement, progress, or completion of the Work by reasons of: (i) an act or neglect of the Owner or Architect, or of an employee or consultant of either, or of a separate contractor employed by the Owner; (ii) changes ordered in the Work; (iii) casualty without the fault or negligence of Contractor, its agents, Subcontractors or Material Suppliers, such as labor disputes, fire, or unusual delay in deliveries; (iv) natural disaster, such as earthquake, tornado, or flood, not reasonably foreseeable or; (v) civil riot or strike on the Project, the time period provided in Paragraph 3 of the Agreement shall be extended by the Owner's approval of the Contractor's written request for such a reasonable time as the Owner may determine.

ARTICLE 9 PAYMENTS AND COMPLETION

9.1 SUBSTANTIAL COMPLETION

- 9.1.1 Substantial Completion shall mean completion of any condition set forth by the Owner, and all work required to obtain a temporary Certificate of Occupancy to allow for the installation of fixtures, and stocking of inventory. The date of Substantial Completion of the Work or designated portion thereof is the date certified by the Owner when construction is substantially complete, in accordance with the Contract Documents and when all required occupancy permits, if any have been issued. Substantial completion of the Work shall include, without limitation, the following:
 - 9.1.1.1 Completion of paving and striping of pavement and parking areas.
 - 9.1.1.2 Completion of off and on site improvements
 - 9.1.1.3 Completion of electrical and lighting systems both interior and exterior.

- 9.1.1.4 Completion of building mechanical systems.
- 9.1.1.5 Issuance of a temporary or permanent certificate of occupancy.
- 9.1.1.6 Complete and operating building fire suppression system.
- 9.1.1.7 Complete and operational fire and security alarm systems.
- 9.1.1.8 Completion of building construction with the exception of punch list items.
Completion of contract work is not considered to be punch list items.

9.2 COMPLETION DATES

- 9.2.1 The Project must be completed in accordance with the Project Phasing Plan and/or Project Completion Schedule incorporating the Owner's milestones. It is essential that the Contractor have all Work substantially complete and all mechanical systems fully operational with full accessibility. All site improvements must be fully accessible and substantially complete. The completion of minor punchlist items must be scheduled to be performed in such a manner as not to hinder deliveries or installation process.
- 9.2.2 Liquidated Damages: The Contractor shall be liable to the Owner for Liquidated Damages for the sum stipulated in the Agreement Between Owner and Contractor for each day that the Completion Date is exceeded in the completion of the Project.

9.3 OPTION ONE - CONTRACTOR FINANCED

9.3.1 Progress Payment

- 9.3.1.1 Contractor Requirement: the Contractor shall submit with their progress payment request, on the forms included in the Contract Documents, the following:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw
General Contractor's Progress Affidavit.	X	X	
Conditional Waiver and Release Upon Progress Payment (Current Draw)	X	X	
Unconditional Waiver and Release Upon Progress Payment for the previous progress payment		X	

- 9.3.1.2 Subcontractor or Material Supplier Requirement: The Contractor shall review for correctness and submit with their progress payment request, on the forms included in the Contract Documents, the following from each Subcontractor and Material Supplier whose contract value is \$20,000.00 or more:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw

Subcontractor's Progress Affidavit	X	X	
Unconditional Waiver and Release Upon Progress Payment for (Current Draw)	X	X	

- 9.3.1.2.1 Electronic documents may be accepted in lieu of originals as specified in Working Form 00 65 20 "Subcontractor's Progress Affidavit."

9.3.2 Final Payment

- 9.3.2.1 Contractor Requirement: The Contractor shall submit with the request for final payment, on the forms included in the Contract Documents, the following:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw
General Contractor's Final Affidavit.			X
Unconditional Waiver and Release Upon Progress Payment (Previous Draw)			X
Conditional Waiver and Release Upon Final payment			X
Unconditional Waiver and Release Upon Final Payment (Due within 14 days of receipt of final payment from the Owner)			X

- 9.3.2.2 Subcontractor or Material Supplier Requirements: The Contractor shall review for correctness and submit with their request for final payment, on the forms included in the Contract Documents, the following from each Subcontractor and Material Supplier whose contract value is \$20,000.00 or more:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw
Subcontractor's Final Affidavit			X
Unconditional Waivers and Releases Upon Final Payment			X

- 9.3.3 Owner's Rights: The Owner reserves the right at any time during the Project to require Contractor to provide payment support documentation on any Subcontractor or Material Supplier regardless of the contract value or total cost.

9.4 OPTION TWO - LETTER OF CREDIT

9.4.1 Progress Payment

- 9.4.1.1 Contractor Requirement: The Contractor shall submit with their progress payment request, on the forms included in the Contract Documents, the following:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw
General Contractor's Progress Affidavit.	X	X	
Unconditional Waiver and Release Upon Progress Payment (previous draw)		X	

- 9.4.1.2 Subcontractor or Material Supplier Requirement: The Contractor shall review for correctness and submit with their progress payment request, on the forms included in the Contract Documents, the following from each Subcontractor and Material Supplier whose contract value is \$20,000.00 or more:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw
Subcontractor's Progress Affidavit	X	X	
Unconditional Waiver and Release Upon Progress Payment (previous draw)		X	

- 9.4.1.2.1 Electronic documents may be accepted in lieu of originals as specified in Working Form 00 65 20 "Subcontractor's Progress Affidavit."

9.4.2 Final Payment

- 9.4.2.1 Contractor Requirement: The Contractor shall submit with the request for final payment, on the forms included in the Contract Documents, the following:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw
General Contractor's Final Affidavit.			X
Unconditional Waiver and Release Upon Progress Payment (Previous Draw)			X
Unconditional Waiver and Release Upon Final Payment (Due within 14 days of receipt of final payment from the Owner)			X

- 9.4.2.2 Subcontractor or Material Supplier Requirements: The Contractor shall review for correctness and submit with their request for final payment, on the forms included in the Contract Documents, the following from each Subcontractor and Material Supplier whose contract value is \$20,000.00 or more:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw
Subcontractor's Final Affidavit			X

Unconditional Waiver and Releases Upon Progress Payment (previous draw)			X
Unconditional Waiver and Releases Upon Final Payment (Due within 14 days of receipt of final payment from the Owner)			X

9.4.3 Owner's Rights: The Owner reserves the right at any time during the Project to require Contractor to provide payment support documentation on any Subcontractor or Material Supplier regardless of the contract value or total cost.

9.5 OPTION THREE - PERFORMANCE BOND & LABOR AND MATERIAL PAYMENT BOND

9.5.1 Progress Payment

9.5.1.1 Contractor Requirement: The Contractor shall submit with their progress payment request, on the forms included in the Contract Documents, the following:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw
General Contractor's Progress Affidavit.	X	X	
Unconditional Waiver and Release Upon Progress Payment (previous draw)		X	

9.5.1.2 Subcontractor or Material Supplier Requirement: The Contractor shall review for correctness and submit with their progress payment request, on the forms included in the Contract Documents, the following from each Subcontractor and Material Supplier whose contract value is \$20,000.00 or more:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw
Subcontractor's Progress Affidavit	X	X	
Unconditional Waiver and Release Upon Progress Payment (previous draw)		X	

9.5.1.2.1 Electronic documents may be accepted in lieu of originals as specified in Working Form 00 65 20 "Subcontractor's Progress Affidavit."

9.5.2 Final Payment

9.5.2.1 Contractor Requirement: The Contractor shall submit with the request for final payment, on the forms included in the Contract Documents, the following:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw

General Contractor's Final Affidavit.			X
Unconditional Waiver and Release Upon Progress Payment (Previous Draw)			X
Unconditional Waiver and Release Upon Final Payment (Due within 14 days of receipt of final payment from the Owner)			X

- 9.5.2.2 Subcontractor or Material Supplier Requirements: The Contractor shall review for correctness and submit with their request for final payment, on the forms included in the Contract Documents, the following from each Subcontractor and Material Supplier whose contract value is \$20,000.00 or more:

	Monthly Draw		
	Draw 1	Ongoing Progress Draws	Final Draw
Subcontractor's Final Affidavit			X
Unconditional Waiver and Releases Upon Progress Payment (previous draw)			X
Unconditional Waiver and Releases Upon Final Payment (Due within 14 days of receipt of final payment from the Owner)			X

- 9.5.3 Owner's Rights: The Owner reserves the right at any time during the Project to require Contractor to provide payment support documentation on any Subcontractor or Material Supplier regardless of the contract value or total cost.

9.6 PAYMENTS WITHHELD

- 9.6.1 The Owner may withhold the whole or any part of any payment to protect against loss on account of:
- 9.6.1.1 Defective materials and/or workmanship.
 - 9.6.1.2 Claims filed or evidence reasonably indicating probable filing of claims.
 - 9.6.1.3 Failure of the Contractor to make payments properly to Subcontractors or for material or labor.
 - 9.6.1.4 A reasonable doubt that the Contract can be completed for the balance then unpaid.
 - 9.6.1.5 Damage to another contractor.
 - 9.6.1.6 Other Contract requirements unfulfilled, including but not limited to those requirements listed in Article "FINAL COMPLETION."
- 9.6.2 Before making any Progress Payments, the Owner may require an updated schedule, Change Order log, and copies of current SWPPP site inspections and logs.

9.7 CONSTRUCTION WASTE MANAGEMENT PAYMENTS

- 9.7.1 The Contractor shall, unless directed otherwise by the Owner in the Instruction to Bidders, recycle a minimum of 90 percent of all construction waste generated by the Project. The Contractor shall identify the value associated with construction waste management on the Trade Proposal and Request for Payment forms. Only on the final Request for Payment form shall the Contractor indicate progress or charge for the construction waste management value.
- 9.7.2 Payment for 100 percent of the construction waste management value shall be made upon the Contractor submitting documentation verifying to the Owner's satisfaction that a minimum of 90 percent of all construction waste has been recycled. Should the Contractor not attain 90 percent recycled construction waste, the Owner will compensate the Contractor the percentage of construction waste that was recycled through issuing a deductive change order against the construction waste management value identified on the final Request for Payment.

9.8 FINAL COMPLETION/CLOSEOUT PROCEDURES

- 9.8.1 Before requesting final inspection the Contractor shall submit a final Application for Payment. In addition to the forms required by the "Payment" paragraphs above, submit the following:
 - 9.8.1.1 General: Submit in format as specified in Article 16 "Submittals."
 - 9.8.1.2 Final Statement: Updated final statement, accounting for final additional changes to the Contract Sum.
 - 9.8.1.3 Insurance Coverage: Evidence of final, continuing insurance coverage complying with insurance requirements.
 - 9.8.1.4 Warranties: Specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 9.8.1.4.1 The Contractor shall submit written warranties for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
 - 9.8.1.5 Occupancy Releases: Releases permitting the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 9.8.1.6 Startup Testing Records: Record of complete startup testing of systems.
 - 9.8.1.7 Test/Adjust/Balance Records: Record of complete testing, adjusting and balancing of systems.
 - 9.8.1.8 Operation and Maintenance Data: The Contractor shall assemble operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. The Contractor shall include operation and maintenance data required in individual specification sections.

- 9.8.1.9 Temporary Facilities: Evidence of termination and removal of temporary facilities from Project site, along with mockups, construction tools, and similar elements.
- 9.8.1.10 Transfer of Utilities: Evidence of transfer of payment and transfer of all utilities.
- 9.8.1.11 Project Record Documents (As-Built): The Contractor shall submit to the Owner one PDF electronic file of scanned red-lined prints of Contract Drawings and Shop Drawings.
- 9.8.1.12 SWPPP Documents: The Contractor shall submit copies of all SWPPP documents including but not limited to inspections reports, site logs, and noted erosion and sediment control plans.
- 9.8.2 If any Subcontractor or Material Supplier refuses to furnish the Contractor with an Unconditional Waiver and Release Upon Final Payment, the Contractor, upon Owner's request, shall furnish the Owner a Discharge of Mechanics Lien Bond, satisfactory to the Owner, indemnifying the Owner against the claim or any lien, or the Owner, at its option, may withhold from the progress or final payment a sum equal to 1-1/2 times the amount of the claim. The Contractor shall purchase the bond without being compensated for the cost of the bond from the Owner. If a lien is filed against the Project at any time and, if within fifteen (15) days after notice of the filing has been given by the Owner to the Contractor, the lien remains unsatisfied or it is not bonded satisfactory to the Owner, the Owner shall thereafter be entitled, regardless of whether the claim is disputed, to pay the full amount of the claim secured by the lien and deduct the cost thereof from the Contract Sum; or if final payment has been made, the Contractor shall promptly reimburse the Owner for the amount so expended. The Contractor shall indemnify, defend, and hold the Owner harmless from all losses, damages and expense, including attorney fees, related to or arising out of the payment claims or liens for work performed or material supplied to the Project.
- 9.8.3 The Contractor agrees to furnish the Owner any reasonable documentation, including, without limitation, payroll records, invoices or canceled checks, which the Owner may request to confirm payment of all indebtedness related to the Project as a condition precedent to any progress payment or final payment. In the event that a Subcontractor or material supplier has not been paid for labor performed or materials furnished in connection with the Project, the Owner, in addition to all remedies available at law or in equity, may pay the Contract Sum due the Contractor by a check made payable to the Contractor and such Subcontractor or Material Supplier and in an amount for which Subcontractor or Material Supplier is due based upon the reasonable judgment of the Owner. Payment by such a joint check shall constitute payment on the Contract Sum.
- 9.8.4 Record of the Contractor's incurred expenses based on self-performed work, and those of their Subcontractors and Material Suppliers, including all fees and direct expenses pertaining to the Project, shall be maintained on the basis of Generally Accepted Accounting Principles (GAAP) and shall be available for inspection by the Owner at all reasonable times and upon reasonable prior notice for a period commencing as of the date of this Agreement and continuing through one year after completion of the Project.

- 9.8.5 Transfer of Utilities: The Contractor shall be responsible for the payment of all utilities during construction, and for providing adequate services as described in the General Conditions. Regardless of the extent of the Owner's equipment and fixture installation process, the transfer of the responsibility for payment of all utilities shall not occur until the construction of the sales and preparation areas are substantially complete and fully operational with only minor punchlist items remaining. At the appropriate time, the Contractor shall submit a request in writing to the Owner requesting the Owner begin the process of transferring all of the utilities into the Owner's name.
- 9.8.6 Demonstration And Training: The Contractor shall instruct the Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system. The Contractor shall schedule training with the Owner at least seven days in advance.
- 9.8.7 Final Cleaning: The Contractor shall conduct final cleaning and waste removal operations just prior to the final completion date indicated in the Contract documents to comply with local laws and ordinances, and federal, state, and local environmental and antipollution regulations.
- 9.8.7.1 Cleaning Agents: The Contractor shall use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. The Contractor shall not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

10.1 PROTECTION OF WORK AND PROPERTY AND RISK OF LOSS

- 10.1.1 The Contractor shall protect the Work, auxiliary building, structures, materials, supplies, and adjacent property from any damage. The Contractor shall provide safeguards, including but not limited to fire extinguishers and lights, barriers and enclosures around all pits, excavations, and other places of danger.
- 10.1.1.1 If damage results, the Contractor shall repair the damage. If the damage was caused by the Owner, the Owner's other contractors or the Owner's operation, the Owner will pay the Contractor as outlined for additional work in Article 7 of the General Conditions, but if such damage was caused by other persons, the Contractor shall pay for repair of such damage or cause the correction thereof to the Owner's satisfaction.
- 10.1.2 The Contractor shall not trespass upon or in any way disturb adjacent property without first obtaining written permission to do so from the owner of such adjacent property. The Contractor shall restore all disturbed adjacent property to its original condition or such other condition as may be agreed in writing between Contractor and such adjacent owner.
- 10.1.2.1 The Contractor shall indemnify, defend and hold harmless the Owner as well as the owner of such adjacent property from and against any and all claims, costs losses, causes of action, liabilities, damages, suits, judgments, and expenses, including without limitation, reasonable attorneys' fees, resulting from the Contractor's entry upon and/or work within an adjacent property.

10.1.3 The Contractor shall maintain and pay for Builder's Risk Insurance in accordance with Article 11.

10.2 TESTS AND INSPECTIONS

10.2.1 The Owner shall at all times have access to the Work wherever it is in preparation or progress, and the Contractor shall provide facilities for observation thereof. If the laws, ordinances, rules or regulations of any public authority, the Contract Documents, or the Owner's instructions require any work to be specially tested or approved, the Contractor shall give the Owner notice of its readiness in time to permit the Owner to observe such test or to inspect the same prior to the time for giving such approval.

ARTICLE 11 INSURANCE AND BONDS

11.1 CONTRACTORS' INSURANCE REQUIREMENTS

11.1.1 Certificates of insurance acceptable to the Owner for all Contractor required insurance shall be filed with the Owner prior to commencement of the Work. The Certificate of Insurance must identify all self-insured retentions and/or deductibles to the current ISO general liability policy. Contractor must provide a minimum of 20 calendar days advanced written notice should said insurance be cancelled (voluntarily or otherwise) or expire. In the event of cancellation or expiration of said insurance during the period of time insurance coverage is required under this agreement, Contractor must provide proof of replacement insurance a minimum of 10 calendar days in advance of the effective date of such cancellation or expiration. Failure to provide such proof if insurance will result in payments being withheld by Owner until such time as such proof of replacement insurance is received.

11.1.2 The Owner may require higher insurance coverage limits and/or different coverages for certain product and service providers.

11.1.3 Insurance shall be underwritten by insurance companies rated A- or higher by A.M. Best

11.1.4 The following must be shown as additional wording on Certificates:

11.1.4.1 "The Kroger Co. and Kroger's Affiliates and Subsidiaries are Additional Insureds."

11.1.4.2 "Waiver of Subrogation in favor of the Owner."

11.1.5 Certificate Holder Address: The Kroger Co. and Kroger's affiliates and subsidiaries' mailing address as shown in Division 00 Section "Agreement Between Owner and Contractor."

11.1.6 General Liability

Commercial General Liability	\$3,000,000
Occurrence Basis	Yes
Product Liability / Completed Operations	\$3,000,000
Each Occurrence	\$3,000,000

Note: General Liability Certificate (and Excess Liability/Umbrella Certificate if one is issued to meet limits) must reflect asbestos abatement coverage, if asbestos abatement is included in scope of work.

11.1.7 Auto Liability

Any Auto	Yes
Combined Single Limit- Bodily Injury and Property Damage	\$1,000,000

Note: As it concerns "Any Auto", a combination of "All Owned Autos, Hired Autos & Non-Owned Autos" OR "Scheduled Autos, Hired Autos & Non-Owned Autos" is acceptable.

11.1.8 Manned Aircraft Liability

Any Manned Aircraft	Yes
Combined Single Limit - Bodily Injury and Property Damage	\$1,000,000

Note: As it concerns "Any Manned Aircraft", a combination of "Owned Aircraft, Hired Aircraft & Non-Owned Aircraft" OR "Scheduled Aircraft, Hired Aircraft & Non-Owned Aircraft" is acceptable.

11.1.9 Unmanned Aerial Systems (UAS) Liability

Combined Single Limit - Bodily Injury and Property Damage per Occurrence	\$1,000,000
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Note: Coverage required if Contractor deploys drones/UAS's relating to services to Kroger.

11.1.10 Workers Compensation.

Statutory Limits	Yes
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11.1.11 Employers Liability

Each Accident	\$500,000
Disease Policy Limit	\$500,000
Disease Each Employee	\$500,000

Note:

- Required coverage limits can be achieved through a combination of Primary & Excess or Umbrella Liability Insurance.*
- In certain instances, "Claims Made" policies may be acceptable, consult Owner to validate exception.*
- Certificates must be received by Owner prior to the commencement of work;*
- Address of the site must be shown on the Certificate.*

11.1.12 Pollution Liability

Each Incident	1,000,000
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11.1.13 Contacts

Contact	Contact Title / Company:	Contact Phone:	Contact e-Mail:
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Name:			
Per Contract	Appropriate Kroger Engineering / Construction Department	See Work Order	
Rob Quast	Director of Insurance & Claims - Kroger	1-513-562-5197	rob.quast@kroger.com
Bob Stewart	Corporate Insurance - Kroger	1-513-762-4756	bob.stewart@kroger.com

11.1.14 Builder's Risk Insurance

Coverage Limit	\$100,000 coverage limit, \$5,000 deductible
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11.1.14.1 The Contractor shall maintain for a period of at least five days subsequent to the written acceptance by the Owner of the project and pay for Builder's Risk Insurance in a company or companies with AM Best ratings of A- or better satisfactory to the Owner. The Contractor shall file a certificate of insurance naming the Owner as additional insured that must be received and retained in file by the certification of such with Owner. All responsibility for deductibles and other uninsured loss is the responsibility of the Contractor at full replacement value to the limits indicated in the above table. The Owner shall be responsible for claims greater than the limits shown in the above table. The provisions of this Paragraph shall in no way relieve the Contractor of liability for any loss for which the Contractor would otherwise be liable.

11.1.14.2 All risk of loss, damage or theft of Contractor's equipment and tools and any Subcontractor's equipment and tools and any property of either's employees that will not become part of the Project will be at the risk of the Contractor or Subcontractor owning said property.

11.1.14.3 The Contractor shall purchase a Floater Policy covering Owner supplied material and equipment at full replacement value, that upon receipt and acceptance of said material or equipment by the Contractor, shall protect it from theft, vandalism, or damage.

11.1.14.3.1 The Floater Policy may be waived by the Owner if the Contractor provides evidence from their builder's risk insurance carrier by email or letterhead correspondence that Owner provided equipment and supplied materials are covered at full replacement value against theft, vandalism, or damage at the same coverage limits indicated below for the Floater Policy.

11.1.14.3.2 Coverage limits for the Floater Policy shall be as follows:

New Store or Expansion	\$250,000 coverage limit, deductible \$10,000
Within Wall Remodel Project	\$150,000 coverage limit, deductible \$10,000
Strip Centers or Fuel Center	\$50,000 coverage limit, deductible \$5,000

11.1.14.4 The Contractor shall bear risk of glass breakage resulting from vandalism and malicious mischief risks.

11.1.14.5 Deductibles shall be at the sole risk of the Contractor as indicated.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

12.1 WORKMANSHIP

12.1.1 The workmanship called for by the Contract Documents shall be of the highest quality in every respect, as usually recognized in the building construction industry. All surfaces, members, frames, and units shall be true, even and in alignment. No warped, bent, dented, or otherwise damaged members or units shall be built into the Project. Connectors shall be true, tight and neat. Finishes shall be free from chips, dents and other imperfections. All factory assemblies shall conform to the highest quality standards of the trades concerned.

12.2 CORRECTION OF WORK

12.2.1 Defective materials and/or workmanship will not be acceptable and if installed shall be removed and replaced with sound materials and highest quality workmanship or otherwise corrected to the Owner's satisfaction. The Contractor shall bear all expense of replacement or remedial work and repairs to and alterations in the work of other contractors necessitated by the Contractor's replacement or remedial work. Should the Contractor be unable to replace or remedy the defective work, the Contractor shall promptly remove the entire Work and reimburse the Owner for all money paid therefore.

12.3 DEDUCTIONS FOR UNCORRECTED WORK

12.3.1 If the Owner deems it inexpedient to correct Work damaged or not done in accordance with the Agreement, or incomplete Work not accomplished by the Contractor (such as incomplete punch list items), an equitable deduction from the Contract Sum shall be made, sufficient to pay the cost of later correction thereof.

ARTICLE 13 MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

13.1.1 The Contract shall be governed by the law of the state where the Project is located.

13.2 SUCCESSORS AND ASSIGNS

13.2.1 The Contractor shall not assign the Contractor's right, title or interest in or to the Contract without the prior written consent of the Owner, which may be given or withheld at Owner's sole discretion; nor shall the Contractor assign any monies due or to become due the Contractor hereunder without the prior written consent of the Owner, which may be given or withheld at Owner's sole discretion.

13.3 RIGHTS AND REMEDIES

13.3.1 No action or failure to act by the Owner shall constitute a waiver of a right or remedy afforded the Owner under the Contract, nor shall such action or failure to act constitute approval or acquiescence in a breach by the Contractor thereunder.

13.4 EQUAL OPPORTUNITY

- 13.4.1 It is the policy of The Kroger Co. that certified Minority-Owned Business Enterprises (MBEs), Women-Owned Business Enterprises (WBEs) and other Diverse-Owned Business Enterprises (e.g., Veteran-Owned Business Enterprises; Service Disabled Veteran-Owned Business Enterprises; Lesbian, Gay, Bisexual & Transgender-Owned Business Enterprises) (DBEs) have the opportunity to participate in the performance of Kroger contracts. In support of the policy, Kroger encourages all our suppliers to provide meaningful contracting and sub-contracting opportunities to M/W/DBEs. Utilization of M/W/DBE suppliers and/or service providers throughout the course of the contract is one of the non-pricing factors that Kroger evaluates during the bid award selection process. Upon request, vendors will be required to track and report their expenditures with diverse-owned companies as it relates to the products and/or services provided to Kroger.
- 13.4.2 The Request for Payment form includes a column for reporting dollars of participation of M/W/DBEs in the Project. At the completion of the Project, the Contractor must provide a list to include M/W/DBE company names, trade or service provided, identification of gender/ethnicity of owner of company, amounts paid.

13.5 QUALITY REQUIREMENTS

- 13.5.1 Quality-control services include inspections, tests, and related actions including reports. Quality-control services are further specified in other portions of the Contract Documents and shall be performed by independent testing agencies provided by the Contractor or Owner, as specified.
- 13.5.2 The Contractor is responsible for coordinating and scheduling inspections and tests with authorities having jurisdiction and the Owner's testing agencies.
- 13.5.2.1 Retesting: The Contractor shall pay for all retesting where results of inspections and tests prove unsatisfactory and indicate noncompliance with requirements.
- 13.5.2.2 Auxiliary Services: The Contractor shall cooperate with agencies performing inspections and tests. The Contractor shall provide auxiliary services as requested. The Contractor shall notify agency in advance of operations requiring tests or inspections, to permit assignment of personnel.
- 13.5.2.3 On completion of testing, inspecting, sample taking, and similar services, the Contractor shall repair damaged construction and restore substrates and finishes.

13.6 ATTORNEYS' FEES

- 13.6.1 In any arbitration or litigation to enforce the terms of the Contract or arising out of the Contract or the performance thereof, the prevailing party shall be entitled to recover its reasonable attorneys' fees and court costs. This paragraph shall apply to the recovery of reasonable attorneys' fees and costs even if Owner employs its own attorneys to enforce or defend its rights or pursue action hereunder.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

14.1.1 If the Work should be stopped under an order of any court or other public authority, for a period of three months, through no act or fault of the Contractor or of anyone employed by the Contractor, then the Contractor may, upon three days written notice to the Owner, stop the Work without liability for such delay; or the Contractor may terminate the Contract and recover from the Owner payment including a reasonable profit for all Work executed to the time of termination.

14.2 OWNER'S RIGHT TO TERMINATE CONTRACT

14.2.1 The Contractor's performance of work under this Agreement shall be terminable for cause upon twenty-four (24) hours' written notice by Owner to Contractor. For purpose of this paragraph, "cause" shall be defined as, and shall include but not limited to, the Contractor: (i) being adjudged a bankrupt, (ii) making a general assignment for the benefit of the Contractor's creditors, (iii) having a receiver appointed on account of the Contractor's insolvency, (iv) persistently or repeatedly refusing or failing, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials to keep the Project on schedule, (v) failing to make prompt payment to Subcontractors or for materials or labor, (vi) persistently disregarding laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or the instructions of the Owner, (vii) otherwise violating a provision of this Agreement, or (viii) failing to provide or maintain the insurance required herein. If Owner terminates the employment of the Contractor, as aforesaid, Owner shall be entitled to take possession of the premises and all materials, tools and appliances thereon and finish the Project by whatever method the Owner may deem expedient. In such case, Contractor shall not be entitled to receive any further payment. If the expense of finishing the Project, including compensation for the Owner's additional services, shall exceed such unpaid balance of the contract sum, then the Contractor shall promptly pay such excess to the Owner. Owner reserves the right to use the Contract sum to make such payment directly to Subcontractors and/or workmen or other persons who have provided work or materials to the Project, on the Contractor's behalf.

ARTICLE 15 CLAIMS AND DISPUTES

15.1 DISPUTE RESOLUTION

15.1.1 Contractor and Owner covenant and agree in event of any claim, dispute or other matter in questions arising out of or relating to the Contract Documents or breach thereof ("Dispute(s)"), Contractor and Owner shall continue to perform, except to the extent performance is otherwise excused pursuant to the Contract Documents, all obligations as required under the Contract notwithstanding the existence of such Dispute(s) and that either party may seek such relief as may be permitted in accordance with the following terms and conditions:

15.1.1.1 Contractor and Owner agree to negotiate in good faith, in an attempt to resolve any dispute(s) for a period of at least thirty (30) days following the receipt of a written notice from either party to the other which shall set forth, in specifics, the nature and description of the Dispute(s) the actions or inactions of the other

party which caused the Dispute(s), and the relief or remedy requested by the notifying party;

- 15.1.1.2 Should the Contractor and the Owner be unable to resolve the Dispute(s) through good faith negotiation, the Contractor and the Owner agree to attempt in good faith to resolve said Dispute(s) through mediation administered by an organization offering commercial mediation services acceptable to the Owner as a condition precedent to dispute resolution and/or litigation herein provided. All mediation procedures shall be conducted in at a location selected by the Owner in the state where the Project is located;
- 15.1.1.3 Should the Contractor and the Owner be unable to resolve said Dispute(s) through mediations, any and all Dispute(s) shall, at the sole discretion of the Owner, be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then pertaining, which election shall be made by the Owner within a reasonable period of time. The organization providing arbitration services, which is acceptable to the Owner, and any arbitrator(s) appointed thereby shall have no jurisdiction, power or authority to decide or award punitive damages. The award(s) rendered by the arbitrators in accordance with this provision shall be final and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof. All arbitration proceedings or hearings shall be conducted at a location selected by the Owner in the state where the Project is located, utilizing such state's laws;
- 15.1.1.4 The Owner may join any other party in the arbitration proceedings that the Owner determines is necessary to reach a complete adjudication of all Disputes arising under the terms of the Contract, and/or Disputes arising under the terms of any other agreement or contract entered into between the Owner and any other party performing work on the Project, so long as such other Disputes arise out of the same core of operative facts;
- 15.1.1.5 All Dispute(s) not resolved by arbitration pursuant to the terms of Subparagraph 15.1.1.3 will be resolved by litigation in any state or federal court located in the state where the Project is located, utilizing such state's laws, after compliance with Subparagraphs 15.1.1.1 and 15.1.1.2 hereof; and
- 15.1.1.6 The failure of either the Contractor or the Owner to comply with the provisions of this Paragraph 15.1 shall be in contravention of the parties expressed intention to implement this alternative means of Dispute resolution and shall constitute a breach of these provisions. The Contractor and the Owner expressly stipulate that any court having jurisdiction over the parties shall be empowered to immediately enjoin any proceeding commenced in contravention of these provisions and the party failing to comply with these provisions shall reimburse the other party for all costs and expenses (including attorneys' fees) incurred in enforcing these provisions.

ARTICLE 16 SUBMITTALS

16.1 GENERAL

- 16.1.1 Contractor shall prepare and submit submittals in electronic data file format on the Owner's PMW.

16.2 SUBMITTAL PROCEDURE:

- 16.2.1 Submittal Administrative Requirements: The Contractor shall coordinate preparation and processing of submittals with performance of construction activities.

- 16.2.1.1 Coordination: The Contractor shall coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity. The Contractor shall submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule. The Contractor shall coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

- 16.2.1.2 Processing Time: The Contractor shall allow 10 days for review of each submittal or each resubmittal by the Owner and/or Architect beginning at the time of receipt by the Owner and/or Architect. The Contractor shall allow additional time if coordination with subsequent submittals is required. Owner and/or Architect will advise Contractor when a submittal being processed must be delayed for coordination. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

- 16.2.1.3 Identification and Information: The Contractor shall identify and incorporate information in each electronic submittal file as follows:

- 16.2.1.3.1 Assemble complete submittal package into a single indexed file with links enabling navigation to each item.

- 16.2.1.3.2 Name file with submittal number or other unique identifier, including revision identifier.

- 16.2.1.3.2.1 File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

- 16.2.1.3.2.2 Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Owner and/or Architect.

- 16.2.2 Direct Buy Submittals: The Owner will provide submittals for Direct Buy Owner purchased items , when requested by the Contractor, for the Contractor's information as indicated in individual specification sections.

16.2.3 Submittal Procedure Requirements: The Contractor shall prepare and submit submittals required by individual Specification Sections marked "For Approval." Types of submittals are indicated in individual Specification Sections.

16.2.3.1 Electronic Submittals: The Contractor shall post electronic submittals as PDF electronic files directly to Owner's PMW.

16.2.3.1.1 Owner and/or Architect will return annotated file. The Contractor shall annotate and retain one copy of file as an electronic Project record document file.

16.2.4 Contractor's Review: The Contractor shall review each submittal and check for compliance with the Contract Documents. The Contractor shall note corrections and field dimensions. The Contractor shall mark with approval stamp before submitting to the Owner and the Architect.

16.2.5 Owner's and/or Architect's Action:

16.2.5.1 General: The Owner and/or Architect will not review submittals that do not bear Contractor's approval status and will return them without action.

16.2.5.2 The Owner and/or Architect will review each submittal, make marks to indicate corrections or modifications required, and return it.

16.2.5.3 Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

16.2.5.4 Submittals not required by the Contract Documents or not identified with review responsibility in the Submittals List may not be reviewed and may be discarded.

16.2.5.5 Where items deviating from the Specifications and/or Drawings have been approved by the Owner, submittals for these substituted items shall be submitted to the Owner and/or the Architect for approval before fabrication.

16.3 SUBMITTAL CHECKLIST

16.3.1 Refer to Division 00 Section "Submittal Checklist."

END OF SECTION 00 72 14

SECTION 00 73 19 – JOBSITE SAFETY RULES

PART 1 - GENERAL

1.1 GENERAL RULES

- A. The Owner will not permit any person or organization to jeopardize the safety or well-being of any employee or invitee on the Owner's premises because of the willful or negligent disregard or negligence of sound, established safety rules. All federal, state, local, and OSHA safety rules must be observed.
- B. All OSHA standards applicable to the Project, methods and locations must be followed. Any noticed infractions or violations of these standards will be brought to the attention of the person in charge for immediate correction.
- C. The Contractor shall provide and require the use of conventional fall protection, i.e. personal fall arrest systems, safety net systems or guardrails systems as defined in 29 CFR 1926.502 when its employees are performing construction work that is in excess of six feet above a lower level.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 73 19

BLANK SHEET

SECTION 01 61 27 - DÉCOR INTERIOR FINISHES AND COLORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Interior finishes and colors for various products specified for interior décor finishes and colors.

B. Related Sections:

1. Refer to specific Sections of the specifications for product and installation requirements of products listed in this Section.

1.2 DEFINITIONS

- A. General Interior Finishes and Colors: Finishes and colors that are not Décor specific. Typically, these are finishes in areas of store not accessible or visible to customers. This includes back rooms, break rooms, store offices, enclosed prep areas. This also includes floors and ceilings in open prep areas and public toilet rooms.

1. Refer to Division 01 Section "General Interior Finishes and Colors."

- B. Décor Interior Finishes and Colors: Finishes and colors specific to a certain Décor. Typically, these are finishes in areas of the store visible and accessible to customers. This includes sales area, open prep areas (excluding flooring and ceilings), and pharmacy.

1.3 PROPRIETARY NAMES

- A. Use of manufacturer's proprietary product names to designate colors, products, or materials is not intended to imply that the products or materials named are required to be used to the exclusion of equivalent products and materials of other approved manufacturers. Approved manufacturers shall include those as specifically named within each specification section and those approved in writing, by the Owner's Representative, at least ten days prior to bidding.

- B. The products listed in this Section are the "Basis of Design" products. When proposing products other than the "Basis of Design" products, furnish the proposed product's actual samples, data sheets, and certificates of performance along with the "Basis of Design" product's actual samples, data sheets, and certificates of performance as a comparison.

PART 2 - PRODUCTS

2.1 DÉCOR INTERIOR FINISH AND COLOR PRODUCT SCHEDULE

Legend No.	Section No.	Material	Manufacturer	Product	Color	Comments
Division 03 Concrete						
JF-701	03 31 05	Construction and Contraction Joint Filler (Gray Concrete)	Euclid Chemical Company	QWIKjoint UVR 65	Standard Medium Gray	Joint filler for gray concrete floors.
JF-702	03 31 05	Column and Expansion Joint Filler (Gray Concrete)	Euclid Chemical Company	Eucolastic 1 NS or SL	Standard Medium Gray	Joint filler for gray concrete floors at columns.
Division 05 - Metals						
CL-705	05 50 00	Powder coated steel column wrap	Madix	custom	PC 031 Silver Vein	Unless otherwise noted/ called out on the Décor plans. (See ASD-157)
Division 06 - Carpentry						
SS-701	06 10 53	Solid Surfacing	Swanstone	Solid Surfacing	215, Sandstone	Lavatory Countertops
			Wilsonart	Solid Surface	9207CS, Flint Rock	
SS-701B	06 10 53	Solid Surfacing	Swanstone	Solid Surfacing	011, Tahiti White	Lavatory Countertops per Drawings with stainless steel sink per PSD-50
SS-702	06 10 53	Solid Surfacing	Aristech Surfaces, LLC	Avonite	F1-8106, Ivory	Window stools and caps for low walls less than 6'-0" AFF.
			E.I. du Pont de Nemours & Co.	Corian	Bone	
SS-703	06 10 53	Solid Surfacing	E.I. du Pont de Nemours & Co.	Corian	Deep Espresso	Seating area cap for low walls less than 6'-0" AFF.
CL-701	06 64 00	Prefinished, Painted Beadboard, Paneling with 2" scoring pattern Size: 16" x 96" x 1/4"	Marlite	Painted Plank (Prefinished)	SW 6991 Black Magic	Sales Floor Perimeter & Seating Area wainscot to 3'-6" AFF
CL-703	06 64 00	Pebble Finish FRP	Marlite	Standard FRP	White	Prep area walls not visible to customers.
CL-704	06 64 00	Slotted Fiberboard Wall Panels	Marlite	Slatwall, 2000 Series	Formica 5887-58 Millennium Oak w/ Black inserts	For use in Floral. Base uses same laminate with black toe kick.
CL-706	06 64 00	Smooth Finish FRP 6" x 12" Scoring	Marlite	Symmetrix FRP	CL706, Dark Gray	Deli prep wall paneling for remodels and over existing finishes
CL-708	06 64 00	Smooth Finish FRP 3" x 12" Scoring	Marlite	Symmetrix FRP	CL708, Blue	Meat/Seafood prep wall paneling for remodels and over existing finishes
CL-709	06 64 00	Smooth Finish FRP 6" x 12" Scoring	Marlite	Symmetrix FRP	CL709, Warm Gray	FFD/ MTO Prepared Foods prep wall paneling for remodels and over existing finishes
CL-710	06 64 00	Smooth Finish FRP 4'x4' panel size	Marlite	Symmetrix Smart Seam Custom 4" x 12" Horizontal	SSA917-G412R, White with Grey Grout Lines, High Gloss	Bakery Prep, Restroom walls for remodels, and over existing finishes where indicated. Specify trim

Legend No.	Section No.	Material	Manufacturer	Product	Color	Comments
				Subway tile	Finish	pieces and Adhesives on order form.
Division 08 - Openings						
TD-701	08 38 00	Traffic Doors	Chase		Black	Kroger Direct Buy Item
AS-701	08 41 13	Aluminum Storefront			Clear Anodized	For new construction.
AS-702	08 41 13	Aluminum Storefront			Dark Bronze Anodized	For remodels to match existing.
Division 09 - Finishes						
CT-701	09 30 00	Ceramic Tile 4" x 12", 5/16" thick	Mosa Tile	Ten Thirty	16900 White	For use on Bakery prep and tall prep walls behind Murray's Cheese, run horizontally – Grout to be GT-707 National Account Agreement item
CT-702	09 30 00	Rectified Porcelain Tile 12 x 24, 3/8" Thickness	Urban Collection	Threads	Olive Finish Matte	Toilet Room floors per Drawings, running bond pattern – Grout to be GT-702 National Account Agreement item
CT-703	09 30 00	Porcelain Tile 4 x 12 Satin finish	Urban Collection		LTD17 Edge of Seventeen (Satin Finish)	Toilet Room walls field tile, horizontal offset pattern – Grout to be GT-703 National Account Agreement item
CT-704	09 30 00	Porcelain Tile 4 x 12 Gloss finish	Urban Collection		LTD06 Sixth Sense (Gloss Finish)	Toilet Room walls stripe accent band, horizontal offset pattern & Sink Accent wall, vertical stacked pattern – Grout to be GT-703 National Account Agreement item
CT-705	09 30 00	Porcelain Tile, 12" x 24", Matte Finish	Atlas Concord	Dwell	Off White	Wine/ Growler bar front. Grout to be GT-707. Horizontal Stack pattern. National Account Agreement item
CT-706	09 30 00	Tile 6" x 12", Gloss finish	Mosa	Fifteen Thirty	Dark Antracite #2 30610	Deli prep wall tile. Horizontal Stack pattern. Grout to be GT-701. National Account Agreement item
CT-708	09 30 00	Porcelain Tile 4" x 12" Gloss Finish	Pantheon	Viva	610-126	Meat/ Seafood wall tile. Horizontal bricklay pattern. Grout to be GT-704. National Account Agreement item
CT-709	09 30 00	Ceramic Tile 6" x 12", Gloss finish	Mosa Tile	Murals	#30590: Mid Warm Grey #4	FFD/ MTO Prepared Foods prep wall tile. Grout to be GT-708. Horizontal stack pattern. National Account Agreement item
CT-710	09 30 00	Quarry Tile	Daltile	Quarry Textures 6 x 6	0T08, Sahara Sand	For remodels only. Grout to be GT-705

Legend No.	Section No.	Material	Manufacturer	Product	Color	Comments
CT-711	09 30 00	Quarry Tile Cove Base	Daltile	Quarry Textures	0T08, Sahara Sand	For remodels only. Grout to be GT-705
CT-712	09 30 00	Quarry Tile Cove Base	Dal Tile	Quarry Textures	0T03 Ashen Gray	For remodels only. For use with Gray Resinous if required by local code. Grout GT-702
CT-714	09 30 00	Glass, metal, stone Tile 4" X 15"	Daltile	Endeavors	F162 Zen STD F16258RANDS WTCH	Blacksplash on wall behind Wine/ Growler bar counters. GT-704
CT-715	09 30 00	Porcelain Tile 4" x 12" Gloss Finish	Pantheon	Viva	610-101	Prep wall tile in meat and seafood depts. where high LRV is required. Horizontal bricklay pattern. Grout to be GT-704. National Account Agreement item
GT-701	09 30 00	Tile Grout	H.B. Fuller Construction Products Inc.	TEC Power Grout	939, Mist	For wall application only, joint width 1/8"
GT-702	09 30 00	Tile Grout	H.B. Fuller Construction Products Inc.	TEC AccuColor EFX Epoxy Special Effects	927, Light Pewter	For floor application only, joint width 1/8"
GT-703	09 30 00	Tile Grout	H.B. Fuller Construction Products Inc.	TEC Power Grout	927, Light Pewter	For wall application only, joint width 1/8"
GT-704	09 30 00	Tile Grout	H.B. Fuller Construction Products Inc.	TEC Power Grout	929, Charcoal Gray	For wall application only, joint width 1/8"
GT-705	09 30 00	Tile Grout	H.B. Fuller Construction Products Inc.	TEC AccuColor EFX Epoxy Special Effects	945, Light Buff	For quarry tile floors (remodels only)
GT-706	09 30 00	Tile Grout	H.B. Fuller Construction Products Inc.	TEC AccuColor EFX Epoxy Special Effects	929, Charcoal Gray	For vestibule floor application only, joint width 1/8"
GT-707	09 30 00	Tile Grout	H.B. Fuller Construction Products Inc.	TEC Power Grout	908, Dove Gray	For wall application only, joint width 1/8"
GT-708	09 30 00	Tile Grout	H.B. Fuller Construction Products Inc.	TEC Power Grout	935, Silhouette	For wall application only, joint width 1/8"
GT-709	09 30 00	Tile Grout	H.B. Fuller Construction Products Inc.	TEC Power Grout	940 Antique White Both	For wall application only.
CA-701	09 30 00	Edge protection	Schluter Systems	Jolly	A100AT satin nickel	Outside corner tile wall edge protection
CA-702	09 30 00	PVC Cove Base Molding	Schluter Systems	PHK1S125PG	Classic Gray	Toilet Room Floor cove base. E90PHK1SPG for outside corners. I90PHK1SPG for inside corners.
AC-701	09 51 13	Type 1 Acoustic Ceiling Panel	USG	Radar Clima Plus #2410	White	All non-sales floor areas and misc areas
AC-702	09 51 13	Type 2 Acoustical Ceiling Panel	USG	Radar Clima Plus Illusion Two/24 #2842	White	For ceilings at lower seating areas, very small vestibules and Square Apparel

Legend No.	Section No.	Material	Manufacturer	Product	Color	Comments
						"Clouds", Fred Meyer Only
AC-703	09 51 13	Type 5 Acoustic Ceiling Panel, washable	USG Corp.	SHEETROCK ClimaPlus #3270	White	For prep areas including island prep areas requiring washable ceilings
AC-706	09 51 13	Type 6 Ceiling Panel 24" x 48" x ½" acrylic egg crate			White	For use in all non Fred Meyer Apparel fitting rooms
AC-707	09 51 13	Decorative Perimeter Trim, 2" profile	USG	Compasso Standard Steel	Prefinished Flat White 050	For Island Prep areas that require washable ceilings.
AC-708	09 51 13	Type 1 Acoustic Ceiling Panel	USG	Radar Clima Plus #2410	White	Same as AC-701
WB-701	09 65 13	Resilient Wall Base	Johnsonite, a Tarkett company	Traditional Vinyl .080	40, Black	
SA-701	09 65 13	Stair Accessories (Tread, riser, landing)	Johnsonite, a Tarkett company	Raised Round Tread, RNRD	40, Black	Typically for remodels or projects with office area mezzanines.
RT-702	09 65 13	Resilient Floor Trim	Johnsonite, a Tarkett company	Transition or Reducer	20 Charcoal	Resilient Tile to Concrete, Carpet to Concrete, Carpet to Resilient Tile
VS-701	09 65 16	PVC Sheet Flooring	Better Life Technology, LLC	G-Floor #GF75CN102 4	(SN) Sandstone	For service elevators that do not carry customers.
VT-701	09 65 19	Luxury Vinyl Tile 9" x 48"	Armstrong	Natural Creations with Diamond 10 Technology	NA121 Coastal Crafted Boardwalk	Remodels only, if retaining VCT flooring throughout store. For continuous use around the perimeter sales floor as well as Produce, Liquor, and Kitchenplace depts.
		Luxury Vinyl Tile 7.75" x 52"	Mohawk	Living Local Premium Wood	838 Beagle	
VT-702	09 65 19	Luxury Vinyl Tile 12" x 24"	Armstrong	Natural Creations with Diamond 10 Technology	NA 332 Braco Putty	Remodels only, if retaining VCT flooring throughout store. For continuous use in Center Sales Area.
			Mohawk	Living Local Chromascope	250 Dusty Trail	
VT-707	09 65 19	Luxury Vinyl Tile	Polyflor North America	Expona Control PUR	6504, Weathered Country Plank	For Vestibules
VT-708	09 65 19	Luxury Vinyl Tile 6" x 48"	Armstrong	Biome	ST283 Boreal Copenhagen	Pharmacy counsel room flooring.
		Luxury Vinyl Tile 7.75" x 52"	Mohawk	Living Local Premium Wood	939 Bay Leaf	
RF-701	09 67 23	Resinous Flooring	-	As specified in Section 09 67 23	Kroger Brown	For use in existing stores with stained concrete
RF-702	09 67 23	Resinous Flooring	-	As specified in Section 09 67 23	Kroger Beige	For Dairy Coolers in existing stores with stained concrete

Legend No.	Section No.	Material	Manufacturer	Product	Color	Comments
RF-703	09 67 23	Resinous Flooring	Dur-A-Flex	As specified in Section 09 67 23	Comet	For use in new stores with natural, unstained concrete.
			Sika		Agate Grey SF150	For Dairy Coolers in new stores with natural, unstained concrete
			Stonhard		4010	
RF-704	09 67 23	Resinous Flooring with Decorative Flake	Sherwin Williams	FasTop	Decorative Mosaic CU-16, 1/16" vinyl flake	Restroom Floors per Drawings
CP-701	09 68 00	Carpet tiles, 24 X 24	Mohawk group	Learn & Live/Taking Steps Collection Pattern/Style: Adopt A Plan GT466	958 Frizzle	For use in Pharmacy, office areas, & optional for customer Service. – Install quarter turn National Account Agreement item
CP-702	09 68 00	Carpet tiles, 12 X 36	Mohawk group	Lichen Collection Pattern: Field Overlay/ GT 403	969 Substrate	For use in apparel dept. fitting rooms. Install in random pattern (No carpet in Fred Meyer Fitting Rooms).
CP-703	09 68 00	Carpet Tiles 24 x 24	Mohawk Group	Tuff Stuff II QL312 Step In Style	989, Obsidian	For vestibules, quarter turn installation. National Account Agreement item
PT-701	09 91 00	Paint	Sherwin-Williams		SW 7723, Colony Buff	For remodels and expansions when the structure is already painted
PT-702	09 91 00	Paint	Sherwin-Williams		SW 7005, Pure White	Drywall Ceilings
PT-703	09 91 00	Paint	Sherwin-Williams		SW 7069, Iron Ore	Hollow metal doors and frames
PT-704	09 91 00	Paint	Sherwin-Williams		SW 7029, Agreeable Gray	
PT-705	09 91 00	Paint	Sherwin-Williams		SW 6464, Aloe	
PT-706	09 91 00	Paint	Sherwin-Williams		SW 6203, Spare White	
PT-707	09 91 00	Paint	Sherwin-Williams		SW 6991, Black Magic	
PT-708	09 91 00	Paint	Sherwin-Williams		SW 7607, Santorini Blue	Color match to meat/seafood prep wall tile
PT-709	09 91 00	Paint	Sherwin-Williams		SW 7024, Functional Gray	Color match to FFD Hot Meals prep wall tile
PT-710	09 91 00	Paint	Sherwin-Williams		SW 7674, Peppercorn	Color match to Deli prep wall tile

Legend No.	Section No.	Material	Manufacturer	Product	Color	Comments
PT-711	09 91 00	Paint	Sherwin-Williams		SW 9051, Aquaverde	Color match to Bakery prep wall tile
PT-714	09 91 00	Paint	Sherwin Williams		SW 9140 Blustery Sky	Restroom walls above tile.
PT-715	09 91 00	Paint	Sherwin Williams		SW 4090, Black	
PT-716	09 91 00	Paint	Sherwin Williams		SW 4084, Safety Yellow	
PT-717	09 91 00	Paint	Sherwin Williams		SW 7012, Creamy	
PT-718	09 91 00	Paint	Sherwin Williams		SW 6626, Sunset	Floral area accent
PT-719	09 91 00	Paint	Sherwin Williams		SW 6221, Moody Blue	Accent wall behind bar.
PT-720	09 91 00	Paint	Sherwin-Williams		SW 6513, Take Five	Wall above Pharmacy
PT-721	09 91 00	Paint	Sherwin-Williams		SW 6709, Gleeful	Floral dept. wall accent color
PT-722	09 91 00	Paint	Sherwin-Williams		SW 6710, Melange Green	Interior walls of Customer Service dept.
PT-723	09 91 00	Paint	Sherwin-Williams		SW 6990, Caviar	Bistro/FFD/MTO area
PT-724	09 91 00	Paint	Sherwin-Williams		SW 6921, Electric Lime	
PT-725	09 91 00	Paint	Sherwin-Williams		SW 6715 Lime Granite	
PT-726	09 91 00	Paint	Sherwin-Williams		SW 6253 Olympus White	
PT-727	09 91 00	Paint	Sherwin-Williams		SW 6255 Morning Fog	
PT-728	09 91 00	Paint	Sherwin-Williams		SW6726 Talipot Palm	
PT-729	09 91 00	Paint	Sherwin-Williams		SW 7033 Brainstorm Bronze	
PT-730	09 91 00	Paint	Sherwin-Williams		SW-7067, Cityscape	Exposed steel columns on sales floor.

Legend No.	Section No.	Material	Manufacturer	Product	Color	Comments
PT-750	09 91 00	Paint	Sherwin-Williams	Industrial Aluminum Paint	SW 4091 Silver Brite	Metal pipe railings at open mezzanine, remodels only.
Division 10 – Specialties						
BP-701	10 26 00	Bumper	McCue	Greenguard 2	#105 Steel Gray	For use on CL-701 only when needed. National Account Agreement item
TC-701	10 21 13	Toilet Compartments	Partition Systems Inc. of South Carolina	Phenolic Panel System	Wilson Art Ebony Recon 7997-60. Alternate: Wilson Art Satin Stainless 4830K-18	Kroger Direct Buy item
WC-721	10 26 00	Impact Resistant Wall Covering	Koroseal Interior Products	Korogard Protective Wallcovering	Black (01) Texture: Dune (P1)	Wainscot for back office hallways, breakroom, etc.
Division 11 – Equipment						
IP-701	11 41 23	Prefabricated Insulated Wall Panels (coolers) (Including Floral)	Kysor Panel Systems	Prefinished by panel mfr.	Natural Galvanized (On surfaces visible to customer)	Kroger Direct Buy item
Division 12 - Furnishings						
BL-701	12 21 13	Solar Shades	Insolroll Window Shading Systems	Fabric Type: Sahara 10%	Fabric color: Chalk Fascia to match	For use in Seating area as needed.
BL-702	12 21 13	Solar Shades	Insolroll Window Shading Systems	Fabric Type: Sahara 10%	Fabric color: Ebony Fascia to match	For use in Mezzanine area as needed.

2.2 DÉCOR INTERIOR FINISH AND COLOR MISC. ITEM AND ROOM SCHEDULE

Item	Material/Color	Comments
All painted wall surfaces, background color	See décor drawings	Finish to be Eggshell
Overpainting of décor “stencils” and “transparencies”	See décor drawings	Finish to be Flat
Gypsum board Ceilings	PT-702	Finish to be Flat
Exposed Ceilings: Structural steel, metal deck, electrical conduit, ductwork, piping, unistrut, etc.		Do not paint. Manufacturer's or fabricator's standard gray primer.
Exposed Drywall Columns	PT-704 (re-model) PT-730 (new store)	Floor to steel deck.
Exposed Ceilings (Expansions and Remodels): Structural steel, metal deck, electrical conduit, ductwork, piping, unistrut, etc.		Refer to Drawings
Exposed Columns (Sales Floor)	PT-730	
Exposed Columns (Expansions and Remodels)		Paint to match existing exposed columns.
Hollow metal doors and frames	PT-703	

Item	Material/ Color	Comments
Exposed Vertical piping		Match adjacent surface
Exposed Structural Steel on Storefront		Match adjacent surface
Metal pipe railing at mezzanine	PT-750	Remodels only.
Miscellaneous Trim		Match adjacent surface unless noted otherwise
Electrical Panels		Match adjacent surface
Ladders	PT-715	
Steel supports for dock lights	PT-716	
Steel Angles at dock levelers, interior pipe bollards	PT-716	
Bent Plate End Wall Cap at the Cleaning Center, to a height of eight feet.	PT-716	
Backroom and Dock Gypsum Board or Block Walls	Not painted	
Cleaning Center and Prep Area	PT-717	
Cart Wash-down Area	PT-717	
Waste Compactor trash chute door surround (8' X 8' area)	PT-717	
Fire Exit Lanes	PT-717	
Rodent Inspection Lines	PT-717	
Emergency Exit Corridors (not used for access to other areas)		Floors & walls to match adjacent sales area floor.
Cooler wall in Prep Areas, Sales Areas, and Corridors that are Visible to Customers		NEW CONSTRUCTION: Cooler wall IP-701 to remain exposed unless indicated otherwise on fixture plan. REMODELS: Electrostatic paint to match adjacent surfaces.
Wall protection in sales area and public corridors	CL-701 BP-701	Apply wainscot only to exposed walls, extending to 6" behind cases. Apply bumper to wainscot per Project Manager to coordinate with bascarts used in store. Corridor floors and walls to match adjacent sales area.
Low walls in sales area and seating area, 60" or lower.	CL-701 SS-703 top cap	Apply wainscot to full height of exposed surfaces of low wall.
Pharmacists Work Area	PT-704	

Item		Material/ Color	Comments
Pharmacy Waiting Area		CL-701 BP-701 CP-701	See Décor Elevations for wall color locations. Bumper at 29" AFF for standard Pharmacy chairs. (Player by Steelcase) Apply carpet tiles to entire area inside security grill.
Pharmacy Counsel Room		CL-701 PT-704 VT-708	
Customer Service Area		Sealed Conc.	CP-701 Carpet tiles are optional. Otherwise match sales area floor. See décor drawings for paint color.
Prep Area walls adjacent to ceramic tile walls but not visible to customers.		CL-703	
Seating area		CL-701	See Décor drawings for paint selections. Do not install bumper. Do not install wainscot behind bench seating.
Back side of drop soffit in open prep area, Deli / Bakery			match color of bottom of drop soffit
Back side of drop soffit in open prep area, Meat / Seafood		CL-703	
Open Offices	Walls	PT-704	
	Floors	Sealed Conc.	Vinyl Tile for remodels only
Store Manager's Office	Walls	PT-704	
	Floors	Sealed Conc.	
ECR Room	Walls	PT-704	
	Floors	Sealed Concrete	
Hallway	Walls	PT-704	Wainscot (WC-721 if not seen by customer)
	Floors		Match adjacent area
Break Room	Walls	PT-704	Wainscot of WC-721
	Floors	Sealed Conc.	Vinyl Tile for remodels only
Conference Room	Walls	PT-704	
	Floors	Sealed Conc.	Unless otherwise noted on plans
CBT Room		Walls	PT-704

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 61 27

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ITEM	DESCRIPTION/ FINISH	COMMENTS
STOREWIDE		
GROCERY SHELVING **See below for KPNR Shelving**	MADIX: PC073 Clear Coat LOZIER: color code: QG8 Clear Coat Powder	New construction: clear coat Remodels: match existing
REFR. CASES (Meat, Seafood, Deli, Produce, Dairy, Frozen Foods, Sushi, and Bakery, Beverage)	Hussmann: 145 Charcoal Gray BUMPERS: Black INTERIOR: Black	All New store cases will be 145 Charcoal Gray. All Minor Cap and WIW projects Divisions need to confirm if existing cases will be painted to match new 145 Charcoal Gray. If not, new case color should match existing.
REFR. CASE FILLERS	LAMINATE: Formica 8848-58 Blackened Legno	
DELI		
MILLWORK AT SERVICE LINE-UP, DELI	LAMINATE: Formica 8848-58 Blackened Legno BUMPERS: Black COUNTER TOPS: Wilsonart Solid Surface Angel Falls; 9223SS	
MADE TO ORDER VENUES (NON THIRD PARTY)	LAMINATE FOR ALL MILLWORK COUNTERS, FILLERS, & END PANELS: Formica 8848-58 Blackened Legno COUNTER TOPS: Stainless Steel except Gourmet Pizza Module GOURMET PIZZA MODULE COUNTER TOPS: Butcher Block w/food safe mineral oil	
SALAD BAR AND SOUP BAR ISLANDS	FIXTURE BASE: Stainless Steel BUMPERS: Rounded to match Stainless Steel COUNTER TOPS: Stainless Steel	
OLIVE BAR	Stainless steel	
Murrays Cheese	Hussmann: 057 Red for new cases Remodels: Paint Pantone color: 200C Red BUMPERS: Black INTERIOR: Black TOP LEDGE: Butcher Block TOE KICK: Stainless Steel	
CULINARY ISLAND and Q2 Cases	Hussmann: 702 Metallic Silver BUMPERS: Black INTERIOR: Black	
BAKERY		
FRESH FOOD DESTINATION (FFD) (AS INDICATED ON THE FIXTURE PLAN) MILLWORK AT SERVICE LINE-UP	IF LAMINATE: Wilsonart 10734-60 Limber Maple IF WOOD: Stain to match Rustic Hickory plywood COUNTERTOP: Butcher Block to match above, w/food safe mineral oil.	
FRESH FOOD DESTINATION (FFD) DONUT BAKERY CASES	IF LAMINATE: Wilsonart 10734-60 Limber Maple	
FRESH FOOD DESTINATION (FFD) DRY ISLAND BAKERY FIXTURES	IF LAMINATE: Wilsonart 10734-60 Limber Maple IF WOOD: stain to match Rustic Hickory plywood	Examples: Artisan Bread fixture, Bread/Roll destination, Nesting Tables
MEAT/SEAFOOD		
MISC. MILLWORK (ENDCAPS, FILLERS, BUNKERS, MERCHANDISERS)	LAMINATE: Formica 8848-58 Blackened Legno	
BULK FOODS		
MILLWORK END CAPS	LAMINATE: Formica 6413-NG Silver Riftwood Natural Grain	
BULK FOODS FIXTURE	LAMINATE: Formica 6413-NG Silver Riftwood Natural Grain	
KITCHEN PLACE		
SHELVING	Madix or Lozier wire shelving: For New Construction: Clear Coat For remodels: match existing Shelves: Wilsonart 10734-60 Limber Maple	
MILLWORK END CAPS	LAMINATE: Wilsonart 10734-60 Limber Maple	

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PRODUCE		
PRODUCE SLAT TABLES	Stained to match Formica 6413-58 Silver Riftwood	
PRODUCE ORCHARD BINS	Stained to match Formica 6413-58 Silver Riftwood	
MOBILE REFR. BERRY CASE	Exterior: Black Interior: Black Wood Trim (grill): stained to match Formica 6413-58 Silver Riftwood Bumpers: Black	
WOOD DISPLAY CRATES	Stained to match Formica 6413-58 Silver Riftwood	
FLORAL		
FLORAL REFR. CASES	Husmann 112 Charcoal Brown or Husmann 145 Charcoal Gray BUMPERS: Black INTERIOR: Black	
FLORAL SLATWALL FIXTURE	SLATWALL SURFACE: Formica 5887-58 Millennium Oak w/ Black inserts BASE: Formica 5887-58 Millennium Oak with Black toe kick	
FLORAL ISLAND KIOSK	TRANSACTION TOP: Wilsonart Solid Surface Angel Falls; 9223SS COUNTER TOP: Wilsonart Solid Surface Angel Falls; 9223SS CABINETRY: Formica 8848-58 Blackened Legno	
MILLWORK FLORAL COUNTERS AND CABINETS (Stores not getting Floral kiosk)	TRANSACTION TOP: Wilsonart Solid Surface Angel Falls; 9223SS COUNTER TOP: Wilsonart Solid Surface Angel Falls; 9223SS CABINETRY: Formica 8848-58 Blackened Legno	
WOOD DISPLAY CRATES	Stained to match Formica 5887-58 Millennium Oak	
FLORAL NESTING TABLES	Stained to match Formica 5887-58 Millennium Oak	
BALLOON SHADOW BOX	Formica 8848-58 Blackened Legno	
WINE DEPARTMENTS / LIQUOR STORES		
LIQUOR STORE CHECKOUT COUNTER MILLWORK	TOP DECK: Johnsonite/Tarkett: IQ Granit #3040-447 Huntoon WG EDGE: Black CABINETS: Formica 8848-58 Blackened Legno	
METAL SHELVING	Metal Finish to be painted black	
SHELVING/ MILLWORK END CAPS	LAMINATE: Formica 8848-58 Blackened Legno	
WINE TASTING FIXTURE/ BAR MILLWORK	Custom - Discuss with GO Interiors Group	
FRONT END		
CHECKSTANDS	UPPER LAMINATE: Formica 5882-58 Citadel Warp LOWER LAMINATE: Formica 8848-58 Blackened Legno TOP DECK: Johnsonite/Tarkett: IQ Granit #3040-447 Huntoon WG INTERIOR: Black TRIM TRIM/BUMPER: Black	
IN-LINE SELF CHECKOUTS/ EURO LANES	For individual units: Formica 5882-58 Citadel Warp TOP DECK: Johnsonite/Tarkett: IQ Granit #3040-447 Huntoon WG	
TOBACCO CORRAL	LAMINATE: Formica 5882-58 Citadel Warp	
MISC. FRONT END	LAMINATE: Formica 5882-58 Citadel Warp	
SERVICE DESK	CABINETS: Formica 8848-58 Blackened Legno COUNTER TOP: Wilsonart Solid Surface Angel Falls; 9223SS INTERIOR CABINETS: Black	

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MISCELANEOUS		
HBC/OTC	SHELVING: MADIX Color code: PC049 Snow White LOZIER Color Code: W08 Cool white powder coat (Pantone code- Cool Gray 1C) ENDCAPS: Same as above	
COSMETICS	SHELVING: MADIX Color code: PC049 Snow White LOZIER Color Code: W08 Cool white powder coat (Pantone code- Cool Gray 1C) ENDCAPS: Same as above	
PEGGED COSMETICS	SHELVING: MADIX Color code: PC049 Snow White LOZIER Color Code: W08 Cool white powder coat (Pantone code- Cool Gray 1C)	
KBAR/ Baby World shelving	LOZIER: color code: QG8 Clear Coat Powder	
PHARMACY MILLWORK	COUNTERTOPS Wilsonart 4924-38 White Carrara MILLWORK FRONTS AND NON COUNTERTOP SURFACES: Wilsonart 8212K-28 Phantom Ecru INTERIOR: Almond Melamine	
PHARMACY SHELVING	Sahara Beige END PANELS: Wilsonart 8212K-28 Phantom Ecru	
HOUSEHOLD/PET/SEASONAL (Shelving, End Caps)	LAMINATE: Formica 5887-58 Millennium Oak	
GENERAL MERCHANDISE Millwork/Tables	LAMINATE: Formica 5887-58 Millennium Oak	
AMERICAN GREETING CARD & PARTY FIXTURES	FIXTURES PROVIDED BY AG	
BOOKS & MAGAZINES (BY VENDOR)	LAMINATE: Formica 5887-58 Millennium Oak	*Remodels can still have the Cocoa Maple if adding on
ASSOCIATE BREAKROOM/OFFICE SPACES (Kitchenette, Breakroom, Office Space Millwork)	CABINETRY: Formica 5887-58 Millennium Oak COUNTER TOPS: Formica 7708-58 Flax Glauze	
SEATING AREA		
CONDIMENT BAR/TRASH RECEPTACLES (IN SEATING AREAS)	LAMINATE: Formica 8848-58 Blackened Legno COUNTER TOPS: Wilsonart Solid Surface Angel Falls; 9223SS	* If seating areas are in the bar please follow bar specs*
KROGER MARKETPLACE SPECIFIC (Apparel)		
SHELVING/ FIXTURES	If receiving DIP, then laminates will be part of the DIP package.	

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SECTION 01 61 33 - PRODUCT WARRANTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes

1. General administrative and procedural requirements for manufacturers' standard or special warranties on products as specified.
2. Schedule of product warranties.

1.2 PRODUCT WARRANTIES

- A. Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Warranty Period: Warranty period shall be as specified in Warranty Schedule in Part 3 and shall commence at date of completion of remodel phase.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 WARRANTY SCHEDULE

- A. Warranty schedule includes all warranties for a Kroger retail store project. All of the warranties in the schedule may not be required for this Project. Review the Drawings and Specifications to determine what warranties are required for the Project.

Section Number	Section Title	Warranty Description	Period
03 31 06	Polished Gray Cast-In-Place Concrete Slabs	Installer's dustproof warranty covering the polished concrete floor system	10 yrs
03 31 10	Polished Integral Colored Cast-In-Place Concrete Slabs	Installer's dustproof warranty covering the polished concrete floor system	10 yrs
03 35 43.11	Concrete Polishing-New Construction	Installer's dustproof warranty covering the polished concrete floor system	10 yrs

Section Number	Section Title	Warranty Description	Period
03 35 43.13	Concrete Polishing-Low Gloss	Installer's dustproof warranty covering the polished concrete floor system	10 yrs
03 35 43.15	Concrete Polishing-Burnished to Polished Conversion	Installer's dustproof warranty covering the polished concrete floor system	10 yrs
03 35 43.17	Concrete Polishing-Dyed Polished Conversion	Installer's dustproof warranty covering the polished concrete floor system	10 yrs
03 35 43.19	Concrete Polishing-Gray Polished Conversion	Installer's dustproof warranty covering the polished concrete floor system	10 yrs
06 10 53	Miscellaneous Carpentry	Solid-Surfacing-Material and Quartz-Surfacing Material	10 yrs
07 01 50	Roofing Demolition And Repair	Letter from roofing repair installers that existing warranty remains in effect after repairs.	-
07 19 00	Water Repellents	Manufacturer's Special Warranty	10 yrs
07 40 00	Metal Roof and Wall Panels	Manufacturer's Special Warranty	2 yrs
07 40 00	Metal Roof and Wall Panels	Special Warranty on Panel Finishes	20 yrs
07 40 00	Metal Roof and Wall Panels	Special Weathertightness Warranty for Roof Panels	20 yrs
07 53 23	EPDM Membrane Roof	Roof manufacturer's Kroger Limited Warranty	20 yrs
07 53 23	EPDM Membrane Roof	Installer's Warranty	2 yrs
07 54 23	TPO Membrane Roofing	Roof manufacturer's Kroger Limited Warranty	20 yrs
07 54 23	TPO Membrane Roofing	Installer's Warranty	2 yrs
07 62 00	Sheet Metal Flashing and Trim	Warranty for sheet metal flashing and trim for roofing shall be covered in the roofing installer's full system warranty	2 yrs
08 33 23	Overhead Coiling Doors	Door sub-assembly, parts, or hardware	2 yrs
08 33 26	Overhead Coiling Grilles	Materials and workmanship	1 yr.
08 33 36	Side Sliding Grilles	Materials and workmanship	1 yr.
08 36 13	Sectional Doors (Insulated Steel)	Materials and workmanship	1 yr.
08 36 13	Sectional Doors (Insulated Steel)	Delamination	7 yrs.
08 36 13	Sectional Doors (Insulated Steel)	Finish	10 yrs.
08 36 13	Sectional Doors (Full view aluminum)	Materials and workmanship	1 yr.
08 36 14	Bascart Sectional Doors (Insulated Steel)	Materials and workmanship	1 yr.
08 36 14	Bascart Sectional Doors (Insulated Steel)	Delamination	7 yrs.
08 36 14	Bascart Sectional Doors (Insulated Steel)	Finish	10 yrs.

Section Number	Section Title	Warranty Description	Period
08 36 14	Bascart Sectional Doors (Full view aluminum)	Materials and workmanship	1 yr.
08 41 13	Aluminum-Framed Entrances and Storefronts	Special Assembly Warranty	2 yrs
08 41 13	Aluminum-Framed Entrances and Storefronts	Special Finish Warranty	5 yrs
08 42 29	Automatic Entrances	Materials and workmanship	2 yrs
08 71 00	Door Hardware	Alarm Lock Exit Devices	2 yrs
08 71 00	Door Hardware	Overhead Door Holders	1 yr
08 71 00	Door Hardware	Hinges	Lifetime
08 71 00	Door Hardware	Closers	10 yrs
08 71 00	Door Hardware	Falcon T Series Locksets	7 yrs
08 71 00	Door Hardware	Von Duprin Exit Devices	1 yr
08 80 00	Glazing	Manufacturer's Special Warranty for Coated-Glass Products	10 yrs
08 80 00	Glazing	Manufacturer's Special Warranty on Insulating Glass	10 yrs
09 65 16	PVC Flooring (Elevators)	Limited Warranty to repair or replace flooring that fails in materials or workmanship.	Limited Lifetime
09 65 19	Vinyl Composition Flooring (VCT)	Limited Warranty to repair or replace flooring that fails in materials or workmanship.	5 yrs
09 65 19	Luxury Vinyl Flooring	Limited Warranty to repair or replace flooring that fails in materials or workmanship.	20 yrs
09 65 19	Luxury Vinyl Flooring (Polyflor)	Limited Warranty to repair or replace flooring that fails in materials or workmanship.	10 yrs
09 67 23	Resinous Flooring	Manufacturer's warranty covering material	5 yrs
		Installers' warranty covering workmanship	5 yrs
09 68 13	Tile Carpeting	Materials and workmanship	Lifetime
09 72 16	Wall Coverings	Materials: Permanent surface staining attributable to mildew or bleed-through of foreign impurities embedded in the backing.	5 yrs.
10 31 00	Manufactured Gas Fireplaces	Firebox and heat exchanger	20 yrs.
10 31 00	Manufactured Gas Fireplaces	Manifold Tubes, Chimney, and Termination	3 yrs.
10 31 00	Manufactured Gas Fireplaces	Igniters, Electronic Components, and Glass	2 yrs.

Section Number	Section Title	Warranty Description	Period
10 31 00.02	Manufactured Electric Fireplaces	Electrical Components	2 yrs.
10 73 16	Manufactured Canopies	Canopy Warranty	5 yrs.
10 73 16	Manufactured Canopies	Finish Warranty	1 yr.
11 13 00	Loading Dock Equipment	Dock Leveler - Structural	10 yrs.
11 13 00	Loading Dock Equipment	Pit Form	10 yrs.
11 13 00	Loading Dock Equipment	Dock Seal	1 yr.
11 41 13	General Store Fixture Installation	Installer's Warranty: See Section 11 41 13 "General Store Fixture Installation" for explanation of warranty.	90 days
11 41 22	Refrigerated Fixture Installation	Installer's Warranty: See Section 11 41 22 "Refrigerated Fixture Installation" for explanation of warranty.	90 days
11 41 33	Fixture and Equipment Plumbing Connections	Installer's Warranty: See Section 11 41 33 "Fixture and Equipment Plumbing Connections" for explanation of warranty.	90 days
11 41 34	Fixtures and Equipment Condensate Drain Connections	Installer's Warranty: See Section 11 41 34 "Fixtures and Equipment Condensate Drain Connections" for explanation of warranty.	90 days
11 41 43	Refrigeration System Installation	Installer's Warranty: See Section 11 41 43 "Refrigeration System Installation" for explanation of warranty.	90 days
11 41 46	EMS Controls Installation	Installer's Warranty: See Section 11 41 46 "EMS Controls Installation " for explanation of warranty.	90 days
11 41 63	Fixture and Equipment Electrical Installation	Installer's Warranty: See Section 11 41 63 "Fixture and Equipment Electrical Installation" for explanation of warranty.	90 days
13 34 13	Greenhouse and Outside Sales Area		
14 20 13	Freight Elevators	Materials and workmanship	1 yr
14 20 23	Passenger Elevators	Materials and workmanship	1 yr
14 20 43	Service Elevators	Materials and workmanship	1 yr
14 26 00	Limited-Use/Limited-Application Elevators	Materials and workmanship	2 yrs
14 31 00	Escalators	Materials and workmanship	1 yr
14 31 13	Shopping Cart (Bascart) Conveyors	Materials and workmanship	1 yr
14 43 19	Vertical Reciprocating Conveyor	Materials and workmanship	1 yr
21 10 00	Water-Based Fire Suppression Systems	Installer agrees to repair or replace components of fire suppression system	1 yr

Section Number	Section Title	Warranty Description	Period
		that fail for any cause, other than misuse	
22 05 33	Heat Tracing	Manufacturer's warranty	10 yrs
22 30 00	Plumbing Equipment	Reclaim water heaters	5 yrs
22 30 00	Plumbing Equipment	Reclaim water heaters - Heating Element (special order only)	1 yr.
22 30 00	Plumbing Equipment	Domestic water heaters	3 yrs.
22 30 00	Plumbing Equipment	Domestic water heaters - Parts	1 yr.
22 42 00	Commercial Plumbing Fixtures	Materials and workmanship	1 yr.
23 09 13	Instrumentation and Control Devices For HVAC	Materials and workmanship	1 yr.
23 11 23	Facility Natural-Gas Piping	Automatic Valves for gas fired appliances, parts only	1 yr.
23 34 23	Power and Gravity Ventilators	Material only	1 yr.
23 37 00	Air Outlets and Inlets	Drop Box Diffusers: Materials and workmanship.	5 yrs.
23 38 13	Commercial Kitchen Hoods	Material only	1 yr.
23 55 23	Fuel-Fired Unit Heaters	Heat exchanger	10 yrs
23 55 23	Fuel-Fired Unit Heaters	Electrical / mechanical operating components	5 yrs.
23 74 13	Air Conditioning/Air-Handling Units	Materials and workmanship (from start-up)	1 yr.
23 74 13	Air Conditioning/Air-Handling Units	Installer Warranty: Handling manufacturer warranty service	90 days
26 05 26	Grounding and Bonding For Electrical Systems	Materials and workmanship	2 yrs.
26 11 16	Service Entrance	Materials and workmanship (from date of installation)	2 yrs.
26 22 00	Low Voltage Transformers	Materials and workmanship (from date of installation)	2 yrs.
26 24 13	Switchboards	Materials and workmanship (from date of installation)	2 yrs.
26 24 16	Panelboards	Materials and workmanship (from date of installation)	2 yrs.
26 27 26	Wiring Devices	Material only	1 yr.
26 28 00	Low Voltage Circuit Protective Devices	Contactors (Limited to GE items)	2 yrs.
26 28 16	Enclosed Switches and Circuit Breakers	(Limited to GE items)	2 yrs.
26 29 00	Low Voltage Controllers	Circuit breakers and fused disconnects (Limited to GE items)	2 yrs.
26 32 13	Engine Generators	Materials and workmanship	5 yrs.

Section Number	Section Title	Warranty Description	Period
28 31 00	Fire Alarm/Security System	Control Panel and system	3 yrs
32 84 00	Planting Irrigation	planting irrigation components	1 yr
32 90 00	Planting	Installer Warranty: Plantings and accessories	1 yr
33 52 00	Liquid Fuel Distribution	Fuel Tanks (from date of installation)	30 yrs.

END OF SECTION 01 61 33

SECTION 01 64 00 - VENDOR CONTACT LIST

GENERAL REQUIREMENTS

The following pages contain Kroger's Vendor Contact Lists:

1. Vendor Contact List for Owner Furnished Items (Kroger Direct Buy Program).
2. Vendor Contact List for General Contractor Furnished Items (Kroger National Account Agreement/Contacts).

Some vendors listed may not apply to this Project.

For more information on Direct Buy Program items and National Account Agreement items, contact the vendor identified on the list.

VENDOR CONTACT LIST for Owner Furnished Items			
KROGER DIRECT BUY PROGRAM			
Owner (Kroger) Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
Air Handlers	See: HVAC Rooftop Units and Air Handlers	Nolan Francis 513-562-4247	
Controls Package (Building Environmental Control) Best Practice # 94	Dennis Brown (Vendor-Remodels Equip.-stores that already have CPC systems) Emerson Climate Technologies (formerly CPC) 1065 Big Shanty Rd. NW, Ste. 100, Kennesaw, GA 30144 Phone: 574-261-2133 Email: dennisbrown@emerson.com	Jake Goodaker 513-387-7683	
	Normand Masse (Vendor - New Store Equipment) Danfoss 11655 Crossroads Circle Baltimore, Maryland 21220 Phone: 727-271-5365 Fax: 1-678-374-7459 Email: nmasse@danfoss.com		
Décor, Artisan, Banner, Bountiful, Urban Mix, Refresh Fair, Neighborhood (Décor Items, not Design Dwgs.)	Jessica Roberts (Vendor) Design Fabrications 1100 E. Mandoline Ave., Suite 100, Madison Heights, MI 48071 Phone: 800-968-9440 or 248-597-0988 Fax: 248-597-0989 Email: jroberts@dfabdesign.com	John Gebka 513-530-7110	
Décor, Neighborhood (Design Dwgs. Only)	Stephanie DeMars Grubb (Drawing Vendor Only) CDS – Commercial Design Systems, Inc. 13825 SW Galbreath Drive Sherwood, OR 97140-8621 Phone: 312-780-9664 Email: Stephanie@cdscandoit.com	John Gebka 513-530-7110	
Dock Package (Pit Forms, Levelers, Seals, Bumpers, Hoods & Wheel Chocks)	John Hogan (Vendor) McCormick Equipment Company 112 Northeastern Dr. Loveland, OH 45140 Phone: 513-677-8888 Cell: 859-519-6601 Fax: 513-677-9322 Email: johnhogan@mccequip.com	Jayne Zerkle 513-864-7986	

VENDOR CONTACT LIST for Owner Furnished Items			
KROGER DIRECT BUY PROGRAM Owner (Kroger) Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
Doors, Overhead - Coiling & Fire, Sectional (Insulated), Sectional Bascart, and Sectional Full View Aluminum	John Hogan (Vendor) McCormick Equipment Company 112 Northeastern Dr. Loveland, OH 45140 Phone: 513-677-8888 Cell: 859-519-6601 Fax: 513-677-9322 Email: johnhogan@mccequip.com	Jayne Zerkle 513-864-7986	
Doors, Automatic Entrance Best Practice # 45	Greg Erickson (Primary) National Account Manager Stanley Access Technologies 65 Scott Swamp Road Farmington, CT 06032 Phone: 480-652-9593 Email: gregory.erickson@allegion.com	Jayne Zerkle 513-864-7986	
	Alex Constantine National Accounts Manager 65 Scott Swamp Road Farmington, CT. 06032 Phone: 786-649-9918 Email: alex.constantine@allegion.com		
	Matthew Shanahan Service CRM 65 Scott Swamp Road Farmington, CT. 06032 Phone: 860-679-6430 Email: matthew.shanahan@allegion.com		
Doors, Traffic & Walk-In Cooler Best Practice # 93	Sandy Wethington (Vendor) Chase Industries, Inc. 10021 Commerce Park Drive, Cincinnati, OH 45246 Phone: 800-543-4455 ext. 2984 Fax: 800-245-7045 Email: ChaseKrogerMailbox@senneca.com	Jayne Zerkle 513-864-7986	

VENDOR CONTACT LIST for Owner Furnished Items			
KROGER DIRECT BUY PROGRAM Owner (Kroger) Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
Exhaust Hood - Fire Suppression System Best Practice #85 Fans, Exhaust & Ventilation Best Practice #86 HVAC Rooftop DOAS Only	Trixie Perry (Vendor) CaptiveAire Systems Inc. 4641 Paragon Park, Raleigh, NC 27616 Phone: 800-334-9256 ext. 315 or 919-882-2410 ext. 315 Fax: 919-227-5948 Email: kroger@captiveaire.com	Nolan Francis 513-864-7986	
Generators Best Practice # 113	Kevin Affeldt - Primary Contact, National Account Manager Cummins Sales & Service 800 West Ryan Road Oak Creek, WI 53154 Phone: 414-690-0606 Email: kevin.affeldt@cummins.com Corey Krueger – Secondary Contact Phone: 715-743-9725 Email: corey.krueger@cummins.com	Jay Schroeder 513-387-7573	
HVAC Air Balancing & Testing	National TAB Scheduling and Coordination Phone: 855-862-6822 Ext. 3 Email: Kroger@nationaltab.com National TAB will provide a "Certificate of Readiness Checklist" prior to scheduling for a successful test, adjust & balance.	Nolan Francis 513-562-4247	Casey Reddy Kroger Co. HVAC Eng 513-698-1809
HVAC Rooftop Units	Razi Dole (Vendor) Lennox Phone: 614-886-0719 Email: razi.dole@lennoxind.com National Account Customer Service Phone: 800-367-6285 Email lennoxnationalaccounts@lennoxind.com (Tech Support) Phone: 800-367-6285 #2 Email: nationalaccountstechnicalsupport@lennoxind.com	Nolan Francis 513-562-4247	

VENDOR CONTACT LIST for Owner Furnished Items			
KROGER DIRECT BUY PROGRAM Owner (Kroger) Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
HVAC – Larger than 30 ton Rooftop Units Air Handlers, Electric Unit Heaters (vestibule)	<p>Jeff Betz (Vendor) Trane Phone: 866-415-2499, Option 4 Mobile: 513-616-6266 Email: jrbetz@trane.com</p> <p>Email: (Proposals, Logistics): kroger@trane.com</p> <p>Email: (Tech Support, Wiring, Install/Setup): natcolstech@trane.com</p>	Nolan Francis 513-562-4247	
Lamps & Ballasts Best Practice # 84	<p>Argelia Wegmann Signify North America Corporation 200 Franklin Square Dr. Somerset, NJ 08873 Customer Service & Sales Center Phone: 817-213-7391 Email: argelia.wegmann@signify.com</p>	Jarid Apfel 513-765-8446	
Lighting, Interior Fixtures, Occupancy Sensors, Switches for Coolers/Freezers	<p>Luke Dillon (Supplies Fixtures) Villa Lighting 2929 Chouteau Ave. St. Louis, MO 63103 Phone: 314-633-0570 or 314-531-2600 Email: luke.dillon@villalighting.com</p>	Jarid Apfel 513-765-8446	
Best Practice # 89	<p>Dan Ludwig (Supplies Fixtures) Villa Lighting 2929 Chouteau Ave. St. Louis, MO 63103 Phone: 314-359-2616 or 314-531-2601 Email: dan.ludwig@villalighting.com</p>	Jarid Apfel 513-765-8446	
Lighting, Site (Poles, Fixtures, Anchor Bolts & Templates) Best Practice # 91	<p>Wendy Norman, LC Cooper Lighting Solutions 1121 Highway 74 South, Peachtree City, GA 30269 Phone: 770-486-4150 Mobile: 770-866-0293 Fax: 770-486-4150 Email: kroger@cooperlighting.com</p> <p>Renee Miller (Supplies Fixtures) Graybar Electric Co. 1022 W. 8th Street, Cincinnati, OH 45203 Phone: 800-846-3230 or 513-621-0600 Fax: 513-621-0710 Email: CIOHKroger@graybar.com</p>	Bernard Kirkland 312-354-0012	

VENDOR CONTACT LIST for Owner Furnished Items			
KROGER DIRECT BUY PROGRAM Owner (Kroger) Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
Partitions, Restroom with Hard- ware, Coat Hooks, Grab Bars & Accessory Components Best Practice # 131	Doug Busbee (Vendor) Partition Systems Inc. of South Carolina 825 Garland Street, Columbia, SC 29201 P.O. Box 408, Columbia, SC 29202 Phone: 803-252-3020 Mobile: 803-572-2353 Fax: 803-252-6030 Email: doug@psisc.com	Jake Goodaker 513-387-7683	
Pharmacy Drive-Thru Window, Walk-Up Window, Best Practice # 36	Cynthia Aceves - National Account Sales Executive Hamilton Safe Company (Gunnebo US) 1030 Round Bottom Rd. Milford, OH 45150 Phone: 513-882-7948 Email: cynthia.aceves@gunnebo.com Rick Istnick (backup) Phone: 513-703-5955 rick.istnick@gunnebo.com	Jake Goodaker 513-387-7683	
Piping, Refrigeration Compo- nent Best Practice # 142	Jen Joyce (Vendor) United Refrigeration Inc. 11401 Roosevelt Blvd, Philadelphia, PA 19154-2197 Phone: 888-578-9100 Fax: 215-677-2596 Email: jjoyce@uri.com	Jake Goodaker 513-387-7683	
Signs, Exterior Best Practice # 180	Terri Holt - Project Manager (Vendor) Cummings Resources LLC dba Cummings Signs Two Lakeview Place, 15 Century Blvd., Suite 200, Nashville, TN 37214 Phone: 800-489-7446 or Cell: (615) 872-2706 Fax: 615-261-7880 Email: terri.holt@cummingsigns.com Ann Baker Phone: 615-872-0068 Email: ann.baker@cummingsigns.com	Jayne Zerkle 513-864-7986	
Skylights Best Practice # 112	Melinda Brueggmann (Vendor) Acuity Brands Lighting 6201 27th Street, Sacramento, CA 95822 Phone: 800-289-4700 or 760-420-5362 Fax: 888-284-8371 Email: melinda.brueggemann@acuitybrands.com	Jayne Zerkle 513-864-7986	

VENDOR CONTACT LIST for Owner Furnished Items			
KROGER DIRECT BUY PROGRAM Owner (Kroger) Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
Structural Steel Package (Joists, Joist Girders, & Decking) Best Practice # 97	Jill E. Engerman - National Accounts Coordinator (Vendor) New Millennium Building Systems, LLC 7575 W. Jefferson Blvd., Fort Wayne, Indiana 46804 Phone: 260-969-3502 Mobile: 260-318-1231 Fax: 260-969-3590 Email: jill.engerman@newmill.com	Brad Johnson 740-703-8787	
Switchgear, Transformers, Panels, Breakers, Disconnects, Motor Starters Best Practice # 81	Matt Foor (Vendor) ABB (formerly GE Industrial Solutions) One Crowne Point, Suite 1530, Sharonville, OH 45241 Phone: 513-823-8447 Mobile: 513-535-1804 Fax: 513-792-2054 Email: matt.foor@us.abb.com	Bernard Kirkland 312-354-0012	
Walk-In Cooler / Freezer Best Practice # 72	Scott Royal (Vendor) KPS Global 4201 North Beach, Fort Worth Texas 76137 Phone: 682-317-5434 Mobile: 817-228-3200 Fax: 817-887-5743 Email: krogerwalkins@kpsglobal.com Email: scott.royal@kpsglobal.com	Jarid Apfel 513-765-8446	
	Backup: Jeff Forsyth Phone: 440-263-2512 Email: jeff.forsyth@kpsglobal.com		
Display Doors and Shelving for Walk-In Cooler / Freezer Best Practice # 72	Primary: Mike Conrath (Vendor – Display Door and Shelving Supplier) Hussmann Corporation 12999 St. Charles Rock Rd Bridgeton, MO 63044 Phone: 314-298-8210 Mobile: 314-713-8630 Fax: 866-314-1695 Email: Mike.Conrath@Hussmann.com	Jarid Apfel 513-765-8446	

VENDOR CONTACT LIST for Owner Furnished Items			
KROGER DIRECT BUY PROGRAM Owner (Kroger) Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
	Secondary: Shawna Shepherd (Vendor - Display Door and Shelving Supplier) Anthony International c/o Zink Marketing 420 Westdale Avenue, Westerville, OH 43082 Phone: 800-492-7400 Fax: 614-899-9797 Email: kao@zinkmarketing.com		
Water Heaters, Fuel Fired Best Practice # 72	Paul Rice (Vendor) Lochinvar Corporation, 300 Maddox Simpson Parkway, Lebanon, TN 37090 Phone: 615.889.8901 ext. 2353 Mobile: 615-318-4567 Email: aprice@lochinvar.com	Jayne Zerkle 513-864-7986	
Water Heaters, Reclaim Reference GC specifications	Russ Williams (Vendor) Paul Mueller Company 1600 West Phelps Street, Springfield, Missouri 65802 Phone: 417-575-9762 Email: rwilliams@paulmueller.com	Jayne Zerkle 513-864-7986	
	Secondary: Jordan Blunt Phone: 417-575-9445 Email: jblunt@paulmueller.com		
Wiring, Electrical Best Practice # 66	Renee Miller (Vendor) Graybar Electric Co. 1022 W. 8th Street, Cincinnati, OH 45203 Phone: 513-562-4127 Fax: 513-621-0710 Email: CIOHKroger@graybar.com	Jayne Zerkle 513-864-7986	

VENDOR CONTACT LIST for General Contractor Furnished items			
KROGER NATIONAL ACCOUNT AGREEMENT/CONTACTS Contractor Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
Bumpers / Rub Rails - Rigid PVC Reference GC specifications	Brian Zornes (Vendor) McCue Corporation 35 Congress Street Salem, MA 01970 Phone: 630-561-3269 Email: bzornes@storeequipment.com	Jayne Zerkle 513-864-7986	
	Melissa Blatte (Vendor – Customer Service Rep.) Phone: 978-219-5310 Email: melissablatt@mccue.com		
Carpeting, Padded Tile, Broadloom Reference GC specifications	Stacy Frank (Vendor) Alt: Kurt Brooks Mohawk Carpet Distribution Inc. 508 E Morris St. Dalton, GA 30721 Mobile: 513-716-4996 Fax: 706-422-6079 Email: stacy_frank@mohawkind.com	Jayne Zerkle 513-864-7986	
Curbs, Roof For Fans, HVAC RTU, and Skylights Reference GC specifications	Dean Cleondis (Vendor) AES Industries Inc. 2171 Highway 229, P.O. Box 781147 Tallassee, AL 36078 Phone: 800-786-0402 or 334-283-6578 Ext. 319 Fax : 334-283-5447 Email: dcleondis@aescurb.com	Nolan Francis 513-562-4247	
Doors, Hollow Metal, Frame, Hardware Package, & Custodial Accessories Reference GC specifications	Allie Bicknell Warrick CSI, CDT (Vendor) National Accounts Manager Cook & Boardman 345 Mason Road La Vergne, TN 37086 Phone: (855) 447-8600 (Direct : 336-816-3653) Fax: 615-942-1171 Email: kroger@cookandboardman.com or awarrick@cookandboardman.com	Jayne Zerkle 513-864-7986	

VENDOR CONTACT LIST for General Contractor Furnished items			
KROGER NATIONAL ACCOUNT AGREEMENT/CONTACTS Contractor Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
Elevators, LU/LA (Limited Usage/Limited Access) Reference GC specifications	Carlton Yee Ping (Vendor) Garaventa Lift P.O. Box 1769 Blaine, WA 98231-1769 Office: 604-594-0422 Mobile: 778-836-9602 Fax: 604-594-9915 Email: cyeeeping@garaventalift.com	Bernard Kirkland 312-354-0012	
Elevators, freight, passenger, service. Escalators, Cart Conveyors Reference GC specifications	Pete Engwer (Vendor) National Accounts Sales Manager ThyssenKrupp Elevator Americas 929 Eastwind Dr, Suite 218 Westerville, OH 43081 Phone: 303-591-6310	Bernard Kirkland 312-354-0012	
Flooring, LVT Reference GC specifications	Stacy Frank (Vendor) Alt: Kurt Brooks Mohawk Carpet Distribution Inc. 508 E Morris St. Dalton, GA 30721 Mobile: 513-716-4996 Fax: 706-422-6079 Email: stacy_frank@mohawkind.com	Jayne Zerkle 513-864-7986	
	Lien Chu (Vendor) AHF Products, Armstrong Flooring Business Development - Commercial National Accounts 3840 Hempland Road Mountville, PA 17554 Mobile: 202.253.2088 Email: Lien.Chu@AHFProducts.com		
Flooring, V-LVT, Vestibule LVT Reference GC specifications	Brandon Lyons Spartan Surfaces 309 Ronnie Lee Circle Louisville, KY 40299 Phone: 502-552-4420 Email: blyons@spartansufaces.com	Jayne Zerkle 513-864-7986	

VENDOR CONTACT LIST for General Contractor Furnished items			
KROGER NATIONAL ACCOUNT AGREEMENT/CONTACTS Contractor Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
Heaters, Unit, Gas-Fired Reference GC specifications	Joseph Brandt (Vendor) Nortek Global HVAC LLC 8000 Phoenix Parkway O'Fallon, MO, 63368 Phone: 636-561-7536 Mobile: 314-378-1869 Email: joseph.brandt@nortek.com	Jayne Zerkle 513-864-7986	
Paneling, FRP Reference GC specifications	Greg Leary Marlite 1 Marlite Drive Dover, OH 44622 Phone: 845-324-0978 Email: gleary@marlite.com	John Gebka 513-530-7110	
Roller Window Shades Reference GC specifications	Tabatha Crawford Phone: 800-447-5534 Ext. 100	John Gebka 513-530-7110	
Tile, Ceramic Reference GC specifications	Robyn Vidic Louisville Tile 3200 E. Kemper Rd. Cincinnati, OH 45241 Phone: 513-532-9707 Email: rvidic@louisville-tile.com	Jayne Zerkle 513-864-7986	
Tile, Ceramic (Daltile Only) Reference GC specifications	Marsha McCauley Daltile 4650 Lake Forest Dr #540 Cincinnati, OH 45242 Phone: 513-460-1168 Email: marsha.mccauley@daltile.com	Jayne Zerkle 513-864-7986	
Tile, Ceramic (Pantheon Only) Reference GC specifications	Eric Schick Pantheon Floor solutions, Inc. Phone: 214-335-2329 Email: eric@pantheontile.com	Jayne Zerkle 513-864-7986	

VENDOR CONTACT LIST for General Contractor Furnished items			
KROGER NATIONAL ACCOUNT AGREEMENT/CONTACTS Contractor Purchased			
ITEM	NAME, ADDRESS, PHONE, FAX, EMAIL	INDIRECT SOURCING CONTACT	ADDITIONAL INFO.
Wall Covering Reference GC specifications	Felicia Colucci (Vendor) MDC Wallcovering 149 Madison Avenue, Suite 1200 New York, NY 10016 Phone: 800-486-9800 Ext. 8389 or 224-366-5089 Fax: 212-213-5517 Email: fcolucci@mdcwall.com	John Gebka 513-530-7110	

END OF SECTION 01 64 00

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes
 - 1. Recycling nonhazardous construction waste.
 - 2. Disposing of nonhazardous construction waste.
 - 3. Recycling of vinyl composition tile.
 - 4. Recycling of mineral fiber ceiling tile.

1.2 PRICE AND PAYMENT PROCEDURES

- A. The Owner desires to achieve a goal of recycling 90 percent of all construction waste. Payment procedures for construction waste management and disposal are identified in Division 00 Section "General Conditions."
- B. Provide a separate cost for construction waste management and disposal as identified in this Section on Division 00 Section "Trade Proposal Form."

1.3 DEFINITIONS

- A. Construction Waste: Demolition, building, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging and waste generated by Workers.
- B. Disposal: Removal off-site of construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- C. Recycle: Recovery of construction waste for subsequent processing in preparation for reuse.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for recycling of 90 percent of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction waste from landfills and incinerators. Facilitate recycling and salvage of materials.
- A. Refer to Division 01 Section "General Conditions" for waste management payment procedures and incentives.

1.5 SUBMITTALS

- A. Waste Management Plan: Submit plan within 7 days of date established for the Notice to Proceed or Contract signing.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report indicating amount of construction waste recycled and amount of construction waste disposed to land fill. Include receipts from recycling and landfill facilities. Use Waste Reduction Progress Report form located on Owner's Project Management Website (PMW) under **Files > Capital > Building & Site Specifications > Procurement and Contracting Requirements > WORKING FORMS-open to retrieve excel files**. A sample of the form is also included at the end of this section.
- C. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for recycling and disposal as a percentage of total waste generated by the Work.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference: Conduct conference at Project site. Review methods and procedures related to waste management.
- C. Recycling Programs: Ceiling and floor tile will be recycled via a manufacturer sponsored program as follows:
 - 1. Approved Recycled Ceiling and Floor Tile Recipient:
 - a. Armstrong World Industries
 - 1) Phone: 1-877-276-7876
 - 2) Website: www.armstrong.com/environmental
 - b. Substitution approved by Owner.
 - 2. A representative of the approved recycled tile recipient must approve the material for reclamation.
 - 3. Prior to removal the VCT flooring is to be registered with the Armstrong Flooring Recycling Center.
 - 4. Floor Tile:
 - a. Approved Floor Tile Material:
 - 1) 12 inch (305 mm) by 12 inch (305 mm) vinyl composition tiles.
 - b. Materials not acceptable for recycling:
 - 1) Asbestos containing flooring tiles.

- 2) Flooring tiles installed with adhesives containing asbestos.
- 3) Flooring tiles being removed from a location undergoing any type of asbestos or hazardous abatement.
- 4) Wet, moldy or weathered flooring tiles.
- 5) Flooring tiles or gaylord boxes/pallets which contain debris (garbage, construction waste).
- 6) Flooring tiles not packaged according to packaging procedures set forth below.
- 7) Flooring tiles or roll-off bins or containers, used by demolition and construction specialists, which contain debris (garbage, construction waste).
- 8) Vinyl composition tiles containing aluminum oxide grit as present in slip retardant tiles.
- 9) Flooring tile being reclaimed that may have come into contact with asbestos containing material, hazardous waste materials or special waste.

5. Ceiling Tile

a. Approved Ceiling Tile Material:

- 1) All brands of pulvable mineral fiber ceiling materials.
- 2) Field painted ceiling tiles, after testing in ceiling tile manufacturer's laboratory to confirm acceptability.

b. Ceiling materials that are not acceptable include:

- 1) Vinyl or fabric-faced ceiling materials
- 2) Foil-backed ceiling materials
- 3) Ceiling materials with visible wood pulp
- 4) Moldy ceiling materials
- 5) Asbestos containing ceiling materials
- 6) Ceiling materials installed below friable asbestos or that are contaminated with any other hazardous material.

1.7 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according requirements in this Section. Plan shall consist of waste identification and waste reduction work plan. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

1. Refer to sample plan at the end of this section.

- B. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator.

1. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
2. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

3. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with operation, termination, and removal requirements in Division 00 Section "General Conditions."
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Division 00 "General Conditions" for controlling dust and dirt, environmental protection, and noise control.

3.2 RECYCLING CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
 1. Mineral Fiber Ceiling Tile and Vinyl Composition Floor Tile Recycling: Comply with recycled ceiling and floor tile recipient's procedures for packaging and shipping.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. At Contractor's option, separate recyclable waste by type either at Project site or in a single container that will be separated later at the recycling facility. Verify with Owner to determine if site constraints will prohibit separating recyclable waste at Project site.

1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site.
2. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.3 RECYCLING VCT FLOORING

- A. The procedure for product handling of recyclable VCT is as described below.

1. Remove the approved VCT and place in the supplied cardboard Gaylord Boxes.
2. Gaylord Boxes and Pallets must be kept dry.
3. Colors must be separated into different Gaylord Boxes when diverse.
4. No wood, metal, construction debris, trash or hazardous material of any kind can be included.
5. Materials should not be loaded above the top of the Gaylord Boxes.
6. Each Gaylord Box should have visible Armstrong RA label attached.
7. Contact Armstrong when a full truckload, 24 Gaylord Boxes, is ready for pick-up.

3.4 DISPOSAL OF WASTE

- A. General: Except for items or materials to be recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

3.5 ATTACHMENTS

- A. Sample Waste Reduction Progress Report.
- B. Sample Construction Waste Management Plan.

(See following pages for sample reports)

Sample Waste Reduction Progress Report

Zero Waste Reporting										
Project Number				Project Type				Project Manager		
Start Date				Opening Date				General Contractor		
	Amount in Tons									
	Trash ¹	Concrete	Wood	Plastic	Asphalt	Metal	Non-Ferrous Metal	Ceiling/Floor Tile	Cardboard	Other ²
January	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0	0	0
July	0	0	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0	0	0
September	0	0	0	0	0	0	0	0	0	0
October	0	0	0	0	0	0	0	0	0	0
November	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0
Percentages	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	¹ Anything not considered Recyclable for the project									
	² Anything not listed, but still Recyclable									

January										
	Amount in Cubic Yards									
	Trash	Concrete	Wood	Plastic	Asphalt	Metal	Non-Ferrous Metal	Ceiling/Floor Tile	Cardboard	Other
1-Jan										
2-Jan										
3-Jan										
4-Jan										
5-Jan										
6-Jan										
7-Jan										
8-Jan										
9-Jan										
10-Jan										
11-Jan										
12-Jan										
13-Jan										
14-Jan										
15-Jan										
16-Jan										
17-Jan										
18-Jan										
19-Jan										
20-Jan										
21-Jan										
22-Jan										
23-Jan										
24-Jan										
25-Jan										
26-Jan										
27-Jan										
28-Jan										
29-Jan										
30-Jan										
31-Jan										
Total (ton	0	0	0	0	0	0	0	0	0	0
Percents	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Sample Construction Waste Management Plan

Goal: To divert 90% or more of all construction waste from landfills through reuse, recycling or salvaging.

Waste Management Contact:

TO BE PROVIDED BY GENERAL CONTRACTOR (put recycler information and contact info here)

Communication Plan:

- Contractor must submit proposed waste hauler to Kroger or the G.C. prior to bringing containers for hauling waste onsite.
- Containers will be labeled with the materials they are for
- Access to containers will be prevented when contractors are not onsite, through fencing, or locking the lids on containers
- The GC is responsible for training subcontractors to follow the CWM plan.
- CWM goals will be discussed during weekly meetings.

Expected Waste and Disposal:

- If recycler is designated as “*Single Stream*” all construction waste should be disposed of in the same waste container, labeled “*Construction Waste*”.
- All non-recyclable, non-hazardous material should be disposed of in a dumpster labeled “*Trash*”, to be sent to a landfill.
- Identify each dumpster by material, i.e. a dumpster labeled “*Concrete*” will be used for

Management and Administration:

- Construction Waste Management and Disposal is to be executed according to specification section 01 74 19.
- Contractor should provide amount of waste sent to landfill and waste diverted in tons on spreadsheet known as Waste Reduction Progress Report, as well as receipt from recycler. Both are to be uploaded to sitefolio under General Contractor -> RFP -> Waste Reduction Progress Reports
- Waste is to be placed in dumpsters designated for the type of waste
- If the 90% goal is not reached, the Contractor will receive compensation proportional to the percent of the goal reached.

END OF SECTION 01 74 19

SECTION 02 41 19 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.

1.2 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes the property of Contractor.
- B. The Owner reserves the right to retain ownership of existing fixtures, equipment, and other items (assets). Remove and handle existing assets deemed sold or retained by Owner in such a manner that will prevent damage and loss including but not limited to safeguarding the items from theft.

1.3 SUBMITTALS

- A. Inventory: Submit a list of assets to be retained by the Owner that have been removed and salvaged.

1.4 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.

1.5 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will be minimally disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that asbestos containing materials will be encountered in the Work. The Owner has conducted an asbestos survey and has identified that there is no asbestos present in the facility.
 - 1. If materials suspected of containing asbestos are encountered, do not disturb; immediately notify Owner. Owner will survey the suspected material and if it is determined to contain asbestos will negotiate a Change Order with Contractor for the removal of the asbestos containing materials.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL

3.2 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
- B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Engage a qualified underground detection services company to located and identify all mechanical and electrical utilities and other hidden potentially dangerous mechanical and electrical items inside and outside the building to reduce the risk of injury.
 - 2. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 3. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.4 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary enclosures as specified in Division 00 Section "General Conditions."
 - 6. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner, tenants and the public from fumes and noise. Provide temporary partitions as specified in Division 00 Section "General Conditions."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations.
- B. Removed and Salvaged Items (Assets):
 1. Clean salvaged items.
 2. Pack or crate items as required after cleaning. Identify contents of containers, if any.
 3. Store items in a secure area until received by the Owner.
- C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner's Representative, items may be removed to a suitable, protected storage location during selective demolition and reinstalled after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Below-Grade Construction: Demolish foundation walls and other below-grade construction that are within footprint of new construction and extending **5 feet (1.5 m)** outside footprint indicated for new construction. Abandon below-grade construction outside this area
 1. Remove below-grade construction, including basements, foundation walls, and footings, to at least **8 inches (203 mm)** below top of finished floor slab as required for installation of HVAC, plumbing, electrical, refrigeration, fire protection piping, and storm piping systems, and appurtenances associated with those systems.
- B. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within **5 feet (1.5 m)** outside footprint indicated for new construction. Abandon utilities outside this area. Fill abandoned utility structures with satisfactory soil materials according to backfill requirements in Contract Documents.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Locate and mark concrete where underground utilities and other items are to be located. Saw-cut into **2 by 2 foot (610 by 610 mm)** sections. Limit depth of cut to depth of existing concrete slab-on-grade to prevent hitting potentially dangerous unidentified buried mechanical and electrical services. Remove concrete without jack hammering.
- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI-WP and its Addendum.
 1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.

- F. Roofing: Remove no more existing roofing than can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
- G. Air-Conditioning Equipment: Reclaim all refrigerant per EPA regulations and Federal Regulation 40 CFR Section 82 prior to demolition. Tag equipment prior to removal.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

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SECTION 02 41 23 - RESILIENT FLOOR TILE AND MASTIC REMOVAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes

1. Removal of existing non-asbestos containing resilient floor tile.
2. Recycling of existing non-asbestos containing vinyl composition tile (VCT).
3. Removal of existing non-asbestos containing mastic.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Pre-Removal Conference: Conduct conference at Project site.

1. Inspect and discuss condition of floor tile and mastic to be removed.
2. Review and finalize tile and mastic removal schedule and verify availability of materials, personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review areas where existing construction requires protection.

B. Scheduling:

1. Coordinate scheduling with Owner to meet project completion dates.
2. Remove all floor tile prior to removal of mastic.

1.3 QUALITY ASSURANCE

A. Remove floor coverings and adhesive according to recommendations in RFCI-WP and its Addendum.

1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.

1.4 SITE CONDITIONS

A. Hazardous Materials: The Owner has tested the resilient floor tile and mastic for asbestos containing materials (ACM). The Owner will provide documentation of floor tile and mastic testing to Contractor.

B. Do not block or hinder use of building by Owner and Customers.

C. Ventilation Control: Provide temporary ventilation required by mastic removal material and construction activities for floor tile and mastic removal. Select equipment that will not have a harmful effect on completed or existing installations or elements being installed. Coordinate

ventilation requirements to produce ambient condition required and minimize energy consumption.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Maintain a sufficient quantity of materials and equipment to assure continuous and efficient work throughout the duration of the Work.
- B. Polyethylene Sheet: ASTM D 4397, 6 mils (0.15 mm) thick.
- C. Mastic Removal Material:
 - 1. Provide a non-flammable low odor or no odor material meeting or exceeding the VOC (volatile organic compound) level requirements of the authority having jurisdiction.
 - 2. Flash Point: Above 140 deg. F (60 deg. C).
 - 3. Restrictions:
 - a. Do not use soybean based or any other oil based mastic remover. These types of mastic remover have harmful effects to colored or stained polished concrete floors.
 - b. Do not use mastic removers that have harmful odor or are otherwise offensive to employees or customers. Schedule removal while facility is closed or during times of low occupancy.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Site Access and Temporary Controls: Conduct floor tile and mastic removal to ensure minimum interference with customers and employees.
- B. Temporary Facilities: Provide temporary barricades and other protection required to restrict customer and employee access and to prevent injury to people and damage to adjacent areas.
- C. Cover existing walls, fixtures or shelves with polyethylene sheet to a height of at least 3 feet (1 m) above finish floor to protect existing walls, fixtures or shelves during the tile and mastic removal Work.

3.2 REMOVAL OF RESILIENT FLOOR TILE

- A. Do not remove VCT flooring until asbestos report has been obtained from Owner.
- B. Remove floor tile intact, as much as possible using mechanical or manual methods.
- C. Remove demolished tile from the building as demolition progresses. Do not allow demolished tile to remain unattended in the store.

3.3 RECYCLING OF VCT MATERIALS

- A. General: It is the Owner's intent to recycle floor tile on this Project. If the Contractor deems that it is not economically feasible to recycle floor tile, Contractor must receive written approval from the Owner to delete recycling from the project.
- B. Definitions.
 - 1. Disposal (If recycling is not performed): Comply with requirements of authorities having jurisdiction.
 - 2. Recycling: Recovery of VCT for subsequent processing in accordance with the recycling program outlined below.
- C. Recycling program: Floor tile will be recycled via a manufacturer sponsored program as follows.
 - 1. Approved Recycled Ceiling and Floor Tile Recipient.
 - a. Armstrong World Industries
 - 1) Phone: 1-877-276-7876
 - 2) Website: www.armstrong.com/environmental
 - 2. A representative of the approved recycled tile recipient must approve the material for reclamation.
 - 3. Approved floor tile material: 12 inch (305 mm) by 12 inch (305 mm) vinyl composition tiles.
 - 4. Materials not approved for recycling:
 - a. Floor tile from buildings built prior to 1990 regardless of previous abatement and/or subsequent replacement of floor tile.
 - b. Asbestos containing floor tiles.
 - c. Floor tiles installed with adhesives containing asbestos.
 - d. Floor tiles being removed from a location undergoing any type of asbestos or hazardous abatement.
 - e. Wet, moldy or weathered floor tiles.
 - f. Floor tiles or gaylord boxes/pallets which contain debris (garbage, construction waste).
 - g. Floor tiles not packaged according to packaging procedures set forth below.
 - h. Floor tiles or roll-off bins or containers, used by demolition and construction specialists, which contain debris (garbage, construction waste).
 - i. Vinyl composition tiles containing aluminum oxide grit as present in slip retardant tiles.
 - j. Floor tile being reclaimed that may have come into contact with asbestos containing material, hazardous waste materials or special waste.
- D. Preparation of waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

- E. Procedures: Separate recyclable waste from other waste materials, trash, and debris. At Contractor's option, separate recyclable waste by type either at Project site or in a single container that will be separated later at the recycling facility. Verify with Owner to determine if site constraints will prohibit separating recyclable waste at Project site.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site.
 - 2. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.
 - 3. Comply with Division 00 "General Conditions" for controlling dust and dirt, environmental protection, and noise control.
- F. VCT Recycling Procedures.
 - 1. Recycling of VCT floor tile is to be accomplished as outlined below in accordance with Armstrong World Industries.
 - a. Register this floor with the Armstrong Flooring Recycling Center.
 - b. Remove the approved VCT and dispose of in the supplied cardboard Gaylord Boxes.
 - c. Contact Armstrong when a full truckload, 24 Gaylords, is ready for pick-up.
 - d. Gaylord Boxes and Pallets must be kept dry.
 - e. Colors must be separated into different Gaylord Boxes when diverse.
 - f. No wood, metal, construction debris, trash or hazardous material of any kind can be included.
 - g. Materials should be placed in a roll-off container and covered.
 - h. Materials should not be loaded above the top of the Gaylord Boxes.
 - i. Each Gaylord Box should have visible Armstrong RA label attached.

3.4 REMOVAL OF MASTIC

- A. Preparation:
 - 1. Before application of mastic remover, inspect the floor for any drains, cracks, fractures, or penetrations and seal properly.
- B. Mastic Removal:
 - 1. Apply mastic remover in accordance with manufacturer's printed instructions and in accordance with authorities having jurisdiction.
- C. Liquefied Mastic Pick-up:
 - 1. Using absorbent, pick up the liquefied mastic and dispose of in accordance with Federal, State, and Local regulations.
- D. Final Rinse of Surfaces:
 - 1. Mop and rinse surfaces with 110 deg. F (43 deg. C) water and deodorizing detergent.
 - 2. Dispose of mop/rinse water down a sanitary drain.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Dispose of demolished materials as required by authorities having jurisdiction.
 - 1. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3.6 CLEANING

- A. Clean adjacent areas of dust, dirt, and debris caused by floor tile and mastic removal operations. Return adjacent areas to condition existing before floor tile and mastic removal operations began

3.7 PROTECTION

- A. At the end of each workday, tape the edge of non-removed tile with safety yellow tape as a precaution to tripping.

END OF SECTION 02 41 23

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SECTION 03 01 80 - CAST-IN-PLACE CONCRETE SLAB CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Cutting and patching of cast-in-place exposed and polished concrete floors.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture, provide proportion mixes by either laboratory trial batch or field experience method, complying with ACI 301. Include all admixtures to be used in the concrete. Include field test data from at least 10 tests or a three-point curve generated using trial mixtures.
- C. Material Test Reports: From a qualified testing agency, indicating and interpreting test results for compliance of the materials, and admixtures with requirements indicated, for all materials utilized in the concrete.

1.3 QUALITY ASSURANCE

- A. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design and extent to that indicated for this project on a minimum of five similar projects, and whose work has resulted in construction with a record of successful in-service performance.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

2.2 CONCRETE MATERIALS

A. Bag Concrete:

1. Minimum Compressive Strength: 5000 psi (34.5 MPa).
2. Slump Limit: 3 inches (76 mm).
3. Add 10 percent, by weight, Type I Portland cement to the mix.
4. Add 3 percent, by weight, liquid pigment to the mix.

a. Products:

- 1) Davis Colors; Hudrotint; West: 800-356-4848, East: 800-638-4444.
- 2) L.M. Scofield Company; Chromix L; 800-800-9900.
- 3) Solomon Colors; ColorFlo; 800-624-0261.

b. Color: C-26, Antique Cork.

B. Ready Mix Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. Minimum Compressive Strength: 5000 psi (34.5 MPa).
2. Slump Limit: 3 inches (76 mm).
3. Add 3 percent dry pigment, by weight, to the mix, either at the batch plant or on the job.

a. Manufacturers:

- 1) Davis Colors.
- 2) L.M. Scofield company.
- 3) Solomon Colors.

b. Color: To match adjacent concrete.

2.3 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

2.4 ACCESSORY MATERIALS

A. Joint Filler: Two component, 1:1 ratio, polyurea elastomer joint filler of 100 percent solids, Shore 65-67 A hardness, rapid curing self leveling, semi-flexible sealant and UV resistant.

1. Products: Specify store number and address when ordering.

- a. Euclid Chemical Company; QWIKjoint UVR 65.
- b. HI-TECH Systems; HT-PE65 Flexible Control Joint Filler.
- c. Metzger/McGuire Co.; Spal-Pro RS-65.

- d. No substitutions allowed.
- 2. Color: Match adjacent concrete.

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Drill through entire slab section at each inside corner with 1/2 inch (13 mm) hammer drill bit.
- B. Saw cut the concrete a minimum of 1-1/2 inch (38 mm) or 1/3 of the slab, whichever is greater. Do not saw all the way through the slab.
- C. Trench Width: Minimum 12 inches (305 mm).
- D. Do not cross cut slab, either at mid sections or ends.
- E. Break out remaining concrete with drop hammer.
- F. Do not damage trench edges or ends at top surface plane. If edge or end is damaged in any way, saw cut that edge again after the work in the trench is done.
- G. Lower floor clean-outs by coring around them with a 12 inch (305 mm) bit.

3.2 STEEL REINFORCEMENT INSTALLATION

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Follow structural engineer's direction. If no direction given, dowel patch to adjacent slab with #3 deformed steel reinforcing bars, 12 inches (305 mm) o.c. a minimum of 4 inches (102 mm) embedment with epoxy. Place bars at mid-point of slab. Insert 6x6x 6 gauge w.w.f. in upper 1/3 of slab.

3.3 CONCRETE FINISHING

- A. Leave top of patch 1/16 inch (1.6 mm) high.
- B. Work top of slab with jitterbug to bring fines to the surface.
- C. Steel trowel to close any pinholes or eliminate minor blemishes, bringing the surface to a dense, smooth, polished finish.
- D. Achieve Face Numbers method minimum local value flatness of $F_t=20$ and levelness of $F_l=15$.
- E. Finish trench edges with 1/4 inch (6 mm) radius edger.

- 1. Product: Goldblatt Tool Company; #GO6235

3.4 CURING

- A. Cure for seven days before polishing.
- B. Do not apply any curing compound.

3.5 POLISHING AND DYEING

- A. Stain or dye the slab patch to match or be slightly darker than the adjoining surfaces.
- B. After patching, rout joints and fill with joint filler.

END OF SECTION 03 01 80

SECTION 03 31 05 - CAST-IN-PLACE CONCRETE SLABS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Non-polished, non colored cast-in-place concrete slabs-on-grade.
 - 2. Formwork.
- B. Refer to Division 03 concrete polishing section(s) for polishing of concrete slabs.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture, provide proportion mixes by either laboratory trial batch or field experience method, complying with ACI 301. Include all admixtures to be used in the concrete. Include field test data from at least 10 tests or a three-point curve generated using trial mixtures.
- C. Material Test Reports: From a qualified testing agency, indicating and interpreting test results for compliance of the materials, and admixtures with requirements indicated, for all materials utilized in the concrete.
- D. Material Certificates: For curing material, stating that material is approved by USDA.
- E. Minutes of pre-installation conference.
- F. Floor finisher ACI certificate and experience.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design and extent to that indicated for this project on a minimum of five similar projects, and whose work has resulted in construction with a record of successful in-service performance.

1. The concrete floor finishing installer's lead finisher of the finishing crew shall be certified under the Concrete Flatwork Finisher Training and Certification Program as granted by the American Concrete Institute.
- C. Design Mixture Responsibility: The ready-mix concrete producer shall be responsible for the compatibility of concrete ingredients and admixtures to ensure that the total air (including entrapped air) content in the concrete caused by the chemical reaction of ingredients is not greater than the percentage listed in Article "Concrete Mixtures" in Part 2 of this Section.
- D. American Concrete Institute (ACI) Publications: Comply with the following unless modified by requirements in the Contract Documents:
 1. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
 2. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
 3. ACI 305R, "Hot Weather Concreting."
 4. ACI 306R, "Cold Weather Concreting."
 5. ACI 347 "Recommended Practice for Concrete Formwork."
 6. ACI 403 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete."
- E. Source Limitations:
 1. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
 2. Obtain ready-mixed concrete from the same batch plant.
- F. Mockups: Cast concrete slab-on-grade panel to demonstrate surface finish, texture, and standard of workmanship of anti-slip finish for approval by Owner.
 1. Build panel approximately **36 sq. ft. (3.3 sq. m)** in location directed by Owner.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 00 Section "General Conditions."
 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete installer.
 - e. Fibrous reinforcing manufacturer.
 2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B. Form-Release Agent: Commercially formulated form-release agent with a maximum of 350 mg/l volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

- A. Joint Dowel Bars: ASTM A 615/A 615M, **Grade 60 (Grade 420)**, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Tapered Plate Dowels: Diamond shaped load plate for construction joints
 - 1. Basis-of-Design Product: PNA Construction Technologies; Diamond Dowel System.
 - 2. Material:
 - a. Diamond Shaped Load Plate: **1/4 inch (6 mm)** thick, saw cut from hot rolled steel plate meeting ASTM A 36.
 - b. Pocket Former: High density plastic with internal collapsible fins and spacer that hold diamond shaped load plate in correct position.
 - 3. Refer to ACI 302.1R-04 for selection of plate size and spacing.

2.3 FIBER REINFORCEMENT

- A. Fibrous Reinforcing: ASTM C 1116-08, Type IV, Alkali-resistant, virgin cellulose fibers.
 - 1. Product: Solomon Colors, Inc.; UltraFiber 500, (800) 624-0261. Specify store number and address when ordering.
 - 2. No substitutions allowed.

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I/II.
- B. Normal-Weight Aggregates: ASTM C 33, graded.
- C. Do not use the following concrete materials in the mix design:
 - 1. Fly ash

2. Ground granulated blast furnace slag.
 3. Air-entraining admixtures.
- D. Water: ASTM C 94/C 94M and potable.
- E. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in ACI 301. Do not use calcium chloride or admixtures containing calcium chloride. Proportions and types of admixtures shall be consistent in all placements.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 4. Mid-Range, Water-Reducing Admixture: ASTM C 494/C 494M.
 5. Non-Chloride Accelerating Admixture: ASTM C 494/C 494M, Type C and E.
 6. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 7. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 8. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.5 REPLACEMENT AND PATCHING MATERIALS

A. Concrete Slab Replacement Materials (Fast Cure)

1. Portland Cement: ASTM C 150, Type III, high early strength
2. Normal-Weight Aggregates: ASTM C 33, graded.
3. Do not use the following concrete materials in the mix design.
 - a. Fly ash
 - b. Ground granulated blast furnace slag.
 - c. Air-entraining admixtures.
4. Water: ASTM C 94/C 94M and potable.
5. Chemical Admixtures:
 - a. Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete.
 - b. Do not use calcium chloride or admixtures containing calcium chloride.
 - c. Maintain consistency of proportions and types of admixtures in all placements.

B. Concrete Slab Patching Material: Portland cement-based, self-drying, fast setting, trowelable patch.

1. Basis of Design Product (For Patches Larger Than 1 inch (25 mm) in Diameter): Ardex Engineered Cements; Ardex SD-P.
2. Basis of Design Product (For Patches 1 inch (25 mm) in Diameter and Smaller): Ardex Engineered Cements; Ardex Feather Finish-Gray.

2.6 VAPOR RETARDERS

- A. Plastic Vapor Retarder and Protective Plastic Sheet: ASTM E 1745, Class A, polyolefin, 10 mils, in areas as indicated. Include manufacturer's recommended adhesive or pressure-sensitive tape.
 - 1. Products:
 - a. Fortifiber Corporation; Moistop Ultra 10; 800-773-4777.
 - b. Insulation Solutions, Inc.; Viper Vaporcheck, 10 mils; 866-698-6562.
 - c. Raven Industries Inc.; Vapor Block 10; 800-635-3456.
 - d. Reef Industries, Inc. Griffolyn 10 mil Green; 800-231-6074
 - e. Stego Industries, LLC; Stego Wrap, 10 mils; 877-464-7834.
 - f. Tex-Trude, LP; X-TREME 10 mils; 281-452-5961.
 - g. Poly-America, L.P.; husky Yellow Guard, 10 mils; 800-527-3322

2.7 CURING AND SEALING MATERIALS

- A. Curing and Sealing Material: Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
 - 1. Product: Euclid Chemical Company (The); Super Diamond Clear VOX. Specify store number and address when ordering.
 - a. No substitutions allowed.
 - 2. Color: Clear.
 - 3. Federal Agency Approvals: USDA approved for food-processing environments.

2.8 RELATED MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - 1. Products:
 - a. BASF Building Systems, MBT Protection and Repair Div.; Confilm; 800-496-6067
 - b. Euclid Chemical Company (The); Eucobar; 800-321-7628.
 - c. L&M Construction Chemicals, Inc.; E-Con. 800-362-3331
 - d. Meadows, W. R., Inc.; Sealtight Evapre; 800-342-5976.
- B. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, lightweight, non-staining, polyethylene, closed cell, chemical-resistant, ultraviolet stable, non-absorbent, low density, compressible foam.
- C. Joint Filler:

1. Contraction (Sawed) Joints, Construction (Cold) Joints, and Cracks: Two component, 1:1 ratio, polyurea elastomer joint filler of 100 percent solids, Shore 65-67 A hardness, rapid curing self leveling, semi-flexible sealant and UV resistant.
 - a. Products: Specify store number and address when ordering.
 - 1) Euclid Chemical Company; QWIKjoint UVR 65.
 - 2) HI-TECH Systems; HT-PE65 Flexible Control Joint Filler.
 - 3) Metzger/McGuire Co.; Spal-Pro RS-65.
 - 4) No substitutions allowed.
 - b. Color: Match adjacent concrete.
2. Columns and Expansion Joints: Polyurethane, Type S, Class 25, Use T, gun grade or pourable as applicable.
 - a. Products:
 - 1) Gun Grade:
 - a) BASF Building Systems; Sonolastic NP 1.
 - b) Euclid Chemical Company; Eucolastic 1 NS.
 - c) Sika Corporation, Inc.; Sikaflex - 1a.
 - d) Tremco; Vulkem 116.
 - 2) Pourable:
 - a) BASF Building Systems; Sonolastic SL 1.
 - b) Euclid Chemical Company; Eucolastic 1 SL
 - c) Sika Corporation, Inc.; Sikaflex-1CSL.
 - d) Tremco; Vulkem 45.
 - b. Color: Match adjacent concrete.

D. Cylindrical Sealant Backings for Polyurethane Joint Filler (As Applicable): ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

E. Construction Joint Protective Plastic Sheet: ASTM D 4397, polyethylene sheet, not less than **10 mils (0.25 mm)** thick.

2.9 CONCRETE MIXTURES

A. Prepare and submit for Owner's testing agency approval design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

B. Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength:

- a. Interior Floor Slabs: 3000 psi (20.7 MPa) at 28 days.
2. Aggregate: Normal weight
3. Minimum Cementitious Materials Content: ACI 301.
4. Maximum Water-Cementitious Materials Ratio: 0.50.
5. Admixtures:
 - a. Plasticizing: ASTM C 1017
 - b. Water Reducing: ASTM 494 Type A
 - c. Admixtures containing chloride are not permitted in reinforced concrete or concrete containing metals.
6. Fibrous Reinforcing: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd. (0.60 kg/cu. m). Add reinforcing fibers directly into concrete mixer at beginning of batch cycle, and allow a minimum of four minutes at mixing speed in concrete mixer for full reinforcing fiber dispersion
7. Slump Limit:
 - a. Take concrete for slump test at point of discharge.
 - b. Standard: 4 inches (100 mm), plus or minus 1 inch (25 mm).
 - c. Do not add water on-site to achieve a higher slump.
 - d. With Mid-Range Water Reducer: 6 inches (152.4 mm) after addition of water reducer to concrete with 4 inch (100 mm) slump.
8. Air Content: Do not allow air content caused by the chemical reaction of ingredients to exceed 3 percent.

2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information. Provide all ready-mixed concrete from same batch plant.
 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Complete the following requirements prior to concrete placement.
 1. Inspect prepared subgrade for suitability for placing of concrete. No standing water, organic material, debris, or other deleterious materials should be present.
 2. Coordinate concrete work with the work of the other trades to allow reasonable time to set sleeves, inserts and other accessories, which must be in position before concrete is placed.

3. HVAC system must be operational to maintain proper temperatures for curing throughout entire installation.
 - a. If temporary heat must be used, only heaters with sealed combustion chambers and positive venting to the outside are permitted. Venting to the outside, complying with ACI 306, is required to prevent discoloration or inconsistency or carbon dioxide poisoning of the concrete. Use of temporary heat must be approved by Owner.
 - b. Proper Recommended Temperature: 55 degrees F (13 degrees C).
4. Employ methods to prevent dust and air-born debris from entering building and settling on slab surface during finishing operations.
5. Proof roll subgrade at least 72 hours prior to concrete placement.
6. Conduct a walkthrough with the Owner and concrete installer to determine that the installation of all underground work is complete and accurately placed.
7. Do not install box outs around interior building columns or other floor penetrations.
8. Pre-wet subgrade. Do not place concrete over standing water.

3.2 FORMWORK

- A. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
 1. Clean and adjust forms prior to concrete placement. Apply form release agents.
 2. Provide openings in formwork to accommodate work of other trades.

3.3 DRAINAGE FILL

- A. Building Slab Drainage Fill: Install in thickness as indicated on Drawings but no less than 4 inches (101.6 mm) thick.

3.4 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.5 VAPOR RETARDERS

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
 1. Place under freezers and other locations as indicated. Extend 2-feet (609.6-mm) beyond edge of freezers.
 2. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

3.6 CONSTRUCTION JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
 - 1. Locate and install construction, isolation and control joints as indicated or required. Give special attention to reentrant corners.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Owner.
 - 1. Locate construction joints so they do not impair strength and appearance of structure. End placements at control joint saw cut line. Do not end placements at highly visible areas.
 - 2. Dowel construction joints with tapered plate dowels or joint dowel bars at 2 feet (610 mm) on center unless indicated otherwise on Drawings or manufacturer's instructions. Do not key construction joints.
 - 3. Place a 4 foot (1219 mm) wide, protective plastic sheet strip on existing slabs (to protect against spillage) when new concrete placement is placed against existing. Remove any new concrete that has overlapped onto previous placement immediately.

3.7 CONCRETE PLACEMENT, GENERAL

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. During placement of slab, a representative of each trade having work in area of placement shall maintain a presence to protect their work.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 2. Water may be added to the concrete mix at the jobsite in conformance with ACI 301-10 subject to the following conditions:
 - a. Slump limits set forth in specifications are not exceeded.
 - b. Concrete is discharged within the time limits set forth in the specifications.
 - c. Maximum water-cement ratio is not exceeded.
 - d. Water added is limited to the amount of water withheld during batching. The concrete producer shall note on the delivery ticket how much water can be added without exceeding the water-cement ratio.
- D. Cold-Weather Placement: Comply with ACI 306R and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below **40 deg F (4.4 deg C)** for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

E. Hot-Weather Placement: Comply with ACI 305R and as follows:

1. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.
2. Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching **0.2 lb/sq. ft. x h (1 kg/sq. m x h)** before and during finishing operations.

3.8 FLOOR SLAB PLACEMENT

- A. Thickness: **4 inches (101.6 mm)** minimum unless indicated otherwise on Drawings.
- B. Place floor slabs in sections as large as practical to meet the final finish requirements.
- C. Recess and slope concrete to drains for all food preparation and service areas that are to receive floor finishes as indicated on Drawings.
- D. Sloped Floors:
 1. Form out and place areas of floor, which are to be sloped to floor drains, after level areas of floor have been placed.
 2. Slope floor to floor drains at **1/8 inch per foot (10.4 mm per m)** in areas indicated on the drawing.
 3. Shape and slope sloped floors as indicated on the Drawings.
- E. Provide concrete mudsill below underfloor raceway for electrical wiring full length of raceway. Refer to Division 28 Section "Raceway and Boxes for Electrical Systems" for additional information.
- F. Provide concrete trenches for refrigerant lines as indicated on Drawings. Building floor to form top of trench, placed after all work has been completed in trench.
 1. After slab placement, cut off PVC or ABS pipes, for refrigeration pipes, flush with concrete slab.

3.9 FINISHING FLOORS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces.
 1. Do not use water on trowels or equipment during finishing.

2. At Contractor's option, apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

B. Finished Appearance:

1. Smooth Finish: Provide in areas not receiving anti-slip finish unless otherwise indicated.
 - a. Appearance: Dense, smooth, polished finish, uniform in texture free of any trowel marks or other imperfections.
2. Anti-Slip Finish: Provide in coolers and freezers not to receive resinous flooring or quarry tile finish material and exposed concrete stair treads.
 - a. Appearance: Equivalent to the texture of medium #120 - 150 grit sandpaper finish free of any trowel marks or other imperfections to match mock-up.
 - b. See Drawings for limits of anti-slip finish.
 - 1) Include anti-slip finish on exposed concrete stair treads.

C. Initial Strike-Off:

1. Perform with a mechanical screed and/or a hand operated straightedge.
2. After initial strike-off, and in a direction at 90 degrees to it, flatten the surface with a 12-foot (3.66-m) minimum straightedge.
3. Overlap each pass of the straightedge by approximately 50 percent. Do not use bull floats.

D. Floating:

1. Equipment: Power trowel machines using float pans.
2. Timing: Begin floating when the mix has stiffened enough to support the weight of the troweling equipment and operator and surface or bleed water has dissipated.
3. Perform two power floatings, if required, to bring the surface to the desired condition for power troweling.

E. Power Troweling:

1. Timing: Begin power troweling as soon as little or no cement paste clings to the blades.
2. Provide a minimum of two power trowelings at the correct time interval for the floor surface.
 - a. For the first troweling, keep trowel blades as flat as possible against the surface to avoid a "washboard" or "chatter" surface.
 - b. Continue troweling until surface is dense, smooth, and free of all minor blemishes and trowel marks.

F. Hand Troweling

1. General: Provide hand troweling to close any pinholes or eliminate minor blemishes bringing the surface to a dense, smooth, polished finish.
- G. Floor Flatness and Levelness: As determined in accordance with **ASTM E 1155 (ASTM E 1155M)** and as follows:
 1. Slabs-on-Grade:
 - a. Specified overall values of flatness F(f)=30; and levelness F(L)=20.
 - b. Minimum local value of flatness F(f)=20; and levelness F(L)=15.
 2. Suspended Slabs:
 - a. Specified overall values of flatness F(f)=25.
 - b. Minimum local value of flatness F(f)=20.
 3. If variations greater than this exist, remove the affected portion of the floor in sections no smaller than **10 ft. (3.05 m)** by **10 ft. (3.05 m)** and replace with new concrete to bring the surface within the tolerance requirements.
 4. Grinding to achieve required flatness or levelness is not allowed.

3.10 CONCRETE CURING AND SEALING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing in unconditioned spaces.
 1. Keep concrete floor free of all dirt, debris, paint, oil or other matter that might prevent adhesion of the surface material.
 2. Do not use where finish material (tile or resinous flooring) is to be installed on concrete slab.
- B. Cure and seal concrete according to ACI 308.1, by the following method:
 1. Concrete Curing (Immediately After Concrete Finishing):
 - a. Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - b. Properly prepare slab to prevent edge curling due to ambient temperatures at time of placement of curing compounds.
 2. Concrete Sealing (Immediately Prior to Fixture Installation):
 - a. Thoroughly clean floor according to curing and sealing compound manufacturer's recommendations.
 - b. Just prior to installation of fixtures install an additional coat of concrete curing and sealing compound according to manufacturer's installation instructions.

- C. Location: Non-polished concrete slabs and curbs, not receiving resinous or resilient flooring and other areas as indicated on the Drawings.

3.11 JOINTS, CONSTRUCTION AND CONTRACTION

- A. Construction Joints in Slabs-on-Grade: After removing formwork, install plastic protective sheet strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Saw cut joints as specified for contraction joints to receive joint filler.
- B. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated.
 - 1. Layout: As indicated on Drawings. Do not use colored chalk to mark saw cut lines.
 - 2. Equipment: Power saws equipped with shatterproof abrasive or diamond-rimmed blades.
 - a. Basis of Design: Husqvarna Corporation; Soff-Cut.
 - 3. Joint Depth: 1/4 the slab thickness or a minimum of 1 inch (25.4 mm).
 - 4. Joint Width: 1/8 inch (3.2 mm).
 - 5. Timing: Saw joints as soon as saw cut can be made without raveling, but no later than 12 hours after concrete has been placed (typically one hour in hot weather to four hours in cold weather after completing finishing of slab at that joint location).
 - a. Employ sufficient number of saws and workers to complete cutting saw joints before shrinkage produces cracking. Maintain at least two saws on site.
 - 6. Change saw blades as needed to insure a clean and sharp joint and to prevent variances in joint width.
 - 7. Continue joints to column or wall face with hand grinder. Joint width and depth shall match width and depth of joints formed with large saw.
 - 8. Surface of Concrete at Joints: Smooth without grooves at the joints.
 - 9. After saw cutting, immediately vacuum up and clean residues.

3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling as long as possible to allow moisture to escape from concrete slab. Install just prior to installing fixtures.
- B. Chase joints with abrasive blade, remove surface and joint contamination with vacuum. Leave joint faces of clean and dry prior to joint sealant installation.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints.
 - 1. Installation shall be by manufacturer certified installer.

2. Do not use joint back-up material (i.e. backer rod, sand, etc.) except below bottom of saw cut in construction joints.
 3. Install joint filler stain preventing film per manufacturer's instructions. Do not allow stain preventing film to run into joint.
 4. Fill joints in two passes to produce slight crown. Overfill shall not exceed 1 inch (26 mm) total width.
 5. Remove excess filler from exposed concrete surface prior to setting.
 6. Add extra filler prior to setting if needed to prevent depressed areas.
 7. Provide cured filler flush with finished concrete surface by razoring off crown.
 8. Refill joints to flush level on week prior to Grand Opening.
- D. Install flexible joint filler at columns and expansion joints per manufacturer's recommendations.
1. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

3.13 CARE AND PROTECTION OF FLOOR

- A. Protect concrete slabs to be burnished or that will remain exposed.
1. Immediately after contraction joints have been cut into slab and cutting residue vacuumed up and cleaned, install protective covering.
 2. Install such that protective covering completely covers slab up to walls and under doors so that paint, joint compound, and other construction materials and activities do not soil or damage floor.

3.14 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Owner. Remove and replace concrete that cannot be repaired and patched to Owner's approval.
- B. Provide test area made of specified materials for Owner's review and approval.
- C. Place concrete patching material as recommended in writing by manufacturer.
- D. Repair excessive cracking in areas receiving floor finishes (tile or resinous flooring) as determined by Owner.
1. Rout cracks (other than hairline shrinkage openings that have maintained their level) with crack chaser 1/2 inch (12.7 mm) deep by 3/16 inch (4.8 mm) wide and pack crack with sand.
 2. Caulk top 1/2 inch (12.7 mm) depth with epoxy sealant, using bulk caulking gun.
- E. Excessive cracking in areas receiving tile, epoxy or carpet will receive an anti-fracture membrane (AFM) installed by the tile, epoxy or carpet installer.

3.15 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports. Field testing to be performed by an ACI certified concrete field testing technician grade I (or equivalent).
- B. Contractor's Responsibilities
 - 1. Notify Owner in advance of concrete placement to allow sufficient time to prepare for required testing.
 - 2. Assist Owner in securing field specimens.
 - 3. Provide and maintain for sole use of Owner's testing laboratory, facilities for safe storage and proper curing of concrete test cylinders at Project site as required by ASTM C31 and acceptable to Owner's testing laboratory.
- C. Inspections:
 - 1. Headed bolts and studs.
 - 2. Verification of use of required design mixture.
 - 3. Concrete placement, including conveying and depositing.
 - 4. Curing procedures and maintenance of curing temperature.
 - 5. Verification of concrete strength before removal of shores and forms from beams and slabs.
- D. Testing and Inspecting: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
 - 1. Testing Services: Tests shall be performed according to ACI 301.
 - 2. Sampling: ASTM C-172.
 - 3. Slump: ASTM C-143, one (1) test at discharge point for each day's placement for each type of concrete. Conduct additional tests when concrete consistency appears to have changed.
 - 4. Compression Test Specimen: ASTM C-31, one set of four standard cylinders for each compressive strength test, unless directed otherwise.
 - 5. Concrete Temperature: ASTM C-1064
 - 6. Compressive Strength: ASTM C-39, minimum testing is one set per day for each mix placed for each 100 cubic yards or fraction thereof; one specimen tested at 7 days, one specimen tested at 28 days and one retained for later testing if required.
 - 7. Test Method for Determining FF Floor Flatness and FL Floor Levelness: ASTM E-1155
 - 8. Flatness and levelness numbers shall be in accordance with ACI 302.1R. Conduct test within 72 hours of concrete placement.
- E. Moisture vapor emission testing shall be conducted as required by the Owner.
- F. Floor Slab Examination: Prior to acceptance, examine floor slab to ensure floor slab can accept application of surface materials. If excessive cracking is observed repair slab as specified.
- G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Owner. Testing and inspecting agency may conduct tests to

determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Owner.

1. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- H. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents
- I. Owner shall make final acceptance and approval of concrete work.

END OF SECTION 03 31 05

**SECTION 03 35 43.15 - CONCRETE POLISHING - BURNISHED CONVERSION OR
REPOLISHING**

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Concrete polishing of existing burnished concrete floors or repolishing of existing polished concrete floors specifically performed by the Owner pre-approved concrete polishing installer working for the building Contractor.
 - a. Refer to concrete polishing plan for extents of type of polishing, hand grinding and polishing, and areas to receive applied surface treatments.
 - b. Work includes the following:
 - 1) Addressing floor imperfections as needed.
 - 2) Opening the surface.
 - 3) Joint preparation and joint filling application.
 - 4) Application of clear liquid concrete densifier.
 - 5) Application of concrete dye (as needed for blending patches and as noted on plans) at integral colored concrete patched areas.
 - 6) Dry grinding and polishing of concrete floor.
 - 7) Hand grinding and polishing.
 - 8) Application of penetrating sealer.
 - 9) Application of slip resistant treatment.
 - 10) Application of salt guard treatment.
 - 11) Application of stain protection treatment (only on sales floor if Diamabrush is not being used by Owner/Operations for cleaning).
 - 12) Unless provided by the General Contractor, providing power via generator for polishing equipment if existing building power is not available.
2. General Contractor Responsibilities:
 - a. Provide an enclosed and climatized sales area to assure a consistent polished concrete finish.
 - b. Provide availability of contiguous floor area per day for polishing operations as follows unless otherwise indicated:
 - 1) Walk Behind Polishing Operations: 2,500 to 3,000 sq. ft. (233 to 279 sq. m).
 - c. Utilities: Provide water, heat, and light.
 - 1) If permanent lighting is not in place, simulate permanent lighting conditions during polishing operations.
 - 2) If power is not available, provide/coordinate temporary power via generator with polished concrete installer..

1.2 ABBREVIATIONS

- A. COF: Coefficient of Friction.
- B. DOI: Distinction of Image.
- C. SCOF: Static Coefficient of Friction.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation Conference: At least two weeks prior to the application of polished concrete floor finish system, conduct conference at Project site with concrete polishing installer (and via phone/web conference for other attendees) to comply with requirements in Division 00 Section "General Conditions." The Contractor will be in charge of the meeting. The Contractor shall take minutes of the meeting and distribute within 48 hours.

1. Attendees:

- a. Contractor.
- b. Polished concrete installer.
- c. Owner.
- d. Owner operations floor care representative.

2. Agenda

- a. Review of Owner provided Floor Finish Plan, Final Fixture Plan, Floor Finish Schedule and remodel Phasing Plan.
- b. Environmental requirements.
- c. Surface preparation.
- d. Repair procedures including review of any potentially unacceptable slab conditions.
- e. Field quality control.
- f. Cleaning.
- g. Protection of systems.
- h. Coordination with other work.
- i. Safety Procedures.
- j. Final turn over process to Owner's floor care representative.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's recommended installation procedures.
- B. Concrete Polishing Plan: Written proposal indicating the extents of type of polishing, hand grinding and polishing and areas to receive applied surface treatments.
- C. Procedure Submittals: Include surface preparation and installation procedures specific to Project.
- D. Installer Certification:

1. List of successfully completed polished concrete floor system projects, including project name and location, name of architect, and type and quantity of polished concrete floor system installed.
- E. Protection Plan: For surrounding areas and non-work surfaces.
- F. Minutes of pre-polishing meeting.
- G. Closeout Submittals
 1. Owner Job Completion Form (included at the end of this section) including:
 - a. Slip coefficient of friction, gloss, and DOI readings.
 2. Warranty: Installer's standard warranty.
 3. Operation and Maintenance Data: Installer's maintenance manual, including maintenance and cleaning instructions for polished concrete floor system.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced certified CPAA installer with adequate number of skilled personnel who are thoroughly trained and experienced in concrete slab polishing with 2-3 years of experience and a minimum of 10 projects performed within three years of similar type, size and complexity as this Work.
 1. Installer must be prequalified with the Owner. Potential installers must submit to the Owner for prequalification. The following installers are prequalified for enterprise-wide work:
 - a. HTI Polymer, Inc.
Contact: Damon Paulson
18702 142nd Avenue NE, Woodinville, WA 98072
Phone: 425-487-8911
Cell: 206-488-7734
Fax: 425-487-8915
Email: damonp@htipolymer.com
 - b. QuestMark, a division of CentiMark Corporation.
Contact: Jim Gasper.
12 Grandview Circle, Canonsburg, PA 15317.
Phone: 800-423-5667 ext. 8615 or 724-514-8615.
Cell: 724-263-4172.
Fax: 724-743-6000.
Email: James.Gasper@centimark.com.
 - c. Perfect Polish, Inc.
Contact: Kyle Trepanier.
184 Cedar Place, Norris, TN 37828.
Phone: (865) 297-4093.
Cell: (865) 494-1875.
Fax: (865) 494-0872.

Email: RFQ@perfectpolishonline.com.

- B. Joint Filler Installer Qualifications: An experienced installer who is certified by manufacturer of joint filler to install manufacturer's products.
- C. Testing procedures:
 - 1. ASTM C 1028 - Standard Test Method for Determining the Static Coefficient of Friction (SCOF) of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.
 - 2. NFSI 101-A-2009 – National Floor Safety Institute using a tribometer for testing.
 - 3. ANSI B101.1-2009.
- D. Mockups: Provide two mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Provide mockups for polished concrete floor finish system including all steps to achieve required finish.
 - a. Size: Minimum 20 ft. x 20 ft. (6.09 m x 6.09 m) of typical poured-in-place flooring condition for each color and pattern in locations directed by Owner.
 - b. One mockup is to demonstrate the need for an additional grind prior to polish.
 - 1) Provide an additional mockup only when the concrete is extremely hard to demonstrate that an additional metal grind is needed or if another mock-up including a grout coat/topping is required.
 - c. Include concrete joint filling process, coordinate with Contractor.
 - 2. Do not proceed with concrete polishing until mockup is approved by Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents unless Owner specifically approves such deviations in writing.
 - 4. Maintain mock-up during construction in an undisturbed condition as a standard for judging the work.

1.6 SITE CONDITIONS

- A. Work area shall have no uncovered openings through doors, windows, skylights, or any other open penetrations in walls and roof.
- B. Do not install polished concrete floor system until permanent lighting levels are present.
- C. Do not install burnished to polished concrete floor system until work area is broom swept and free of work from other trades.
- D. Maintain grinding and vacuum equipment to contain dust caused by grinding/polishing operations.

1.7 WARRANTY

- A. Warranty: Installer's dustproof warranty covering the polished concrete floor system.

1. Warranty Period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SUBSTITUTION LIMITATIONS

- A. No other products shall be installed other than those that have been approved in writing by the Owner and incorporated into the Agreement. Requests for approved comparable substitute items must be submitted in writing to the Owner together with all necessary supporting data for both the specified and equal item. The Owner shall be the sole judge of the suitability, acceptability and equality of the substitute material and may accept or reject the same. No material, not accepted by the Owner in writing, may be substituted for a specified material. If the substitution of any material or equipment increases costs in any way, these costs shall be borne by the Installer.
- B. For a comparable product to be considered for approval by the Owner, the Installer must submit product information of the proposed product along with the product information of the specified product and shall furnish the product data sheets, MSDS sheets and certificates of performance of both for comparison.

2.2 SYSTEM DESCRIPTION

- A. Installation of polished gray or dyed concrete floor system for existing burnished interior concrete floors by grinding and polishing with various size grit metal-bonded and resin-bonded diamonds and application of concrete densifier.

2.3 PERFORMANCE CRITERIA, POLISHED

- A. Polished Concrete Floor: Meet or exceed the following criteria:
 1. Specular Gloss/Reflectance: ASTM D523, minimum gloss reading of 40 without any guards or non-penetrating sealers.
 - a. Sheen Level: CPAA level 3, honed finish.
 - 1) Final Sheen: Match accepted mock-up.
 2. Surface Appearance: Grind and polish only the cream topping to achieve a light uniform salt and pepper appearance.
 - a. A slight burn in some areas from the concrete finishing may still be visible and is acceptable.
 - b. Deeper grind and polish to correct floor flatness issues must be tested and approved by the Owner.
 3. Static Coefficient of Friction, NFSI 101-A-2009.
 - a. Dry Surface: SCOF \geq 0.50.
 - b. Wet Surface: SCOF \geq 0.60.

2.4 PERFORMANCE CRITERIA, SLIP RESISTANT FINISH

A. Slip Resistant Finish: Meet or exceed the following criteria:

1. Pre-COF Dry: 0.50 - 0.60.
2. Pre COF Wet: 0.40 - 0.55.
3. Post COF: 0.60 - 0.80.

2.5 PATCHING AND REPLACEMENT MATERIALS

A. Structural Surface Filler and Repair Material (Grout Coat): Two-part, 100 percent solids, rapid-set, high strength, low viscosity concrete repair material for repair of spalled concrete, cracked concrete, and for filling pin holes and small surface defect treatment on concrete floors before polishing.

1. Products:

- a. Concrete Polishing Solutions; CPS Armor Grout; (877) 472-8200.
- b. HI-TECH Systems, HT-Spall TX3; (800) 454-5530.
- c. SASE Company, Inc.; All-Spall 3; (800) 522-2606.

2. Shore Hardness (ASTM D2240): At least 67.
3. Elongation (ASTM D412): Minimum 4 to 8 percent.
4. Tensile Strength (ASTM D412): Minimum 4600 psi.
5. Compressive Strength (ASTM D695): Minimum 3900 psi (Neat) and 4800 psi (sand).
6. Bond Strength (ASTM D882): Minimum 3450 psi.

B. Slab Topping: Fast setting, high strength, hydraulic, cementitious polishable overlay complying with ASTM C1708 for thicker slab toppings.

1. Product: CTS Cement Manufacturing Corp.; Rapid Set Tru Self Leveling.
2. Compressive Strength: 6500 psi at 28 days per ASTM C109.
3. Tensile Strength: 365 psi, minimum at 28 days per ASTM C307.
4. Location: As indicated on Drawings only.

2.6 POLISHED CONCRETE FINISHING PRODUCTS

A. Clear Concrete Densifier: Odorless liquid form of a lithium silicate to permanently seal, densify, dustproof, and harden concrete surfaces and provide abrasion resistance by penetrating into concrete pores and chemically reacting. On projects scheduled to receive concrete dye, use compatible densifier product as recommended by concrete dye manufacturer.

1. Products:

- a. AmeriPolish, Inc.; 3D HSL; (479) 725-0033.
- ~~b.~~ Dayton Superior Corporation; Pentra Hard; (888) 977-9600.
- c. PROSOCO, Inc.; Consolideck LS; (800) 255-4255.
- d. SASE Company, Inc.; SFS D2 Densifier High Solids; (800) 522-2606.

B. Concrete Dye (as needed for blending only):

1. Products:
 - a. AmeriPolish, Inc.; SureLock; (479) 725-0033.
 - b. AmeriPolish, Inc.; Dye Classic; (479) 725-0033.
 - c. PROSOCO, Inc.; GemTone Stain; (800) 255-4255.
2. Water soluble dye to be used on floors in stores with Apparel departments.
3. Solvent based dye to be used on floors in stores without Apparel departments.
4. Color: As required to achieve proper blending.

C. Penetrating Sealer:

1. Products:
 - a. Ameripolish, Inc.; SR2; (479) 725-0033.
 - b. PROSOCO, Inc.; Concrete Protector; (800) 255-4255.
 - c. SASE Company, Inc.; SPR3-WB; (800) 522-2606.

D. Slip Resistant Treatment: Manufacturer's proprietary acidic compound to provide slip resistance to floor with embedded etch installation process.

1. Products:
 - a. InvisiTread; www.invisaproducts.com/shop; (800) 544-5974, info@invisaproducts.com. Specify store number and address when ordering.
 - b. No substitutions allowed.

E. Salt Guard Treatment:

1. Products:
 - a. PROSOCO, Inc.; Saltguard; (800) 255-4255 or approved substitution.

F. Stain Protection Treatment:

1. Products: PROtec Stain Guard; (800) 544-5974. Specify store number and address when ordering
 - a. No substitutions allowed.

G. Cleaning Solution: Mild, highly concentrated, ph neutral liquid concrete cleaner and conditioner; biodegradable, and environmentally safe.

H. Water: Potable.

2.7 JOINT FILLERS

A. Joint Filler Replacement at Contraction (Sawed) Joints, Construction (Cold) Joints, and Cracks (As Required): Two component, 1:1 ratio, polyurea elastomer joint filler of 100 percent solids, Shore 65-67 A hardness, rapid curing self leveling, semi-flexible sealant.

1. Products: Specify store number and address when ordering.

- a. Euclid Chemical Company, The; QWIKjoint UVR 65.
 - b. HI-TECH Systems; HT-PE65 Flexible Control Joint Filler.
 - c. Metzger/McGuire Co.; Spal-Pro RS-65.
 - d. No substitutions allowed.
 2. Color: As specified in Division 01 Section "Décor Interior Finishes and Colors."
- B. Joint Filler Replacement at Columns and Expansion Joints (As Required): Polyurethane, Type S, Class 25, Use T, gun grade or pourable as applicable.
 1. Products:
 - a. Gun Grade:
 - 1) BASF Building Systems; MasterSeal NP 1.
 - 2) Euclid Chemical Company; Eucolastic 1 NS.
 - 3) Sika Corporation, Inc.; Sikaflex - 1a.
 - 4) Tremco; Vulkem 116.
 - b. Pourable:
 - 1) BASF Building Systems; MasterSeal SL 1.
 - 2) Euclid Chemical Company; Eucolastic 1 SL
 - 3) Sika Corporation, Inc.; Sikaflex-1CSL.
 - 4) Tremco; Vulkem 45.
 2. Color: As specified in Division 01 Section "Décor Interior Finishes and Colors."
- C. Cylindrical Sealant Backings for Polyurethane Joint Filler (As Applicable): ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

PART 3 - EXECUTION

3.1 GRINDING AND POLISHING EQUIPMENT

- A. Floor Grinder:
 1. Manufacturers (No substitutions allowed):
 - a. HTC, Inc.
 - b. Diamatic, USA.
 - c. SASE Company, Inc.
 - d. Concrete Polishing Solutions (CPS).
 - e. Husqvarna Construction Products.
 2. Rotation: Multi-orbital planetary action, opposing rotation.
 3. Head: Metal bonded diamond/resin.
 4. Grinding Pressure: 675 lbs. (306 kg).
- B. Removal Tool (Installer's Option): Iron or steel claw for removal of glues, thinsets, water proofing membranes, epoxies, floats, and patches.

1. Product:
 - a. SASE Company, LLC; One of the following:
 - 1) Hard to Medium Concrete: Wulf Iron Claw, HOL.200515.
 - 2) Medium to Soft Concrete: Wulf Steel Claw, HOL.200516.
 - b. Comparable substitution.
- C. Vacuum System: Directly connected to floor grinder to reduce amount of dust exposure and to provide a dust free environment.
 1. Filtration System: HEPA 3-stage.
 2. Air Movement: Minimum 350 cfm (165.2 L/s).
 3. Water Lift: 8.5 mercury.
 4. Hose Diameter: 3 inches (76 mm).
 5. Primary Filter Area: 60 sq. ft. (5.6 sq. m) plus.
- D. Equipment Safety: When liquid petroleum (LPG) powered equipment is employed, incorporate the following safety precautions:
 1. Documentation: Maintain documentation associated with LPG equipment including documentation that operators are trained in the safe operation of propane-powered machines. The Owner reserves the right to review all documentation upon request.
 2. Ventilation: Provide complete building ventilation when operating equipment.
 3. Noise Levels:
 - a. Operating noise levels must not exceed the OSHA standard of 85 db (action limit) or 90 db 8-hour TWA (time weighted average).
 - b. Perform noise level tests semi-annually, conducted by qualified vendor personnel, using appropriate and calibrated equipment. Maintain a written record of tests and submit to Owner upon request.
 - c. Calibrate testing equipment or instruments in accordance with the manufacturer's recommendations and submit acopy of records evidencing calibration to Owner upon request.
 4. Equipment Requirements: Maintain equipment in a safe condition at all times. To assure compliance, the installer shall comply with the following requirements for each piece of equipment. Failure to comply with these requirements shall result in removal from the project:
 - a. Testing: Complete emissions testing monthly.
 - b. YL Listing: All units must be UL-listed.
 - c. Carbon Monoxide (CO) Emissions: Shall not exceed the OSHA standard of 35 PPM (parts per million) TWA or ceiling limit of 200 PPM.
 - d. LP Container Capacity: No greater than 20 lb. and complying with all DOT regulations.
 - e. Engine:
 - 1) Supply with a carbon monoxide detector that will shut the equipment off when the levels exceed those specified.

- 2) Equip with a vacuum-actuated fuel cutoff valve preventing excess flow of propane in the event of a leak or rupture in the fuel line.
 - 3) Equip with an anti-backfire muffler.
 - 4) Turn off equipment when not in use. Do not idle.
- f. Fuel Cylinders: Stored in the exterior of the building in a ventilated, lockable cage. Only one cylinder will be allowed in the building for each machine being used at any one time, which is the one cylinder installed on the machine.
- g. Dust and Air Filters: Inspect and clean before each use of the machine.
- h. Equipment Service: Service each machine monthly.
- 1) Maintain service record and submit to Owner upon request.
 - 2) Maintenance record, at minimum, shall include date, machine serial number, service performed, and name of the service technician.

5. Ambient Air Monitoring Requirements

- a. Exhaust Port Monitoring: Conduct monthly. Record results as a percentage of CO at idle and full throttle, as well as instantaneous readings recorded in PPM, conducted in the operator's breathing zone during idle and full throttle tests.
- 1) If the breathing zone result equals or exceeds 25 PPM, cease use of the machine. Adjust, repair, or replace parts as required returning equipment to service.
 - 2) All personnel operating LPG powered equipment must wear a carbon monoxide badge detector.
 - 3) Do not use any propane-fueled equipment in building unless the installer has records documenting the equipment has met the above emission testing requirements.
- b. Carbon Monoxide (CO) Monitoring: Conduct utilizing a CO device that will give instantaneous reading levels in PPM. Conduct all tests after a 4 to 5 minute warm up of the machine. Conduct each test for a continuous 60-second period.
- 1) If any ambient air CO concentration exceeds 35 PPM 8-hour TWA (as referenced in the NIOSH Pocket Guide to Chemical Hazards), use of the propane powered equipment must be discontinued until it has been properly serviced and complies with these guidelines.
 - 2) The Owner reserves the right to conduct random, periodic testing, without notice, of the installer's equipment. Any units found to exceed emissions levels will be suspended from use until the installer proves compliance levels are achieved. Suspension of the installer's agreement may result at the sole discretion of the Owner.

6. Monitoring Equipment Guidelines

- a. Use only instruments designed to monitor CO resulting from combustion of propane gas in an internal combustion engine for testing exhaust emissions from propane-powered equipment.

- b. Do not use instruments designed to monitor ambient air to take readings in the muffler or tail pipe. They may become damaged. Selecting the proper instrument for each test.
- c. The installer shall be responsible for the choice of testing equipment and the Owner reserves the right of approval all testing equipment.
- d. Instruments used for testing shall be calibrated at intervals recommended by the instrument manufacturer. The monitor, model number, and date of calibration shall be recorded with all test results.

3.2 EXAMINATION

A. Pre-Polish Inspection:

- 1. Prior to concrete polishing, clean floor with an auto scrubber equipped with soft nylon brushes and neutral cleaner to provide a clean floor for inspection.
- 2. Inspect concrete floors that are to be polished and photo document the overall appearance of the floor. Include photo documentation of any substantial imperfection in the floor.
- 3. Include the Owner, concrete installer, and floor polishing installer in the inspection.
- 4. Submit written report and photos of any areas in question to the Contractor and Owner.

- B. Examine surfaces to receive treatment. Notify Contractor if surfaces are not acceptable. Do not begin application until unacceptable conditions have been corrected.

3.3 PREPARATION

- A. Mark-off active work areas with caution tape.

- B. Construction joints must be filled prior to commencement of polishing.

3.4 INSTALLATION, GENERAL

- A. Polished Concrete Floor Finish System: Apply polished concrete finish system to cured and prepared slabs to match sheen of accepted mockup.
- B. Coordinate polishing operations with other associated work and trades.
- C. No topical materials are allowed to achieve the required gloss and DOI readings.
- D. Maintain maximum dust control throughout entire polishing process and properly dispose of grinding waste offsite in accordance with all applicable laws and regulations and with authorities having jurisdiction.

3.5 POLISHING PROCESS

A. General:

- 1. Provide a dust free environment during the grinding process and prior to the application of other products listed. Comply with OSHA and all current federal and state regulations dealing with silica dust.
- B. Perform grinding and polishing process as follows to achieve smoothly polished concrete finish with an appearance and sheen level as specified in Article "Performance Criteria, Polished."

1. Maintain maximum dust control throughout entire polishing process.
2. Begin grinding process with #40 grit metal-bonded tooling for burnished concrete floors or areas as needed for repolish.
 - a. At Installer's option, iron or steel claw removal tool may be used.
3. Repair damaged or unacceptable cracks, pin holes, voids, joints, etc. per Drawings and to Owner's satisfaction.
4. Mechanically clean the side walls of the concrete joints missing filler and install new specified joint filler.
5. Begin grinding process with #150/Hybrid grit metal bonded tooling.
6. Thoroughly clean floor with auto scrubber.
7. Perform hand grinding around columns, floor sinks, trench drains and along perimeter walls exposed to the customer's view and base rails of all existing refrigerated cases and fixtures which remain in place as indicated in agreed to drawing. Hand grinding quality to match the same texture and gloss level as the main sales floor area. Contractor is responsible for removal all kick plates.
8. Apply clear concrete densifier for gray concrete and colored for colored concrete patch areas to point of rejection. This will vary based upon porosity and denseness of slab. Use demonstration to determine if color will be needed to give slab a more uniform colored appearance.
9. Continue grinding process with #200 resin bonded tooling.
10. Thoroughly clean floor with auto scrubber.
11. Apply dye (as needed for blending) per manufacturer's recommendation if required at colored concrete patched areas.
12. Begin polishing process utilizing #400 resin bonded tooling.
13. Apply slip resistant treatment according to manufacturer's instructions. Apply before and after coefficient of friction testing.
14. Continue polishing process with #800 and #1500 grit resin bonded tooling.
15. Thoroughly clean floor with auto scrubber.
16. Apply penetrating sealer throughout the sales area applying according to manufacturer's instructions.
17. After confirmation with Owner's operations/floor care representative, apply stain protection treatment (only if Owner's floor care is not using Diamabrush) and salt guard treatments according to manufacturer's instructions.
18. Conduct final polishing process utilizing #1500 grit diamond impregnated polishing pad on high speed propane burnisher to enhance shine.
19. Perform slip coefficient testing.
20. Perform initial gloss and DOI readings per Owner Job Completion Form and where directed by Owner.
21. Complete cleanup of all work and installation areas.

3.6 SLIP RESISTANT TREATMENT

A. Install in the following locations:

1. In front of the wet rack produce cases a minimum of 4 feet (1.22 m) or further out as necessary to terminate at the first control joint.
2. The entire floor of all bascart storage areas.

B. Application: Incorporate into the overall polished concrete finishing process as follows:

1. Begin application upon reaching 400 grit honing process.
2. Spray apply slip resistant treatment, allow to sit until it neutralizes (turns cloudy), agitate if needing more etch.
3. Once neutral, scrub off floor with several passes using floor scrubber to remove residual treatment.
4. Add dye (if required) and finish polishing process-

3.7 SALT PROTECTION TREATMENT

- A. Provide treatment for geographic locations where ice or snow is anticipated.
- B. Apply product on approximately **1,500 S.F (139.35 sq. m)** of polished concrete floors inside store entry area at each set of entry doors. Treatment should extend **12 feet (3.66 m)** to **15 feet (4.572 m)** on each side of the entry door.
 1. Refer to reference drawing for exact locations and area.
- C. Thoroughly remove oil, dirt, laitance, and other contaminants, clean floor surface with an auto scrubber and clean water and allow to dry before applying salt protection.
- D. Test area prior to application
- E. Application: Apply evenly with microfiber mop or in accordance with the manufacturers written instructions and burnish in with a high-speed propane burnisher.

3.8 STAIN PROTECTION TREATMENT

- A. Apply stain protector in designated areas such as wine and floral departments in addition to 3 to 4 shopping aisles containing pickles, salad dressings and laundry products as stipulated in the individual project proposal.
 1. Refer to reference drawing for exact locations and area.
- B. Thoroughly clean floor surface with an auto scrubber and clean water and allow to dry before applying stain protector.
- C. Test area prior to application.
- D. Application: Per manufacturer's instructions, apply two thin coats of stain protector versus one thick coat and burnish in with a high-speed propane burnisher.

3.9 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Perform the following tests and inspections and submit Owner provided SCOF, DOI, and gloss readings with Owner Job Completion Form.
- B. Static Coefficient of Friction (SCOF):
 1. Perform tests prior to and after application of slip resistant treatment.
 2. Perform testing in center of all aisles identified by Owner.
- C. Gloss and DOI Testing:

1. ASTM D523 (current version) utilizing a gloss meter based on level of gloss required.
 - a. Gloss is associated with the capacity of a surface to reflect more light in directions close to the specular than in others. Measurements by this test method correlate with visual observations of surface shininess made at roughly the corresponding angles.
2. ASTM 5767 (current version) utilizing a DOI meter based on the DOI required.
 - a. An important aspect of the appearance of glossy coating surfaces is the distinctness (clarity) of images reflected by them. The values obtained in this measuring procedure correlate well with visual ratings for DOI (image clarity).
3. Take reading in the center of all aisles in locations identified by Owner.

- D. Owner Job Completion Form: Contractor to walk the store with applicator/polishing Installer to complete and submit to the Owner.

3.10 PROTECTION

- A. Until Project is turned over to Owner, clean polished concrete floor as required to prevent surface residue from forming on the concrete surface.
- B. Install protective covering where construction activities could soil or damage floor or where items are stored.

3.11 FINAL SCRUB AND BURNISH

- A. Within 48 hours prior to Store Grand Opening or Reopening, polishing installer to perform a final scrub and polish of the floor to a minimum gloss reading of 40 and DOI of 30. Perform final gloss readings at this time.

END OF SECTION 03 35 43.15

(Concrete Polishing Job Completion Form follows this page)

Concrete Polishing Job Completion Form

Store Number/Location: _____

Complete this form prior to turn over of floor cleaning responsibility from the Contractor to Owner. It should be emailed to Owner Project Manager and uploaded to Owner, web-based project system.

- ☐ Confirm new concrete cured for a min of 28 days and required lighting was in place. (Specify Owner approved exception. _____)
- ☐ Confirm slip resistance treatment, InvisaTread, was applied per the drawings (min of 4' in front of produce cases with misting). Static Coefficient of Friction: Sample Area 2' from cases. Before _____ After _____
- ☐ List manufacturer/product used for the following:
- Densifier: _____
- Penetrating Sealer: _____
- Repair Material: _____
- Salt Guard (new concrete entry areas): _____
- ☐ Final Sample Readings:

Area/Location	Coef of Friction (0.5-0.8)	Gloss (40 min)	DOI (30 Min)
Entry Doors – 20' in			
Produce – Center of floor			
Produce – 2" in front of misting case			
Bakery – 4' in front of cases			
Deli – 4' in front of cases			
Back Aisle – Center Location			
Dairy – Center/front of rear load			
Grocery – Center Aisle No:			
Grocery – Center Aisle No:			
Frozen Food – Center Aisle No:			
Pharmacy 4' from pickup			
Behind Self-Checkout center 4' back			
Exit door- center 8' back			
Breakroom (modified polish)			

Misc. Notes: _____

Polishing Contractor

Company Name/Address

Signature

Date

Name (Printed)

Building General Contractor

Company Name/Address

Signature

Date

Name (Printed)

BLANK SHEET

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Contractor supplied items.
 - a. Fabrications from steel and iron shapes, plates, bars, tubes, and pipe
 - 1) Miscellaneous steel framing and supports.
 - 2) Miscellaneous steel trim.
 - b. Fabrications from sheet metal
 - 1) Stainless steel column wraps
 - 2) Stainless steel wall protection at hoods and sinks.
 - 3) Stainless steel accessories for wall protection.
 - c. Fabrications from steel wire
 - 1) Metallic-coated-steel wire fence fabric.

1.2 SUBMITTALS

- A. Product Data: For fence fabric and bollard cover.
- B. Shop Drawings: Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
1. Shop Drawings shall bear the seal of a professional engineer who is registered in the state the project occurs, and who is providing services as a specialty engineer.
 2. Templates: For anchors and bolts.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.
- B. Ferrous Metals:
1. Steel Plates, Shapes, Bars: ASTM A-36.
 2. Cold Formed Steel Tubing: ASTM A-500, Grade B.
 3. Steel Pipe: ASTM A-53, Type E or S, Grade B.
 4. Structural Cold-Rolled Steel Sheets: ASTM A-611, Class 1, of grade required for design loading.
 5. Galvanized Structural Steel Sheets: ASTM A-446, Coating Designation G90.
 6. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304 with No. 4 brushed finish.
 7. Metallic-Coated-Steel Wire: Welded-wire fence fabric, hot-dip galvanized after fabrication. Weight of zinc coating shall be not less than 1.0 oz./sq. ft. (305 g/sq. m).

8. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - a. Size of Channels: 1-5/8 by 1-5/8 inches (41 by 41 mm).
 - b. Material: Galvanized steel, ASTM A 653/A 653M, commercial steel, Type B, with G90 (Z275) coating; 0.108-inch (2.8-mm) nominal thickness.

C. Fasteners

1. General: Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.
2. Cast-in-Place Anchors in Concrete: Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.
3. Anchor Bolts: Headed or L-shaped steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.
4. Threaded Rods: ASTM A36. Sizes and embedment as indicated on the Drawings.
5. Concrete Inserts: Malleable iron (ASTM A-47) or cast steel (ASTM A-27) inserts, with steel bolts, washers and shims; hot dip galvanized.
6. Expansion Anchors: Size, and embedment indicated on Drawings.
 - a. Manufacturer: Hilti, Inc. 800-879-8000.
 - b. Masonry Anchors: Sleeve anchors unless otherwise noted.
 - c. Concrete Anchors: Kwik Bolt 3 unless otherwise noted.

7. Epoxy Adhesive Anchors:

- a. Basis of Design Product: ITW Ramset/Redhead; Epcon "Ceramic 6."

D. Miscellaneous Materials

1. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI #79.
 - a. Color: Gray for metal fabrications in exposed ceiling area or other items not to receive a finish coat.
2. Galvanizing Repair Paint: SSPC-Paint 20, high-zinc-dust-content paint for regalvanizing welds in steel.
3. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.
4. Concrete fill: ASTM C 94 ready mix or prepackaged concrete. Proportion mix:
 - a. Minimum cement content 600 lbs./cu. yd. (356 kg./cu. m).
 - b. Maximum aggregate sizes:
 - 1) Foundation: 1 inch (25.4 mm).

- 2) Pipe Fill: 1/2 inch (12.7 mm).
 - 3) Maximum slump: 6 inches (152.4 mm).
5. Fence Fabric: Metallic-coated-steel wire.
- a. Spacing of Vertical Wires: 2 inches (51 mm).
 - b. Vertical Wire Size: 14 gage, 0.8 inch (2 mm).
 - c. Spacing of Horizontal Wires: 4 inches (102 mm).
 - d. Horizontal Wire Size: 14 gage, 0.8 inch (2 mm).

2.2 FABRICATION

A. General:

1. Do not begin fabrication prior to shop drawing approval.
2. Use materials of size and thickness shown or, if not shown, of required size, grade and thickness to produce strength and durability in finished product.
 - a. Weld corners and seams continuously; grind exposed welds smooth and flush.
 - b. Form exposed connections with hairline, flush joints; use concealed fasteners where possible.
3. Inserts and Anchorages: Furnish inserts and anchoring devices to be built into other work for installation of miscellaneous metal items; coordinate delivery to job site to avoid delay.

B. Miscellaneous Framing and Supports: Fabricate of welded construction in as large units as possible. Drill and tap as required to receive hardware and similar items. Include required anchors for building into other work; spaced not more than 12 inches (304.8 mm) o.c.

C. Miscellaneous Steel Trim: Fabricate to shapes and sizes as required for profiles shown and continuously weld joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings, and anchorages; coordinate assembly and installation with other work.

D. Column Covers: Stainless steel with #4 finish, as detailed.

E. Wall and Ceiling Panels at Hoods and Sinks where Indicated: Provide 20 gage, 0.0375 inch (0.953 mm) stainless steel wall covering and lay-in ceiling panels with #4 finish on walls under hoods and sinks and lay-in ceiling, where indicated on Drawings, extending the length of hood, or longer if indicated on plans. Comply with UL requirements.

1. Use minimum number of sections with top and bottom raw edges dressed with 1/2 inch (12.7 mm) inward hems on edges exposed at the end of the hood.

2.3 FINISHES

A. Steel and Iron Finishes:

1. Hot-dip galvanize items as indicated to comply with ASTM A 123/A 123M or ASTM A 153/A 153M as applicable.
2. Shop Priming:

- a. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting," for shop painting.
- b. For lintels supporting exterior masonry wythes and members exposed to weather in finished structures blast steel clean per SSPC-SP6 "Commercial Blast Cleaning" and paint with zinc rich primer.
 - 1) Products:
 - a) Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
 - b) Carboline Company; Carbozinc 621.
 - c) ICI Devoe Coatings; Catha-Coat 313.
 - d) PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
 - e) Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
 - f) Themec Company, Inc.; Theme-Zinc 90-97.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, with edges and surfaces level, plumb, and true.
 1. Fit exposed connections accurately together. Weld connections that are not to be left as exposed joints but cannot be shop welded. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication.
 2. Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
 3. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- A. Stainless Steel Wall Panels:
 1. Adhere panels to substrate with silicone sealant placed in a checkerboard pattern with **3/8 inch (9.5 mm)** beads of sealant as specified in Division 07 Section "Joint Sealants."
 2. Use stainless steel "S" joints between sections. Fasten "S" joints at perimeter of covering to the wall with stainless steel screws on **12 inches (305 mm)** centers.
 3. Seal perimeter with silicone sealant as specified in Division 07 Section "Joint Sealants."
- B. Touch up surfaces and finishes after erection.
 1. Painted Surfaces: Clean field welds, bolted connections, and abraded areas and touch up paint with the same material as used for shop painting.
 2. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05 50 00

SECTION 06 10 53 - MISCELLANEOUS CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Miscellaneous framing with dimension lumber.
2. Wood blocking and nailers.
3. Wood furring.
4. Miscellaneous plywood, plywood backing panels and underlayment.
5. Wall sheathing.
6. Wood trim.
7. Solid-surfacing-material for window stools, wall caps, and countertops.

1.2 SUBMITTALS

- A. Product Data: For fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Samples: Solid-surfacing.

1.3 QUALITY ASSURANCE

- A. Lumber Standard: DOC PS 20 and applicable rules of respective grading and inspecting agency for species and product as certified by ALSC Board of Review.
- B. Plywood Standard: DOC PS 1 (ANSI A199.1) and, for products not manufactured under PS 1 provisions, with APA PRP-108 and applicable APA Performance Standard for type of panel required.
- C. Grade Marks: Provide each unit of lumber and plywood mill marked with stamp containing symbol of grading agency certified by ALSC - Board of Review, mill number or name, grade designation, species designation, rules under which graded and condition of seasoning at time of manufacture. Omit marking from surfaces to be exposed in completed work with transparent finish or without finish.
- D. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E119 by a testing and inspecting agency acceptable to authorities having jurisdiction over the Work.

1.4 WARRANTY

- A. Solid-Surfacing-Material and Quartz-Surfacing Material: Provide manufacturers standard warranty against defects in materials. Warranty shall provide material only to repair or replace defective materials.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 TREATED MATERIALS

- A. Application:

1. Wood-Preservative-Treated Materials: Wood nailers on top of exterior parapet walls and other wood materials as indicated.
2. Fire-Retardant-Treated Materials (FRT): As indicated in this Section and on Drawings.

- B. Wood-Preservative-Treated Materials

1. Preservative Treatment by Pressure Process: AWPAC2 with preservative chemicals acceptable to authorities having jurisdiction and containing no arsenic or chromium.
2. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.
3. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

- C. Fire-Retardant-Treated Materials

1. General: Comply with performance requirements in AWPAC20 (lumber) and AWPAC27 (plywood).
2. Type: Exterior.
3. Flame Spread Rating: 25 or less
4. Fuel Contributed Rating: 50 or less
5. Smoke Developed Rating: 50 or less.
6. Identify fire-retardant-treated wood with UL label and UL rating FR-S.

2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including blocking, nailers, rooftop equipment bases and support curbs, and furring.
- B. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber with 19 percent maximum moisture content of any species.
- C. For concealed boards, provide lumber with 19 percent maximum moisture content.

2.4 SHEATHING

- A. Miscellaneous Plywood Wall Sheathing: Exposure 1 sheathing, thickness as indicated on Drawings.
 - 1. Provide fire-retardant-treated plywood as indicated on Drawings.

2.5 INTERIOR WALL SHEATHING

- A. Oriented-Strand-Board (OSB): DOC PS 2, Exposure 1 sheathing.
- B. Plywood:
 - 1. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, 3/4-inch (19-mm) nominal thickness.
 - 2. Interior Walls: Exterior C-D grade, thickness as indicated on Drawings.
 - a. Provide fire retardant treat plywood as indicated on Drawings.

2.6 INTERIOR WOOD TRIM

- A. General: Provide kiln-dried finished (surfaced) material.
- B. Hardwood Lumber Trim for Transparent (Stain or Clear) Finish: Species as indicated on drawings.
- C. Lumber Trim for Opaque (Painted) Finish: Either finger-jointed or solid lumber.

2.7 SOLID-SURFACING-MATERIAL

- A. Solid-Surfacing-Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.
- B. Solid-Surfacing-Material Window Stools and Partial Height Wall Caps.
 - 1. Products:

- a. Aristech Surfaces, LLC; Avonite Surfaces.
 - b. E.I. du Pont de Nemours & Co., Inc.; Corian.
 - c. Formica Corporation; Formica Solid Surfacing.
 - d. Swan Corporation; Swanstone.
 - e. Wilsonart, LLC.
2. Thickness: Minimum **1/2 inch (13 mm)**.
 3. Edge Condition: Eased thick with edges eased.
 4. Color: Manufacturer's standard solid color as specified in Division 01 Section "Décor Interior Finishes and Colors."

C. Solid-Surfacing-Material Countertops

1. Product:
 - a. Aristech Surfaces, LLC; Avonite Surfaces.
 - b. E.I. du Pont de Nemours & Co., Inc.; Corian.
 - c. Formica Corporation; Formica Solid Surfacing.
 - d. Swan Corporation; Swanstone.
 - e. Wilsonart, LLC.
2. Thickness: As indicated on Drawings or if not indicated as required to meet manufacturer's warranty.
3. Color: As specified in Division 01 Section Décor Interior Finishes and Colors."
4. Fabricate tops in one piece, unless otherwise indicated. Comply with solid-surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing and to the AWI/AWMAC/WI's "Architectural Woodwork Standards" for Custom Grade.
 - a. Fabricate tops with shop-applied edges and integral backsplashes of materials and configuration indicated.
 - b. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints.
 - c. Reinforce joints and corners with strip of solid polymer material, **2 inches (50 mm)** wide.
 - 1) Do not use any wood product for reinforcement of joints or corners.
 - d. Fabricate tops with loose sidesplashes for field application.
5. Drill holes in countertops for plumbing fittings in shop.

2.8 FASTENERS

- A. General: Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Power-Driven Fasteners: NES NER-272.

- C. Self-Drilling, Self-Tapping Screws:
 - 1. Basis of Design: Titelock No. 6 PL Screws; Milcor
- D. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- C. Securely attach carpentry work to substrates and supporting members using fasteners of size that will not penetrate members where opposite side will be exposed to view or receive finish materials. Install fasteners without splitting wood; fasten panel products to allow for expansion at joints, unless otherwise indicated.
- D. Plywood and OSB Installation: Comply with American Plywood Association recommendations for fabrication and installation, including joint spacing and fastening requirements.
 - 1. Fasten plywood sheathing to metal substrates with self-drilling, self-tapping drywall screws.
 - 2. Attach plywood backing behind FRP panels with drywall screws to 10' above floor where indicated on drawings.
- E. Gypsum Sheathing Installation: Comply with GA-253 and with manufacturer's written instructions.
 - 1. Install boards with a 3/8-inch (9.5-mm) gap where non-load-bearing construction abuts structural elements. Install boards with a 1/4-inch (6.4-mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
 - 2. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- F. Wood Trim Installation: Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.
 - 1. Match color and grain pattern across joints.
 - 2. Install trim after gypsum board joint-finishing operations are completed.

3. Install to tolerance of **1/8 inch in 96 inches (3 mm in 2438 mm)** for level and plumb. Install adjoining finish carpentry with **1/32-inch (0.8-mm)** maximum offset for flush installation and **1/16-inch (1.6-mm)** maximum offset for reveal installation.

G. Solid-Surfacing-Material Installation:

1. Shop prime and seal concealed work with at least first coat specified in Division 09 Section "Painting." Machine and sand woodwork to comply with requirements of standards for specified grade.
2. Scribe and cut work to fit adjoining work. Anchor tops securely to support systems. All joints should be supported by framing and specified slipsheet. Edges to be joined should be straight, smooth and clean.
3. Make joints between adjacent horizontal sheets with manufacturer's standard adhesive.
4. Make cutouts with router equipped with sharp **3/8 inch (9.5 mm)** minimum diameter carbide bit. Round corners of cutout and smooth edges top and bottom, all around cutout.
5. Clearances between joints:
 - a. Uncaulked joints **1/32 inch (0.79 mm)** for every **8 feet (2438 mm)** length.
 - b. Caulked joints **1/8 inch (3 mm)** wide to allow satisfactory sealant penetration and expansion.
6. Clean solid-surfacing-material using conventional cleaning techniques; do not use acid cleaners. Remove stains or cigarette burns with abrasive cleansers that cannot be removed with soap and water.

END OF SECTION 06 10 53

SECTION 06 46 00 - INTERIOR DÉCOR PACKAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/ Contractor Installed.
 - a. The Kroger Company will supply the interior decor package as indicated on the Drawings including:
 - 1) Wood and plastic trim
 - 2) Décor signage
 - 3) Other items as indicated.
 - b. Comply with requirements in Division 00 Section "General Conditions."
2. Contractor supplied items:
 - a. Anchors, blocking, fasteners, and other items not provided by Owner necessary for a complete installation.
3. Contractor installed items:
 - a. Interior decor package.

1.2 SUBMITTALS

- A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
1. Shop Drawings: Plans, elevations, sections, details, hardware mounting heights, and attachments to other work.

PART 2 - PRODUCTS

2.1 INTERIOR DÉCOR PACKAGE

- A. Refer to Division 01 Section "Vendor Contact List" for information on interior décor package.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install Interior Décor Package per manufacturer's instructions and general installation instructions of Division 06 Section "Miscellaneous Carpentry."

END OF SECTION 06 46 00

SECTION 06 64 00 - PREFINISHED PANELING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Flat fiberboard wall panels.
2. Slotted fiberboard wall panels.
3. Flat fiberglass reinforced plastic (FRP) panels.

1.2 SUBMITTALS

- A. Product Data: For finishing materials and processes.
- B. Samples: For each product

1.3 QUALITY ASSURANCE

- A. Conform to building code requirements for interior finish.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials factory packaged on strong pallets. Keep materials dry and protected during delivery.
- B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (range of 60 to 75 deg. F (15.6 - 23.9 deg. C) for 48 hours prior to installation.

PART 2 - PRODUCTS

2.1 PREFINISHED WOOD FIBERBOARD PANELING:

- A. Manufacturers: Marlite or approved substitution.
- B. Flat Fiberboard Wall Panels.
1. Material: High-Density Fiberboard core with melamine surface.
 2. Panel Size: 16 inches (406 mm) by 96 inches (2438 mm).
 3. Thickness: 1/4 inch (6 mm).
 4. Surface Burning Classification: ASTM E84 Class C; flamespread of 200 or less, smoke developed of 450 or less.

5. Trim: Panel manufacturer's standard 0.09 inch (2.3 mm) thick vinyl moldings to meet project conditions and matching panel color. Provide division bar, inside corner, outside corner and end cap as applicable.
6. Product and Color: As specified in Division 01 Section "Décor Interior Finishes and Colors."

C. Slotted Fiberboard Wall Panels

1. General:
 - a. Material: Medium-Density Fiberboard: ANSI A208.2, Grade MD with engineered grooves designed to fit standard merchandising fixtures.
 - b. Panel Size: 48 inches (1220 mm) by 96 inches (2438 mm).
 - c. Thickness: 3/4 inch (19 mm) plus/minus 0.008 inch (0.2 mm).
2. 3-Inch Slotted Laminate Surface:
 - a. Groove Spacing: 3 inches (75 mm) on center.
 - b. Surface Finish: High-pressure laminate, 0.03 inch (0.7 mm) thick, cold press bonded with PVA Type II water resistant adhesive.
 - c. Product and Color: As specified in Division 01 Section "Décor Interior Finishes and Colors."
 - d. Plastic Groove insert: Black plastic or manufacturer's standard groove insert.
3. 6-Inch Slotted Laminate Surface:
 - a. Groove Spacing: 6 inches (152 mm) on center (Horizontal and Vertical).
 - b. Surface Finish: High-pressure laminate, 0.03 inch (0.7 mm) thick, cold press bonded with PVA Type II water resistant adhesive.
 - c. Product and Color: As specified in Division 01 Section "Décor Interior Finishes and Colors."
 - d. Groove Finish: Painted to match surface.

2.2 FIBERGLASS REINFORCED PLASTIC (FRP) PANELING

A. Manufacturers:

1. Crane Composites, Inc.
2. Kalwall Corp.
3. Marlite

B. Flat Wall Panels

1. Material: ASTM D5319, composite plastic panels of random chopped fiberglass roving, modified polyester copolymer, inorganic fillers and pigments.
 - a. Comply with USDA requirements.
 - b. Thickness: 0.09 inch (2.29 mm).
 - c. Surface Burning Classification: ASTM E84 Class C; flamespread of 200 or less, smoke developed of 450 or less.

- d. Panel Finish, Color, Texture, and Scoring Pattern: As specified in Division 01 Section "Décor Interior Finishes and Colors."
- 2. Trim:
 - a. Pebble Finish FRP Panels: Panel manufacturer's standard PVC moldings to meet project conditions and matching panel color. Provide division bars (T-molding), inside corners, outside corners, and end caps as required.
 - 1) For outside corners, provide manufacturer's standard PVC heavy-duty L-shaped outside corner guards.
 - b. Smooth Finish FRP Panels: Heavy weight extruded aluminum 6063-T5 alloy prefinished by manufacturer with factory oven-baked finish. Provide inside corners, outside corners, division bars (T-molding), and end caps as required.
 - 1) Inside and Outside Corners: Match color of panel.
 - 2) Division Bars (T-Molding):
 - a) For scored panels, match scoring (simulated grout) color (typically white).
 - b) For non-scored panels, match color of panel.
 - c. Smooth Finish FRP Scored Subway Tile Panels with Hidden Seam: Panel manufacturer's standard PVC moldings as required to meet project conditions and matching panel color. Provide inside corners, outside corners, and end caps as required.
- 3. Adhesive: Solvent based panel adhesive as recommended by panel manufacturer.
- 4. Sealant: Panel Manufacturer's standard silicone sealant meeting requirements of Division 07 Section "Joint Sealants" and matching color of panel or scored joint as indicated.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition paneling to average prevailing humidity conditions in installation areas. Examine shop-fabricated work for completion and complete work as required, including removal of packing.
- B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
- C. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

3.2 INSTALLATION

- A. Set all paneling to required levels and lines, with members plumb and true, and cut to fit.
- B. Scribe and cut paneling to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- C. Install prefinished paneling as indicated on drawings in full accordance with manufacturer's instructions. Caulk all tongue and groove joints and all molding with silicone sealant.
 - 1. Do not use division bar (T-molding) for scored FRP panels in deli/bakery or meat/seafood prep areas. Install silicone joints to match color and spacing of score lines.
 - a. Exception: For remodels, where panel is installed over existing wall with uneven surface, use aluminum division bar (T-molding).
- D. Install prefinished paneling over substrate as indicated on Drawings, in strict accordance with manufacturer's recommendations, using non-flammable adhesive. Panels to be set in full bead of silicone caulking at top of base. Top edge to have finished trim (end cap).

END OF SECTION 06 64 00

SECTION 07 01 50 - ROOFING DEMOLITION AND REPAIR

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes

1. Removal of existing roofing, insulation, and flashing to deck.
2. Required minor renovation for reroofing work.

1.2 PROJECT COORDINATION

- A. Sequence minor demolition and renovation with work sequence of work being installed.
- B. Coordinate with reroofing work so that all existing items removed in one day can be replaced along with the new roofing work in the same day.
- C. Coordinate additional renovation work to maintain the facility in a watertight condition.

1.3 SUBMITTALS

- A. Warranty: Existing warranty letter.

1.4 QUALITY ASSURANCE

- A. Source Limitations: For repair of existing roof under warranty, obtain components for membrane roofing system, including membrane, flashing metal flashing, and insulation from same manufacturer as roofing membrane.
- B. Preinstallation Conference: Conduct conference at Project site.
1. Prior to repair of existing roofing, conduct a pre-installation conference at the project site.
 2. Attendance: Owner, Contractor, Roofing installer, job superintendent and roof manufacturer's technical representative.
 3. Agenda:
 - a. Maintaining water tightness of the building during roofing repair, including night seal procedures.
 - b. Roofing details and procedures.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing repairs to be installed according to manufacturer's written instructions and warranty requirements.

1.6 WARRANTY

- A. Provide letter from roofing repair installers that existing warranty remains in effect after repairs.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plywood Sheathing: Fir or Southern Yellow Pine Plywood, C-C plugged, NCX exterior type, fire retardant treated FR-S U.L. rating, 5/8 inch (16 mm) minimum thickness or match existing.
- B. Wood Nailers and blocking: Preservative treated complying with requirements in Division 06 Section "Miscellaneous Carpentry" and with preservatives that are compatible with the roof membrane.
- C. Steel Roof Deck: Panels, without top-flange stiffening grooves, complying with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, either galvanized or prime painted to match existing deck and with profile matching existing deck.
- D. Fasteners:
 - 1. Nails: Non-ferrous, cement coated, or hot dip galvanized.
 - 2. Factory Mutual approved, non-corrosive coated, case-hardened steel screw with FM approved steel plate.
 - 3. Tapcons or Rawl Spikes.
- E. Miscellaneous Materials: Best grade of quality approved by roofing manufacturer for specific application.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify that required barricades and other protective measures are in place as specified in Division 01 Section "General Conditions."
- B. As a minimum requirement one layer minimum of 1 inch (25 mm) isocyanurate insulation covered by 1 layer minimum of 3/4 inch (19 mm) CDX plywood must be utilized for any areas of traffic, (foot traffic, roof top equipment or any other type traffic), across any roof area.

1. The covering must be installed in a manner to withstand applicable wind loads expected at the site during construction.

3.2 MINOR DEMOLITION OPERATIONS:

- A. Perform demolition activities in a careful and orderly manner with the least amount of disturbance or damage to adjoining surfaces and structures.
- B. Avoid excessive vibrations in demolition procedure that would be transmitted through the existing structure and finish materials.
- C. Coordinate work with Owner's operational requirements.

3.3 DISPOSAL

- A. Materials, equipment and debris resulting from demolition operations shall become property of the Contractor. Remove and dispose of demolition debris in accordance with requirements of Division 01 Section "General Conditions."

3.4 MINOR RENOVATION WORK:

- A. Nailers:
 1. Verify manufacturer's recommended details and installation procedures to maintain existing roofing warranty.
 2. Replace damaged or deteriorated wood nailers with new nailers and curbs as required. Install additional nailers as required.
 3. Clean and prepare existing surfaces to receive wood nailers and curbs.
 4. Install nailers and curbs continuously without gaps and level and true with joints flush.
 5. Securely fasten nailers to structure with expansion fasteners. Use of power-actuated fasteners is prohibited.
 6. Apply sealant to voids.
- B. Flashings: Raise flashings to **8 inches (203 mm)** high minimum.
- C. Equipment Renovation: Refer to Drawings.
- D. Rooftop Equipment: Refer to Drawings.
- E. Abandoned Equipment Curbs & Supports: Remove all abandoned equipment curbs & supports down to deck. Repair or install new steel decking as needed to match existing. Refer to Drawings.
- F. Plumbing Vents: Extend plumbing vents or modify as necessary to accommodate new flashing installation; minimum height as required by local code.
- G. Drains, Sleeves and Curbs: Secure and seal drains, sleeves, curbs, ducts and other work which pass through roof as required to receive new roofing system.

- H. Prevent adhesive from dripping into building.
- I. Existing Metal Decking:
 - 1. Remove loose rust, bitumen, or foreign material from deck.
 - 2. Resecure, repair, or replace decking as required to provide suitable substrate for new roofing insulation. Perform replacement of damaged decking on unit cost basis when approved by Owner.
- J. New Metal Decking
 - 1. Install new decking of like type, gauge and dimensions to provide suitable substrate in areas where penetrations through deck are removed. Extend new decking **18 inches (457 mm)** minimum past next nearest bar joist or support member. Include demolition and related work in Bid.
 - 2. Coordinate demolition work and removal with reroof project to maintain facility in dry watertight condition. Promptly dispose of removed equipment and materials at an authorized disposal site.

END OF SECTION 07 01 50

SECTION 07 72 13 - MANUFACTURED CURBS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER NATIONAL ACCOUNT AGREEMENT:** Contractor purchased - Contractor installed.
 - a. The following items are to be provided by the Contractor and purchased under a national account agreement with the Kroger Co.:
 - 1) **Material:** Manufactured roof curbs and equipment supports for fans, condensers, and other equipment with the exception of roof top units with integral curbs.
2. Installation of roof curbs for roof-mounted equipment by Contractor.
3. Additional items supplied and installed by Contractor not part of Kroger National Account Agreement:
 - a. Bolts, nuts, washers, screws, and other items not provided by Owner necessary for a complete installation.

1.2 SUBMITTALS

- A. Shop Drawings: Showing fabrication and installation details for roof accessories.

1.3 QUALITY ASSURANCE

- A. Sheet Metal Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" details as required for installation of units to coordinate with type of roofing indicated.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Rating: Manufactured roof curbs for RTUs, skylights and condensers shall be structural rated for a joist spacing **6 feet (1.8 m)** O.C.

2.2 MANUFACTURER

- A. Manufacturer: AES Industries Inc.

1. Kroger Account Representative: (334) 283-6578. Specify store number and address when ordering.
 2. No substitutions allowed.
- B. Construction: Coated 14 gauge steel sheet curb sections, corners mitered or enclosed and fully welded; 2 inch by 4 inch (nominal dimension) pressure treated continuous wood nailers mechanically fastened with corrosion resistant fasteners at 12 inches on center to exterior face of curb. Shop prime welded connections with zinc-rich paint complying with SSPC-Paint 20.
- C. Height: As indicated on Drawings, but no less than as required by authorities having jurisdiction.
- D. Profile: As indicated on Owner's ASD and HSD Standard Details.
- E. Reinforce curb sections as required for design loads indicated on Drawings.
- F. Provide seismic/wind restraint brackets as indicated or required by authorities having jurisdiction.
- G. Provide 1/2 inch (13 mm) diameter burglar bars only when indicated on Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install roof curbs according to manufacturer's written instructions and Drawings. Anchor roof curbs securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof curb installation. Install roof curbs to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Install roof curbs to fit substrates and to result in watertight performance.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
- D. Install roof curbs level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
- E. Seal joints with elastomeric or butyl sealant as required by manufacturer of roof curbs.

END OF SECTION 07 72 13

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Urethane joint sealants.
2. Silicone joint sealants.
3. Mildew-resistant joint sealants.
4. Latex joint sealants.

1.2 SUBMITTALS

1. Product Data: For each joint-sealant product indicated.
2. Samples: For each type and color of joint sealant required.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.4 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
- B. Do not paint over silicone joint sealants.
- C. Do not paint over urethane sealants until cured for time as recommended by sealant manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Provide products listed in other Part 2 articles by one of the following manufacturers. Shortened versions (shown in parentheses) of the manufacturers' names are used in Part 2:
1. (DOW) Dow Corning Corporation
 2. (GE) GE Construction Sealants; Momentive Performance Materials, Inc.
 3. (MBS) Master Builders Solutions; brand of MBCC Group.
 4. (PEC) Pecora Corporation
 5. (PPG) PPG Paints; PPG Industries, Inc.
 6. (SIK) Sika Corporation; Joint Sealants.
 7. (SWC) Sherwin-Williams Company (The).
 8. (TRM) Tremco, Inc.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As specified in Division 1 Sections "Exterior Finishes and Colors" and "Interior Finishes and Colors."

2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

2.4 JOINT SEALANTS

- A. **S-1: Urethane Sealant:** Hybrid urethane, S or M, NS, 35 or 50, NT, nonsag, nontraffic-use, minimum plus 35 percent and minus 35 percent movement capability, urethane joint sealant; ASTM C920, Type S or M, Grade NS, Class 50, Use NT.
1. Products:
 - a. MBS MasterSeal NP 100.
 - b. PEC Dynatrol I-XL Hybrid.
 - c. SIK SikaHyflex 150 LM.
 - d. TRM Dymonic FC.
 2. Exterior Locations:

- a. Vertical expansion and control joints in masonry.
3. Interior Locations:
 - a. Vertical expansion and control joints in masonry.
 - b. Joints at concrete curbs and concrete slabs.
 - c. Joints at concrete curbs and walls.
 - d. Gypsum board to masonry.
- B. **S-2:** Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
 1. Products:
 - a. DOW DOWSIL 791.
 - b. GE SCS2000 Silpruf.
 - c. PEC 864 NST.
 - d. SIK Sikasil WS 295.
 - e. TRM Spectrem 3.
 2. Exterior Locations:
 - a. Aluminum or steel to masonry including windows, storefronts, and doors.
 - b. Aluminum to aluminum.
 - c. Steel to steel.
 3. Interior Locations:
 - a. Aluminum or steel to masonry including windows, storefronts, and doors.
 - b. Aluminum to aluminum.
 - c. Steel to steel.
- C. **S-3:** Silicone Sealant: Acid or neutral Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
 1. Products:
 - a. DOW 786 Mildew Resistant.
 - b. GE SCS1700 Sanitary.
 - c. PEC 898 NST.
 - d. PPG Top Gun 350 Acid Curing Silicone Sealant, 1419 Series.
 - e. SIK Sikasil GP.
 - f. TRM Tremsil 200.
 2. Interior Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters and joints requiring NSF, USDA and other sanitary code requirements.

D. **S-4:** Latex Sealant: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.

1. Products:

- a. PEC AC-20.
- b. PPG 140 Acrylic Sealant, 1413 Series.
- c. SWC 850A.
- d. TRM Tremflex 834.

2. Interior Locations:

- a. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and other interior non-moving joints.

E. **S-5:** Exterior expansion and control joints in EIFS.

- 1. As specified in Division 07 Section "Exterior Insulation and Finish Systems."

F. **S-6:** Exterior horizontal surfaces subject to traffic requiring caulking, unless otherwise indicated.

- 1. As specified in Division 32 Section "Paving Joint Sealants."

G. **S-7:** Interior horizontal surfaces in concrete slabs subject to traffic requiring caulking.

- 1. As specified in Division 03 Sections.

2.5 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

- 1. Rod Diameter: 1.5 times opening width.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.3 JOINT SIZES

- A. Elastomeric Sealants, Non-Traffic Joints: Depth equal to 50 percent of normal joint width, but not more than **1/2 inch (12.7 mm)** and not less than **1/4 inch (6.4 mm)**.
- B. Non-Elastomeric Sealants, Non-Traffic Joints: Depth in range of 75 percent to 125 percent of normal joint width.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER NATIONAL ACCOUNT AGREEMENT:** Contractor purchased - Contractor installed.
 - a. The following items are to be provided by the Contractor and purchased under a national account agreement with the Kroger Co.:
 - 1) **Material:** Hollow-metal steel doors and frames.
2. Installation of hollow-metal steel doors and frames by Contractor.

1.2 SUBMITTALS

- A. Product Data: Including construction details, material descriptions, core descriptions, label compliance, and finishes for each type of steel door and frame specified.
- B. Shop Drawings: Showing a schedule of standard steel doors and frames using same reference numbers for details and openings as those on Drawings.

PART 2 - PRODUCTS

2.1 SUPPLIER

- A. Supplier: Cook & Boardman, a division of The Cook & Boardman Group, LLC.
 1. Kroger Account Representative; (615) 964-6000, kroger@cookandboardman.com. Specify store number and address when ordering.
 2. No substitutions allowed.

2.2 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies (When Required): Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

2.3 INTERIOR DOORS AND FRAMES

A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.

1. Physical Performance: Level B according to SDI A250.4.
2. Frames:
 - a. Materials: Uncoated, steel sheet, minimum thickness of **0.053 inch (1.3 mm)** (16 gage).
 - 1) Provide **0.067 inch (1.7 mm)** (14 gage) metallic-coated steel sheet, minimum **A60 (ZF180)** coating, frames for traffic doors, compactor doors and other areas as indicated.
 - b. Construction: Full profile welded.
 - 1) For remodels, knocked down frames may be provide upon written approval of Owner.
3. Exposed Finish: Factory primed with manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI A250.10 acceptance criteria for field-painted finish.

2.4 MISCELLANEOUS MATERIALS

- A. Supports and Anchors: Fabricated from electrolytic zinc-coated or metallic-coated steel sheet.
- B. Jamb Anchors: Masonry, stud-wall, compression, or postinstalled expansion type; not less than 18 gage, **0.052 inch (1.321 mm)** thick.
 1. Masonry wall anchors: Crimped tees at least **2-1/2 inches (63.5 mm)** by **10 inches (254 mm)**.
 2. Provide UL listed anchors for labeled frames.
- C. Floor Anchors: Single-unit clip angles, formed from same material as frames, not less than 16 gage, **0.064 inch (1.626 mm)** thick.
 1. Provide adjustable floor anchors at bottom of mullions.
- D. Tension Plates: Provide 18 gage, **0.052 inch (1.321 mm)**, **2-inch (50.8 mm)** by buck width, with tube spacers welded to bucks at approximately **2 feet (609.6 mm)** o.c. for anchorage of jambs against steel or concrete columns, or at other locations where masonry anchors cannot be used. Frames shall be drilled and countersunk for **1/4 inch (6.35 mm)** flat head bolts.
- E. Plaster Guards: Formed from same material as frames, not less than 26 gage, **0.022-inch (0.559-mm)** thick.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Remove welded-in shipping spreaders installed at factory.
- B. Install standard steel doors and frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- C. Standard Steel Frames: Install standard steel frames for doors and other openings, of size and profile indicated. Comply with SDI 105.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-protection-rated openings, install frames according to NFPA 80.
 - b. Apply bituminous coating to backs of frames that are filled with mortar or grout containing antifreezing agents.
- D. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.

END OF SECTION 08 11 13

BLANK SHEET

SECTION 08 38 00 - TRAFFIC DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply the traffic doors.
 - 1) Double acting insulated traffic doors (rigid plastic).
 - 2) Double acting flexible traffic doors (flexible PVC).
 - b. Comply with requirements in Division 00 Section "General Conditions."
2. Contractor supplied items:
 - a. Bent steel and hollow metal frames.
 - b. Fasteners, supports, and other items not provided by Owner necessary for a complete installation.
3. Contractor installed items:
 - a. Traffic doors and frames.

1.2 SUBMITTALS

- A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
1. Product Data: For each type and size of traffic door.
 2. Shop Drawings: Including a schedule of doors using same reference numbers for details and openings as those on Drawings

PART 2 - PRODUCTS

2.1 TRAFFIC DOORS

- A. Double Acting Insulated Rigid Plastic Traffic Doors: Refer to Division 01 Section "Vendor Contact List" for information on insulated rigid plastic traffic doors.
- B. Double Acting Flexible PVC Traffic Doors: Refer to Division 01 Section "Vendor Contact List" for information on rigid plastic traffic doors.

- C. Hollow Metal Frames for Double Acting Insulated Rigid Plastic Traffic Doors: Refer to Division 08 Section "Hollows Metal Doors and Frames" for information on hollow metal frames for traffic doors where indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install traffic doors complete with frames, necessary hardware and accessories, anchors, inserts, and hangers in accordance with Shop Drawings and manufacturer's instructions.
- B. Install assemblies plumb level, and properly aligned.
- C. Lubricate, test and adjust traffic doors to operate easily, free from warp, twist, or distortion.
- D. Coordinate installation of bollards or wall stops with drawings.

END OF SECTION 08 38 00

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Non-load-bearing steel framing members for the following applications:
 - a. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).
 - b. Interior suspension systems (e.g., supports for ceilings, etc.).

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by a testing and inspection agency.

PART 2 - PRODUCTS

2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. Framing Members, General: Comply with AISI S220 and ASTM C645, Section 10 for conditions indicated.
1. Steel Sheet Components: Comply with AISI S220 and ASTM C645, Section 10 requirements for metal, unless otherwise indicated.
 2. Protective Coating: Comply with AISI S220; ASTM A653/A653M, **G40 (Z120)**; or coating with equivalent corrosion resistance. Galvannealed products are unacceptable.
 - a. Coating demonstrates equivalent corrosion resistance with an evaluation report acceptable to authorities having jurisdiction.

2.2 SUSPENSION SYSTEM COMPONENTS

- A. Provide one of the following suspension systems:
1. Light gage metal framing with the following components:

- a. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, **0.0625-inch- (1.59-mm-)** diameter wire, or double strand of **0.0475-inch- (1.21-mm-)** diameter wire.
 - b. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, **0.162-inch (4.12-mm)** diameter.
 - c. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of **0.0538 inch (1.37 mm)** and minimum **1/2-inch- (12.7-mm-)** wide flanges.
 - d. Hat-Shaped, Rigid Furring Channels: ASTM C 645, **7/8 inch (22.2 mm)** deep, minimum base metal thickness of **0.0179 inch (0.45 mm)**.
2. Grid Suspension System for Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - a. Products:
 - 1) Armstrong World Industries, Inc.; Drywall Grid Systems.
 - 2) Chicago Metallic Corporation; 640-C Drywall Furring System.
 - 3) USG Corporation; Drywall Suspension System.

2.3 STEEL FRAMING FOR FRAMED ASSEMBLIES

A. Steel Studs and Runners: AISI S220 and ASTM C645, Section 10.

1. Minimum Base-Metal Thickness: Provide actual thickness indicated below or manufacturer's standard "equivalent thickness" stud and runner meeting actual thickness span requirements.
 - a. Floor Mounted Partitions: 20 gage, **0.0312 inch (0.79 mm)**.
 - b. Hanging Partitions (bulkheads): 25 gage, **0.0179 inch (0.45 mm)**.

B. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base Metal Thickness: 25 gage, **0.0179 inch (0.45 mm)**.
2. Depth: **7/8 inch (22.2 mm)**.

C. Partial Wall (Pony Wall) Framing Connection Support: Provide one of the following based on height of partial wall and required lateral loading:

1. Light Duty: **3/8-inch (9.5-mm)** ASTM A36/A36M steel-plate ST50H stud connector designed to support out-of-plane loading of cantilevered partial wall systems that are unsupported at the top track.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Pony Wall LGPW Series or comparable product by a current member of the SFIA:
 - b. Minimum Base-Steel Thickness: **0.0538 inch (1.37 mm)**.
 - c. Size (Height; Width by Length): Height as required for height of wall with **2-3/8-by-5-1/2-inch (60-by-140-mm)** long plate.

2. Heavy Duty: 1/2-inch (12.7-mm) ASTM A36/A36M steel-plate ST50H stud connector designed to support out-of-plane loading of cantilevered partial wall systems that are unsupported at the top track.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide ClarkDietrich; Pony Wall PW Series or comparable product by a current member of the SFIA:
 - b. Minimum Base-Steel Thickness: 0.0966 inch (2.45 mm).
 - c. Size (Height; Width by Length): Height as required for height of wall with 2-3/8-by-5-1/2-inch (60-by-140-mm) long plate.

2.4 AUXILIARY MATERIALS

- A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated. Also comply with requirements in ASTM C 840 that apply to framing installation.

3.2 INSTALLING SUSPENSION SYSTEMS

- A. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement. Do not attach hangers to roof deck.
- B. Suspend hangers from building structural steel as follows:
 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 2. Do not attach hangers to roof deck.
- C. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- D. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.3 INSTALLING FRAMED ASSEMBLIES

- A. Install steel studs with bottom and top runner tracks anchored to substrates with fastener spacing not exceeding **24-inches (610-mm)** on center. Provide fasteners at corners and ends of tracks. Isolate system from building structure to prevent transfer of loading and deflections into metal support system, both vertically and horizontally.
- B. Reinforce hanging support of gypsum drops with **1 5/8-inch (41.27-mm)** black iron channels, or other steel channels approved by structural engineer, by threading through metal studs as low as practical. Do not locate at middle of stud. Support wire to be attached to top cord of joists/joist girders panel points or as indicated on drawings. Do not attach hangers to roof deck.
- C. Space steel studs and furring as indicated on Drawings.
- D. Steel Stud Spacing for Fascias and Soffits: As indicated on Drawings.
- E. Frame doors, recessed light fixtures and other openings with studs and runners, gage and number, and arrangement as manufacturer's recommends for size of opening, weight of doors, and height and stud size, unless otherwise indicated.
- F. Install supplementary framing, runners, furring, blocking and bracing at openings and terminations in gypsum drywall, and where required for support of other work which cannot be adequately supported on gypsum board alone.
- G. Install partial wall framing connection support inside the track or directly to the floor structure. Anchor to the floor as indicated on Drawings. Attach the studs to both flanges of the partial wall framing connection.
- H. Installation Tolerance: Install each framing member so fastening surfaces vary not more than **1/8 inch (3 mm)** from the plane formed by faces of adjacent framing.

END OF SECTION 09 22 16

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Interior gypsum board.
2. Cement board.

1.2 QUALITY ASSURANCE

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

PART 2 - PRODUCTS

2.1 INTERIOR GYPSUM BOARD

A. Manufacturers:

1. Certainteed Corp.
2. G-P Gypsum Corporation.
3. Continental Building Products, Inc.
4. National Gypsum Company.
5. USG Corporation.

- B. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

- C. Regular Type: 1/2 inch (12.7 mm), tapered, unless noted otherwise.

- D. Type X: 5/8 inch (15.9 mm), tapered.

- E. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M or ASTM C 1396/C 1396M, 1/2 inch (12.7 mm), Type X, tapered.

2.2 CEMENT BOARD

- A. Cementitious Units: ANSI A118.9, 1/2 inch (12.7 mm), tapered.

1. Products:

- a. Certainteed Corp.; FiberCement Backerboard
- b. Custom Building Products; Wonderboard.
- c. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
- d. National Gypsum Company; PermaBase Cement Board.
- e. Triton Watertight Systems; Triton BK Backer Board.
- f. USG Corporation; DUROCK Cement Board.

2.3 TRIM ACCESSORIES

- A. Trim Accessories: ASTM C 1047, manufacturer's standard metal trim accessories, of the beaded type, with face flanges for concealment in joint compound, except where semi-finishing or exposed type is indicated. Provide corner beads, L-type edge trim beads, U-type trim beads, special L-kerf-type edge trim beads, and one-piece control joint beads as indicated.
 - 1. Interior Trim: Galvanized or aluminum-coated steel sheet or rolled zinc
 - 2. Exterior Trim: Hot-dip galvanized steel.

2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Wallboard: Paper.
 - 2. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Provide chemical-hardening type for tape bedding, and ready-mixed vinyl-type for topping, on interior work.
 - 2. Provide water-resistant type manufactured by United States Gypsum Co. for use with water-resistant (MR) gypsum board.
 - 3. Provide chemical-hardening type for exterior work.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these

locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

3.2 APPLYING GYPSUM BOARD

A. Install gypsum board in the following locations:

1. Cementitious Backer Board: Provide as a substrate to ceramic tile in food preparation areas and restrooms from floor up to 4-feet (1.22-m) AFF.
2. Moisture Resistant Gypsum Board: Provide in all food preparation areas and restrooms from 4-feet (1.22-m) to ceiling.
3. Provide gypsum board on partitions from floor to ceiling, unless otherwise indicated.
4. Provide drywall at vertical transition between ceilings of different height.
5. Do not apply drywall to exterior walls behind refrigerated cases and shelving.

3.3 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints at locations indicated on Drawings.

1. Do not bridge building expansion joints.
 - a. Frame both sides of joints with furring and other supports, as indicated.
 - b. Leave space of the width indicated between boards, and install one-piece metal control joint.
2. Place control joints, using a standard "V" joint. Coordinate joint locations with masonry wall control joints.
3. Isolate drywall work from abutting structural and masonry work; provide edge trim and acoustical sealant as recommended by manufacturer.

3.4 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 2: Dock and backroom walls, HVAC return air plenums, return airshafts and air-cooled compressor rooms to ensure airtight and surfaces to receive additional finishes such as FRP or ceramic tile.

- a. At joints and interior angles, embed the tape in the joint compound and immediately apply the joint compound over the tape. Apply one coat of the joint compound on fastener heads, and flanges of trim accessories. Panel surfaces must be free of excess joint compound, but tool marks and ridges are acceptable.
2. Level 4: Surfaces to receive painting or wall covering.
 - a. At joints and interior angles, embed the tape in the joint compound and immediately apply the joint compound over the tape. Apply two additional separate coats of the joint compound over flat joints. Apply one additional coat of the joint compound over interior angles. Apply three separate coats of the joint compound over fastener heads and flanges of trim accessories. Panel surfaces and the joint compound must be smooth and free of tool marks and ridges. "Drywall primer" must be applied to surfaces before applying final decoration.
- E. Cementitious Units: Finish according to manufacturer's written instructions.
- F. Sanding and Dust Control: Comply with manufacturer and OSHA 29 CFR 126.1153 requirements and guidelines as they relate to sanding quality and dust exposure.
 1. Wet sanding or vacuum sanding are required to control gypsum board and joint compound dust to an acceptable standard as evaluated by the Owner.
 2. Controlling and containing dust is essential for food safety in all areas involving open/operating facilities with Owner's employees, products, and customers.
 3. The Owner reserves the right to take additional containment and cleaning measures to control dust at the Contractor's expense.

3.5 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

SECTION 09 30 00 - TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Unglazed quarry tile.

2. **KROGER NATIONAL ACCOUNT AGREEMENT**

- a. The following items are to be provided by the Contractor and purchased under a national account agreement with the Kroger Co.:

- 1) **Material:** Tile as identified in Division 01 Section "Product Finishes and Colors" as "National Account Agreement Item."

3. Installation of all tile and accessories by Contractor.
4. Additional items supplied and installed by Contractor not part of Kroger National Account Agreement:

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples: Each type, composition, color, and finish of tile.

1.3 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish one full, unopened box of each type, composition, color, pattern, and size indicated that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

PART 2 - PRODUCTS

2.1 SUPPLIER

A. Supplier:

1. Louisville Tile Distributors, Inc.
2. Pantheon Floor Solutions, Inc.
3. Daltile.

- B. Refer to Section 01 64 00 "Vendor Contact List" for contact information.

- C. No substitutions allowed.
- D. Specify store number and address when ordering.

2.2 TILE PRODUCTS

- A. ANSI Ceramic Tile Standard: Provide Standard grade tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
- B. Unglazed Quarry Tile: Square-edged flat tile.
 - 1. Basis-of-Design Product: Match existing.
 - 2. Wearing Surface: Abrasive aggregate embedded in surface.
 - 3. Size: Match existing.
 - 4. Thickness: Manufacturer's standard.
 - 5. Face: Plain.
- C. Tile Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
 - 1. Quarry Tile Base: Coved.
 - 2. External Corners and Edges: Bullnose.
 - 3. Internal Corners: Field-buttet square corners. For coved base and cap use angle pieces designed to fit with stretcher shapes.

2.3 SETTING AND GROUTING MATERIALS

- A. Manufacturers:
 - 1. LATICRETE International Inc.
 - 2. MAPEI Corporation
 - 3. TEC/H.B. Fuller Construction Products Inc.
- B. Basis-of-Design Products: Match existing or As specified in Division 01 Section "Décor Interior Finishes and Colors."
- C. Mortar Materials
 - 1. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
- D. Grout Materials for Floors
 - 1. Chemical-Resistant, Water-Cleanable, Epoxy Grout: ANSI A118.3, 100 percent solids epoxy, stainless, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - a. Products:
 - 1) LATICRETE International Inc.; Spectralock Pro

- 2) MAPEI Corporation; Kerapoxy CQ.
- 3) TEC/H.B. Fuller Construction Products Inc.; AccuColor EFX Epoxy Special Effects.

E. Grout Color: Match existing.

2.4 MISCELLANEOUS MATERIALS

- A. Elastomeric Sealants: Elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 7 Section "Joint Sealants."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions.
- C. Remove protrusions, bumps, and ridges by sanding or grinding.
- D. Blending: For tile exhibiting color variations, use factory blended tile or blend tiles at Project site before installing.

3.2 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation."
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- F. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile

fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

- G. Joint Widths: Unless otherwise indicated in Division 01 Sections "Décor Interior Finishes and Colors," install tile with manufacturer's recommended minimum grout width.
- H. Grout tile to comply with requirements of ANSI A108.10, unless otherwise indicated.
 - 1. For chemical-resistant epoxy grouts, comply with ANSI A108.6.
- I. Metal Transition Strips: Install at locations indicated or where exposed edge of tile flooring meets other flooring.
- J. Apply grout sealer to cementitious grout joints of restroom walls according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

3.3 PROTECTION

- A. Cover tile floors with heavy-duty, non-staining construction paper, masked in place. Remove paper and rinse protective coat of neutral cleaner from all tile surfaces prior to acceptance of tile work
- B. Prohibit foot and wheel traffic from using newly tiled floors for 24 hours

3.4 FLOOR TILE INSTALLATION SCHEDULE

- A. Interior floor installation on crack-suppression membrane over concrete; thin-set mortar.
 - 1. Tile: Ceramic or Quarry
 - 2. Thin-Set Mortar: Latex-portland cement mortar.
 - 3. Grout: Chemical-resistant, water-cleanable, epoxy grout.

END OF SECTION 09 30 00

SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Acoustical panels and exposed suspension systems for ceilings.

1.2 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: Provide acoustical panels with surface burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84.
- B. Seismic Standard: Provide acoustical panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:
1. International Building Code
 2. CISCA's Recommendations for Acoustical Ceilings: Comply with CISCA's "Recommendations for Direct-Hung Acoustical Tile and Lay-in Panel Ceilings."
- C. Seismic Loads: Design and size components to withstand seismic loads in accordance with the International Building Code, Section 1613.1 for Category C.

1.3 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Acoustical Ceiling Panels: One full, unopened box of each type and color of ceiling tile installed.

PART 2 - PRODUCTS

2.1 ACOUSTICAL PANELS, GENERAL

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, light reflectances, and humidity resistance unless otherwise indicated.
- B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

2.2 ACOUSTICAL PANELS

A. Manufacturers:

1. Armstrong Ceilings & Wall Solutions.
2. CertainTeed Corporation; Saint-Gobain North America.
3. USG Corporation.

B. Panel Types:

1. **Type 1:** ASTM E1264, Type III, mineral base with painted finish; Form 2, Pattern C E, square edge, 24 by 48 inches (610 by 1220 mm) by 5/8 inch (16 mm) thick with mold and mildew inhibitor.
 - a. Basis-of-Design Product and Color: As specified in Division 01 "Décor Interior Finishes and Colors."
 - b. Light Reflectance (LR): 0.84.
 - c. Ceiling Attenuation Class (CAC): 35.
 - d. Noise Reduction Coefficient (NRC): 0.55.
 - e. Metal Suspension System: Type A.
2. **Type 5:** ASTM E1264, Type XX, 1/2 inch (13 mm) gypsum base with a 2 mill minimum washable membrane-faced overlay, Pattern G, square edge, 24 by 48 inches (610 by 1220 mm). by 1/2 inch (13 mm) thick.
 - a. Basis-of-Design Product and Color: As specified in Division 01 Section "General Interior Finishes and Colors."
 - b. Light Reflectance (LR): 0.77.
 - c. Ceiling Attenuation Class (CAC): 35.
 - d. Metal Suspension System: Type B.

2.3 METAL SUSPENSION SYSTEMS, GENERAL

A. Manufacturers:

1. Armstrong Ceiling & Wall Solutions.
2. CertainTeed Corporation; Saint-Gobain North America.
3. Rockfon (Rockwool International).
4. USG Corporation.

B. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.

C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," and the International Building Code, Section 1613.1 for seismic building category indicated.

- D. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire, ASTM A 641/A 641M, Class 1 zinc coating, soft temper or nickel-copper-alloy wire, ASTM B 164, nickel-copper-alloy UNS No. N04400.
1. Size: 12-gage minimum or as required so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, and in accordance with the International Building Code, Section 1613.1 for seismic building category indicated.
- E. Aircraft Cable (For Ceiling Cloud Suspension System): Stainless steel, type 304, 7 x 7 multi-stranded complying with Federal Specification RR-W-410E.
1. Size: 1/32 inch (0.8 mm) diameter minimum or as required so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of cable, and in accordance with the International Building Code, Section 1613.1 for seismic building category indicated.
 2. Cable Fittings: Provide sleeves, turnbuckles, clamps, terminals as required for a complete installation.
- F. Slotted Channel Framing: As specified in Division 05 Section "Metal Fabrications."

2.4 METAL SUSPENSION SYSTEM

- A. **Type A:** Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, hot-dip galvanized according to ASTM A 653/A 653M, G30 (Z90) coating designation, with prefinished, cold-rolled, 15/16-inch- (24-mm-) wide, metal caps on flanges.
1. Structural Classification: Intermediate-duty system.
 2. End Condition of Cross Runners: Butt-edge or override type.
 3. Face Design: Flat, flush.
 4. Cap Material: Steel cold-rolled sheet.
 5. Cap Finish: Factory painted to match adjacent acoustical panel, unless noted otherwise.
- B. **Type B:** Wide-Face, Capped, Double-Web, Hot-Dip Galvanized, G60 (Z180), Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, hot-dip galvanized according to ASTM A 653/A 653M, G60 (Z180) coating designation, with prefinished, cold-rolled, 15/16-inch- (24-mm-) wide, metal caps on flanges.
1. Structural Classification: Intermediate-duty system.
 2. End Condition of Cross Runners: Override type.
 3. Face Design: Flat, flush.
 4. Cap Material: Aluminum.
 5. Cap Finish: Factory painted to match adjacent acoustical panel, unless noted otherwise.

2.5 METAL EDGE MOLDINGS AND TRIM

- A. Roll-Formed Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.

1. Provide 7/8 inch (22 mm) horizontal flange.

2.6 CEILING CLOUD SUSPENSION SYSTEM

- A. Edge Trim System: Extruded aluminum alloy 6063 trim channel, 10 foot straight and curved profiles.
 1. Products:
 - a. Armstrong Ceiling & Wall Solutions; Axiom Classic.
 - b. Certaineed Corporation; Saint-Gobain North America; Cloud Perimeter Trim.
 - c. Rockfon (Rockwool International); Infinity.
 - d. USG Corporation; Compasso.
 2. Face Width: As indicated.
 3. Flange Width: 3/4 inch (19 mm)
 4. Field Suspension Grid: Type A
 5. Acoustical Panel: As indicated on Drawings.
 6. Brackets, Clips, Connectors: Manufacturer's standard.
 7. Load Transfer Bracket: Manufacturer's standard.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 1. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.66 m). Miter corners accurately and connect securely.
 2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- C. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- D. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
- E. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

3.2 INSTALLATION, SEISMIC DESIGN CATEGORY C

- A. Installed in accordance with ASTM C 636 and CISCA 0-2.
- B. Ceiling Weight: No more than 2.5 psf., including grid, panels, light fixtures, and air terminals. Support other services independently from the ceiling system.
- C. Wall Molding:
 - 1. Minimum 7/8-inch horizontal flange
 - 2. Provide grid terminal ends with 3/8-inch clearance from the wall and at least 3/8-inch perch on the molding.
 - 3. Perimeter attachment of grid is not permitted.
- D. Hangers: Meet requirements of ASTM C 636. Attach hangers to top chord or flange of structural members or to slotted channel framing installed at top chord or flange of structural members. Do not attach hangers to roof deck.
- E. Suspension System: 60-pound connection strengths in compression and tension at main beam and cross tee intersections and splices.
- F. Perimeter Spacers: Provide spacer bars at perimeter to prevent spreading.
- G. Light fixtures: For light fixtures weighing 56 lbs or less, provide 12-gage wires attached slack at diagonal corners. For light fixtures weighing in excess of 56 pounds, independently support from building structure.
- H. Penetrations: Allow 3/8-inch minimum clearance.

3.3 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 13

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SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Wall base.
2. Molding accessories (Do not use in vestibules. Refer to Section 09 68 13 "Tile Carpeting" for metal edge transitions strips to be used in vestibules).

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples: For each type of product indicated, in manufacturer's standard-size Samples of each resilient product color, texture, and pattern required.

1.3 PROJECT CONDITIONS

- A. Maintain temperatures within range recommended by manufacturer, but not less than **70 deg F (21 deg C)** or more than **95 deg F (35 deg C)**, in spaces to receive floor tile during the following time periods:
1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. After postinstallation period, maintain temperatures within range recommended by manufacturer, but not less than **55 deg F (13 deg C)** or more than **95 deg F (35 deg C)**.
- C. Install resilient products after other finishing operations, including painting, have been completed.

1.4 EXTRA MATERIALS

- A. Furnish one unopened box of each type, color, and pattern of resilient base and accessory installed that are packaged with protective covering for storage and identified with labels describing contents.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

- A. Wall Base: ASTM F 1861

B. Manufacturers

1. AHF Products, LLC; Armstrong Flooring Brand.
2. Flexco Corp.
3. Johnsonite, a Tarkett company.
4. Mohawk Group, The.
5. Roppe Corporation.
6. VPI, LLC, Floor Products Division.

C. Colors and Patterns: As specified in Division 01 Section "Décor Interior Finishes and Colors."

D. Type (Material Requirement): TV (vinyl).

E. Group (Manufacturing Method): I (solid).

F. Style: Cove (with top-set toe).

G. Minimum Thickness: 0.080 inch (2.0 mm).

H. Height: 4 inches (102 mm).

I. Lengths: Cut lengths, 48 inches (1219 mm) long or coils in manufacturer's standard length.

J. Outside and Inside Corners: Job formed.

K. Surface: Smooth.

2.2 RESILIENT MOLDING ACCESSORY

A. Carpet to Resilient Tile 1/4 inch (6.35 mm) carpet to 1/8 inch (3 mm) resilient flooring):

1. Products:
 - a. Johnsonite, a Tarkett company; CTA-XX-H.
 - b. Mohawk Group, The; CRA05.
2. Material: Vinyl or rubber.
3. Size: 2-1/2 inch (63.5 mm), gradual transition.
4. Color: As specified in Division 01 Section "Décor Interior Finishes and Colors."

B. Carpet to Concrete 1/4 inch (6.35 mm) or 9/32 inch (7 mm) carpet to 0 inch (0 mm) flush flooring):

1. Products:
 - a. Johnsonite, a Tarkett company; CTA-XX-J.
 - b. Mohawk Group, The; CRA08.
2. Material: Vinyl or rubber.
3. Size: 2-1/2 inch (63.5 mm), gradual transition.
4. Color: As specified in Division 01 Section "Décor Interior Finishes and Colors."

C. Resilient Tile to Concrete **1/8 inch (3 mm)** to **0 inch (0 mm)** flush flooring):

1. Products:

- a. Johnsonite, a Tarkett company; RRS-XX-C or RRS-XX-D.
- b. Mohawk Group, The; CRA09.

2. Material: Vinyl or rubber.

3. Size: **1 inch (25 mm)** or **1-1/4 inch (31.75 mm)**.

4. Color: As specified in Division 01 Section "Décor Interior Finishes and Colors."

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement-based formulation provided or approved by resilient product manufacturers for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

- a. Cove Base Adhesives: 50 g/L.
- b. Rubber Floor Adhesives: 60 g/L.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.

B. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

C. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.

D. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

1. Do not install resilient products until they are the same temperature as the space where they are to be installed.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 RESILIENT WALL BASE INSTALLATION

- A. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- B. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- C. Do not stretch wall base during installation.
- D. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.
- E. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 6 inches (152 mm) in length.
 - a. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 6 inches (152 mm) in length.
 - a. Cope corners to minimize open joints.

3.3 RESILIENT ACCESSORY INSTALLATION

- A. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
 - a. Do not wash surfaces until after time period recommended by manufacturer.
- B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

END OF SECTION 09 65 13

SECTION 09 65 19 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Luxury Vinyl Tile (LVT).
 - 2. Resilient tile flooring adhesive.
 - 3. Trowelable leveling and patching compounds.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples: Manufacturer's standard size units (approximately 2-inch (51 mm) square) of each color and pattern of resilient floor tile required.

1.3 PROJECT CONDITIONS

- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After post-installation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Close spaces to traffic during floor covering installation.

1.4 EXTRA MATERIALS

- A. Furnish one unopened box of each type, color, and pattern of floor tile installed that are packaged with protective covering for storage. Identify with labels describing contents and store with other extra materials.

1.5 WARRANTY

- A. Warranty information for resilient tile flooring is specified in Division 01 Section "Product Warranties."

1. Verify that all products used for the flooring installation (tile, patch, leveling compound, adhesive, etc.) are compatible/acceptable by each manufacturer and will not void any warranties.

PART 2 - PRODUCTS

2.1 LUXURY VINYL TILE

- A. Luxury Vinyl Tile (LVT): ASTM F 1700 Class III, Type B.
 1. Products: Refer to Division 01 Interior Finishes and Colors Sections.
 2. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.
 3. Smoke Developed: ASTM E 662 450 or less.
 4. Size: As specified in Division 01 Section "Décor Interior Finishes and Colors."
 5. Thickness: 0.125 inches (3.2 mm) overall (nominal).

2.2 INSTALLATION MATERIALS

- A. Moisture Mitigation and Primer (For Areas Other than Vestibule Flooring: ASTM F3010, Solvent-free two-part epoxy.
 1. General: Provide for areas where RH levels are tested higher than recommended for adhesives needed exhibiting MVER up to 16 lbs and RH up to 100 percent to suitable levels before applying underlayment.
 2. Product: As recommended by resilient flooring adhesive manufacturer.
 - a. Submit product data, resilient flooring adhesive manufacturer approval, and concrete testing results to Architect and Owner for approval.
 3. Volumes Solids: 100 percent.
 4. Minimum Dry Film Thickness: 10 mils (0.254 mm) per coat.
 5. Walkable: 2 to 3 hours
 6. Compressive Strength: Minimum 5,500 psi (385 kg/cm²) at 28 days, ASTM C109M.
 7. Flexural Strength: 1,200 psi (84 kg/cm²) at 28 days, ASTM C348.
 8. VOC Content: 0 grams per liter.
- B. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement-based formulation provided or approved by resilient product manufacturer for applications indicated.
 1. Products: As manufactured or recommended by resilient flooring adhesive manufacturer and resilient product manufacturer.
 - a. Submit product data and resilient flooring adhesive and resilient product manufacturer approval to Architect and Owner for approval.
 - b. Submit moisture mitigation and primer manufacturer approval as applicable to Architect and Owner for approval.

2. Alternate Product: For use with Henry adhesives:
 - a. ARDEX Americas; ARDEX MRF.
- C. Trowelable Leveling and Patching Compound for Vestibule Luxury Vinyl Tile (V-LVT): Polymer-modified, Portland/CSA cement-based formulation.
 1. Product: Aquaflex, Inc.; Patch and Skim mixed with Aquaflex 1+1 Polymer.
 - a. No substitutions allowed.
 2. Solids: 100 percent.
 3. VOC Content: 0 g/L
- D. Adhesives:
 1. **AD-2** - Adhesive for Luxury Vinyl Tile (LVT): Modified urethane with VOC Content of less than 14 g/L; calculated and reported, SCAQMD 1168 recommended by manufacturer to suit LVT resilient products and substrate conditions indicated and to assure full warranty protection.
 - a. General: Provide product manufactured by or approved by resilient flooring manufacturer.
 - b. Products:
 - 1) AHF Products, LLC; Armstrong Flooring Brand; S-1000 Adhesive.
 - 2) Henry; A Brand of Ardex Americas; 647 PlumPro.
 - 3) Mohawk Group; Performance Accessories Collection, Total Bond Resilient Flooring Adhesive.
 - c. Installation Requirements: Adhesive requires rolling the floor in two directions with a **100-lb. (45 kg)** roller per manufacturer's instructions after installation of tile.
 - d. Traffic Restrictions (Cure Time): Allow at least 3 hours for light foot traffic, 4 hours for heavy foot traffic, 6 hours for shopping carts (**150 lbs. (68 kg)**) and 8 hours for heavy rolling loads after installation of flooring.
 - e. Cleaning Restrictions: Floor may be wet washed or auto-scrubbed the minimum number of hours as recommended by flooring adhesive manufacturer, but no less than 6 hours after installation and rolling floor.
 2. **AD-4**: Adhesive for Vinyl Composition Tile (VCT) and Luxury Vinyl Tile (LVT) for Use with Remodel Phasing Requiring Near Immediate Foot Traffic/Use:
 - a. General: Provide product manufactured by or approved by resilient flooring manufacturer.
 - 1) AHF Products, LLC; Armstrong Flooring Brand; Flip Spray Adhesive.
 - 2) Tarkett North America; Tarkett SpraySmart 901 Spray Adhesive100.
 - 3) Mohawk Group; MS160 Aerosol Resilient Adhesive.
 - b. Coverage:

- 1) Vinyl Composition Tile (VCT): Do not exceed 185 sq. ft. (17 sq.m) per 22 oz. (0.65 l) can.
 - 2) Luxury Tile (LVT): Do not exceed 150 sq. ft. (14 sq. m) per 22 oz. (0.65 l) can.
- c. VOC Content: 0 g/L.
 - d. Traffic Restrictions (Cure Time): After rolling, immediately after installation of flooring.
 - e. Cleaning Restrictions: Floors may be wet washed or auto-scrubbed a minimum of 72 hours after installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where installation of resilient products will occur, with installer present, for compliance with manufacturer's requirements. Verify that substrates and conditions are satisfactory for resilient product installation and comply with requirements specified.
 1. Prior to existing floor tile removal, identify on a floor covering plan locations of the following conditions:
 - a. Failure of underlayment.
 - b. Burning of tile during floor care
 - c. Telescoping of construction joints through existing tile.
 - d. Telescoping of other imperfections through existing tile.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.
 1. Refer to Division 02 Section "Resilient Floor Tile and Mastic Removal" for existing adhesive removal requirements.
- B. Concrete Substrates: Prepare according to ASTM F 710 and ASTM F3191 (porosity).
 1. Concrete substrate must be deemed porous per ASTM F3191. Place a bead of water on the concrete surface about the size of a dime and observe. If the water absorbs into the concrete with-in 1 minute it is porous, if it does not absorb, provide additional sanding, abrasive work, or other measures to insure proper porosity.
 2. Provide dry, clean, smooth and structurally sound concrete substrate free of depressions, scale, or foreign deposits.
 - a. Provide surface free of dust, solvents, varnish, paint, wax, oil, grease, sealers, curing compounds, residual adhesive, adhesive removers, and other foreign

- materials that might affect the adhesion of resilient flooring to the substrate or cause a discoloration of the flooring from below.
- b. Do not use spray paints, permanent markers, or other indelible ink markers to write on the back of the flooring material or mark the substrate as they could bleed through, telegraphing up to the surface and permanently staining the flooring material.
 - c. Mechanically remove any contaminants that are present on the substrate prior to the installation of the flooring material.
 - 1) In renovation or remodel work, remove any existing adhesive residue so that 100 percent of the overall area of the original substrate is exposed when installing LVT. Do not use solvents. Refer to Division 2 Section " Resilient Floor Tile and Mastic Removal" for adhesive removal procedures.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
4. Moisture Testing (Not Required for Vestibules or LVT installed with adhesive AD-3):
- a. Perform tests recommended by manufacturer using one of the following methods. Proceed with installation only after substrates pass testing:
 - 1) Percent Relative Humidity (RH) in Concrete Slabs (Preferred Method): Conduct testing for internal relative humidity of concrete slabs in strict accordance with the latest edition of ASTM F 2170, "Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes."
 - 2) Moisture Vapor Emission (MVER) Test: Conduct MVER tests in accordance with the latest edition of ASTM F 1869, "Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride." Before conducting tests, remove any curing agents or residues down to bare concrete. Perform calcium chloride tests only on ordinary concrete floors. Tests are not applicable on lightweight concrete, smoothing or leveling compounds, gypsum underlayments, or other fills.
- C. Repair, as required, damaged existing substrates as identified by Contractor on a floor covering plan.
- D. Provide additional floor prep for spray applied adhesives including but not limited to cleaning, locating imperfections that would telegraph through the applied tile.
- E. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.
- 1. For vestibule floors, prepare concrete surfaces prior to product application per ASTM F710 to smooth, porous and clean surface.
 - a. Maintain concrete substrate free of topical liquid water.
 - b. Use only mechanical methods to clean existing sub-floor.
 - c. Fill cracks, holes, and depressions with specified trowelable leveling and patching compound.

- 1) Mix trowelable leveling and patching compound with manufacturer's proprietary polymer.
 - 2) Add contents polymer to pail provided plus an equivalent amount of water.
 - 3) To the liquid add the contents of the bag.
 - 4) Mix under agitation with a paddle attached to drill. Mix approximately less than 2 minutes to lump-free consistency.
 - 5) Do not add any additional water.
- F. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
1. Do not install resilient products until they are same temperature as space where they are to be installed.
- G. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 TILE INSTALLATION

- A. Comply with manufacturer's current "Kroger Installation Recommendations" provide by contact listed in Section 01 64 00 "Vendor Contact List." Review/confirm any questions or concerns prior to the start of installation.
- B. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
1. Lay tiles in pattern indicated.
- C. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
1. Lay tiles with grain direction alternating in adjacent tiles (basket-weave pattern).
 2. Lay LVT plank flooring following directional arrows on back and vary the placement of the planks so that the end joints are at least **6 inches (152 mm)** from the next adjacent plank, and are not repeating a location more frequently than every six planks.
- D. Scribe, cut, and fit tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
- E. Extend tiles into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, non-staining marking device.

- G. Install tiles on covers for telephone and electrical ducts and similar items in finished floor areas. Maintain overall continuity of color and pattern with pieces of tile installed on covers. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhesive Application: Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. Additional Installation Requirements Using adhesive AD-3:
 - 1. After one hour, but no later than two hours after the flooring is installed, roll the entire floor with a **100-lb. (45 kg)** roller in two directions
 - 2. Starting at the center and working toward the edges, roll the material in the direction of the trowel notches and then again in the opposite direction.
 - 3. Do not work on newly adhered flooring except to roll. If unavoidable, use a kneeling board.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil with a neutral cleaner.
 - 4. Protective Polish:
 - a. VCT: Apply 2 coats protective polish in accordance with flooring manufacturer's instructions.
 - b. LVT/V-LVT: Protective polish is not required unless recommended by LVT/V-LVT manufacturer.
 - c. Do not wash, auto-scrub, or strip surfaces a minimum of five days after installation or application of protective polish.
- B. Washing and Auto-Scrubbing: As specified in Part 2 under individual adhesive cleaning restrictions.
- C. Protection: Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

END OF SECTION 09 65 19

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SECTION 09 67 23 - RESINOUS FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Cementitious urethane resinous flooring system.

1.2 DEFINITIONS

- A. Approved Standard Sample: Manufacturer's standard sample pre-approved by Owner showing color and texture developed exclusively for the Owner and maintained by Manufacturer.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Approved Applicators: Contact resinous flooring manufacturer to obtain a list of approved qualified applicators located within the geographic region of the Project. Accept pricing only from qualified applicators approved by the resinous flooring manufacturer.
- B. Sequencing: Resinous flooring installation must be completed within a 12 hour time frame. This includes existing floor preparation, installation of body and topcoat, and required cure time ready for foot traffic. Time frame does not include any required patching of existing concrete floor slab.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: Approved Standard Sample for each exposed finish.
- C. Qualified Installers: Complete list of manufacturer certified/approved installers available for the work.
- D. Qualification Data of Selected Installer: Written information that demonstrates capabilities and experience of selected firm. Include list of at least 10 completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- E. Installer Certificate/Letter of Approval: Signed by manufacturer certifying that selected installers comply with specified qualification requirements.
- F. Concrete Moisture and Ph Test Reports: For each area where resinous flooring system is to be installed.
- G. Field Technical Services Representative Reports.

- H. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who employs only persons trained and approved by resinous flooring manufacturer for applying resinous flooring systems indicated and has completed at least ten installations of similar size and complexity.
1. Engage an installer who is certified/approved in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated and has completed at least ten projects of similar size and complexity.
 2. The Installer's supervisor shall be on site at all times and will be thoroughly familiar with the work in progress. This supervisor shall have authority to receive and execute all direction provided by the Architect, manufacturer's field technical services representative, or the Owner.
- B. Field Technical Services Representative Qualifications: Employed by the system manufacturer to assist in the quality assurance and quality control process of the installation and to perform/assist installer with any required field inspections and problem solving with the installer.
- C. Mockups: Apply mockups to verify that material and installation matches the Approved Standard Sample and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Apply full-thickness mockups on 3/4 inch (19 mm), 2 feet by 3 feet (610 mm by 915 mm) exterior grade plywood.
 2. Include 48-inch (1200-mm) length of integral cove base with inside and outside corner if integral cove base is required by health department of authority having jurisdiction and indicated on Drawings.
 3. Simulate finished lighting conditions for Owner's review of mockups.
- D. Preinstallation Conference: Conduct conference not less than thirty days prior to starting work at Project site with Contractor, installer, Owner, and manufacturer's field technical services representative.

1.6 FIELD CONDITIONS

- A. Site Requirements
1. Temperature: Between 60 deg F (15.6 deg C) and 85 deg F (29.4 deg C) providing the substrate temperature is above the dew point. Consult manufacturer for temperatures outside of this range.
 2. Relative Humidity: Less than 85 percent. Surface temperature shall be at least 5 deg F (15 deg C) above the dew point.
 3. Lighting: Provide adequate lighting equal to the final lighting level during the preparation and installation of the system.
- B. Conditions of new concrete to be coated with cementitious urethane material.

1. Moisture cure concrete for a minimum of 7 days and fully cure for 14 days in accordance with ACI-308 prior to the application of the coating system pending moisture tests. Consult manufacturer for parameters outside of this range.
2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary nor desirable).
3. Sealers and curing agents should not be used. If sealers and curing agents are used, they must be completely removed prior to installation of the system.

1.7 WARRANTY

- A. General warranty information is specified in Division 01 Section "Product Warranties."
- B. Special Manufacturer's Warranty: Manufacturer agrees to repair or replace components of resinous flooring system that fail in materials or workmanship within specified warranty period.
 1. Warranty Period: Five years.
- C. Special Project Warranty: Submit resinous flooring Installer's warranty, signed by Installer, covering the installation of resinous flooring, including all components of resinous flooring system for the following warranty period:
 1. Warranty Period: Five years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

- A. Manufacturers: Specify store number and address when ordering:
 1. DAF Dur-A-Flex, Inc.
 - a. Contact: Chris Carney; (312) 882-3024; chrisc@dur-a-flex.com.
 2. KEY KeyResin/FlowResin Company.
 - a. Contact: Dan O'Connell, 513-903-7984; doconnell@keyresin.com.
 3. SHW The Sherwin-Williams Company.
 - a. Contact: Scott Kaiser; 503-319-5209; scott.kaiser@sherwin.com.
 4. SIKA Sika Industrial Flooring, Division of Sika USA.
 - a. Contact: Michael Carroll; (206) 406-4400; carroll.michael@us.sika.com.
 5. STHD The Stonhard Group, a part of RPM Performance Coatings.
 - a. Contact: David Senn; (330) 472-6178; dsenn@stonhard.com.

2.2 RESINOUS FLOORING (URETHANE SLURRY FLOORING SYSTEM)

- A. Location: Deli, meat, dairy, and other locations as indicated.
- B. System Characteristics:
 - 1. Color: Match existing or Approved Standard Sample for color as specified in Division 01 Section "Interior Finishes and Colors."
 - 2. Wearing Surface: Textured for slip resistance. Match Approved Standard Sample.
 - 3. Overall System Thickness: 1/4 inch (6.4 mm) (exclusive of waterproofing and reinforcing membrane, when required).
- C. System Components: Manufacturer's standard components that are compatible with each other and as follows:
 - 1. Body: Pigmented cementitious urethane resin, 100 percent solids.
 - a. Products:
 - 1) DAF Poly-Crete MDB.
 - 2) KEY Urecon SL.
 - 3) SHW FasTop Multi SL45.
 - 4) SIKA PurCem 22NA.
 - 5) STHD Stonclad UT.
 - b. Color: Match topcoat color.
 - 2. Non-Slip Broadcast: Manufacturer's standard silica sand or quartz aggregate for pigmented topcoat.
 - 3. Topcoat: Gloss, pigmented, two component, solid color polyaspartic topcoat.
 - a. Products:
 - 1) DAF Accelera S.
 - 2) KEY Key Resin #470/471.
 - 3) SHW 4844 or 4850.
 - 4) SIKA Sikafloor 510/510LPL.
 - 5) STHD Stonseal UT-7.
 - b. Color: As specified in Division 01 Section "Décor Interior Finishes and Colors."

2.3 ACCESSORY MATERIALS

- A. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.
- B. Contraction (Sawed) Joint Filler and Construction (Cold) Joint Filler: 100 percent solids polyurea filler, Shore A 80 or higher, Rapid curing, self-leveling elastomer.

1. Product:
 - a. Euclid Chemical Company (The); EUCO QWIKjoint 200
 - b. L&M Construction Chemicals, Inc; Joint Tite 750.
 - c. Metzger/McGuire; Spal-Pro RS 88.
 - d. The Sherwin-Williams Company; 4880 Polyurea Joint Sealant.
 - e. Sika USA; Sikafloor Load Flex.
2. Color: As specified in Division 01 Section "Décor Interior Finishes and Colors."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where resinous flooring will be installed for compliance with requirements for installation tolerances, floor slope, and other conditions affecting performance of the Work. Report any discrepancies to Owner and proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean and dry substrate with a Ph of 11-13 for resinous flooring application.
- B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
 1. Concrete Substrate Testing: Perform concrete substrate testing indicated and submit results to Owner for verification. Proceed with application only after substrates pass testing and have been verified by Owner's testing agency.
 - a. Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 90 percent.
 - b. Verify that concrete substrates are dry. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 15 lb of water/1000 sq. ft. (6.8 kg of water/92.9 sq. m) of slab in 24 hours.
 - c. Verify that concrete substrates have a Ph of 11-13 and that resinous flooring will adhere to them. Perform tests recommended by manufacturer.
 2. Mechanically abrade the concrete surface as recommended by the resinous flooring manufacturer.
- C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

- D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions. Install patching and fill material in appropriate time frame prior to installation of resinous flooring to allow for complete cure.
- E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations.

3.3 APPLICATION

- A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated, matching the Approved Standard Sample and approved mockup.
 - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion. Do not use primer.
 - 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
 - 3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
 - 4. For junction points in floor areas adjacent to epoxy flooring that are not covered by details, obtain approval of methods proposed from Owner's Representative prior to proceeding.
- B. Terminations
 - 1. Chase edges to lock the resinous flooring system into the concrete substrate along lines of termination.
 - 2. Penetration Treatment: Lap and seal flooring system onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.
 - 3. Trenches: Continue coating system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.
 - 4. Treat floor drains by chasing the coating to lock in place at point of termination.
- C. Integral Cove: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.
 - 1. Integral Cove Base: 6 inches (150 mm) high.
 - 2. Location:
 - a. Restroom floors as indicated on Drawings.
 - b. Other areas to receive resinous flooring if required by health department of authority having jurisdiction.
- D. Joints and Cracks
 - 1. Treat control joints to bridge potential cracks and to maintain monolithic protection.

2. Treat cold joints and construction joints to bridge potential cracks and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.
3. Discontinue floor coating system at vertical and horizontal contraction and expansion joints by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

3.4 FIELD QUALITY CONTROL

A. Resinous Flooring Inspection:

1. Arrange for resinous flooring manufacturer's field technical services representative to inspect resinous flooring installation and perform field problem solving issues with the installer at the following phases of installation:
 - a. Floor preparation.
 - b. Base coat installation.
 - c. Top coat installation.
2. Field technical services representative shall submit report to Owner at each phase of installation stating:
 - a. Any issues noted and resolution of issues.
 - b. Certification that resinous flooring was installed properly and in accordance with this Section and manufacturer's written installation instructions.

B. At the direction of Owner and at locations designated by Owner, conduct the following tests:

1. Core Sampling: Take one core sample per 1000 sq. ft. (92.9 sq. m) of resinous flooring, or portion of, to verify thickness. For each sample that fails to comply with requirements, take two additional samples. Repair damage caused by coring and correct deficiencies.
2. Bond Test: At the direction of Owner and at locations designated by Owner, conduct bond test using procedures as recommended by the resinous flooring manufacturer.

C. Non-Conforming Work: Any area found to be defective, for any reason other than damage caused by the Owner, will result in a complete removal of the material within the room or area and reinstallation or the material at the expense of the Contractor. The Contractor will also be responsible for all additional costs associated with the non-conforming work including but not limited to the following:

1. Removal of fixtures and equipment to a location designated by Owner including disconnecting of utilities.
2. Replacement of fixtures and equipment to original operating location including reconnecting of utilities.
3. Temporary relocation and start up of fixtures and equipment for use by the Owner while corrective work is undertaken.
4. Monetary compensation to Owner due to the interruption of normal business operation as determined by Owner's store operations as a result of any corrective work required.

3.5 PROTECTION AND CLEANING

- A. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application.
- B. Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

END OF SECTION 09 67 23

SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Surface preparation and the application of paint systems.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: Three factory color chips **3/4-inch by 2-inches** (19-mm by 51-mm) minimum with color name and product number for each finish and for each color and texture required.

1.3 QUALITY ASSURANCE

- A. Only those brands and qualities of paint listed in Part 2 shall be used. Materials must be top line as specified. "Professional" or "Economy" lines will not be acceptable.
- B. The same manufacturer to be used for the finish coat as was used for the prime coat for any one area. Prime coat to be tinted to the approximate shade of the finish coat. All coats must be thoroughly dry before applying succeeding coats. When items to be painted have received a shop coat of paint, the prime coat and finish coat called for are in addition to the shop coat.
- C. Exposed Structure Ceiling Test Sample (Remodels and Expansions): Apply sample of specified paint system indicated to verify compatibility of specified system with substrates and atmospheric conditions, to verify paint thickness, and to set quality standards for materials and execution.
1. Provide test sample of at least **100 sq. ft.** (9 sq. m).
 2. Apply test sample to area approved by Owner that includes metal deck, joists, structural steel, ductwork, piping, and conduit.
 3. Apply test sample at least one week prior to installation of paint system.
 4. If test sample is not approved or shows signs of delamination or flash rusting, correct conditions and apply additional test samples at no added cost to Owner until sample is approved.

1.4 PROJECT CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between **50 and 95 deg F** (10 and 35 deg C).

- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than **5 deg F (3 deg C)** above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 PAINT, GENERAL

A. Manufacturers

1. MOR Benjamin Moore and Co.
2. PPG PPG Paints.
3. SWC Sherwin-Williams Co. (The).

B. Basis of Design: Sherwin-Williams Co. (The).

1. Paints and coatings in this specification are based on the products of the Sherwin-Williams Company. If products are provided by one of the other approved manufacturers above, submittals must be accompanied by a product comparison chart and color comparison board showing proof of equality with the Sherwin-Williams products.

C. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

D. Colors: As specified in Division 01 Sections "General Interior Finishes and Colors" and "Décor Interior Finishes and Colors"

E. Sheen: Provide sheen indicated.

2.2 PRIMERS AND BLOCK FILLERS

A. **PP-1:** Acrylic Enamel (Flat)

1. SWC DTM Acrylic Primer/Finish,#B66W1

B. **PP-2:** Interior Masonry Block Filler

1. SWC Heavy Duty Block Filler#B42W46

C. **PP-3** Acrylic Primer (Interior)

1. SWC ProMar 200 Zero Interior Latex PrimerB28W02600

D. **PP-4** Exterior Masonry Surfacers

	1.	SWC	Loxon Block Surfacers	A24W200
E.	PP-5		Exterior Acrylic	
	1.	SWC	Loxon Concrete & Masonry Primer	A24W8300
2.3	FINISH PAINTS			
A.	P-1:		Acrylic Enamel (Semi-gloss)	
	1.	SWC	DTM Acrylic Coating	B66 Series
			VOC: <150g/L	
B.	P-2:		Acrylic Latex (Satin)	
	1.	SWC	Emerald Exterior Acrylic Satin	K48 Series
C.	P-3:		Acrylic (Flat)	
	1.	SWC	ProMar 200 Zero VOC Int Latex Flat	B30-2600 Series
D.	P-4:		Acrylic (Eggshell)	
	1.	SWC	ProMar 200 Zero VOC Interior Latex Egg-Shell.....	B20-2600 Series
E.	P-5:		Acrylic (Semi-Gloss)	
	1.	SWC	ProMar 200 Zero VOC Int Latex Semi-Gloss.....	B31-2600 Series
F.	P-6:		Acrylic Traffic Marking Paint	
	1.	SWC	Pro-Park Waterborne Traffic Marking Paint.....	B97 Series
G.	P-7:		Water-based Catalyzed Epoxy (Semi-gloss)	
	1.	SWC	Pro Industrial Pre-Catalyzed Waterbased Epoxy	K46-150
H.	P-8:		Not Used	
I.	P-9:		WaterBorne Acrylic Dryfall (Egg Shell)	
	1.	SWC:	Waterborne Acrylic Dryfall (Egg Shell)	#B42W2
J.	P-10:		Not Used.	
K.	P-11		Acrylic, Exterior (Flat)	
	1.	SWC	Loxon Acrylic Coating	A24W300 Series
L.	P-12		Acrylic, High Performance, (Semi-gloss)	

1. SWC Sher-Cryl HPA B66-350 Series
- M. **P-13:** Water-Based Latex Enamel Exterior Pipe Insulation Paint (Insulation paint and pipe insulation shall be of same manufacturer).
 1. Armacell WB Armaflex Finish919-304-3846
 2. RBX, Inc. RBX 374.....800-765-6475
- N. **P-14:** Water-Based Latex Enamel (Flat).
 1. SWC A-100 Exterior Latex FlatA6 Series

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
 1. Where interior traffic paint is indicated for sealed concrete, apply traffic paint prior to application of sealer.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Concrete: 12 percent.
 2. Masonry (Clay and CMU): 12 percent.
 3. Wood: 15 percent.
 4. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. Prior to painting, protect sprinkler heads and fire alarm and data cables from paint overspray.
 2. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.
 2. Verify that metal decks have been provided "paintable" with surface films and other agents removed that may impede adhesion of paint.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Concrete and Clay Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
- G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- H. Shop-Primed Substrates: Clean field welds, connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- I. Wood Substrates:
1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 2. Sand surfaces that will be exposed to view, and dust off.
 3. Prime edges, ends, faces, undersides, and backsides of wood.
 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- J. Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.
- K. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.
- L. Existing Painted Surfaces:
1. In accordance with paint manufacturer's recommendations, all surfaces and absorbed contaminants (i.e., dirt, dust, grease, oil, mildew, moisture, chemical fall-out, etc.) shall be removed prior to applying any new coat of paint.

2. Removal of old painting system prior to the application of a new coat of paint shall not be required unless adhesion problems between the existing coating and the new proposed coating cannot be eliminated.
 - a. New coating shall be compatible with existing coating based on previous testing of coating products for adhesion by manufacturer and installer's field experience.
 - b. A test patch shall be used when previous testing does not exist or is unacceptable to the Owner.
 - c. The preparation of substrates does not apply to previously coated surfaces that contain lead. These surfaces require special preparation. Refer to the recommendations of the paint manufacturer for preparation requirements.
 - 1) Any previously coated surfaces containing lead should be brought to the attention of the Owner immediately.
3. High pressure water clean exterior surfaces prior to repainting using pressures indicated below to ensure complete removal of loose paint, stains, dirt and other foreign matter, with such work to be carried out only by qualified tradesmen experienced in high pressure water cleaning. The use of spray equipment such as water hose cleaning will not be considered satisfactory. Allow sufficient drying time and test surfaces using an electronic moisture meter before commencing work.
 - a. EIFS: 300 to 500 psi @ 6 inches
 - b. Wood Soffits: 600 to 1,500 psi @ 6 inches
 - c. Firm Masonry, Concrete: 1,500 to 4,000 psi @ 6 to 12 inches

3.3 APPLICATION

- A. Apply paints in accordance with manufacturer's written application instructions and minimum millage (thickness) requirements.
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
 1. Use applicators and techniques suited for paint and substrate indicated.
 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 4. Paint vents, electrical panels, doors and frames to match adjacent wall finish unless noted otherwise.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
 1. Omit primer over metal surfaces that have been shop primed and touchup painted.
 2. Omit primer over previously painted surfaces except as required to provide compatibility between existing coating and finish coat and as required to cover bare substrate.

- D. If exposed structure painted ceiling system (metal deck, joists, metal duct, piping and conduit) is left exposed to the exterior environment 90 days prior to painting, the entire ceiling system must be reprimed as specified.
- E. Painting Mechanical and Electrical Work: Paint exposed plumbing, heating, and electrical material to match the walls and ceilings of that area unless noted otherwise. This includes, but is not limited to, pipes, insulation, conduit ducts, access panels, grilles, diffusers, whether the adjacent surfaces receive paint or not. Include dampers or baffles behind grilles.
- F. Surfaces and Items Not to be Painted:
 - 1. Do not paint prefinished items, concealed surfaces, finished metal surfaces, and operating parts unless noted otherwise.
 - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 3. Do not paint low voltage wiring and cabling.
- G. Terminate finishes **6-inches (152-mm)** behind line of sight at permanent fixtures or casework.
- H. Paint to wrap returns and terminate accordingly unless noted otherwise.
- I. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- J. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

(Painting Schedules follow on next page)

3.4 EXTERIOR PAINTING SCHEDULE

Area	Prime Coat (1 Coat)	Finish Coat (1 Coat unless otherwise noted)
Concrete and Asphalt Paving:		
Parking stripes	-	P-6
Sidewalk edges uses as curbs as indicated on drawings, bascart ramp edges Stair risers.	-	P-6
Masonry:		
Concrete Masonry Unit Walls (New construction or existing unpainted) <ul style="list-style-type: none"> Integral color block and brick and standard gray block, for whole walls and graphics. 	PP-4	P-10
Concrete Masonry Unit Walls (Previously painted)	PP-5	P-11
Clay Brick and Cast Stone Walls (New construction or existing unpainted) <ul style="list-style-type: none"> Painted graphics and other wall areas designated on Drawings. 	PP-5	P-2
Plastic: PVC		
PVC plastic piping	PP-1	P-1
Steel:		
Miscellaneous steel including ladders, railings, lintels, structural steel door frames, canopy steel, equipment supports, pipe supports, and any other exterior non-galvanized metal. (Spot prime shop primed surfaces as required)	PP-1	P-12
Miscellaneous galvanized steel items as indicated on drawings including miscellaneous flashings, sheet metal vents, flues & ductwork above roof. (Spot prime shop primed surfaces as required)	PP-1	P-12
Hollow metal doors and frames on exterior face and edges. (Spot prime shop primed surfaces as required)	PP-1	P-12
Exposed steel and iron piping and other bare metal. (Spot prime shop primed surfaces as required)	PP-1	P-12 (2 coats)
Exterior fire protection piping (including P.I.V. fire dept connections and sprinkler drains)(Spot prime shop primed surfaces as required)	PP-1	P-12 (2 coats)
Aluminum		
Aluminum storefront, including doors, structure and flashing, other prefinished aluminum.	DO NOT PAINT	DO NOT PAINT
Prefinished aluminum vents and flues above roof	DO NOT PAINT	DO NOT PAINT
Primed aluminum metal trim around main entrance feature (Typically on Kroger Market-place)	DO NOT PAINT	P-2
EFIS, Synthetic Stucco		
(New) Exterior insulation & finish system, synthetic stucco	DO NOT PAINT	DO NOT PAINT
(Existing) Exterior insulation & finish system, synthetic stucco	P-14	P-14

3.5 INTERIOR PAINTING SCHEDULE

Area	Prime Coat (1 Coat)	Finish Coat (1 Coat)
Concrete		
Fire exit lanes.	-	P-6
Inspection stripe. (see floor covering plan)	-	P-6
Masonry (CMU):		
Cleaning center & prep area.	PP-2	P-7 (1 coat)
Cart Wash-down Area	PP-2	P-7 (1 coat)
Waste Compactor trash chute door surround (8' X 8' area)	PP-2	P-7 (1 coat)
Breakroom, Office, Meeting Rooms, etc.	PP-2	P-5 (1 coat)
Metal:		
Concealed structural steel, metal deck, piping, ductwork, etc.	DO NOT PAINT	DO NOT PAINT
All exposed steel members on storefront. (Spot prime shop primed surfaces as required)	PP-1	P-1
Office mezzanine stair hand railings, backroom ladders, handrails, and stairs. (Spot prime shop primed surfaces as required)	PP-1	P-1
Steel supports for dock lights. (Spot prime shop primed surfaces as required)	PP-1	P-1
Steel angles at dock levelers, interior pipe bollards and bent plate end wall cap at the cleaning center (when required) to a height of 8-feet (2.4-m). (Spot prime shop primed surfaces as required)	PP-1	P-1
Case Top Valance (Galvanized steel stud runner)	PP-1	P-1
Exposed galvanized metal	DO NOT PAINT	DO NOT PAINT
Hollow metal doors and frames, factory primed	-	P-1 (2 coats)
Vents, electrical panels, factory primed	-	P-1 (2 coats)
Metal, Exposed Structure Ceiling Area		
New Construction: Exposed structure ceiling structural steel and columns, joists, and deck and piping and ductwork in ceiling area.	DO NOT PAINT	DO NOT PAINT
Remodels: Exposed structure ceiling structural steel and columns, joists, and deck and piping and ductwork in ceiling area.	P-9	P-9

Area	Prime Coat (1 Coat)	Finish Coat (1 Coat)
Repriming of rusty or abraded exposed structure ceiling structural steel, joists, and deck in ceiling area.	Match shop primer	-
Aluminum		
Aluminum or vinyl clad storefront system	DO NOT PAINT	DO NOT PAINT
Wood, Semi-Gloss		
Wood décor trim	Prefinished	P-5
Misc. Trim, unfinished	PP-3	P-5
Plywood walls	DO NOT PAINT	DO NOT PAINT
Gypsum board ceilings		
Exposed gypsum board ceilings, where indicated	PP-3	P-3 (1 coat)
Gypsum board walls		
Exposed gypsum board walls, unless otherwise indicated	PP-3	P-4 (1 coat)
Décor stenciling on exposed gypsum board walls,	-	P-3 (2 coats)
Other		
Aluminum interior window frames	DO NOT PAINT	DO NOT PAINT
Cooler and freezer walls and doors	DO NOT PAINT	DO NOT PAINT

END OF SECTION 09 91 00

SECTION 09 97 13 - ELECTROSTATICALLY APPLIED COATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Application of electrostatic coating systems including surface preparation, prime coats and topcoats.
2. Items to be electrostatically painted include the following:
 - a. Surfaces of metal shelving.
 - b. Existing and relocated refrigerated cases.
 - c. Exposed cooler wall and door panels previously painted.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: Of each color for review of color only.

1. Provide samples of each color and material to be applied, with texture to simulate actual conditions, on draw down display cards.

1.3 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying electrostatic coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Source Limitations: Obtain primers for each coating system from the same manufacturer as the finish coats.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.

8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.5 PROJECT CONDITIONS

1. Apply electrostatic coatings only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide coatings specifically compounded by manufacturer for electrostatic spray application. Where primers are indicated or required, provide only primers that are approved by manufacturer for use with finish coating materials.

B. Metal Cleaner: Biodegradable cleaner and degreaser.

1. Basis-of-Design Product: Accessa Coatings Solutions; RCHD Citaprep Cleaner.

C. Primer: Rust inhibitive, anti-corrosive metal primer and barrier coat, resistant to finish coats containing strong solvents.

1. Basis-of-Design Product: Accessa Coatings Solutions; Universal InviraPrime.

D. Electrostatic Epoxy Enamel: Two-component polyamide epoxy enamel.

1. Basis-of-Design Product: Accessa Coatings Solutions; InviraPoxy.

2. Color: As specified in Fixture Finish Reference Guide located on Owner's Project Management Website (PMW) at Files>Capital>Design Data and Requirements>Décor.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation and Cleaning: Before applying electrostatic paint, clean metal surfaces of substances that could impair bond of the electrostatic paint. Remove surface contamination such as, oil, grease, loose paint, mill scale, dirt, foreign matter, rust, mold and mildew to assure sound bonding to the tightly adhered existing paint.

1. Scrape loose, blistered, scratched or otherwise imperfect paint down to bare metal and sand adjacent tightly adhering paint down to feather edge.
 2. Degrease and clean surfaces by wet sanding, rinsing with clean water and wiping down with metal cleaner. Rinse with warm water and wipe down with clean rags until surface is dry.
- B. Provide surface-applied protection before application of electrostatic paint.
1. Mask items not to be painted.
 2. If item to be painted is attached to substrate, provide masking on existing floors, walls and columns and other adjacent surfaces.
- C. Material Preparation: Mix and prepare electrostatic paint materials according to manufacturer's written instructions.
1. Use only thinners approved by electrostatic paint manufacturer and only within recommended limits.

3.2 APPLICATION

- A. General: Apply electrostatic paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 2. Provide finish coats that are compatible with primers used.
- B. Scheduling Painting: Apply primer coat to surfaces that have been cleaned and prepared for electrostatic painting as soon as practicable after preparation and before subsequent surface deterioration.
1. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
 2. If undercoats, stains, or other conditions show through final coat of electrostatic paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
- C. Application Procedures: Apply electrostatic paints by Ramsburg #2 electrostatic deposition method.
- D. Prime Coats: Before applying finish coats, electrostatically apply rust inhibitive primer to act as an intermediate coat between existing painted surfaces and new coating.
- E. Finish Coats: Electrostatically apply finish coats completely covering surfaces to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
1. Over primer apply a dustcoat of finish paint in order to prevent runs and stop lifting.

2. Apply final coat of paint of uniform film thickness and with a smooth and clean appearance.

- F. Completed Work: Match approved samples for color, texture, and coverage. Repaint work not complying with requirements.

3.3 CLEANING

- A. Cleanup: At the end of each workday, remove masking, empty cans, rags, rubbish, and other discarded paint materials from Project site.

1. After completing painting, clean adjacent paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.4 PROTECTION

- A. Protect adjacent construction against damage from electrostatic painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Owner.

- B. Provide "Wet Paint" signs to protect newly painted finishes.

END OF SECTION 09 97 13.16

SECTION 10 26 00 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER NATIONAL ACCOUNT AGREEMENT:** Contractor purchased - Contractor installed.
 - a. The following items are to be provided by the Contractor and purchased under a national account agreement with the Kroger Co.:
 - 1) **Material:**
 - a) Rigid PVC bumpers/rub rails.
2. Installation of rigid PVC bumpers/rub rails, impact resistant wall covering, corner guards, and vinyl chair rails by Contractor.
3. Additional items supplied and installed by Contractor not part of Kroger National Account Agreement:
 - a. Corner guards.
 - b. Installation accessories as required for each item including but not limited to the following items:
 - 1) Concrete inserts.
 - 2) Non-shrink metallic grout.
 - 3) Bumper fasteners.
 - 4) Joint sealant.
 - 5) Fastening Hardware.

1.2 SUBMITTALS

1. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 CORNER GUARDS

A. Extruded Plastic Corner Guards:

1. Basis of Design: Korogard Wall Protection Systems; a division of RJF International Corporation; Korogard Series G875, or a comparable product by one of the following:
 - a. Arden Architectural Specialties, Inc.

- b. IPC Door and Wall Protection Systems; Division of InPro Corporation.
- c. Pawling Corporation.
- 2. Material: PVC plastic, acrylic-modified vinyl sheet or opaque polycarbonate sheet; with formed edges; fabricated with 90- or 135-degree turn to match wall condition.
- 3. Fire Rating: ASTM E 84 Class I.
- 4. Thickness: Nominal 0.078 inch (1.98mm).
- 5. Wing Size: Nominal 3/4 by 3/4 inch (20 by 20 mm).
- 6. Mounting: Manufacturer's recommended adhesive or double-faced adhesive foam tape.
- 7. Color and Texture: As specified in Division 01 Section "Décor Interior Finishes and Colors" or matching impact-resistant sheet wall covering when used with this material.

B. Stainless Steel Corner Guards.

- 1. Material: Stainless steel, Type 304, fabricated from one-piece, formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.
- 2. Thickness: Minimum 16 gauge, 0.0625 inch (1.6 mm).
- 3. Finish: Directional satin, No. 4.
- 4. Wing Size: Nominal 3-1/2 by 3-1/2 inches (90 by 90 mm).
- 5. Corner Radius: 1/8 inch (3 mm).
- 6. Mounting: Countersunk screws through factory-drilled mounting holes.

2.2 BUMPERS AND RUB RAILS

A. Rigid Polycarbonate

- 1. Product: McCue Corp.; Greenguard 2.
 - a. Contact: McCue customer service, (800) 800-8503. Specify store number and address when ordering.
 - b. No substitutions allowed.
- 2. Material: Rigid polycarbonate bumpers/rub rails, U.L. Classified.
- 3. Size: 2 inch (51 mm) by 1-1/8 inch (28.5 mm)
- 4. Color: Refer to Division 01 Section "Decor Interior Finishes and Colors."

B. Flexible PVC (for Rounded Corners)

- 1. Product: McCue Corp.; Cartguard 2 Flex.
 - a. Contact: McCue customer service, (800) 800-8503. Specify store number and address when ordering.
 - b. No substitutions allowed.
- 2. Material: Flexible PVC bumpers/rub rails, U.L. Classified.
- 3. Size: 2 inch (51 mm) by 1-1/8 inch (28.5 mm)
- 4. Color: Refer to Division 01 Section "Decor Interior Finishes and Colors."

2.3 ACCESSORIES

- A. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107.
- B. Bumper Fasteners: As recommended by bumper manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Perform drilling and fitting required for installation; set work accurately in location, alignment and elevation, measured from established lines and levels. Provide anchorage devices and fasteners where necessary for installation to other work.
- B. Install rails in accordance with manufacturer's recommendations.
- C. Install corner guards level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

END OF SECTION 10 26 00

BLANK SHEET

SECTION 10 28 13 - TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner furnished - Contractor installed.
 - a. The Kroger Company will supply the following washroom accessories:
 - 1) Paper towel dispensers
 - 2) Soap dispensers
 - b. Comply with requirements in Division 00 Section "General Conditions."
2. **KROGER NATIONAL ACCOUNT AGREEMENT:** Contractor furnished - Contractor installed.
 - a. The following custodial accessories are to be provided by the Contractor and purchased under a national account agreement with the Kroger Co.:
 - 1) Hook strip.
3. Contractor installed items:
 - a. Washroom accessories.
 - b. Custodial accessories.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Templates, instructions, and directions for installation of anchorage devices and cut-out requirements in other work.
- C. The Owner will provide the submittals for Owner furnished products for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Requirements: comply with the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1 for mounting heights and locations if not indicated on Drawings.

2.2 WASHROOM ACCESSORIES (FURNISHED BY OWNER)

- A. Refer to Division 01 Section "Vendor Contact List" for contact information on products furnished by the Owner.

2.3 CUSTODIAL ACCESSORIES (PROVIDED BY CONTRACTOR)

- A. Hook Strip:
 - 1. Product: Bobrick Washroom Equipment, Inc.; Hook Strip, B-232 x 24.
 - 2. Material:
 - a. Hooks: Stainless steel, 12 gauge, type 304.
 - b. Mounting Strip: Stainless steel, 18 gauge, type 304.
 - 3. Size: 24 inches (610 mm) wide by 4 inches (102 mm) high.
 - 4. Number of Hooks: 3.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Keys: Properly label keys and turn over to Owner.

3.2 INSTALLATION

- A. Install products and accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated on Drawings.

END OF SECTION 10 28 13

SECTION 11 13 00 - LOADING DOCK EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER DIRECT BUY PROGRAM**

a. The Kroger Co. will supply and install the following items:

1) **Material:**

a) Dock door protectors.

2) **Labor:** Installation by the Owner for the following:

a) Dock door protectors.

1.2 SUBMITTALS

A. The Owner will post the following information on the Owner's Project Management Website (PMW) for the Contractor's use in preparing the substrate:

1. Product Data: For dock equipment.

2. Shop Drawings: Plans, elevations, sections, details, hardware mounting heights, and attachments to other work.

1.3 WARRANTY

A. Warranty information for loading dock equipment is specified in Division 01 Section "Product Warranties."

PART 2 - PRODUCTS

2.1 LOADING DOCK EQUIPMENT (SUPPLIED BY OWNER/INSTALLED BY OWNER)

A. Kroger Account Representative: Refer to Division 01 Section "Vendor Contact List."

B. Loading Dock Door Protector

1. Tilting bollard that protects overhead door when gate is down and the track when gate is up.

a. Product: McCue Corporation; CartStop LDP36.

b. Material: Heavy-duty steel.

- c. Length: 36 inches (914 mm).
- d. Finish: Powder coat.
- e. Color: Safety yellow.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of loading dock equipment.

3.2 INSTALLATION (CONTRACTOR RESPONSIBILITIES)

- A. Preparation: Prepare and coordinate openings ready for installation of dock equipment by Owner's Installer.

3.3 INSTALLATION (OWNER'S INSTALLER RESPONSIBILITIES)

- A. General: Install loading dock equipment, including safety devices and accessories as required for a complete installation.
- B. Loading Dock Door Protector: Attach loading dock door protector in a manner that complies with requirements indicated for spacing, arrangement, and position relative to guide rails and doors. In the upright position, the loading dock door protector should be approximately 1 inch (25.4 mm) in front of the guide rails and the arm at least 1/2 inch (13 mm) away from inside rail area.

3.4 ADJUSTING

- A. Adjust loading dock equipment to function smoothly and safely, and lubricate as recommended by manufacturer.
- B. After completing installation of exposed, factory-finished loading dock equipment, inspect exposed finishes and repair damaged finishes.

3.5 DEMONSTRATION

- A. Engage installation technician to train Owner's personnel to operate loading dock equipment.

END OF SECTION 11 13 00

SECTION 11 41 03 - PREFABRICATED INSULATED WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply prefabricated insulated door and wall panels for the walk-in freezer walls as indicated on the drawings.
 - b. Comply with requirements in Division 00 Section "General Conditions."
2. Contractor supplied items:
 - a. Anchors, hardware, fasteners, and other items not provided by Owner necessary for a complete installation.
 - b. Freezer door.
3. Contractor installed items:
 - a. Walk-in freezer wall panels and door.

1.2 SUBMITTALS

- A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
1. Shop Drawings: Show layout and types of panels, anchorage details, openings, special jointing, accessories, and attachments to other construction.
 2. Product Data: For each type of panel indicated.

1.3 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: Insulated walk-in cooler and freezer panels will have insulation-core materials with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Flame-Spread Index: 25 or less, unless otherwise indicated.
 2. Smoke-Developed Index: 450 or less, unless otherwise indicated.

PART 2 - PRODUCTS

2.1 PREFABRICATED INSULATED WALL PANELS

- A. Refer to Division 01 Section "Vendor Contact List," Drawings, and vendor provided shop drawings for sizes and locations.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Contractor's Responsibilities for Owner Furnished Product: As specified in Division 00 Section "General Conditions."
- B. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units to building structure where indicated on the shop drawings with manufacturer's recommended anchoring devices.
- C. Install stainless steel base as recommended by manufacturer where indicated on Drawings (stainless steel based may be installed in other locations in addition to base of prefabricated insulated wall panels).

3.2 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to manufacturer's written instructions for proper operation.

END OF SECTION 11 41 03

SECTION 11 41 13 - GENERAL STORE FIXTURE INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY

A. General:

1. This Section specifies installation of general store (non-refrigerated) fixtures and equipment furnished by the Kroger Company referred to as the Owner.
2. This Section includes various store type installations. Some of the items specified in this Section will not be used on the Project. Refer to Fixture Plan for items included in the Project.
3. Supervision to coordinate the activities of all trades will be furnished by others. The Installer is responsible for supervising their own Work and meet dates shown on the installation and phasing schedule.
4. The Installer shall be responsible to unload, assemble as needed, and set in place fixtures and equipment provided by the Owner and indicated on the Fixture Plan or sections within this specification.
5. Hoods and fire extinguishers in hoods not included in this contract.
6. Comply with requirements in Division 00 Section "General Conditions."

B. Section includes:

1. All labor, material and equipment specified in this Section and on the Fixture Plan necessary for a complete and working installation of Owner's general store (non-refrigerated) fixtures and equipment.
2. Installation of the Owner furnished general store (non-refrigerated) fixtures and equipment shown on the Drawings (Fixture Plan) including, but not limited to the following:
 - a. Fixtures and equipment indicated on the Fixture Plan.
 - b. Additional equipment furnished for installation in each department which is not indicated on the fixture plan but is described within this Section.
 - 1) Consult with Owner for location of placement for any item not indicated on the Fixture Plan.
 - c. Owner's Division specific miscellaneous fixtures and equipment and other materials as indicated in Division 11 Section "Supplementary General Store Fixture Installation."
3. Installer supplied items necessary for a complete installation as identified in Part 2 of this Section including but not limited to the following:
 - a. Plywood, lumber, metals, stainless steel, PVC pipe, F.R.P. and paneling for a complete installation.
 - b. 4 inch 072, Chocolate vinyl cove base for fixtures for a complete installation.

- c. 4 inch lag bolts, nails, bolts, nuts, screws, hangers, chains, washers, threaded rods, and other materials and devices.
- d. Adhesive and silicone sealant.
- e. Other materials and devices not provided by Owner necessary to complete the fixturing installation.
- f. 1/2 inch conduit to cut down for meat label rack.
- g. Leveling shims, aluminum or plastic to level equipment and fixtures.
- h. Paint, stain, and varnish as required for a complete installation.

C. Section does not include:

- 1. Hand Soap Dispensers: Furnished and installed by soap manufacturer.
- 2. Sinks: Furnished and installed by Building Plumbing Contractor.
- 3. Service Scales: Furnished and installed by manufacturer.

D. Modifications and additions to this Section, if required, are indicated in Division 11 Section "Supplementary General Store Fixture Installation." If Division 11 Section "Supplementary General Store Fixture Installation" is not included in this Project Manual, no modifications and additions to this Section are indicated. Where any portion of this Section is modified or deleted by Division 11 Section "Supplementary General Store Fixture Installation," the unaltered portions shall remain in effect.

1.2 DEFINITIONS

A. Certain terms and words used throughout Section shall be defined as follows:

- 1. **Owner:** The person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's Representative.
- 2. **Contractor:** The General Contractor with overall responsibility to build a complete store, on schedule, ready for operation as a complete food store.
- 3. **Installer:** The entity identified in this Section responsible for but not limited to material and installation of the general store fixtures, as identified in this Section.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate layout, schedule and sequence of general store fixture installation with other Work to ensure a smooth fixture installation and completion on or before the required date indicated in the Contract Documents and the Owner's fixturing schedule.

- 1. Report to Owner any defaults in work furnished and installed by others that causes conditions unsuitable for Installer's Work. Failure to inspect and report unsuitable conditions shall constitute acceptance of work furnished and installed by others as fit and proper for coordination with the Installer's work.

B. Cooperation with Other Trades: Cooperate with other installers doing work on the Project to prevent any conflict that would require moving or changing any devices, or other equipment, or require other installers to relocate devices and equipment when installed according to plans and specifications.

1. Where interference exists, notify Owner before proceeding with installation.

1.4 WORK SCHEDULES

- A. Reference the Pre-Bid requirements and notes, especially for remodels and expansions. Typically, a new store work schedule shall consist of five 8-hour workdays ending no earlier than 3:00 p.m. local time at the store or in shifts as required in the Phase Plan or Project Schedule.
 1. For non-local Installers, as approved by the Owner, work may be conducted in four 10-hour days provided the work day does not end prior to 3:00 p.m. local time.
- B. Office, Pharmacy, Computer Room and Customer Care Office Moves: For remodel projects involving modification or relocation of these areas, provide a laborer to assist in the move. The Work shall occur at night and the appropriate hours necessary to perform the work shall be included in the Installer's cost.

1.5 SUBMITTALS

- A. The Owner will provide the following submittals for Owner supplied items for the Installer's information upon request:
 1. Product Data: Including construction details, material descriptions, rated capacities, operating characteristics, furnished specialties, accessories, dimensions of individual components and profiles, and finishes.
 2. Shop Drawings: Showing fabrication and installation details.
 3. Fixture Plan drawing.
 4. Phasing Plan.
 5. Project construction schedule.
- B. Closeout Submittals
 1. Operation and Maintenance Data: For equipment furnished and installed by Installer and equipment furnished by Owner to include in emergency, operation, and maintenance manuals. Include service and installation instructions.
 - a. Collect manuals for equipment installed in this Section and place in a three ring binder. Deliver to the Owner's store manager upon completion of the Work. Coordinate Refer to General Contractor for additional requirements.
 - b. The Owner will supply the Installer with receiver copies of all equipment and fixture purchase orders to include in Operation and Maintenance Manual.

1.6 QUALITY ASSURANCE

- A. Continually monitor field installation for code compliance and workmanship quality. Installation shall comply with all manufacturers' recommendations. Material, equipment, and labor shall comply with the following:

1. Rules and regulations of authorities having jurisdiction including any applicable local safety and sanitary codes or ordinances.
 2. Fixture plan.
 3. Project Specifications.
 4. Standard specifications.
 5. Manufacturer's instructions.
 6. Addenda
- B. Maintain a set of Contract Documents on the Project for Owner to review and verify any discrepancies.
- C. Comply with applicable requirements of the Occupational Safety and Health Act requirements.
- D. Correct punch list items to the satisfaction of the Owner, prior to close out of the project. Coordinate with the Owner to respond expediently.
- E. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- F. Quality Standard for Woodwork: Comply with requirements for woodwork in AWT's "Architectural Woodwork Quality Standards."
1. Custom quality unless indicated otherwise.
 2. Maintain one copy of current standard at Site.
- G. Quality Standard for Metal Work:
1. NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.
 2. NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying the designated finishes.
- H. Painting: Comply with Kroger Section 09 91 00 "Painting."
- I. If quality standards or specifications conflict, comply with the most stringent requirement.

1.7 PRODUCT DELIVERY AND STORAGE

- A. Keep equipment crated until ready for use.
- B. Organize fixture and equipment storage by department and in a manner that will facilitate easy and rapid access and deployment. Distribute product to the necessary departments or to the designated staging location prior to install as directed by Owner.
1. Store only one department in any container. Label containers with department and inventory.
 2. Store and stage fixtures in a neat and organized manner.
- C. Provide protection from theft, damage, and the elements for equipment stored inside or outside.

1. Furnish and install padlocks on all freezer and coolers. Store small items that can be easily stolen, equipment and supplies not to be uncrated, including scales, pictures, electronic equipment, small misc. equipment, ladders, deli supplies, and other items as directed in the locked cooler until such time as the stocking of the store has started and the floor has received its initial cleaning. As directed by the Owner, after Installer has completed fixturing, distribute items stored in the cooler to their respective departments.
- D. Assume responsibility for fixturing related equipment received on the job until installation is complete.
- E. Verify Owner equipment deliveries as equipment is received.
 1. Owner will supply Installer with equipment delivery schedule and fixture purchase order information.
 2. Verify each freight bill at the time of equipment delivery and hold freight bill corresponding to the Owner purchase order and turn them over to Owner on a weekly basis. Note the actual vendor and quantity of each item received on the Owner provided project detail log with date, time, and any pertinent information with weekly copies to the Owner. Failure to comply with the above may result in delay of payment to Installer.
 3. Attach packing slips to the freight bill.
 4. When only some of the equipment on a purchase order is received, the receivers are to be retained on the job until every item on the purchase order has been delivered. In the case of a partial shipment, record the purchase order number, the vendor's name, and the description of the equipment on the freight bill. In the case of no freight bill, such as items delivered by U.P.S., record the same information on a delivery log to review with the Owner on a weekly basis.
 5. Maintain receiving report for weekly receipt of equipment received. Upload into the Owner's electronic web site in Excel format. The Owner will make any necessary entries or corrections and then upload the report into the Owner's equipment ordering system.
- F. Notify the Owner of equipment received from a carrier in damaged condition within 48 hours. Record the following information for all such deliveries:
 1. Driver's name and signature verifying damages.
 2. Time and date of equipment delivery.
 3. Name of equipment damaged.
 4. Description of damages.
 5. Photos of damage.
- G. Notify Owner of any hidden damages for products received at time of discovery.
- H. Handle shipping material, trash, pallets, etc, and properly dispose off site.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of other construction by field measurements before beginning Work.
 1. Layout and verify locations of concealed framing, blocking, reinforcements and furring that support fixtures by field measurements before being enclosed.

2. Report discrepancies to the Owner prior to beginning work.
- B. For remodels, temporarily relocate cases as indicated or directed by Owner. Verify special project scope and schedule. Start and verify operation of self-contained equipment, both new and temporary and make any necessary repairs. Repairs will be handled by Change Order.
- C. Environmental Limitations: Do not schedule a departmental delivery or install woodwork until building is enclosed, wet work including painting is complete, and HVAC system is operating, or temporary means of environmental control are installed and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period. Any exception to this must be submitted in writing for Owner's approval.
 1. Overhead work shall be complete.
 2. If fixtures must be stored in other areas, store only in areas where environmental conditions comply.

1.9 WARRANTY

- A. Installer's Warranty: Standard form in which Installer agrees to repair or replace any component that does not comply with requirements or that deteriorates or malfunctions as a result of improper installation by the Installer within specified warranty period.
 1. Warranty Period: 90 days from date of store Grand Opening provided installation is accepted and approved as completed in compliance with the Contract Documents by the Owner.
 2. Warranty Retainage: Until the end of the warranty period, 5 percent of the contract amount due the Installer will be held as a retainage unless a different retainage percentage is required by the Authority Having Jurisdiction.
 3. Warranty Service: During the warranty period, regardless if the service call is due to failure of equipment or failure of the installation, the Installer shall enter the service call with Service Hub, the Owner's electronic service call system. Submit service reports to the Owner at the end of the warranty period.
 - a. As part of the Installer's warranty service, the Installer shall make arrangements to have a service technician present at the store for the Grand Opening day to correct problems or make adjustments designated by the Owner, working a minimum of four hours, commencing two hours before store opening.
- B. Refer Division 00 Section "General Conditions" for general warranty information.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED PRODUCTS

- A. Receive, handle, store, and protect materials, equipment, fixtures or supplies delivered to the site by the Owner for installation under this Section. Schedule and coordinate deliveries.

2.2 INSTALLER FURNISHED PRODUCTS

A. Interior Protective Stainless Steel Guard Posts and Refrigerated Case Corner Guards.

1. Manufacturers: Specify store number and address when ordering.
 - a. National Cart Co.
 - 1) Contact: Cheryl Marsala, cheryl.marsala@nationalcart.com, (800) 455-3802 ext. 156 www.nationalcart.com.
 - b. Retail Specialty Inc.
 - 1) Contact: rsiceo@yahoo.com, (586) 566-716, www.rsihq.com.
2. Guard Posts: 2 inch (50 mm) diameter, 36 inches (915 mm) high 10 gage stainless steel.
 - a. Kroger Legend No. GE63.
 - b. Include floor mounted socket and flange.
3. Corner Guards: Half round, 10 gage stainless steel, floor mounted, size as indicated on Fixture Drawings.
 - a. Kroger Legend No. GE63C-24:
 - 1) Diameter: 7-1/4 inch (185 mm).
 - 2) Height: 24 inches (610 mm).
 - b. Kroger Legend No. GE63CS:
 - 1) Diameter: 4-5/8 inch (117 mm).
 - 2) Height: 12 inches (305 mm).

B. Pipe Railing (At checkout lane where indicated):

1. Basis-of Design Product: C.R. Laurence Company; WRS Welded Post Railing System.
2. Material: Stainless steel, Type 304.
3. Finish: Polished.
4. Corners: Bent.
5. Mounting: Welded floor flange for surface mounting with manufacturer's standard stainless steel cover.

C. Stainless-Steel Sheet: ASTM A 240 or ASTM A 666, Type 304, with No. 4 satin finish.

D. Cove Base for Fixtures: ASTM F 1861, Type TV (vinyl), Group I (solid), Cove (with top-set toe), 0.080 inch (2.0 mm) minimum thickness, 4 inches (102 mm) height, smooth surface, black.

E. Adhesive: As required by manufacturer

F. Joint Filler: Two component, 1:1 ratio, polyurea elastomer joint filler of 100 percent solids, Shore 65-67 A hardness, rapid curing self leveling, semi-flexible sealant and UV resistant.

1. Products: Specify store number and address when ordering.
 - a. Euclid Chemical Company; QWIKjoint UVR 65.
 - b. HI-TECH Systems; HT-PE65 Flexible Control Joint Filler.
 - c. Metzger/McGuire Co.; Spal-Pro RS-65.
 - d. No substitutions allowed.
 2. Color: Match adjacent substrate.
- G. Silicone Sealant: ASTM C 920, Type S, Grade NS, Class 25, Use NT, A or N-Curing, Mildew-Res.
1. Products:
 - a. Dow Corning Corporation; 786 Mildew Resistant.
 - b. GE Silicones; Sanitary SCS1700.
 - c. Pecora Corporation; 898.
 - d. Tremco, Inc.; Tremsil 200BASF Omniplus
- H. Butyl-Rubber-Based Joint Sealant: ASTM C 1311.
1. Products:
 - a. Bostik, Inc.; Chem-Calk 300.
 - b. Pecora Corporation; BC-158.
 - c. Tremco, Inc.; Butyl Sealant.
- I. Concrete Inserts: Malleable iron (ASTM A-47) or cast steel (ASTM A-27) inserts, with steel bolts, washers and shims; hot dip galvanized. 3-inch (76-mm) long 1/2-inch (13-mm) diameter concrete sleeve anchor with flat washer and nut for installing corner guards.
- J. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107.
- K. Hardware: Lag bolts, eye screws, nails, eye bolts and miscellaneous nuts & bolts, screws, hangers, chains and hooks, washers, threaded rods, and other materials and devices required to install fixtures and equipment.
- L. Leveling shims for Leveling Equipment and Fixtures: Aluminum or plastic.
- M. Hardware and Accessories
1. Garment Hook for Fitting Rooms:
 - a. Basis-of-Design Product: SunHouse Group; #241-659.
 - b. Material: 304 Stainless steel.
 - c. Size: 1.35 inches (34 mm) overall diameter by 0.55 inches (14 mm) diameter by 2.45 inches (62 mm) long.
 - d. Finish: Fine brushed.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of loading dock equipment.

3.2 FLOOR PROTECTION

- A. Adequately protect finished flooring and polished concrete floors where installation activities could soil or damage floor or where items are to be stored.
- B. Place skids or shipping containers on protective covering and prevent from coming in direct contact with the finished flooring and polished concrete floors.
- C. Diaper lifts and equipment used finished flooring and polished concrete floors to protect from leaks. Inspect wheels and remove any foreign objects such as screws, nails, etc., that could damage finished flooring and polished concrete flooring. Wheels on such equipment to be white or taped to prevent marks. Remove lifts from finish floor at end of each day.
- D. No battery charging is allowed on finished flooring and polished concrete floors.
- E. Inspect lifts regularly for items that may be lodged in the tires. Remove items or replace tires as required so as not to damage any floor finishes. Installer will be responsible for costs to repair floors damaged due to installation of fixtures.

3.3 INSTALLATION

- A. General:
 - 1. Normal Business Hours: Assign personnel during normal business hours (example: 7:30 to 4:30 Monday thru Friday) or in shifts as required in the Phase Plan or Project Schedule to receive equipment. Assign two individuals exclusively designated to sign for deliveries of Owner furnished equipment. Any redelivery charges due to unsuccessful attempted deliveries during normal business hours will be paid by the Installer.
 - a. Night Hours: Reference the Pre-Bid requirements and notes for days and hours required for special night work if any.
 - 2. Unload, uncrate, and assemble all equipment, material, and supplies as shown on the Fixture Plan and listed on the store equipment listing.
 - 3. Properly install equipment (ie. leveled, assembled, sealed as required, etc.) and place in proper location (department) in the store per the Fixture Plan, fixture legend, and purchase order.
 - 4. Install fixtures to comply with manufacturer's installation instructions, details in Drawings and local jurisdiction requirements.

5. Install seismic supports and bracing as required by manufacturer and authorities having jurisdiction, and as required for stability. Extend and fasten members to supporting structure as required or refer to structural drawings if provided for anchoring.
6. Install fixtures level, plumb, true, and straight, with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
7. Anchor fixtures to anchors or blocking built in or directly attached to substrates, where applicable.

B. Grocery Shelving

1. Install grocery shelving as indicated on Fixture Plan, including extenders, bakery shelving and specialty pieces, level and true and according to the manufacturer's recommendations. Use chalk line or transit for lineup and leveling procedure. See fixture plan for area in which new shelving will be installed.
2. Mount end panels furnished by Owner shall at the end of each shelving B-line.
3. Securely lag single face shelving to its back-up wall and wire or metal strap to its back-up case. The Owner shall approve the method of anchoring prior to installation of anchors.
4. Cut shelving to fit columns snugly and properly support where shelving must fit around columns. Sheet metal column covers will be provided. See Detail GISD- 50
5. Install cosmetic shelving sections including extenders, pegboard backers, glass shelves, canopies and signs.
6. Tie back all G-50 and G-30 end caps to center standards of shelving B-lines with provided hardware.
7. Bolt upper shelves together where loads are heavy. See Owner for details.
8. Installer shall be responsible for palletizing, shrink wrap and load un-used shelving on delivery truck as directed by owner or as described in additional scope of work document.
9. Contact Owner for a schedule of vertical shelf spacing and widths a minimum of three days before installation of shelves. Do not begin shelving installation until this schedule is received. Some shelves will be bolted together for rigidity of the shelving line-up. See Owner for locations.

C. Cooler Shelving

1. Install 36 inch (914 mm) by 47 inch (1194 mm) cooler shelving in all walk-in freezers, coolers, and retarders as shown on fixture plan, detail sheets, and as directed by Owner. (Refer to cooler panel installation instructions).
 - a. Additional cooler shelving is required in areas other than freezers, coolers and retarders. Check fixture plan on Drawings and detail sheets for additional locations (a total of approx 300 shelves overall).
2. The bottom edge of each shelving standard should rest on concrete curb, shim as necessary to be in alignment. Attach shelving standards to vertically embedded wood in the edge of each wall panel as indicated on Kroger Standard Details GISD-16A. Install a minimum of five lag screws per shelf standard. Use 3.5 inch (88.9 mm) long by 3/8 inch (9.5 mm) diameter hot dipped galvanized lag bolts with hot dipped galvanized washers screwed through slots in standards and into vertical embedded wood in the edge of cooler panel.

D. Other Shelving

1. Install wall mounted metal cooler shelving in preparation areas as indicated on fixture plan.
 - a. The bottom edge of each shelving standard should rest on concrete curb. Shim as necessary to maintain alignment. Wherever possible, attach shelving standards to vertically embedded wood in the edge of each wall panel as indicated on Kroger Standard Details GISD-16A. Use 3.5 inch (88.9 mm) long by 3/8 inch (9.5 mm) diameter hot dipped galvanized lag bolts with hot dipped galvanized washers screwed through slots in standards and into vertical embedded wood in the edge of cooler panel. For odd sized panel width where standard must attach to horizontal embedded wood install 3 inch (76.2 mm) long by 3/8 inch (9.5 mm) diameter Hilti HLC sleeve anchor with hot dipped galvanized washers installed through slots in standards and into horizontal embedded wood as indicated on Kroger Standard Details GISD-16. Drill hole in slots of shelf standard as needed to accommodate attachment hardware.
 - b. For single row shelving, 18 inch (457 mm) sections of wall standards can be used with only four points of attachment to wall.
2. Install metal shelving in cleaning center.
3. Install metal shelving in grocery backroom and/or dock per fixture plan on Drawings.
 - a. If partition walls are constructed with metal studs, special provisions for thru bolts and/or back-up blocking shall be required.
4. Install all free standing chrome wire shelving.
5. Install product rear load metal shelving and reach in glass doors on dairy cooler.
6. Install 36 foot (11 m) dog food rack at location noted.

E. General Merchandise Security Area Storage Shelving

1. When shown on fixture plan, assemble lock span shelving with four 3/4 inch (19 mm) particle board shelves for old style or metal shelves for new style shelves per section of upright support framing.

F. Vestibule, Front End, Sales Area

1. Unload, assemble as needed and set in place the following fixtures and equipment when provided by Owner and not necessarily indicated on Fixture Plan:
 - a. Newspaper racks
 - b. Advertising display racks
 - c. Magazine racks
 - d. Battery powered electric shopping carts
 - e. Shopping Carts
 - f. Miscellaneous portable display racks positioned around the front end area.

2. Electronic Scanning and Miscellaneous Computer Equipment: Receive, properly check against receiver copies of purchase orders, and secure in locked cooler separate from other store equipment. Coordinate with Owner.

G. Checkout Lanes and U-Scans

1. Assemble, set in place, level, and anchor to floor. Coordinate anchoring method with Owner.
2. Secure checkouts in place by caulking perimeter of base with clear silicone sealant. Coordinate with Owner prior to application of sealant for final approval of locations of checkout lanes.
3. Check and adjust operation of conveyor belts. Operate a minimum of four hours. Comply with manufacturer's instruction for adjustments.
4. Power poles for U-scans and check lanes provided by Owner. Refer to installation instructions and Kroger (ESD) Electrical Specification Details.
5. Install the following associated items of checkouts including anchoring, holes for access of electrical plugs, etc.:
 - a. Check writing stands
 - b. Credit card verifier stands
 - c. Specialty signs
 - d. Merchandising racks
 - e. Bagging racks
 - f. Terminal stands
 - g. Terminal display stands
 - h. Monitor stands
 - i. EFT stands
 - j. Close off chains
 - k. Customer comment card holders.
 - l. Fred Meyer Goodstar boxes.
 - m. Check stand steps.
 - n. Recycled bag holders.
 - o. Hand sanitizer dispenser.
 - p. Rug Doctor Display: Modify fixtures as required to accept display.
 - q. Banner signs in entries and front of checkstands.

H. Customer Service Office

1. Prefabricated, Modular Store Office and Counters: Install at locations shown on Fixture Plan layout on Drawings. Caulk seams, joints and gaps with clear silicone sealant. Install file cabinets and cash drawers in cabinet recesses. Caulk around each unit to prevent items from falling in gaps. Install vinyl cove base on exposed areas.
 - a. Provide trim around top of modular office where it butts up against walls or store front to close gaps. Paint or stain trim to match office.
2. Counter Tops: Install counter tops as indicated on Fixture Plan, cut counters as needed for quality installation.
 - a. Core drill counter tops using minimum bore diameter required to pass electrical and communication cables with plugs to receptacles below as required.

3. Safe: Uncrate and set (approx. 5,600 lbs. (2540 kg)). Install chute thru accounting room wall when indicated on Fixture Plan. Provide door for chute opening, provide and install trim around door to match adjacent. Safe chute supplied by safe manufacturer.
 4. Miscellaneous Service Related Signs, Store License Frame, Ad Boards, Bulletin Boards, Check Writing Stands, Credit Card Verifier Stands and Other Customer Service Related Items: Install in locations as directed by Owner.
 5. Cleaning Closet: When indicated on Drawings, furnish and install the following as indicated on Fixture Plan or directed by Owner:
 - a. Coat hooks
 - b. Storage Shelving
- I. Sales Area (Accessible to Customer): Install the following fixtures and equipment:
1. All Departments
 - a. Collapsible Wet Floor Safety Cones and Holders: Install on columns, cases, or as directed by Owner.
 2. General
 - a. Two Door Bagged Ice Case: When case is provided by vendor, assist in coordinating installation.
 - b. Vendor Racks: Such as hosiery and batteries.
 - c. Greeting Card Racks: Secure to floor (anchor bolt) per vendor installation instructions.
 - d. Miscellaneous Merchandising Racks (Film, Batteries, etc.).
 - e. Owner Supplied Millwork as per Fixture Plan.
 - f. Collapsible wet floor safety cones and holders. Install on column or cases.
 - g. Seafood Condiment Millwork Fixture.
 - h. Card Fixtures: Anchor vendor supplied and installed card fixtures to floor per manufacturer's instructions.
 - i. Power Panel Displays: Mount on side of TOEM shelving.
 - j. Plexiglass sign holders in entries as directed by the Store Director/Manager.
 3. Produce Department
 - a. Wood end caps and racks
 - b. U-Bag-It Dispensers: Install on produce cases. Verify exact location with Owner.
 - c. Paper Towel Dispensers. Verify exact location with Owner.
 - d. Approximate Weight Scales
 - 1) Hanging Scales: Install at location indicated on Fixture Plan or as directed by Owner. Coordinate means of support with Owner. Install at least one approximate weight scale, centrally located in department. Scale pan to be 48 inches (1.22 m) above finished floor to meet ADA requirements.
 - 2) Scale cabinet and approximate weight scale when indicated on Fixture Plan.
 - e. Produce Case Sign Kit: Install on produce cases as directed by Produce Manager.
 - f. Slat Wall: 12 inch (305 mm) high slat wall on produce wall case canopy where packaged salads will be merchandised.

4. Salad Bar/Soup Bar/Olive Bar: To prevent sneeze guard from moving, apply a small bead of silicone between track and glazing. Seal all penetrations in the bottom base of the salad bar.

J. Meat Preparation Equipment

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment performing additional specific installation actions as listed below:
 - a. M-5 Table with Plastic Tops and Pan Shelf: Attach four legs to table frame with set screws provided by manufacturer and mount pan shelf under table. Mount removable knife rack on each M-5 table. See GISD-100. Adjust legs to compensate for sloped floor condition.
 - 1) Mount meat tray on back half of M-5 table. Verify exact location of mounting with Owner.
 - b. M-30 and/or M-33 Tables: Attach four legs to table frame with set screws provided by manufacturer and level tables. Set plastic tops on M-30 and/or M- 33 tables. Adjust legs to compensate for sloped floor condition.
 - c. Wrappers: Model 110 Wrappers, Aluminum Wrapping Table: Slide wing shelved into slots on sides of wrap unit.
 - d. Rotary Bin: Attach stand to rotary tub (when necessary).
 - e. Wall Mounted Desk (GE-10): When indicated, assemble desk as necessary, attach angle brackets to metal desk and lag bolt to blocking in insulated wall panel or toggle bolt securely attach to metal stud wall. See GISD-15.
 - f. M-8 (L or R), Meat Mill and Stand: Meat mill and stand are supplied by different suppliers. Set stand, adjust legs to compensate for sloped floor condition, then set meat mill on top of stand.
 - g. M-10 Meat Saw(s): Adjust legs to compensate for sloped floor condition.
 - h. Model 107 Wrapper(s): Adjust legs to compensate for sloped floor condition.
 - i. Knife Racks: Install one on each M-5 cutting table and one adjacent to meat mill mounted on wall in cooler.
 - j. Conveyor: Attach to floor mounting brackets at each end and at each joint with bolts provided by manufacturer. See Fixture Plan for conveyor elevations. Furnish and install 3/4 inch aluminum angle, 3/4 inch by 2 inch angle platter stop for width of conveyor at low end of each conveyor. Also run aluminum angle the full length of each conveyor attached to the wall supports to prevent trays from hanging up on the wall supports or trim.
 - k. Cutlery Grinder Shelf: Bolt to wall next to electrical outlet and set cutlery grinder on shelf. Verify exact location with Owner.
 - l. Meat Pans, Platters, Carts and Dollies: Uncrate and place in the meat cooler.
 - m. Miscellaneous Items: Install the following items (securely attached to wall) in locations indicated on Fixture Plan or as directed by Owner :
 - 1) First aid kit.
 - 2) Hose rack: Install adjacent to hot water hose bib. Lag bolt to blocking in insulated wall panel or toggle bolt securely attached to metal studs.
 - 3) Paper towel dispensers.
 - 4) Q gun wall hooks.

- 5) Wall thermometers in meat preparation areas. Mount 60" above floor in location as directed by Owner.
- 6) Bulletin Board: Install directly above desk.
- 7) Install bulletin board directly above desk.
- 8) Broom Rack
- 9) Cleaning components
- 10) Cleaning station
- 11) Safety equipment station
- 12) Flytraps, as located on the fixture plan.

K. Produce Preparation Equipment

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment performing additional specific installation actions as listed below:
 - a. 107 Wrapper, Aluminum Wrapping Table: Slide wing shelf down onto two retaining studs on the side of the table. Adjust legs to compensate for sloped floor condition.
 - b. Wall Mounted Desk (GE-10): When indicated, assemble desk as necessary, attach angle brackets to metal desk and lag bolt to blocking in insulated wall panel or toggle bolt securely attach to metal stud wall.
 - c. Ice Cart
 - d. Scale Tables: Adjust legs to compensate for sloped floor condition.
 - e. Stainless Steel Tables: Adjust legs to compensate for sloped floor condition.
 - f. Knife Rack: Install adjacent to disposer unit. Exact location to be determined by Owner.
 - g. P-22, galvanized sorting table with galvanized top: attach four legs to table frame with set-screws provided by manufacturer and place top on table frame. Adjust legs to compensate for sloped floor condition.
 - h. Scales and labelers, if applicable, shall be installed by the manufacturer's representative. Store in locked space or set in department as directed by Owner.
 - i. Produce Trim Station: Not included in this contract and to be installed by plumbing installer.
 - j. Produce Pans, Platters, Wire Carts, Dollies, and Platter Carts: Uncrate and place in produce cooler.
 - k. Free Standing and Wall Mounted Metal Shelving: Assemble and install. Exact locations to be determined by Owner.
 - l. Service Desk, Fixtures and Shelving for Floral Items: Install as indicated.
 - m. Miscellaneous Items: Install the following items (securely attach to wall) in locations directed by Owner:
 - 1) Hose rack: Install adjacent to hot water hose bib. Lag bolt to blocking in insulated wall panel or toggle bolt securely attached to metal studs.
 - 2) Paper towel dispenser
 - 3) Q gun wall hooks
 - 4) Wall thermometer: install in produce preparation area. Mount 60" above floor. Exact location to be determined by Kroger PM.
 - 5) Install access hole for helium discharge line at helium tank cabinet.
 - 6) Install yellow A-frame floor hazard sign brackets in produce and floral departments.

- 7) Broom rack
- 8) Cleaning components.
- 9) Cleaning station.
- 10) First aid kit.
- 11) Safety equipment station.
- 12) Lock out / tag out station.
- 13) Fly traps, as located on the fixture plan.

L. Deli/Bakery Preparation Equipment

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment performing additional specific installation actions as listed below:
 - a. Stainless Steel Worktables: Adjust legs to level unit and compensate for sloped floor condition. Place sliding doors in tracks on tables where required.
 - b. Self-Serve Display Cases (Non-Refrigerated) and Wire Shelves: Unpack and install shelves as directed. Adjust legs or shim as required to level fixture.
 - c. Non-Refrigerated Bakery Case(s): Set shelves and doors in place. Install base filler to match adjacent cases as required. Adjust legs or shim as required to level fixture.
 - d. 107 Wrappers, Aluminum Wrapping Table: Slide wing shelves into slots on sides of wrap unit. Adjust legs to compensate for sloped floor condition.
 - e. Pizza Wrapper: Adjust legs to compensate for sloped floor condition.
 - f. Breeding table and landing table.
 - g. Stainless Chef Prep Table.
 - h. Microwave Oven and Stand.
 - i. Menu Boards (if applicable for the décor package): Securely attach to wall and provide additional block as necessary.
 - j. Wall Mounted Desk (GE-10): When indicated, assemble desk as necessary, attach angle brackets to metal desk and lag bolt to blocking in insulated wall panel or toggle bolt securely attach to metal stud wall. See GISD-15. Install two desks.
 - k. Rotating Oven(s) and Proofers: Installed by manufacturer.
 - l. Mixer, Bread Slicer and Stand, Cake Decorator Table, Meat Slicers, Chicken Rotisseries, Chrome Wire Shelving Units and Pressure Fryer.
 - m. Slicer Carts: Install behind service cases.
 - n. Wooden Bread and Bagel Shelving Units.
 - o. Deli Scales: Receive and store. Scales will be uncrated and installed by the Manufacturer. Store in locked cooler until needed.
 - p. Cutting Boards, Scale Stand, and Paper Dispenser: Attach two cutting boards, one scale stand, and paper dispenser(s) to each case. Also set in place all racks, pans, pan holders, etc. furnished with case. This is necessary to determine at an early date if any items are missing.
 - q. Steam Table: Includes setting all pans, racks, and other items.
 - r. Pans, Platters, Platter Carts, and Utensils: Receive and store in the deli cooler.
 - s. Miscellaneous Items: Install the following items at location indicated on Drawings or as directed by Owner:
 - 1) Cake Top Decorations Pegboard: Furnish and install 1/4- Inch (6 mm) pegboard approximately 4 foot (1219 mm) by 8 foot (2438 mm) with oak frame mounted on wall at location to be determined by Owner.

- 2) Banner Bulletin Boards: Exact location to be determined by Owner.
 - 3) Knife Rack(s): Hang at locations as directed by Owner.
 - 4) Table Top Can Opener: Mount at locations as directed by Owner.
 - 5) Cake Order Bar(s) and Cake Display Board: Install at locations as directed by Owner.
 - 6) Wire Rack Cup Holders on Deli Cases.
 - 7) Pan and Utensil Rack: Install **7 feet (2.13 m)** AFF with threaded rod from bar joists where indicated on Fixture Plan.
 - 8) Erecta Shelving: Install as indicated on Fixture Plan.
 - 9) Cup Dispensers: Install in condiment counter at the direction of the Deli Merchandiser.
 - 10) Millwork Panels for Sushi Shop.
 - 11) First Aid Kit.
 - 12) Hose Rack: Install adjacent to hot water hose bib. Lag bolt to blocking in insulated wall panel or toggle bolt securely attached to metal studs.
 - 13) Paper Towel Dispensers.
 - 14) Q Gun Wall Hooks.
 - 15) Bulletin Board: Install directly above desk (GE- 10).
 - 16) Fly Sconce: Securely attach to wall at location indicated on Fixture Plan. Install with bottom of unit **6 foot (1.83 m)** AFF.
 - 17) Can Opener.
 - 18) Yellow A-frame Floor Hazard Sign Bracket.
 - 19) Cup Dispenser(s): Install in condiment counter at the direction of the Deli Merchandiser.
 - 20) Revolving Oven: Oven manufacturer will install oven. Unload and uncrate oven and assist installer (two workers for one half-day). Final connections shall be performed by Building Plumbing and HVAC Contractors.
 - 21) Beverage center.
2. Stainless Steel Water Cut Off Flashing: Install stainless steel floor flashing (thickness as indicated) at the rear of service case and fixture. Install flashing under case trim where possible and seal joints water tight with clear silicone sealant. Refer to Kroger Standard Detail GISD-14.

M. Cheese/Pasta Department or Cheese Kiosk:

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment performing additional specific installation actions as listed below:
 - a. Electronic Scale and Printer: Receive and store until needed.
 - b. Install the following (coordinate with Owner for exact location):
 - 1) Paper towel dispenser.
 - 2) Additional Millwork: Set as shown on Fixture Plan.
 - 3) Can opener.
 - 4) Yellow A-frame floor hazard sign.
 - 5) Case-to-case Wood Filler and Shelves: Field fabricated to assure tight fit.
 - 6) Gates: Install as shown on the fixture plan.
 - 7) Soap dispenser.
 - 8) Stainless Steel Sheets:

- a) Install to cover backs of refrigerated cases, where visible.
- b) Install at chases to top of ceiling as required.

N. Service Meat and Seafood Preparation

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment performing additional specific installation actions as listed below:
 - a. Stainless steel tables
 - b. Wire storage shelving
 - c. Miscellaneous small wares and utensils
 - d. Electronic Scale and Printer: Receive and store.
 - e. Slicer, Seafood steamer, wrapper
 - f. Three roll wrapper and slicer.
 - g. Fly Grid
 - h. Hose Rack: Install adjacent to hot water hose bib. Lag bolt to blocking in insulated wall panel or toggle bolt securely attached to metal studs.
 - i. Assemble and set plastic wrap machine. Assemble per manufacturer's instructions.
 - j. Wall Mounted Desk (GE-10): When indicated, assemble desk as necessary, attach angle brackets to metal desk and lag bolt to blocking in insulated wall panel or toggle bolt securely attach to metal stud wall. See GISD-15.
 - k. Miscellaneous items: Install the following items at locations as directed by Owner:
 - 1) Can opener
 - 2) Install one Owner supplied bulletin board above GE-10 desk.
 - 3) Assemble and place erecta shelving.
 - 4) Install yellow A-frame floor hazard sign bracket.
 - 5) Install cup dispenser(s)
 - 6) Install wall mounted flytraps.
 - 7) Safety equipment station.
 - 8) Cleaning station.
 - 9) Health placards.
2. Stainless Steel Water Cut Off Flashing: Install stainless steel floor flashing (thickness as indicated) at the rear of service case and fixture. Install flashing under case trim where possible and seal joints water tight with clear silicone sealant. Refer to Kroger Standard Detail GISD-14.

O. Chicken Shop

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment performing additional specific installation actions as listed below:
 - a. Stainless Steel Worktables: Adjust legs to level unit and compensate for sloped floor condition. Place sliding doors in tracks on tables where required.
 - b. Rational Combi Therm Ovens
 - c. Chicken fryers.
 - d. 107 Wrappers, Aluminum Wrapping Table: Slide wing shelves into slots on sides of wrap unit.

- e. Breeding table and landing table.
 - f. Microwave oven and misc. prep equipment.
 - g. First aid kits.
 - h. Soap dispensers.
 - i. Paper towel dispensers.
 - j. Q gun wall hooks.
2. Stainless Steel Water Cut Off Flashing: Install stainless steel floor flashing (thickness as indicated) set in sawed joint filled with polyurea joint filler at the rear of service case and fixture. Install flashing under case trim where possible and seal joints water tight with clear silicone sealant. Refer to Kroger Standard Detail GISD-14.

P. Seating Area

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment:
- a. Tables and chairs.
 - b. Bench seating.
 - c. Trash receptacles
 - d. Pictures in seating area.

Q. Pharmacy

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment performing additional specific installation actions as listed below:
- a. Customer waiting chairs and tables.
 - b. Storage shelving.
 - c. Prefabricated work area cabinets.
 - d. Counter tops for work area and counseling area per fixture plan on Drawings and details by manufacturer.
 - e. Nicorette Stand.
 - f. Narcotics scale and weights.
 - g. Typewriter.
 - h. Under counter refrigerator.
 - i. File cabinets.
 - j. Vitamin shelving.
 - k. Soap dispenser, towel dispenser, work desk.
 - l. TV, Bracket, and Furniture: Install as shown. If necessary, provide wood blocking for TV bracket.
 - m. Provide cut outs in tops for printers and all necessary cables.
 - n. Ad Board: Hang in pharmacy seating area.
 - o. Rx Drive-Thru Window Shade: Install shade with wording Closed to be visible from outside and supplied with drive- thru window.
 - p. Narcotics Wall Safe: Securely attach to floor and wall per manufacturer's installation instructions.

R. Floral

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment performing additional specific installation actions as listed below:
 - a. Plastic cube displays, metal plant floor display racks.
 - b. (Three) door backstock storage refrigerators.
 - c. Hanging basket displays.
 - d. Floral center care shelving displays.
 - e. Prefabricated, Modular Service Center Storage Cabinets and Counters: Install at location shown on fixture plan on Drawings. Caulk seams, joints and gaps with clear silicone sealant. Supply and install 4 inch (102 mm) black vinyl cove base on exposed areas. Trim around top and sides of service center where it butts up against walls to eliminate gaps.
 - f. Soap dispenser, paper towel dispenser.
 - g. Storage shelving brackets and shelves.
 - h. Storage wire display racks.
 - i. Floral slat wall.
 - j. Helium Tank Chain: Furnish and install chain around helium tank in floral closet. Install opening in cabinets and or wall for helium discharge unit when remote discharge unit is installed.
 - k. Fillers: Furnish and install as required.
 - l. Exterior floral unistrut hooks and bedding plant displays.
 - m. Balloon Rack: Install per décor plan.
2. Overhead canopy and light fixtures are installed by others.

S. Beer and Wine:

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment performing additional specific installation actions as listed below:
 - a. Custom Wine Shelving: Install custom signage on wine shelving.
 - b. Promo Display Units and Shelving Display Ends: Install as shown on Fixture Plan.

T. Miscellaneous Fixturing

1. Unload, uncrate, assemble as required per manufactures instructions, and set in place the following fixtures and equipment performing additional specific installation actions as listed below:
 - a. Prefabricated Metal Lockers: Bolt lockers to each other and anchor to wall and floor as required by local jurisdiction.
 - b. Metal Hat and Coat Racks and Storage Cabinets: Install as shown on Fixture Plan on Drawings.
 - c. Pallet Racks: Assemble frames and cross beam sections of pallet racks per Drawings. Set racks out from wall and securely bolt each section to wall with brackets furnished by Owner. Bolt front legs to floor. Coordinate assembly height of legs with Owner.
 - d. Furniture: Install in manager's office, computer room, conference and lunch rooms.

- e. Fly Grids: Install and trim in vestibule and on dock. Top of grid to be set at **6 foot – 11 inches (2108 mm)**. Coordinate exact location with Owner.
 - f. DSD cabinet: Mount securely to wall at location indicated as shown on Fixture Plan at 40" above finish floor on dock for receiving clerk.
 - g. Mailbag Hooks: Furnish and install mailbag hooks on dock at the direction of Store Manager. See Owner for type and quantity of hooks.
 - h. Mail Slots: Install in manager's and co-manager's area. Mail slots furnished by Owner.
 - i. Vacuum Cleaner Accessory Board: Install in backroom cleaning center. Coordinate exact location with Owner
 - j. Child bascart seat attachments (Six).
 - k. Vestibule Kiddy Rides: Install leveling legs (packed in coin changer box) and level units. Plug in and check operation. Check volume control and adjust per Store Manager's preference. Insure volume does not interfere with phone conversations at pay phones. Volume control is located on a box under unit and mounted to frame. Volume is controlled by small micro switch.
 - l. Battery Chargers: Install shelf and/or mount battery chargers in backroom or DSD area near cleaning center and/or eye wash station as indicated on Fixture Plan.
 - m. Fire Extinguishers: Install in all locations as may be required. Top of extinguishers to be no higher than **5 feet (1525 mm)** above floor. Install fire extinguishers must be hung as soon as they arrive at job site.
 - n. Salvage Baler: Install at location indicated on Fixture Plan and anchor to floor with eight 5/8 inch Dyna bolts (two each corner). Exact location to be determined by the Owner.
 - o. Vestibules/Bascart Stops: Install chrome or stainless steel pipe railing as shown on fixture plan. Posts furnished by Owner.
 - p. Five-Deck Meat Cases: Furnish and install 48 plexiglass dividers (11 5/8 inch by 14 inch) in peg lunchmeat section. Verify exact size and quantity with the meat department merchandising representative.
 - q. Bascart Corrals: Assemble and set in parking lot as indicated in Drawings or per Store Manager's direction. Typically 12 to 16.
 - r. Race Car Carts: Assemble and place in cart storage area.
 - s. Breakroom TV, and Furniture: Install as shown. If necessary, provide wood blocking for TV bracket.
 - t. Customer waiting benches place at locations designated on Fixture Plan or in locations designated by Owner.
2. Equipment to be unloaded, uncrated, and set in place with no special installation is as follows:
- a. Bascarts (no crating)
 - b. Dollies, L-Carts, Automatic floor scrubber, buffing machines, pallet jacks, power pallet jack, power straddle stacker, misc. tables, benches and chairs, trash cans.
 - c. Towel Dispensers and Liquid Soap Dispensers (supplied by Owner): Install in restrooms at sinks. Coordinate exact location with Owner.
 - d. Restraining Chain for Stepladder: Furnish and install. Fasten two eyes in wall at location determined by Owner at time of installation. Restraint to consist of a **36 inch (914 mm)** piece of **1/8 inch (3 mm)** chain with an "S" hook on one end and a harness snap on the other end.
 - e. Cleaning Center: Install complete as per Fixture Plan and details. Furnish necessary materials as required. See GISD-8.

- f. Bulletin Boards: Install four bulletin boards, 4 foot (1219 mm) by 8 foot (2438 mm); (Owner provided) one in employees' lunchroom, one in upstairs managers office, one in department head room, and one in vestibule.
3. Palletize, shrink wrap and load any un-used shelving, cases, or fixtures on Owner's truck as directed by Owner.

U. Miscellaneous Fillers Closures and Protection

1. Vertical Refrigeration Piping Enclosures: For stores with ceilings, conceal refrigeration piping from overhead steel to top of refrigerated cases in PVC pipe false column with pipe diameter to match existing building columns. When the refrigeration piping and other associated electrical conduits will not fit in a false column this installer to provide vertical pipe enclosure coordinate with refrigeration system installer and see GISD-4.
2. Filler Panels: Furnish and install filler panels, matching height of tallest adjacent fixture, to eliminate large gaps between fixtures or cases.
3. Case End Closures: Fabricate and install laminated particle board case end closures and edge to match adjacent case or surfaces. Closures at cases less than 12 inches (305 mm) to be sheet steel painted to match the case, unless utilized for display of product.
4. Filler at the End of Shelving Backed Up to the Glass Door Frozen Food Cases and Adjacent to the Wraparound Frozen Food Cases or Other End Fixture: Fill space between units by boxing in neatly with laminated particle board to match adjacent case color.
5. Case Top Return Air Closure: Furnish and install case close-off material on top of cases installed against wall used for return air. See GISD-2.
6. Furnish and install aluminum, stainless steel, or marlite paneling required to cover gaps (holes, voids, openings, cracks, etc.) under, behind and/or between cases, shelving units and fixtures (as directed by Owner) that back up against walls, other cases or other fixtures greater than 1/2 inch (13 mm) wide with appropriate materials mentioned above over 5/8 inch (16 mm) plywood backing. Gaps less than 1/2 inch (13 mm) wide are to be caulked with silicone sealant.
7. Furnish and install "Filler" sections as shown on the fixture plan on Drawings. Finish shall be laminate to match adjacent cases. Shape and contour of filler to match adjacent cases. Where applicable, rub rails will be installed to match adjacent cases. See Owner for details prior to fabrication.
8. Wall Mounted Refrigeration Pipe Guard: Protect refrigerant piping, running up the store's back wall and coming from the mechanical enclosure with 3/4 inch (19 mm) fire retardant treated plywood with UL stamp is visible. See GISD-17
9. Check lanes: Install chrome pipe railing next to end checkout counter as shown on fixture plan.
10. Sales Area Protective Guard Posts: Top of posts to be 2 feet 8 inches (812.8 mm) above floor. Core floor and install posts after cases have been set, maintaining 1-inch (25-mm) clearance between posts and cases. Refer to fixture plan for exact quantity and locations.
 - a. Provide non-shrink non-metallic grout for setting of post inserts.
11. Sales Area Refrigerated Case Corner Guards: Install on corners of glass door frozen food/IC end cases, meat/seafood islands, dairy islands, and frozen food/IC islands. The guards are required for all stores, whether or not they are shown on fixture plan. Reference ASD-160.

V. Miscellaneous Carpentry, Interior Decor

1. Furnish and install two 10 feet (3 m) long pieces of 6 inch (152 mm) diameter PVC pipe for storage of salvage baler wire anchor securely to wall 4 feet (1219 mm) above floor adjacent to baler. Fasten to wall every 4 feet (1219 mm) with 1 inch (25 mm) wide perforated galvanized metal strap and masonry anchor.
2. Wood backing for Product signs where applicable.
3. Photo Murals, Verbiage: Install on wall as directed. (Verify with Owner to determine if applicable for this store). Provide fasteners and anchors and adhesive. (Typically, adhesive tape, special construction adhesive and brad nails).
4. Install decorative end panels above low profile end bunker cases as indicated on the fixture plan. Kroger supplied Local Catalog item. Verify with Owner.
5. Light Bulb Storage Rack: Fabricate and install.
6. Building Plans and Spec Storage Box: Fabricate and install in sprinkler riser cage or other location as directed by Owner. See GISD-24.
7. Display platforms and 1/8 inch (3 mm) thick hardboard stacking boards. Verify size and quantity with Engineer and grocery M.R.
8. Beer Base Boards: Provide two beer base boards, 4 feet by 4 feet by 4 feet (1220 mm by 1220 mm by 1220 mm) with 1/2 inch (13 mm) plywood top, painted flat black. Verify size and quantity with Engineer and grocery M.R.

3.4 ADJUSTING

- A. Repair damaged and defective fixtures, where possible, to eliminate functional and visual defects. Where not possible to repair, notify Owner for replacement fixtures.
- B. Methods and materials for repair must be submitted and approved by the manufacturer and the installer prior to making repair.
- C. Touch up shop-applied finishes to restore damaged or soiled areas.
- D. Adjust Marco table bumpers as required.

3.5 CLEAN UP

- A. Remove rubbish, boxes, shipping crates, and debris daily. Provide an open trash container of sufficient size to hold generated trash. Empty on a frequency sufficient to handle the amount of trash generated.
- B. Keep work area in an orderly, reasonably clean condition. Sweep affected sales floor areas after each shift.
- C. Unless set in their final location, items on the sales floor areas will be on wheeled dollies. Pallets will not be allowed to remain on the sales floor for extended periods of time.
- D. Clean installed equipment and completed work ready for Owner's use.
- E. Fixture contractor will be responsible for costs to repair floor damaged during installation of fixtures.

- F. Occupational Safety and Health Act:
- G. It shall be the general contractor's duty to ascertain that all subcontractors comply with provisions of the Occupational Safety Act. Subcontractors will be responsible to the general contractor who must enforce all provisions.
- H. Clean, lubricate, and adjust hardware.
- I. Sweep and clean out temporary storage trailers/containers when empty.

3.6 WASTE MANAGEMENT

- A. Owner's Salvage: Verify extent of items for Owner's salvage. Remove, protect and temporarily store Owner's salvage until Owner removes it.
- B. Waste Products and Materials: Fixtures and materials that are not reused or salvaged for Owner become Contractor's property. Remove from Site and dispose of them legally.
 - 1. Comply with Owner's waste management goals when indicated.
 - 2. Comply with local jurisdiction's waste management requirements.

END OF SECTION 11 41 13

SECTION 11 41 22 - REFRIGERATED FIXTURE INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY

A. General:

1. This Section specifies installation of refrigerated fixtures and equipment furnished by the Kroger Company referred to as the Owner.
2. This Section includes various store type installations. Some of the items specified in this Section will not be used on the Project. Refer to Refrigeration and Fixture Drawings for items included in the Project.
3. Supervision to coordinate the activities of all trades will be furnished by others. The Installer is responsible for supervising their own Work and meet dates shown on the installation schedule.

B. Section includes:

1. All labor, material and equipment specified in this Section and on the Refrigeration and Fixture Drawings necessary for a complete and working installation of Owner's fixtures and equipment.
2. Installation of the Owner furnished refrigerated fixtures shown on the Drawings (Fixture Plan) include, but are not limited to the following:
 - a. Installation of refrigerated cases.
 - b. Installation of temp tags for Owners temperature monitoring system.
 - c. Installation of refrigerated case shelving, and inserts.
 - d. Installation of the misting system for the produce wet rack.
 - e. Install refrigerated ice machines as shown on Drawings. Adjust as required.
 - f. Nails, bolts, nuts, screws, hangers, chains, washers, threaded rods, and other materials and devices.
 - g. Adhesive and silicone sealant.
 - h. Other materials and devices not provided by Owner necessary to complete the refrigerated case installation.

- C. Modifications and additions to this Section, if required, are indicated in Section 11 41 22.01 "Supplementary Refrigerated Fixture Installation." If Section 11 41 22.01 "Supplementary Refrigerated Fixture Installation" is not included in this Project Manual, no modifications and additions to this Section are indicated. Where any portion of this Section is modified or deleted by Section 11 41 22.01 "Supplementary Refrigerated Fixture Installation," the unaltered portions shall remain in effect.

1.2 DEFINITIONS

- A. Certain terms and words used throughout Section shall be defined as follows:

1. **Owner:** The person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's Representative.
2. **Contractor:** The General Contractor with overall responsibility to build a complete store, on schedule, ready for operation as a complete food store.
3. **Installer:** The entity identified in this Section responsible for but not limited to material and installation of the refrigerated fixtures, as identified in this Section.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. **Coordination:** Report to Owner any defaults in work furnished and installed by others that causes conditions unsuitable for Installer's Work. Failure to inspect and report unsuitable conditions shall constitute acceptance of work furnished and installed by others as fit and proper for coordination with the Installer's work.
- B. **Cooperation with Other Trades:** Cooperate with other installers doing work on the Project to prevent any conflict that would require moving or changing any devices, or other equipment, or require other installers to relocate devices and equipment when installed according to plans and specifications.
 1. Where interference exists, notify Owner before proceeding with installation.

1.4 WORK SCHEDULES

- A. Typical work schedule shall consist of five 8-hour workdays ending no earlier than 3:00 p.m. local time at the store or in shifts as required in the Phase Plan or Project Schedule.
 1. For non-local Installers, as approved by the Owner, work may be conducted in four 10-hour days provided the work day does not end prior to 3:00 p.m. local time.
- B. **Office, Pharmacy, Computer Room and Customer Care Office Moves:** For remodel projects involving modification or relocation of these areas, provide a laborer to assist in the move. The Work shall occur at night and the appropriate hours necessary to perform the work shall be included in the Installer's cost.

1.5 SUBMITTALS

- A. The Owner will provide the following submittals for Owner supplied items for the Installer's information upon request:
 1. **Product Data:** For each item and accessory supplied by Owner.
 2. **Shop Drawings:** For special components and installations not detailed in manufacturer's product data.
- B. **Closeout Submittals**

1. Operation and Maintenance Data: For equipment furnished by installer and equipment furnished by Owner to include in emergency, operation, and maintenance manuals. Include service and installation instructions.
 - a. Collect manuals for equipment installed in this Section and place in a three ring binder. Deliver to the Owner's store manager upon completion of the Work. Refer to General Conditions for additional requirements.
 - b. The Owner will supply the Installer with receiver copies of all equipment and fixture purchase orders to include in Operation and Maintenance Manual.
2. Record Drawings: As-built drawings showing the location of refrigerated cases

1.6 QUALITY ASSURANCE

- A. Work, materials, and equipment shall comply with rules and regulations of authorities having jurisdiction. Continually monitor field installation for code compliance and workmanship quality. Installation shall comply with all manufacturers' recommendations.
- B. Maintain a set of Contract Documents on the Project for Owner to review and verify any discrepancies.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. For remodels, do not store material in the sales area. Material stored in the back room must be out of the way of the Owner's operations.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of other construction by field measurements before beginning Work.
- B. For remodels, temporarily relocate cases as indicated or directed by Owner. Verify special project scope and schedule. Start and verify operation of self-contained equipment, both new and temporary and make any necessary repairs. Repairs will be handled by Change Order.

1.9 WARRANTY

- A. Installer's Warranty: Standard form in which Installer agrees to repair or replace any component that does not comply with requirements or that deteriorates or malfunctions as a result of improper installation by the Installer within specified warranty period.
 1. Warranty Period: 90 days from date of store Grand Opening provided installation is accepted and approved as completed in compliance with the Contract Documents by the Owner.
 2. Warranty Retainage: Until the end of the warranty period, 5 percent of the contract amount due the Installer will be held as a retainage unless a different retainage percentage is required by the Authority Having Jurisdiction.

3. Warranty Service: During the warranty period, regardless if the service call is due to failure of equipment or failure of the installation, the Installer shall enter the service call with Service Hub, the Owner's electronic service call system. Submit service reports to the Owner at the end of the warranty period.
 - a. As part of the Installer's warranty service, the Installer shall make arrangements to have a service technician present at the store for the Grand Opening day to correct problems or make adjustments designated by the Owner, working a minimum of four hours, commencing two hours before store opening.
- B. Refer Division 00 Section "General Conditions" for general warranty information.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED PRODUCTS

- A. Receive, handle, store, and protect materials, equipment, fixtures or supplies delivered to the site by the Owner for installation under this Section. Schedule and coordinate deliveries.

2.2 INSTALLER FURNISHED PRODUCTS

- A. General: Installer furnished products includes the following:
 1. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - a. Basis of Design Product: Unistrut Corporation; Series P-4000 or heavier
 2. Silicone Sealant: ASTM C 920, Type S, Grade NS, Class 25, Use NT, A or N-Curing, Mildew-Res.
 - a. Product:
 - 1) Dow Corning Corporation; 786 Mildew Resistant.
 - 2) GE Silicones; Sanitary SCS1700
 - 3) Pecora Corporation; 898
 - 4) Tremco, Inc.; Tremsil 200BASF Omniplus
 3. Butyl-Rubber-Based Joint Sealant: ASTM C 1311.
 - a. Products:
 - 1) Bostik, Inc.; Chem-Calk 300.
 - 2) Pecora Corporation; BC-158.
 - 3) Tremco, Inc.; Butyl Sealant
 4. Any additional parts or materials required for a complete system to Owner's specifications.

- B. Unless otherwise specified, all materials and equipment items shall be new. All materials used in the Project shall be equal to approved samples in every respect. When required by the Owner, the Contractor shall provide certificates of conformance for materials specified.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of refrigeration systems.
- B. Examine roughing-in for refrigerant piping systems to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: For stores remaining open during construction, perform Work in a manner as to provide a minimum of annoyance and interference to Owner's operations, its customers and vendors.
 - 1. No work shall be done by the Installer that will void a manufacturer's warranty.
 - 2. If during the course of the Work any piece of equipment under the scope of this Work is damaged (the damage occurring after arrival), notify the Owner immediately, listing the model number, serial number and the extent of the damage. Ensure the damage is corrected.
 - 3. Remove and dispose of trash and debris resulting from the uncrating, joining, and assembly of equipment completely and in an orderly fashion. Remove trash and debris daily and dispose of materials lawfully.

3.3 UNLOADING, SETTING, AND ASSEMBLY

- A. General:
 - 1. Arrange for equipment manufacturer's representative to be present during unloading and setting (refer to Owner's P.O. and delivery schedule).
 - 2. Immediately upon delivery, inventory contents of containers. Notify supplier and Owner in writing when cases do not include material normally supplied in accordance with the equipment list, including holding charge. Lack of holding charge is unacceptable.
 - 3. Protect refrigeration fixtures prior to installation.
 - 4. Inspect cases after uncrating. The equipment and accessories furnished are pre-wired and are purchased with the manufacturer's standard one-year parts warranty. If equipment arrives at the Project damaged:
 - a. Obtain a signed inspection report, in duplicate, from carrier.
 - b. Notify the Owner and fixture supplier immediately.
 - c. Do not conduct repairs or replacement until authorized.

5. Upon authorization, obtain, from the manufacturer, and replace any malfunctioning parts or equipment.
6. Check self-contained refrigerated equipment for proper operation and correct temperature settings.
7. Check Fixture Plan Layout, R-1 Refrigeration Equipment Plan, and any Addenda for self-contained equipment. Follow manufacturer's specifications for start-up and checking.

B. Cases

1. Uncrate and set refrigerated cases and equipment per manufacturer's installation instructions and as indicated on the refrigeration equipment layout Drawings.
 - a. Set cases level. Check for levelness front to back, end to end, using a 6 foot long level or other more stringent leveling instrument when necessary. Verify that cases are in line and joints properly sealed and pulled together tight.
 - b. Install with metal case shims provided by the manufacturer. If more shims are required than furnished, use similar field supplied metal material.
 - c. Adjust doors and hinges for proper fit, level, seal and closure for cases equipped with display doors.
 - d. Stay current with the manufacturer's installation and operation manuals provided.
2. Install seismic supports and bracing as required by manufacturer and authorities having jurisdiction, and as required for stability. Extend and fasten members to supporting structure as required or refer to structural drawings if provided for anchoring.
3. Install trim, joint strips, shelves, rack and kick plates on refrigerated cases. Prior to installing trim and kick plates, inspect under fixture to verify that all construction debris and materials have been removed.
4. Sealing
 - a. General:
 - 1) Apply sealant in ample amounts in a continuous bead to form smooth, uniform beads; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 2) Apply sealant without removing factory installed case ends.
 - 3) Allow ample time for sealant to cure prior placing to case/system on line.
 - 4) Once equipment is set, do not shift or move without breaking and resealing joints.
 - b. Apply butyl rubber sealant at case joints.
 - c. After cases are set, apply silicone sealant to inner and outer case joints, including seam at bottom of cases.
 - 1) In the event that RL cases are back to back, apply sealant to joint area inside of case.
 - 2) Seal penetrations into cases with silicone sealant.
 - 3) Provide clear silicone sealant or same color of surrounding area.
5. Close off open spaces between case ends or kick plates with a material similar to case material.
6. Place refrigeration case shelving in the respective cases after start-up.

- a. Pegged product to have a stub shelf or baffle to preserve the cases air curtain.
 - b. Shelving with lights to be plugged and lamp operation verified.
 - c. Notify the Owner when complete.
7. Temp Tags: Install Owner supplied temp tags for Owners temperature monitoring system in every refrigerated case, cooler, freezer, and refrigerator. Install per the "Tag Placement Guide" pages 31-38 of the "Fast Alert System Facility Install Guide": www.sitefolio.net/Kroger/TeamPageHome.sf?idTeam=1104&idTeamPageGroup=25&idTargetFile=154558.
 8. Install and verify accuracy of the manufacturer provided loose thermometer per manufacturer's instructions in the warmest location of each case after it is merchandised to comply with NSF certification.
 9. Install case manufacturer provided dividers as follows:
 - a. Install and adjust clear acrylic dividers between like temperatures on separate circuits (i.e. frozen food next to frozen food).
 - b. Install and adjust insulated partitions on mixed temperature applications (i.e. frozen food next to ice cream).
 - c. Refer to the refrigeration schedule for exact application and location of partitions and dividers.
 10. Electrical Configuration: Configure cases as identified on the refrigeration schedule.
 - a. Configure cases for 208 volt, 1-phase single or 3-phase feeders from the defrost panel.
 - b. For 3-phase systems, cases will have case manufacturer's factory installed fuses.
 11. Install Owner provided misting system, misting system timers, and reverse osmosis filter (if required) for produce wall cases.

C. Walk-in Boxes and Preparation Areas

1. Install Owner supplied loose shipped evaporator coils by suspending from top chord of bar joist with **3/8 inch (9.5 mm)** plated or galvanized threaded steel rod.
2. For coils installed in the walk-in coolers/freezers, support above ceiling panel with slotted channel framing (Unistrut).
 - a. Cut slotted channel framing in lengths to span a full ceiling panel width plus a minimum of **6 inches (150 mm)** overlap on each adjacent panel.
 - b. Support coils from top chord of bar joist.
 - c. Seal cooler penetrations both inside and out with foam and silicone sealant.
3. Comb out any damaged fins on coils after installation
4. Install strip curtains on designated walk in freezers, meat and dairy coolers before startup.

END OF SECTION 11 41 22

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SECTION 11 41 33 - FIXTURE AND EQUIPMENT PLUMBING CONNECTIONS

PART 1 - GENERAL

1.1 SUMMARY:

A. General:

1. This Section specifies supply water and drain connections of fixtures and equipment furnished by the Kroger Company referred to as the Owner.
2. This Section includes various store type installations. Some of the items specified in this Section will not be used on the Project. Refer to Fixture and Building Plumbing Drawings for items included in the Project.
3. Supervision to coordinate the activities of all trades will be furnished by others. The Installer is responsible for supervising their own Work and meet dates shown on the installation schedule.

B. Section includes:

1. All labor, material and equipment specified in this Section and on the Fixture Drawings necessary for a complete and working installation of Owner's fixtures and equipment.
2. Installation piping and final connections for the Owner furnished equipment and fixtures shown on the Drawings (Fixture Plan) include, but are not limited to the following:
 - a. Installation of water supply lines and final connection to refrigerated and non-refrigerated fixtures and equipment.
 - b. Installation of water supply lines, drain lines and final connections to non-refrigerated fixtures and equipment.
 - c. Any additional parts or materials required for a complete and working installation of Owner's fixtures and equipment.

C. Modifications and additions to this Section, if required, are indicated in Section 11 41 33.01 "Supplementary Fixture and Equipment Plumbing Connections." If Section 11 41 33.01 "Supplementary Fixture and Equipment Plumbing Connections" is not included in this Project Manual, no modifications and additions to this Section are indicated. Where any portion of this Section is modified or deleted by Section 11 41 33.01 "Supplementary Fixture and Equipment Plumbing Connections," the unaltered portions shall remain in effect.

D. Work performed by others (unless noted otherwise on the Drawings):

1. Prep area hand washing sinks.
2. Food prep and utensil washing sinks.
3. Water softening and conditioning equipment.

E. Refer to Section 114134 "Fixtures and Equipment Condensate Drain Connections" for drain connections to refrigerated cases and coils.

1.2 DEFINITIONS

A. Certain terms and words used throughout Section shall be defined as follows:

1. **Owner:** The person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's Representative.
2. **Contractor:** The General Contractor with overall responsibility to build a complete store, on schedule, ready for operation as a complete food store.
3. **Installer:** The entity identified in this Section responsible for but not limited to material and installation of the final plumbing water and drain connections to the refrigerated and non-refrigerated equipment, as identified in this Section.
4. **Building Plumbing Contractor:** The contractor responsible for the installation of the building plumbing infrastructure to which the Installer of the work of this section will make their final connections.

1.3 ADMINISTRATIVE REQUIREMENTS

- ### A. Coordination:
- Report to Owner any defaults in work furnished and installed by others that causes conditions unsuitable for Installer's Work. Failure to inspect and report unsuitable conditions shall constitute acceptance of work furnished and installed by others as fit and proper for coordination with the Installer's work.
- ### B. Cooperation with Other Trades:
- Cooperate with other installers doing work on the Project to prevent any conflict that would require moving or changing any devices, or other equipment, or require other installers to relocate devices and equipment when installed according to plans and specifications.
1. Where interference exists, notify Owner before proceeding with installation.

1.4 WORK SCHEDULES

- ### A. Typical work schedule shall consist of five 8-hour workdays ending no earlier than 3:00 p.m. local time at the store or in shifts as required in the Phase Plan or Project Schedule.
1. For non-local Installers, as approved by the Owner, work may be conducted in four 10-hour days provided the work day does not end prior to 3:00 p.m. local time.
- ### B. Office, Pharmacy, Computer Room and Customer Care Office Moves:
- For remodel projects involving modification or relocation of these areas, provide a laborer to assist in the move. The Work shall occur at night and the appropriate hours necessary to perform the work shall be included in the Installer's cost.

1.5 SUBMITTALS

- ### A. The Owner will provide the following submittals for Owner supplied items for the Installer's information upon request:
1. **Product Data:** For each item and accessory supplied by Owner.

2. Shop Drawings: For special components and installations not detailed in manufacturer's product data.

1.6 QUALITY ASSURANCE

- A. Work, materials, and equipment shall comply with rules and regulations of authorities having jurisdiction. Continually monitor field installation for code compliance and workmanship quality. Installation shall comply with all manufacturers' recommendations.
- B. Maintain a set of Contract Documents on the Project for Owner to review and verify any discrepancies.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of other construction by field measurements before beginning Work.

1.8 WARRANTY

- A. Installer's Warranty: Standard form in which Installer agrees to repair or replace any component that does not comply with requirements or that deteriorates or malfunctions as a result of improper installation by the Installer within specified warranty period.
 1. Warranty Period: 90 days from date of store Grand Opening provided installation is accepted and approved as completed in compliance with the Contract Documents by the Owner.
 2. Warranty Retainage: Until the end of the warranty period, 5 percent of the contract amount due the Installer will be held as a retainage unless a different retainage percentage is required by the Authority Having Jurisdiction.
 3. Warranty Service: During the warranty period, regardless if the service call is due to failure of equipment or failure of the installation, the Installer shall enter the service call with Service Hub, the Owner's electronic service call system. Submit service reports to the Owner at the end of the warranty period.
 - a. As part of the Installer's warranty service, the Installer shall make arrangements to have a service technician present at the store for the Grand Opening day to correct problems or make adjustments designated by the Owner, working a minimum of four hours, commencing two hours before store opening.
- B. Refer Division 00 Section "General Conditions" for general warranty information.

PART 2 - PRODUCTS

2.1 INSTALLER FURNISHED PRODUCTS

- A. General Product Requirements: Furnish and install products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Substitutions: Comparable products shall match the specified product in every respect. Provide certificates of conformance for comparable products when required by the Owner.
- B. Tubing, Fittings and Insulation for Water Lines: Products include but are not limited to:
 1. Water and Drain Metal Piping: ACR, Type L, hard copper.
 - a. Fittings and P-Traps:
 - 1) Manufacturers:
 - a) Mueller Industries, Inc.
 - b) Henry Technologies.
 - c) Superior Products LLC.
 2. Metal Piping: ACR, Type M, hard copper
 - a. Fittings and P-Traps:
 - 1) Manufacturers:
 - a) Mueller Industries, Inc.
 - b) Henry Technologies.
 - c) Superior Products LLC.
 3. Bronze Fittings:
 - 1) Manufacturers:
 - a) Nibco Inc.
 - b) Conbraco Industries, Inc., Apollo Valves.
 - c) Viega Propress.
 4. Valves: Ball type, brass
 - a. Manufacturers:
 - 1) Watts Water Technologies.
 - 2) Apollo Valves.
 - 3) B & K Plumbing Valves, a Brand of Mueller Industries.
 5. Plastic Piping: Polyvinyl chloride (PVC), schedule 40 DWV. ASTM D-2665
 6. PVC Socket Fittings and P-Traps: ASTM D 2665, socket type, made to ASTM D 3311.
 - a. Manufacturers:
 - 1) Charlotte Pipe and Foundry Company.
 - 2) Genova Products, Inc.
 - 3) U.S Plastic Corp.
 7. PVC Fittings and P-Traps: ASTM D 2665, socket type, made to ASTM D- 2665,

- a. Manufacturers:
 - 1) Lasco Fittings, Inc.
 - 2) Genova Products, Inc.
 - 3) U.S Plastic Corp.
- 8. Brazing Rods:
 - a. Products:
 - 1) Lucas-Milhaupt, Inc.; Sil-Fos
 - 2) Johnson Matthey Metal Joining; Easy-Flo.
- 9. Piping Insulation: Closed cell polymeric foam insulation.
 - a. Products:
 - 1) Armacell, LLC; AP/Armaflex II.
 - 2) K-Flex, USA; Insul-Tube/K-Flex LS.
- 10. Insulation joint sealant: Fast drying neoprene contact adhesive.
 - a. Products:
 - 1) K-Flex, USA; K-Flex 320
 - 2) Armacell, LLC; #520 contact adhesive
- 11. Piping Insulation: Closed cell polymeric foam insulation.
 - a. Products:
 - 1) Armacell, LLC; AP/Armaflex II.
 - 2) K-Flex, USA; Insul-Tube/K-Flex LS.
- 12. Insulation joint sealant: Fast drying neoprene contact adhesive.
 - a. Products:
 - 1) K-Flex, USA; K-Flex 320
 - 2) Armacell, LLC; #520 contact adhesive
- 13. Foam Insulation: Two-component, quick-cure polyurethane foam
 - a. Products:
 - 1) The Dow Chemical Company; Froth-Pak or approved substitution.
- C. Water Piping Support: Material required to support and secure water piping, includes but is not limited to:
 - 1. Copper bell hanger, Copper Van Hanger, copper plated split ring pipe hangers

- a. Manufacturers:
 - 1) Jones Stephens Corp.
 - 2) Carpenter & Paterson, Inc.
- D. Water Filter: Water filters to be supplied and installed by the Building Plumbing Contractor. Refer to Section 22 11 00 "Facility Water Distribution."
- E. Other Products: Furnish and install additional parts or materials as required for a complete system to the Owner's specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of fixture and equipment plumbing connections.
- B. Examine roughing-in for fixture and equipment plumbing connections to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: For remodel projects perform work in a manner as to provide a minimum of annoyance and interference to Owner's operations, its customers and vendors.
 - 1. Do not perform any Work in such a manner that voids a manufacturer's warranty.

3.3 WATER SUPPLY AND DRAIN CONNECTIONS

- A. Water Supply Connection Work by Installer
 - 1. All Store Equipment Requiring Water Connection:
 - a. Install cold water piping, pressure regulators, vacuum breaker, back check, and shut off valves.
 - b. Furnish and install piping as needed from the Building Plumbing Contractor furnished and installed shut off valve to the fixture and equipment indicated on the Drawings.
 - c. Install water piping free of leaks tested at maximum water service pressure.
 - 2. Misting System: Install water piping from the valves, located under the produce cases, to the misting system (supplied by Owner) located in the produce cases. Furnish and install type "L" soft copper tubing and soldered fittings. Insulate water lines inside the produce cases and protect from the suction line.

3. 5-Deck Produce Cases: Spray hose quick connection pre-installed in every other case (one per line-up minimum). Install RO water connection from stub near case or misting system.
4. Alto-Shaam Combi-Therm Oven: Connect **3/4 inch (19 mm)** flexible PVC water supply line (furnished with each oven) to **3/4 inch (19 mm)** supply valves for each oven.
5. Ice machines and Proofers: Install **1/2 inch (13 mm)** cold water line with a 'Y' type strainer, water filter, and pressure regulator (in that order) to ice machines. Insulate piping from the water valves to the ice machines.
6. Ice Machine Connections:
 - a. Assemble parts and controls supplied for ice machines with the bin remote from the ice making assembly.
 - b. Adjust pressure regulator to **15 psig (103 kPa)**.
 - c. Check ice machine for proper operation.
7. Hot Food Tables, Steamers, Steam Tables, Coffee Makers and Icemakers: Install soft copper water piping from water valves to equipment.
8. Pharmacy Reverse Osmosis (RO) Water Filtration Dispensing System: Install RO system equipment, water filters, backflow preventer (check valve), and PEX piping.
9. Store Equipment Requiring Filters: Install water filters and piping. Locate filters where not seen by customers but are in close proximity of the equipment and easily accessible by store personnel. Make final connections including but not limited to the following equipment:
 - a. Ice machines.
 - b. Coffee machines.
 - c. Steam tables.
 - d. Bakery oven.
 - e. Retarders.
 - f. Ice tea brewer.
 - g. Carbonated beverage dispensers.
 - h. Combi-therm ovens.
 - i. Steamers.
 - j. Hot food tables.
 - k. Proofers.
 - l. Salad bar.
 - m. Sterilox unit.
 - n. Meat and seafood case humidification system.
 - o. Other miscellaneous prep area equipment.
 - p. Pharmacy reverse osmosis water filtration dispensing system.
 - q. Produce misting system with special piping and components.

B. Drain Connection Work by Installer:

1. Drainage Piping for All High Temp Discharge Store Equipment: Drain connection above grade, trap from fixtures discharging **140 degree F. (60 degree C.)** or hotter water.
 - a. Equipment includes, but is not limited to the following:
 - 1) Pasta cooker.
 - 2) Proofers.

- 3) Steamers.
 - 4) Salad bar soup wells.
 - 5) Bakery ovens.
 - 6) Hot food tables.
 - 7) Alto-Shaam Combi-Therm ovens.
 - 8) Dish washing & utensil washing equipment.
 - b. Install with Type "L" hard drawn copper tubing, with wrought copper bronze fittings and 95/5 tin/antimony or 94/6 tin/silver solder for drain lines and fittings.
 - c. Install lines to drain most practical for use. Furnish and install air gap at drain in conformance with authorities having jurisdiction.
 - d. Install "P" traps as required by authorities having jurisdiction.
 - e. Install drain line for each Alto-Shaam Combi-Therm oven in accordance with installation instructions furnished with each unit.
2. Drainage Piping for All Non-High Temp Discharge Store Equipment:
- a. Equipment includes, but is not limited to the following:
 - 1) Quick chillers.
 - 2) Ice machines.
 - 3) Lobster tank.
 - b. Install with Type "M" hard drawn copper tubing and fittings.
 - c. Install lines to drain most practical for use. Furnish and install air gap at drain in conformance with authorities having jurisdiction.
 - d. Install "P" traps as required by authorities having jurisdiction.
 - e. Ice Machine Connections: Connect icemaker overflow to nearest drain. Install drain line from storage bin to nearest drain.
 - f. Drain for Carbonated Beverage Dispensers: Install PVC piping and fittings.

END OF SECTION 11 41 33

SECTION 11 41 34 - FIXTURES AND EQUIPMENT CONDENSATE DRAIN CONNECTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. General:

1. This Section specifies condensate drain connections of fixtures and equipment furnished by the Kroger Co. referred to as the Owner.
2. This Section includes various store type installations. Some of the items specified in this Section will not be used on the Project. Refer to Refrigeration and Fixture Drawings for items included in the Project.
3. Supervision to coordinate the activities of all trades will be furnished by others. The installer is responsible for supervising their own Work and meet dates shown on the installation schedule.

B. Section includes:

1. All labor, material and equipment specified in this Section and on the Refrigeration and Fixture Drawings necessary for a complete and working installation of Owner's fixtures and equipment.
2. Condensate drain connections for the Owner furnished equipment and fixtures shown on the Drawings (Fixture Plan) include, but are not limited to the following:
 - a. Installer supplied items and Work:
 - b. Installation of condensate drain lines from refrigerated fixtures and equipment.
 - c. Any additional parts or materials required for a complete and working installation of Owner's fixtures and equipment.

C. Modifications and additions to this Section, if required, are indicated in Section 11 41 34.01 "Supplementary Fixture and Equipment Condensate Drain Connections." If Section 11 41 34.01 "Supplementary Fixture and Equipment Condensate Drain Connections" is not included in this Project Manual, no modifications and additions to this Section are indicated. Where any portion of this Section is modified or deleted by Section 11 41 34.01 "Supplementary Fixture and Equipment Condensate Drain Connections," the unaltered portions shall remain in effect.

D. Refer to Section 114133 "Fixture and Equipment Plumbing Connections" for drain connections to equipment other than refrigerated cases and coils.

1.2 DEFINITIONS

A. Certain terms and words used throughout Section shall be defined as follows:

1. **Owner:** The person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's Representative.

2. **Contractor:** The General Contractor with overall responsibility to build a complete store, on schedule, ready for operation as a complete food store.
3. **Installer:** The entity identified in this Section responsible for but not limited to material and installation for the condensate drain connections to the refrigerated equipment, as identified in this Section.
4. **Building Plumbing Contractor:** The contractor responsible for the installation of the building plumbing infrastructure to which the Installer of the work of this section will make their final connections.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. **Coordination:** Report to Owner any defaults in work furnished and installed by others that causes conditions unsuitable for Installer's Work. Failure to inspect and report unsuitable conditions shall constitute acceptance of work furnished and installed by others as fit and proper for coordination with the Installer's work.
- B. **Cooperation with Other Trades:** Cooperate with other installers doing work on the Project to prevent any conflict that would require moving or changing any devices, or other equipment, or require other installers to relocate devices and equipment when installed according to plans and specifications.
 1. Where interference exists, notify Owner before proceeding with installation.

1.4 WORK SCHEDULES

- A. Typical work schedule shall consist of five 8-hour workdays ending no earlier than 3:00 p.m. local time at the store or in shifts as required in the Phase Plan or Project Schedule.
 1. For non-local installers, as approved by the Owner, work may be conducted in four 10-hour days provided the work day does not end prior to 3:00 p.m. local time.
- B. **Office, Pharmacy, Computer Room and Customer Care Office Moves:** For remodel projects involving modification or relocation of these areas, provide a laborer to assist in the move. The Work shall occur at night and the appropriate hours necessary to perform the work shall be included in the Installer's cost.

1.5 SUBMITTALS

- A. The Owner will provide the following submittals for Owner supplied items for the Installer's information upon request:
 1. **Product Data:** For each item and accessory supplied by Owner.
 2. **Shop Drawings:** For special components and installations not detailed in manufacturer's product data.

1.6 QUALITY ASSURANCE

- A. Work, materials, and equipment shall comply with rules and regulations of authorities having jurisdiction. Continually monitor field installation for code compliance and workmanship quality. Installation shall comply with all manufacturers' recommendations.
- B. Maintain a set of Contract Documents on the Project for Owner to review and verify any discrepancies.

1.7 FIELD CONDITIONS

- A. Field Measurements: Before beginning work, inspect all building drains, field measure and verify all plumbing drain locations with respect to the building plumbing drawings and report in writing any discrepancies, variances, or defects to the Contractor and Owner.

1.8 WARRANTY

- A. Installer's Warranty: Standard form in which Installer agrees to repair or replace any component that does not comply with requirements or that deteriorates or malfunctions as a result of improper installation by the Installer within specified warranty period.
 - 1. Warranty Period: 90 days from date of store Grand Opening provided installation is accepted and approved as completed in compliance with the Contract Documents by the Owner.
 - 2. Warranty Retainage: Until the end of the warranty period, 5 percent of the contract amount due the Installer will be held as a retainage unless a different retainage percentage is required by the Authority Having Jurisdiction.
 - 3. Warranty Service: During the warranty period, regardless if the service call is due to failure of equipment or failure of the installation, the Installer shall enter the service call with Service Hub, the Owner's electronic service call system. Submit service reports to the Owner at the end of the warranty period.
 - a. As part of the Installer's warranty service, the Installer shall make arrangements to have a service technician present at the store for the Grand Opening day to correct problems or make adjustments designated by the Owner, working a minimum of four hours, commencing two hours before store opening.
- B. Refer Division 00 Section "General Conditions" for general warranty information.

PART 2 - PRODUCTS

2.1 INSTALLER FURNISHED PRODUCTS

- A. General Product Requirements: Furnish and install products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Substitutions: Comparable products shall match the specified product in every respect. Provide certificates of conformance for comparable products when required by the Owner.
- B. Tubing, Fittings and Insulation for Condensate Lines: Case drain tubing and fittings are not furnished with the cases. Products include but are not limited to:
 1. Metal Piping: ACR, Type M, hard copper.
 - a. Fittings and P-Traps:
 - 1) Manufacturers:
 - a) Mueller Industries, Inc.
 - b) Henry Technologies.
 - c) Superior Products LLC.
 2. Plastic Piping: Polyvinyl chloride (PVC), schedule 40 DWV. ASTM D-2665
 - a. PVC Pipe:
 - 1) Manufacturers:
 - a) Charlotte Pipe
 - b) Genova Products
 - c) U.S Plastic Corp.
 - b. PVC Fittings and P-Traps: ASTM D 2665, socket type, made to ASTM D- 2665,
 - 1) Manufacturers:
 - a) Lasco Fittings, Inc.
 - b) Genova Products
 - c) U.S Plastic Corp.
 3. Brazing Rods:
 - a. Products:
 - 1) Lucas-Milhaupt, Inc.; Sil-Fos
 - 2) Johnson Matthey Metal Joining; Easy-Flo.
 4. Piping Insulation: Closed cell polymeric foam insulation.
 - a. Products:
 - 1) Armacell, LLC; AP/Armaflex II.
 - 2) K-Flex, USA; Insul-Tube/K-Flex LS.
 5. Insulation joint sealant: Fast drying neoprene contact adhesive.
 - a. Products:

- 1) K-Flex, USA; K-Flex 320
 - 2) Armacell, LLC; #520 contact adhesive
 6. Foam Insulation: two-component, quick-cure polyurethane foam
 - a. Products:
 - 1) The Dow Chemical Company; Froth-Pak or approved substitution.
- C. Condensate Drain Piping Support: Material required to support and secure condensate drain piping, includes but is not limited to:
 1. Copper bell hanger, Copper Van Hanger, copper plated split ring pipe hangers
 - a. Manufacturers:
 - 1) Jones Stephens Corp.
 - 2) Carpenter & Paterson, Inc..
- D. Heat Tape.
 1. Basis of Design Product: Raychem, a division of Tyco Thermal Controls; # 5XL1-CR.
 - a. Furnish and install for piping exposed to freezing conditions indoors and outdoors.
 - b. Furnish and install RayClic Type Termination Kits with the system.
- E. Other Products: Furnish and install additional parts or materials as required for a complete system to the Owner's specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of fixtures and equipment condensate drains.
- B. Examine roughing-in for fixtures and equipment condensate drains to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: For remodel projects perform work in a manner as to provide a minimum of annoyance and interference to Owner's operations, its customers and vendors.
 1. Do not perform any Work that voids a manufacturer's warranty.

3.3 DRAIN CONNECTIONS

A. Refrigerated Cases and Equipment Drains:

1. Refrigerated cases will be furnished with a trap, either built-in or supplied loose by the equipment manufacturer, for connection to case drains.
2. Run case drains to the nearest hub drain or floor sink with schedule 40 PVC pipe unless other material is required by code.
 - a. Furnish and install cleanout unions in the most accessible location for cleaning.
 - b. Run drains full size whenever possible. Cement and clean connections.
 - c. Drain lines to be cleaned and cemented.
 - d. Furnish and install PTFE tape (Teflon) for threaded fittings.
 - e. Cut the ends of drain pipe at angle to help ensure air gap.
3. Install pipe to one hub drain or floor sink for every two cases, or separate drain for each case. Drain each case independently all the way to the hub drain or floor sink.
 - a. Hussmann Impact Cases: One drain stub per case.
 - b. Hussmann Excel Cases: Two drain stubs per case.

B. Walk-in Cooler/Freezer and Prep Area Evaporator Drains:

1. Walk-in Coolers: Furnish and install copper drain lines and traps from coils to hub drain or floor sink outside walk-in boxes.
2. Low Temperature Walk-in Freezers: Furnish and install type M, hard copper drain lines from coils to hub drain or floor sink outside of freezer. Route drain lines to exit box as quick a possible reducing potential for freezing. Slope drain lines not less than 15 degrees. Insulate drain lines and wrap with heat tape inside of freezer. Hard wire electrical connections.
3. Refrigerated Preparation Areas: Furnish and install type M hard copper drain lines for coils. Run lines shall to condensate drain most practical for use
4. Verify drain line installation route with Owner prior to installation of condensate lines.
5. Do not install drain lines smaller than the coil drain and connection.
6. Install copper union at the bottom of the pan to permit removal of the drain line.
7. Install drain lines so as not to interfere with removal of the drain pan.
8. Install union fitting within 12 inches (305 mm) of the drain pan.
9. Heat tape for freezer drain lines shall be installed by the Fixture Electrical Installer.
10. Seal wall penetrations with expanding foam and silicone sealant, inside and out.
11. Install walk-in's coil drain lines "P" traps immediately outside the walk-in boxes, tight against wall and not at the hub drain where it can be damaged. Do not install traps inside the walk-in box unless specifically required by authorities having jurisdiction

C. Other Condensate Drains:

1. Disconnect condensate pan heaters for self-contained equipment and install 1 inch (25 mm) drain line piped to a nearby drain where possible.

END OF SECTION 11 41 34

SECTION 11 41 43 - REFRIGERATION SYSTEM INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY

A. General:

1. This Section specifies installation of the refrigeration system furnished by the Kroger Company referred to as the Owner.
2. This Section includes various store type installations. Some of the items specified in this Section will not be used on the Project. Refer to Drawings for items included in the Project.
3. The Installer is responsible for supervising their own work and meet dates shown on the installation schedule.

B. Section includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply the following equipment:
 - 1) Refrigeration pipe and fittings.
 - b. Comply with requirements in Division 00 Section "General Conditions."
 - c. Refer to Division 00 Sections "Instructions to Bidders" and "Direct Buy Refrigeration Copper Pipe Bidding" for bidding procedures.
2. Contractor supplied items:
 - a. All other material and equipment specified in this Section and on the Drawings necessary for a complete and working installation of Owner's refrigeration system.
3. Installation of the Owner furnished items shown on the Drawings including, but not limited to the following:
 - a. Refrigeration piping and copper fittings.
 - b. Condensing units/systems.
 - c. Remote condensers.
 - d. Refrigerant for charging systems.
 - e. Refrigeration system devices associated with controls.
 - f. Refrigeration Systems.
4. Installation of Installer supplied items including, but not limited to the following:
 - a. Miscellaneous copper tubing and fittings not provided in the Direct Buy take off.
 - b. Refrigeration oil.
 - c. Identification of systems.
 - d. Valves and controls for existing systems.

- C. Modifications and additions to this Section, if required, are indicated in Section 11 41 43.01 "Supplementary Refrigeration System Installation." If Section 11 41 43.01 "Supplementary Refrigeration System Installation" is not included in this Project Manual, no modifications and additions to this Section are indicated. Where any portion of this Section is modified or deleted by Section 11 41 43.01 "Supplementary Refrigeration System Installation," the unaltered portions shall remain in effect.

1.2 REFERENCES

A. Definitions

- 1. Certain terms and words used throughout Section shall be defined as follows:
 - a. **Owner:** The person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's Representative.
 - b. **Contractor:** The General Contractor with overall responsibility to build a complete store, on schedule, ready for operation as a complete food store.
 - c. **Installer:** The entity identified in this Section responsible for but not limited to material and installation of the refrigeration system, as identified in this Section.

B. Reference Standards

- 1. Kroger Refrigerant Management Policy: See end of this Section.
- 2. Code of Federal Regulations 40 C.F.R. part 82 - Protection of Stratospheric Ozone
- 3. Kroger Controller Set Points Document: Located in Owner's project management website.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Report to Owner any defaults in work furnished and installed by others that causes conditions unsuitable for Installer's Work. Failure to inspect and report unsuitable conditions shall constitute acceptance of work furnished and installed by others as fit and proper for coordination with the Installer's work.
- B. Cooperation with Other Trades: Cooperate with other installers doing work on the Project to prevent any conflict that would require moving or changing any refrigerant lines, devices, or other equipment, or require other installers to relocate devices and piping when installed according to plans and specifications.
 - 1. Where interference exists, notify Owner before proceeding with installation.
- C. Work Schedules
 - 1. Typical work schedule shall consist of five 8-hour workdays ending no earlier than 3:00 p.m. local time at the store or in shifts as required in the Phase Plan or Project Schedule.
 - a. For non-local Installers, as approved by the Owner, work may be conducted in four 10-hour days provided the work day does not end prior to 3:00 p.m. local time.

2. Three weeks prior to opening day, the Installers work crews will work minimum of five 8-hour days.
 3. Work Restrictions: For remodels, pre-piping of systems that require blocking a shopping pattern must be done between the hours of 10 P.M. and 7 A.M., unless receiving prior approval of the Owner.
- D. For remodels, temporarily relocate cases and or systems as indicated or directed by Owner. Verify special project scope and schedule.

1.4 SUBMITTALS

- A. The Owner will provide the following submittals for Owner supplied items for the Installer's information upon request:
1. Product Data: For each item and accessory supplied electronically by Owner.
 2. Shop Drawings: For special components and installations not detailed in manufacturer's product data.
- B. Pre-Construction Submittals
1. Pre-inspection checklist.
 2. Proposed line routing plan.
- C. Closeout Submittals
1. Operation and Maintenance Data: For equipment provided by Installer and equipment provided by Owner to include in operation and maintenance manuals. Include service and installation instructions.
 - a. Collect manuals for equipment installed in this Section and place in a three-ring binder. Deliver to the Owner's store manager upon completion of the Work. Refer to General Condition for additional requirements.
 - b. The Owner will supply the Installer with receiver copies of all equipment and fixture purchase orders to include in Operation and Maintenance Manual.
 2. Record Drawings: As-built drawings showing the location of refrigeration lines. Include the location of isolation valve, control valves (EPR's and solenoids) and line sizing.
 3. Kroger Refrigerant Management Tracking Form.
 4. Accidental Release Report.
 5. Completed Kroger Site Punch List.
 6. Piping Test Check Sheet.
 7. Superheat Recording.

1.5 QUALITY ASSURANCE

- A. Work, materials, and equipment shall comply with rules and regulations of authorities having jurisdiction. Continually monitor field installation for code compliance and workmanship quality. Installation shall comply with all manufacturers' recommendations.
- B. All refrigeration Work to be in compliance with the Kroger Refrigeration Management Policy.

- C. Maintain a set of Contract Documents easily accessible within the building for Owner to review and verify any discrepancies.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. For remodels, do not store material in the sales area. Material stored in the back room must be out of the way of the Owner's operations.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of other construction by field measurements before beginning Work. If there are any discrepancies notify Owner.

1.8 WARRANTY

- A. The Installer agrees to repair or replace any component that deteriorates or malfunctions as a result of improper installation by the Installer within specified warranty period including replacement of all components under warranty of equipment manufacturer.

1. Warranty Period: 90 days from date of store Grand Opening provided installation is accepted and approved as completed in compliance with the Contract Documents by the Owner.
2. Return of Warranted Parts: The Installer is responsible for the return of all manufacturers' warranted parts, and will be held liable for all in-warranty parts not returned. The equipment manufacturer will be liable for all costs incurred due to defective material and workmanship of equipment. If loss is due to installation, then the responsibility is that of the Installer. If the loss is joint responsibility, then the Owner will hold both parties responsible and The Owner will allocate responsibility for each liable party. If failure is due to the Owner's negligence or the service company performing maintenance, then it will be the Owner's responsibility. Although the original equipment manufacturer (OEM) and other trades may assist the Installer with operation issues, final responsibility for the operation is the is that of the Installer.
3. Manufacturer Warranted Equipment: Before the store Grand Opening, the warranty is to include labor and replacement of all parts. Obtain manufacturer's approval before making repairs. If approved, the manufacturer will accept invoicing for expenses involved in the repair. Where repairs must be made on an emergency basis without obtaining manufacturer's approval, the installer shall obtain Owner's approval and proceed with repair. Installer shall be reimbursed for necessary labor and materials required to make emergency repair.
4. Warranty Retainage: Until the end of the warranty period, 5 percent of the contract amount due the Installer will be held as a retainage unless a different retainage percentage is required by the Authority Having Jurisdiction.
5. Warranty Service: During the warranty period, regardless if the service call is due to failure of equipment or failure of the installation, the Installer shall enter the service call with Service Hub, the Owner's electronic service call system. Submit service reports to the Owner at the end of the warranty period.
 - a. In the event that the Installer fails to respond to an emergency call within the specified time during the warranty period as defined in the details of the call they receive from Service Hub, the Owner reserves the right to have the problem corrected at the Installer's expense.

- b. In the event that the Owner's in-house personnel (service person) must complete items, Installer agrees to pay time and material to the Owner for the work. The Owner's time will be charged at the Installer's current billable rate for straight time or overtime as appropriate. Charge includes any lodging and travel cost associated with repair.
- c. As part of the Installer's warranty service, the Installer shall make arrangements to have a service technician present at the store for the Grand Opening day to correct problems or make adjustments designated by the Owner, working a minimum of four hours, commencing two hours before store opening.

B. 60 Day Warranty Inspection

- 1. Schedule a warranty walk-thru with the Owner 60 days after the Grand Opening as specified in article "Field Quality Control" in Part 3 of this Section. Within two weeks of the 60-day warranty inspection and prior to acceptance by the Owner and release of the refrigeration installer's warranty, correct all deficiencies noted at the time of the inspection.

C. Refer Division 00 Section "General Conditions" for general warranty information.

PART 2 - PRODUCTS

2.1 GENERAL

- A. New Equipment: Liquid line solenoids/suction stops, EPRs and solenoid coils are sized and supplied by the refrigeration equipment manufacturer as indicated on refrigeration equipment manufacturer's Shop Drawings.
- B. Existing Equipment: Installer is to provide liquid line solenoids/suction stops, EPRs and solenoid coils required in the existing equipment within the store. See refrigeration design plans for clarification.

2.2 OWNER FURNISHED PRODUCTS

- A. Receive, handle, store, and protect materials, equipment, fixtures or supplies delivered to the site by the Owner for installation under this Section. Schedule and coordinate deliveries.
- B. Refrigeration Tubing and Fittings.
 - 1. The Owner will furnish all refrigeration pipe and fittings including copper P-Traps through the Direct Buy Refrigeration Copper Pipe Bidding procedure as described in Division 00 Sections "Instructions to Bidders" and "Direct Buy Refrigeration Copper Pipe Bidding."
 - a. Piping: ACR, Type L, hard copper piping (cleaned, dehydrated, and capped lengths).
 - b. CO2 System Piping:
 - 1) Circuit Piping (1-3/8 inch and smaller): ACR, Type L, hard copper piping (cleaned, dehydrated, and capped lengths).

- 2) Circuit Piping (1 5/8 inch and larger): ACR, Type K, hard copper piping (cleaned, dehydrated, and capped lengths).
- 3) Pressure Relief Lines: ACR, Type K, hard copper piping (cleaned, dehydrated, and capped lengths).
- 4) Supply and Return Lines from Gas Coolers: Iron/copper piping (cleaned, dehydrated, and capped lengths).

a) Product: Mueller Streamline Co.; Streamline XHP.

2. The Owner will permit the Installer to make adjustments before the Owner places the actual order as long as the adjustments do not exceed the value of the total copper pipe originally calculated on the Copper Pipe Take-Off Form. If the changes translate to higher cost in relation to the total copper price originally calculated, the Installer will be responsible for the difference by providing any additional copper pipes, fittings, and other material equal in quality to Owner supplied items, to complete the Work at the sole expense of the Installer. All left over copper tubing and fittings are the installer's property to remove from the premises.

- C. Refrigerant: New and recovered refrigerants remain the property of the Owner and shall be accounted for as identified in the Kroger Refrigerant Management Policy (attached to this section).

2.3 INSTALLER FURNISHED PRODUCTS

- A. General: Unless otherwise specified, all materials and equipment items shall be new. All materials used in the Project shall be equal to approved samples in every respect. When required by the Owner, the Installer shall provide certificates of conformance for materials specified.

- B. Isolation Ball Valves: Full port construction matching line size ID with access port to allow the isolated portion of the circuit to be serviced. Access valve to be fitted with Mueller A 04544 Flare Seal Cap which contains Mueller A 00401 Copper Flare Gasket and tightened to 8-12 lb-ft or one quarter turn past finger tight. Provide 1 inch (25 mm) thick self-sealing elastomeric insulation cover.

1. Isolation Ball Valves (CO2 Systems): For circuits 1-1/8 inch and smaller provide Parker Hannifin Corp., Sporlan Division; Sporlan EBV(T)-PR. Circuits over 1-1/8 inch to utilize a standard ball valve and a field installed check valve bypass as shown on refrigeration details.
2. Manufacturers:
 - a. Danfoss A/S
 - b. Emerson Climate Technologies
 - c. Mueller Industries, Inc.
 - d. Parker Hannifin Corp., Sporlan Division.
 - e. Superior Valve Co.

- C. Brazing Rods:

1. Product:

- a. Lucas-Milhaupt, Inc.; Sil-Fos.
 - b. Johnson Matthey Metal Joining; Easy-Flo.
- D. Piping Insulation: Closed cell polymeric foam insulation.
 - 1. Product:
 - a. Armacell; AP/ArmaFlex II.
 - b. K-Flex, USA; Insul-Tube/K-Flex LS.
- E. Piping insulation plastic saddle pipe support:
 - 1. Product:
 - a. Armacell; Insuguard Pipe Saddle.
 - b. Cooper B-Line; Snap n Shield.
 - c. Hydra-Zorb Co.; Bronco Insulation Tube & Pipe Saddle.
 - d. ZSI-Foster; Snap-A-Saddle.
 - 2. Color:
 - a. White: Where structural steel is to be painted.
 - b. Black: Where structural steel is to remain unpainted.
- F. Insulation joint sealant: Fast drying neoprene contact adhesive.
 - 1. Product:
 - a. K-Flex, USA; K-Flex 320.
 - b. Armacell; #520 contact adhesive.
- G. Slotted Channel Framing to support refrigeration lines: Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Basis of Design Product: Unistrut Corporation; Series P-4000 or heavier.
- H. Channel Mounted Pipe Clamping Device (Pipe Clamp): Steel clamp with locknut and thermoplastic elastomer cushion.
 - 1. Basis of Design Product: Unistrut Corporation; Cush-A-Clamp.
- I. Oil for Parallel Compressors: Polyolester (if required)
 - 1. Basis of Design Product: Exxon Mobil Corporation; Mobil EAL ARTIC 22
- J. Silicone Sealant: ASTM C 920, Type S, Grade NS, Class 25, Use NT, A or N-Curing, Mildew-Res.
 - 1. Product:
 - a. Dow Corning Corporation; 786 Mildew Resistant.
 - b. GE Silicones; Sanitary SCS1700.

- c. Pecora Corporation; 898.
 - d. Tremco, Inc.; Tremsil 200BASF Omniplus.
- K. Butyl-Rubber-Based Joint Sealant: ASTM C 1311.
 - 1. Products:
 - a. Bostik, Inc.; Chem-Calk 300.
 - b. Pecora Corporation; BC-158.
 - c. Tremco, Inc.; Butyl Sealant.
- L. Insulation Jacking: UV protection
 - 1. Basis-of-Design Product:
 - a. Johns Manville; Zeston 2000 Series PVC
- M. Receiver insulation UV resistant coating
 - 1. Basis-of-Design Product:
 - a. Armacell; ArmaFlex WB, white finish.
- N. Foam Insulation: Two-component, quick-cure polyurethane foam
 - 1. Basis of Design Product:
 - a. The Dow Chemical Company; Froth-Pak.
- O. Any additional parts or materials required for a complete system to Owner's specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for refrigerant piping systems to verify actual locations of piping connections before equipment installation and provide Owner with line routing plan.
- B. After examination, provide documentation of potential issues and propose recommendations for the refrigeration systems related to the Project and indicate any deficiencies on the Pre-Inspection Checklist.
- C. Identify any debris or hazardous conditions in areas where the Installer will be working.
- D. Note condition of existing insulation on refrigeration lines that will be reused.
- E. Notify Owner of any existing refrigeration line sets that are to be re-used that do not have proper support or saddles.
- F. Walk the store with the Owner and the Owner's refrigeration mechanic or third party and complete the Pre-Inspection Check List. Items that are found as subjects of concern shall have an agreement of resolution documented prior to starting any system modification. After the

agreement of resolution is received the Installer shall be responsible for refrigerant leaks on that system until the terms of warranty are satisfied.

3.2 INSTALLATION

- A. General: For stores remaining open during construction, perform work in a manner as to provide a minimum of annoyance and interference to Owner's operations, its customers and vendors.
1. No work shall be done by the Installer that will void a manufacturer's warranty.
 2. If during the course of the Work any piece of equipment under the scope of this Work is damaged (the damage occurring after arrival), notify the Owner immediately, listing the model number, serial number, and the extent of the damage. The Installer shall ensure the damage is corrected.

3.3 RECEIVING, UNLOADING, SETTING, AND ASSEMBLY

- A. General:
1. Arrange for equipment manufacturer's representative to be present during unloading and setting (refer to Owner's P.O. and delivery schedule).
 2. Immediately upon delivery, inventory contents of containers. Notify supplier and Owner in writing when cases and other refrigerated equipment do not include material normally supplied in accordance with the equipment list, including holding charge. Lack of holding charge is unacceptable.
 3. Protect refrigeration equipment prior to installation.
 4. Inspect equipment after uncrating. The equipment and accessories furnished are pre-wired and are purchased with the manufacturer's standard one-year parts warranty. If equipment arrives at the Project damaged:
 - a. Obtain a signed inspection report, in duplicate, from carrier.
 - b. Notify the Owner and fixture supplier immediately.
 - c. Do not conduct repairs or replacement until authorized.
 - d. Take photographs of damaged equipment and provide to Owner.
 5. Upon Owner's authorization, replace any malfunctioning parts or equipment with manufacturer's original equipment. Proceed with installation only after unsatisfactory conditions have been corrected.
 6. Remove and dispose of trash and debris resulting from the uncrating, joining, and assembly of equipment completely and in an orderly fashion. Remove trash and debris daily and dispose of materials lawfully.
 7. Receive, unload, uncrate, store, and assemble equipment, materials and supplies covered by this Section including evaporator coils and other equipment that reflects the refrigeration installer's bid for installation.
- B. Prefabricated Mechanical Center
1. Remove shipping spacers.
 2. Verify that hold down nuts on spring mounted compressors are not touching the compressor feet, and are not more than approximately **1/16 inch (1.5 mm)** above the mounting foot.

3. Check components, including flare fittings, and electrical connections, to insure tight and operative connections.
4. Install the following items included with the prefabricated mechanical center:
 - a. Exhaust fan.
 - b. Intake louvers.
 - c. Rain hoods.
 - d. External light.
 - e. Gasket (roof mounted only).
 - f. Trolley.
 - g. Ambient air sensor.
 - h. Steps (when supplied).
5. Unload and set the refrigeration prefabricated mechanical center.
6. Remove lower lifting hooks that may interfere with the installation of the center.
7. Weld steel channels to top of structural steel.
8. Refrigeration Installer to be present for the setting of the prefabricated mechanical center.
9. If prefabricated mechanical center is roof mounted, ensure curb gasket is installed.

C. Condensers

1. Unload and set the rooftop condensers. Adjust equipment supports to level condensers and secure with screws provided with supports.
2. Secure condensers to equipment supports per direction included in ASD-81 and ASD-81A or as otherwise indicated on Drawings.
3. Install anti-vibration mounting pads under evaporative condensers.
4. Refrigeration Installer to be present for the setting of the condensers. If condensers are roof mounted, ensure curb gasket is installed.

D. Distributive Refrigeration Racks:

1. Remove factory installed panels to access lifting points on frame.
2. Adjustment: Install field supplied shims between vibration isolation pads supplied with each rack and the floor per manufacturer's printed instructions.
 - a. Install field supplied shims. Maintain manufacturer's recommended clearances.
3. Accessibility: Install per manufacturer's recommended clearances and as required by Authorities Having Jurisdiction.

E. Conventional Systems

1. Secure unit to curb for rooftop units.
2. Hang unit from structural steel for cooler top installation.
3. Run refrigeration piping.
4. Screen and foam penetrations.
5. Assist controls installer in programming unit.

3.4 PIPING, REFRIGERANTS, OIL, AND LUBRICATION

A. Refrigerant Lines, Fittings and Accessories

1. Cut spun end off rack circuits, attach 90 degree long radius elbow and pipe through mechanical enclosure wall and seal with grommets provided.
2. When line sizing is not provided or installer is reusing or extending existing lines, verify proper line sizing in accordance with the capacity required. Base line sizing on length of run and height of riser and select the proper line size in accordance with the refrigeration systems manufacturer's line sizing recommendations. Before starting installation, submit a pipe routing plan to the Owner showing the method used to install refrigerant lines in trenches, pits and PVC sleeves. Any required re-routing of lines must be approved by the Owner.
3. Protection: Provide temporary protection of the piping system until the Work is in satisfactory operation. After piping has been inspected and is operational, advise general installation installer to proceed with installing the permanent guards as required to protect the piping and from damage.
 - a. Provide no less than 20 psi (138 KPa) nitrogen holding charge on plugged copper so that it is not being held with any atmospheric contaminants overnight.
4. Do not allow crossing copper pipes to touch each other. Offset or insulate to avoid copper-to-copper contact. Do not allow refrigerant piping to come in contact with electrical conduit, dissimilar grounded metals, fire retardant wood, pressure treated wood or abrasive surfaces. Install piping to permit expansion and contraction without harm to the system.
5. For underground installations install hard copper piping inside under floor PVC sleeves. Pressure test and insulate lines prior to assembly into pits and burial. Keep refrigerant piping clean and dry. Keep refrigerant piping sealed and pressurized except during cutting or fabrication. Extend lines a minimum 12 inches (305 mm) above finished floor elevation and cover both lines with insulation to prevent concrete from coming into contact with the copper. Foam in gap between concrete and insulation.
 - a. Arrange for Owner inspection prior to covering underground installations.
 - b. Do not use soft copper in any permanent installation without written approval of Owner.
6. Valves:
 - a. Verify that valves provided by the manufacturer are as called out on the refrigeration schedule and install per refrigeration schedule.
 - b. Supply all other valves that are not supplied by the manufacturer and are not on the refrigeration schedule.
 - c. On distributive piping systems, install isolation ball valves to allow isolation of each individual refrigeration circuit including that circuit's control valve.
 - d. Install isolation ball valve in accessible location to isolate under floor section of piping. Locating under cases is not accessible; indicate all isolation valve locations on As-Built plan provided to Owner at project close out.
 - e. Install an access port to allow pump out of the isolated circuit. Access valve to be fitted with Mueller A 04544 Flare Seal Cap which contains Mueller A 00401 Copper Flare Gasket and tightened to 8-12 lb-ft or one quarter turn past finger tight.
 - f. Provide normally closed solenoids with manual lift stem per refrigeration schedule. See refrigeration schedule to identify manufacturer furnished and installed valves.
 - g. Seal and securely tighten cap on valves with caps or stem covers.

- h. With the exception of island cases, install the valve assemblies on the top of the first case of each system where piping is stubbed out of wall.
- 7. Provide check valves and pressure equalization line from condensers to ports on receiver, as indicated by manufacturer's installation instructions.
 - a. Owner's manufacturer's equipment specification requires cases to contain a braze-in type valve with 1/4 inch (6 mm) SAE male flare access port with a hex head cap with copper gasket in-line before leaving fixture, for checking suction line pressure. Refrigeration walk-in coils also have manufacturer supplied access port.
 - b. Refrigeration walk-in coils also have manufacturer supplied access port. Access valve to be fitted with Mueller A 04544 Flare Seal Cap which contains Mueller A 00401 Copper Flare Gasket and tightened to 8-12 lb-ft or one quarter turn past finger tight.
- 8. Cutting
 - a. Cut tubing with a wheel-type cutter and ream to original bore.
 - 1) Do not saw-cut tubing unless approved in writing by Owner. When saw-cutting is absolutely necessary and approved by Owner, remove all debris and drag or wipe tubing clean after reaming.
 - b. Drag clean any piping left open and sand before using.
 - c. After a cut is made, deburr piping and clean with emery cloth.
- 9. Pipe Joint Construction:
 - a. Fittings:
 - 1) Do not use flare fittings.
 - 2) Material: Wrought copper only.
 - 3) Fabricate changes in line size and direction with fittings.
 - b. Turns:
 - 1) Fabricate turns in hard-drawn refrigeration piping by the use of 90-degree long radius fittings. Short radius is not acceptable.
 - 2) 45-degree fittings are not allowed.
 - 3) Do not use stub-in or formed long sweeping elbows, or pulled tees.
 - c. Brazing:
 - 1) Braze joints with a brazing alloy combining a minimum of 15 percent silver for copper-to-copper and 45 percent silver for copper-to-brass or steel.
 - 2) Protect equipment against heat damage during brazing operation.
 - 3) Use only oxy/acetylene welding equipment to obtain 2500 F (1371 C) tip temperature.
 - 4) Do not paint brazed joints with the exception of steel components such as suction accumulators and suction filters. Paint these items with red oxide

primer where connections are made. Notify Owner prior to painting to allow for inspection of joints.

- 5) A sufficient amount of dry nitrogen gas must be flowing through the copper lines during brazing to displace oxygen and eliminate scale and oxidation.

10. Pipe Joint Inspection:

- a. The owner has option to cut five brazed fittings to inspect for proper use of nitrogen. If oxidation is present at any one of the fittings inspected, an additional five fittings will be inspected.
- b. Replace all fittings inspected.
- c. If the Owner discovers that dry nitrogen gas is not being used to fill pipes during brazing, the Installer:
 - 1) Will be fined \$1,500.00 per event not limited to one event per day.
 - 2) Shall replace all suction and liquid line filters and any filters located in case and clean all expansion valves and screens.
 - 3) Shall complete above requirement after 48 hours of operation. The Owner reserves the right to have the Installer remove and replace all piping related to circuit of system. The standard requirement to change filter/dryers within 30 days of completion remains the same. All required labor and parts shall be at Installer's expense.
- d. Suction cores & Filters:
 - 1) Prior to performing modifications to a system, replace any missing suction cores.
 - 2) On conventional systems, remove suction cores and inspect after 30 days of operation. Place removed cores in motor room for inspection. If removed filters contain debris, install a second set of cores and run the system for an additional 30 days. Final filter will be felt core supplied by the Refrigeration Installer.
 - 3) For single condensing units affected by the project provide a cartridge suction filter in place of any brazed in filters

11. Completed Piping Holding Charge

- a. Refrigeration control pressure transducers should be shipped loose. If not, remove and plug ports before pressurizing or evacuating.
- b. Maintain each line set under **175 psig (1207 kPa)** until ready for connecting to the appliance and the rack.
- c. Connect a gauge ready access port to each line set to monitor pressure. This may be accomplished with one gauge, provided the liquid and suction lines are looped together, so that both are pressurized as a set.
- d. Point liquid line tees down. Point suction line tees up.

12. Provide a one-piece "P" type oil trap on suction lines with vertical risers of any length.

- a. For under slab fed piping install one-piece "P" type oil trap at base of riser under slab.
- b. Oil trap to be size of horizontal run.

- c. In remodel projects, sizing of vertical risers shall be in accordance with the condensing unit manufacturer's and Owner's recommendations.
 - d. When the suction line vertical riser length exceeds **12 feet (3.66 m)** install an additional one-piece "P" type oil trap at the midpoint of the riser.
 - 13. Keep horizontal runs of refrigeration piping accessible for maintenance and repairs. Do not install behind wall cases or back-to-back frozen food cases. Install along top of case or make additional vertical drops to cases. Attach to cases or metal studs with proper channels and clamps. Do not use metal straps.
 - a. Stub out vertical refrigeration piping from structural steel to case **1.5 inches (38 mm)** below the top of cases to ensure proper case top piping.
 - b. For case top refrigeration piping, install long radius suction line P-traps and provide the proper slope for oil return while keeping the piping as close to the case top as possible so that piping will remain hidden behind the **6 inch (150 mm)** high case top valance.
 - c. Any horizontal run behind cases must be approved by Owner's project engineer.
 - d. Any horizontal lines on top of cases shall be supported with unistrut.
 - 14. Install refrigeration piping straight and free from kinks and restrictions. Slope horizontal suction lines toward condensing units a minimum of **1/16 inch (1.6 mm)** per foot. On horizontal runs behind cases or in any instance, when the standard "trapeze" is not used, provide slotted channel framing with proper clamps.
 - 15. Penetrations:
 - a. Building or Prefabricated Mechanical Center: Where refrigerant pipes or electrical conduit penetrate walls, insulate pipe and seal the opening with sealant, screen, and foam. Provide a weather tight pipe box over refrigerant piping roof openings.
 - b. Cooler: Seal electrical conduit penetrating cooler walls to prevent airflow through pipe. Seal penetrations into the cooler with sealant and foam.
 - c. Encase refrigeration piping passing through concrete shall be encased in **1 inch (25 mm)** thick closed cell polymeric foam insulation with PVC exterior sleeves.
 - 16. Route discharge piping for pressure relief valves from ground mounted mechanical enclosure to ensure safety.
 - 17. Install purge valve on drop leg, minimum **3/8 inch (10mm)** valve size, at highest point on condenser lines.
- B. Hangers and Supports:
- 1. Provide piping supports spaced no greater than **10 feet (3.05 m)** on center, provide additional supports as necessary to hold piping straight and prevent sagging or vibration, Refer to RISD-33.
 - 2. Install hangers to properly prevent vibration or undue strain on any pipe fittings. Double stack supports, only if necessary.
 - 3. Use only plastic saddle pipe supports to support suction and liquid lines.
 - 4. Provide slotted channel framing for vertical supports with channel mounted pipe clamping devices installed on each individual line. Insulate per RISD-34.
 - 5. Suspend channels with a minimum of two **3/8 inch (9.5 mm)** minimum all-thread rods with double nuts. Refer to RISD-33.

6. Provide cadmium plated or galvanized nuts and bolts with self-locking nuts or double nuts on pipe clamps.
7. Attach new hanger rods for all new lines to top of joist or at panel points.
8. Unistrut channel series P-4000 or heavier, will be used for vertical supports on each individual line.
9. Pipe clamps:
 - a. Do not clamp over insulation.
 - b. Do not secure piping using tie wraps.
 - c. Provide one clamp for risers under 10 feet (3 m) in height and at least two clamps for risers over 10 feet (3 m) in height. Refer to RISD-33.
 - d. Support piping lines within 4 feet (1220 mm) before and after turns.
10. Provide specified clamp for vertical applications. Alternate clamping device may be provided for horizontal insulated pipe installations where saddles are prohibitive.

C. Insulation

1. Install insulation in accordance with manufacturer's written instructions.
2. Cover directional changes in refrigeration piping by making two 22.5-degree (mitered) cuts and gluing joints. Also, provide four 22.5-degree mitered cuts and glued joints for all traps. Do not pull insulation around elbow or split insulation unless approved by Owner.
3. Insulate all suction lines from accumulator to fixtures and walk-ins.
4. Insulate refrigeration lines, both liquid and suction, heat reclaim, at penetrations through floors and walls for at least 6 inches (152 mm) on both sides of the opening. Seal penetrations with rigid foam.
5. Insulate suction lines from a point one inch inside the case to as close as possible to the compressor.
 - a. Thickness:
 - 1) Pipes Less Than 1 inch (25 mm): 1/2 inch (13 mm) thick for both medium and low temperature applications.
 - 2) Pipes 1 inch (25 mm) or Larger: 0.75 inch (19 mm) thick for both medium and low temperature applications.
 - 3) Low Temperature CO2 Refrigeration System Suction Lines: 1-1/2 inch (38 mm).
 - 4) Medium Temperature CO2 Refrigeration System Suction Lines: 1 inch (25 mm)
6. Insulate liquid header, sub-cooler, and stubs on systems in a parallel installation which have mechanical sub-cooling.
 - a. Thickness: 0.75 inch (19 mm) thick, including liquid line drier shells, except those portions of the line inside the cases.
7. Insulate CO2 refrigeration system liquid lines.
 - a. Thickness: 1 inch (25 mm).

8. Only insulate liquid lines for systems that utilize sub-cooling and all CO2 refrigeration systems.
9. Insulate only the supply lines, all the way to the coils, for heat reclaim lines, HVAC and H2O.
 - a. Thickness: 0.75 inch (19 mm).
10. Seal joints with insulation joint sealant, applied to both surfaces. Allow to become tacky before joining.
11. Wrap exterior pipe insulation with PVC jacking to protect from exposure to UV damage.
12. Insulation for Receivers Located Under Rooftop Condensers:
 - a. New receivers should come insulated and coated with white UV resistant coating. If not, install closed cell rubber sheet insulation and apply white UV resistant coating.
 - b. For existing receivers on remodels, replace missing insulation and remove all existing insulation on that has become deteriorated. Install new closed cell rubber sheet insulation and apply white UV resistant coating.
 - c. Thickness: 0.75 inch (19 mm).

D. Heat Reclaim

1. Install HVAC, water heater, and heat reclaim refrigerant piping prior to start-up of the refrigeration systems.
2. HVAC Heat reclaim coils will be provided by the Owner and will be factory installed into the HVAC unit.
3. Hot water heat reclaim tanks, temperature sensor that controls the three-way valves supplying refrigerant to the heat reclaim water heater, and the three-way valves are supplied by others.
4. If high pressure drops are measured for reclaim water heaters inform the Owner's project manager so that a bypass valve can be installed (pressure drop in excess of 2 psi (13.8 KPa)).
5. Install Shrader fitting in heat reclaim discharge piping near the compressor (or discharge header) for testing and evacuation.
6. Verify that controls are set, and the heat reclaim is working properly.
7. Route heat reclaim piping below the roof.
8. Identify and reuse all heat reclaim. Notify Owner if any heat reclaim circuit will be abandoned.

E. Condensers

1. Examination: Verify that condensers have adequate space to allow proper air circulation with no obstructions that would cause the air to re-circulate. Notify Owner if conditions exist that do not allow free airflow through the condenser. Verify fan rotation including those with VSD control and while in bypass.
2. Install condenser piping as indicated. Include installation of a stub with shut off valve and an access valve fitting at the highest point of the discharge gas line above the condenser inlet manifold. Access valve to be fitted with Mueller A 04544 Flare Seal Cap which contains Mueller A 00401 Copper Flare Gasket and tightened to 8-12 lb-ft or one quarter turn past finger tight.

- a. Piping Connection to the Condenser Outlet Manifold: Same size as manifold stub.
- b. Install a ball valve in the drop leg for condenser isolation.
3. When installing an evaporative condenser system, coordinate with Contractor.
4. Install outdoor temperature sensors on the condenser under the no. 1 fan on new outdoor condensing units
5. Clean condenser coils prior to grand opening.

F. Cases, Preparation Areas and Walk-ins

1. Properly support and secure case piping.
2. Line Reductions in Case Piping: Install per manufacturer's recommendations.
3. Run piping for the same application through the cases rather than on the outside, where possible.
 - a. Do not run piping for one case lineup through another case lineup.
 - b. Do not run piping for one system lineup through another system lineup.
 - c. Support piping inside fixtures with foam tape and insulation.
4. Install piping free of kinks in a manner that allows service access to all refrigeration components of the fixture. Protect piping with insulation so that normal servicing of components is not hindered.
5. Vertical Refrigeration Piping Enclosures: For stores with ceilings, conceal refrigeration piping from overhead steel to top of refrigerated cases in PVC pipe false column with pipe diameter to match existing building columns. When the refrigeration piping and other associated electrical conduits will not fit in false column general installation installer to provide vertical pipe enclosure coordinate with general installation installer.
6. Thermometers for new walk-in coolers and freezers are factory installed. For remodels the Installer shall insure that all existing thermometers are installed in 1 inch (25 mm) by 6 inch (152 mm) copper pipe with cap and bulb of thermometer installed in tube with pipe filled with refrigerant oil. Insure pipe with bulb is located as far away from the door as possible.

G. Refrigerants

1. Owner will supply refrigerant unless otherwise indicated on Drawings or specified prior to bid. Install only refrigerant identified on the refrigeration legend as provided by the Owner.
 - a. Inform the Owner of the estimated number of pounds required for the Work. Refrigerant will be provided in disposable cylinders, which are to be recycled when empty in accordance with Kroger Refrigerant Management policy and 40 C.F.R. part 82. guidelines.
2. Reclaim Cylinders
 - a. The Owner will supply the reclaim tank unless otherwise specified.
 - b. Attach informational tag to reclaim cylinder upon completion of reclaiming process on equipment. Completely fill in information on cylinder tag and store cylinders in compliance with OSHA regulations pending shipment. Complete bill of lading prior to shipment.

- c. Reclaimed cylinders are the sole responsibility of the Refrigeration Installer until cylinders are accepted by the Owner's maintenance department and the Owner's project manager is notified.
- d. Ship reclaim cylinders in accordance with regulations of department of transportation having jurisdiction. Request transportation from Owner's project manager 72 hrs prior to shipment.

H. Guards

1. Fabricate and install guards as necessary to protect any controls (including but not limited to suction stop valves) where subject to damage by Owner's operation.
2. Fabricate guards in such a manner to provide ease of service.

3.5 REFRIGERATION ELECTRICAL INSTALLATION (reference)

- A. Refer to Section 11 41 63 "Fixture and Equipment Electrical Installation."
- B. Coordinate electrical hook up of refrigerated equipment with the Fixture Electrical Installer.

3.6 REMOVAL OF EQUIPMENT (Remodels Only)

A. Existing Compressor Requirements

1. Remove existing compressors as indicated.
2. Seal openings with metal flanges or caps as required. Minimize environmental contamination, physical damage and any other condition that would affect the reusable condition of the removed compressors.
3. Remove existing compressors from areas of operation in preparation for shipment. Palletize units on ground floor in back storage area of stores and notify Owner's project engineer when removed compressors are ready for shipment. Coordinate with store management concerning storage of compressors as to not affect store operations.
4. Submit to Owner's project manager a written inventory report of model/serial numbers of compressors being shipped to supplier.
5. If a new compressor is supplied and not required during remodel, owner will be notified so new compressor shall be shipped back to supplier.

B. Removal of condensing units.

1. Remove existing condenser units as indicated on R1 Drawing or Scope of Work. Remove units carefully in suitable condition for possible reuse.
2. Evacuate refrigerant into reusable approved containers. Follow Owner's refrigerant handling procedure and turn over containers to Owner.
3. Cut and cap refrigeration lines remaining in building and on unit. Verify that the electrical installer has disconnected and removed the electrical supply.
4. If unit is located in an air-cooled compressor room, close off opening between remaining units with **1/2 inch (13 mm)** plywood attached to adjacent units or building walls for air tight condition.
5. Remove existing condenser unit from areas of operation in preparation for shipment on pallet and store on premises as directed by Owner or store director/manager. Do not store in location that will affect store operations. Notify Owner when units have been removed and are ready for shipment.

6. Submit a written inventory report indicating model/serial numbers of units removed to Owner's project manager.

3.7 SYSTEM TESTING AND START-UP

- A. Conduct testing and start-up procedures in accordance with manufacturer's service and installation manual and ASHRAE 147 criteria.
- B. Freezers:
 1. Preparation: Verify that concrete floor slab has cured for at least 7 days prior to commencing refrigeration system start-up.
 2. Pull-Down Process: A gradual temperature pull-down process is recommended in the following sequence:
 - a. 24 hours at 40 degrees F (4.4 degrees C).
 - b. Drop to 30 degrees F (-1.1 degrees C) for 24 hours.
 - c. Drop to 20 degrees F (-6.7 degrees C) for 24 hours.
 - d. Set to the final operating temperature.
- C. Filters:
 1. Before commencing Work, supply and replace suction filters, liquid line dryers, and oil filters.
 - a. For an existing conventional system with a braised in filter, replace with a canister filter.
 2. Remove suction filters 30 days after store Grand Opening.
 - a. Place filters next to equipment for inspection from Owner. After inspection, properly dispose of filters.
 - b. If filters are showing signs of debris, supply and install a second set of filters in the system for additional 30 days.
 - c. Install pleated suction filters upon verification of clean system at or after grand opening. New systems are provided with canister type filters
- D. Piping Test Check Sheet: Record testing results on Piping Test check Sheet (See end of this Section).
- E. Pre-Check
 1. Before beginning the leak check procedures, carry out the following pre-check:
 - a. Visually inspect refrigerant lines and joints for proper piping assembly and installation.
 - b. Ensure proper bracing.
 - c. Ensure that there are no metal-to-metal contact points.
 - d. Manually verify that mechanical joints are tight.
- F. Isolate components not suitable for the pressure levels indicated.

1. Warning: some components are not suitable for high pressure levels, including, but not limited to, some compressors, pressure transducers, and safety relief valves. Check with the component manufacturer if any doubt exists as to whether certain components should be isolated from the rest of the system during pressure tests.
- G. Open all valves, either manually or by energizing the solenoids, including the following:
1. Ball valves to circuits, branches, satellites, condenser, heat reclaim, receiver, etc.
 2. Main liquid line solenoid valve.
 3. Suction stop EPR valves.
 4. Both sides of condenser and heat reclaim piping.
 5. De-energize the solenoid valves (which are normally open).
- H. Pressure Testing for leaks
1. Confirm and execute more stringent pressure testing requirements of state or local authorities having jurisdiction. Charge new and existing systems and individual circuits/line sets/case line-ups with regulated dry nitrogen (and the appropriate tracer gas) to hold a minimum stationary pressure of **200 psig (1379 KPa)** for a minimum of 2 hours.
 2. Existing circuits to be modified, extended, or reworked shall be isolated by installing a ball valve and cap at a point where the new material is to be tied into the existing lines/system
 3. Check system access points to verify pressurization.
 4. Carry out the following procedure when a leak is discovered:
 - a. Isolate leak from rest of system.
 - b. Repair leak.
 - c. Retest area to verify leak has been repaired.
 - d. Re-pressurize the area to **200 psig (1379 KPa)**.
 - e. Before continuing, verify that all valves that were closed to isolate the leak are reopened after the leak has been repaired.
 5. Release the nitrogen charge to the atmosphere (verify that adequate ventilation is provided in the space).
 6. After passing these tests the system or circuit is ready to be evacuated.
- I. Pre-Evacuation
1. Before beginning the evacuation process, verify the following:
 - a. Verify that system is completely depressurized.
 - b. Plan procedures so breaking the vacuum with refrigerant does not introduce contaminants into the system.
 - c. Connect the evacuation pump to three points on the rack. If the system is small, connections at 2 points will be adequate.
 - 1) Connect to the **3/8 inch (9.5 mm)** flare ports.
 - 2) Use copper lines in lieu of hoses.
 - 3) If hoses must be used, provide special vacuum hoses in lieu of standard pressure hoses.

d. Vacuum pump:

- 1) Use multistage vacuum pumps. Connect to several branch circuits to access all components of the system.
 - a) Verify that each pump is tested prior to use and vacuum sensors are in working order. The pump must be able to achieve a vacuum of at least 300 microns. Test vacuum gauges and vacuum sensors according to manufacturer's instructions.
- 2) Use clean vacuum pump oil as recommended by the pump manufacturer.
- 3) Verify that electrical connections to the pump are secure and uninterrupted.
- 4) Check vacuum pump connections for leaks.
- 5) Monitor the pump for signs of normal operation (e.g. "vapor" from the pump exhaust early in the procedure that tapers off).

e. Lines and valves:

- 1) Use copper lines or hoses that are suitable for vacuum duty.
- 2) Use packless valves.
- 3) Properly tighten and check Schrader valve caps. Check the condition of o-ring in Schrader valve caps.
- 4) Properly tighten access valves and caps. Access valve to be fitted with Mueller A 04544 Flare Seal Cap which contains Mueller A 00401 Copper Flare Gasket and tightened to 8-12 lb-ft or one quarter turn past finger tight. In a deep vacuum, the open stems will draw in and cause a loss of vacuum. This will not be noticed during a pressure test.

f. Micron vacuum gauge

- 1) Before beginning evacuation, calibrate the micron gauges per manufacturer's instructions.
- 2) Verify with a gauge that the vacuum pump can pull a vacuum of at least 300 microns.
- 3) Attach a gauge prior to vacuum test.
- 4) Measure vacuum at the two most extreme positions of the system, 300 microns at furthest point.
- 5) Once the vacuum pump is isolated and turned off, begin any micron verification test only when the vacuum is determined to be stabilized at or below the required microns.

J. Evacuation Procedure

1. General: Perform evacuation and drying in the following manner after a satisfactory pressure test. Notify the Owner 72 hours in advance of any evacuation tests so that the Owner or their appointed representative may witness the vacuums obtained. The Owner's project manager or their appointed representative must approve and witness final micron readings, before refrigerant is introduced to the system. Provide written test results to the Owner's project manager or appointed representative. Any system placed in operation without final evacuation being witnessed by the Owner shall at the Owner's request be purged and re-evacuated. Reclaimed refrigerant is to be considered

- contaminated. Remove from the job site and replace with virgin refrigerant at the Installer's expense.
2. New System or Circuit (New Case, Line, or Other System Component that is New and not Previously Charged with Refrigerant or Oil):
 - a. Pull a system (or the isolated portion of a system) vacuum down to at least 1000 microns. If the system cannot pull a vacuum at any step, repair the leak using the previously described procedure with tracer gas.
 - b. If the 1000 micron (+/- 50 microns) vacuum holds stationary for one hour, break the vacuum with dry nitrogen to a pressure of 2 psig (13.8 KPa).
 - c. Install system suction and liquid drier cores.
 - d. Pull a second vacuum to a minimum of 700 microns.
 - e. Close vacuum header valves and allow system to stand for a minimum of one hour.
 - f. If the 700 micron (+/- 50 microns) vacuum holds stationary, break the vacuum with dry nitrogen to a pressure of 2 psig (13.8 KPa).
 - g. Pull a third vacuum to a minimum of 300 microns.
 - h. Close vacuum header valves and allow system to stand (once the vacuum is determined to be stationary at or below 300 microns).
 - i. If the 300 micron vacuum holds for 24 hours with a maximum drift of 100 microns, then the new system is ready to be charged with refrigerant.
 - j. For tying in a new circuit or lines into an existing operating system complete the following final procedure:
 - 1) Close valves and isolate the minimum existing section of line/circuit.
 - 2) Complete the final tie-in.
 - 3) Pull a vacuum of at least 1500 microns prior to putting into service.
 - 4) After the circuit is fully operable, thoroughly inspect connections for any refrigerant leaks.
 3. Existing System or Circuit (Relocation of Existing Cases, Lines, or other System Components that have been Previously Charged with Refrigerant and Oil):
 - a. Pull a system (or the isolated portion of a system) vacuum down to at least 1500 microns. If the system cannot pull a vacuum at any step, repair the leak using the previously described procedure with tracer gas.
 - b. If the 1500 micron (+/- 50 microns) vacuum holds stationary for one hour, break the vacuum with dry nitrogen to a pressure of 2 psig (13.8 KPa).
 - c. Pull a second vacuum to a minimum of 1000 microns.
 - d. Close vacuum header valves and allow system to stand for a minimum of one hour.
 - e. If the 1000 micron (+/- 50 microns) vacuum holds stationary, break the vacuum with dry nitrogen to a pressure of 2 psig (13.8 KPa).
 - f. Pull a third vacuum to a minimum of 700 microns.
 - g. If the minimum 700 micron vacuum holds stationary for one hour, then the system is ready to be charged with refrigerant.
 - h. For tying in a circuit or lines into an existing operating system complete the following final procedure:
 - 1) Close valves and isolate the minimum existing section of line/circuit.
 - 2) Complete the final tie-in.
 - 3) Pull a vacuum of at least 1500 microns prior to putting into service.

- 4) After the circuit is fully operable, thoroughly inspect connections for any refrigerant leaks.

K. Charging

1. Leave open the following:
 - a. Ball Valves: To circuits, satellites, condenser, heat reclaim, receiver.
 - b. Main Liquid Line Solenoid Valve: Should now be under control of the electronic controller.
 - c. Branch Circuit Liquid Line Solenoid Valves: Back out manual open stems.
 - d. Suction Stop EPR: Should now be under control of the electronic controller.
 - e. Split Condenser: Should be operating under pressure controls.
 - f. Verify operation of condenser fans and rotation direction.
 - g. Verify operation of case and evaporator fans to avoid flood back.
2. Close ball valve immediately downstream of the receiver.
3. Connect proper refrigerant tank to receiver access port through a liquid line drier.
4. Charge receivers to 60 percent on the liquid gauge or to the point of pressure equalization.
5. Disconnect refrigerant tank from the receiver access port.
6. Open ball valve immediately downstream of the receiver.
7. Continue charging system by connecting proper refrigerant drum to the suction header.
 - a. Isolate refrigerant circuit liquid line and charge through that port.
 - b. Charge system to 30 percent of the receiver on the liquid gauge.
 - c. Set compressor and all pressure controls.
 - d. Suction pressure should remain below a pressure corresponding to zero degrees temp system. Suction pressure should remain below a pressure corresponding to forty degrees.
 - e. Avoid adding more oil until system is properly charged.
8. Supply and install polyolester (POE) lubricant in parallel compressors (typically shipped from factory dry) prior to charging the system with refrigerant.
 - a. Check oil level in the compressor between 24 and 48 hours after the refrigeration equipment has been placed in operation and add or remove oil as required to attain proper level.
 - 1) Any additional oil needed for refrigeration systems will be provided by the Contractor.
 - b. Before operating fan motors, pump motors, or other associated equipment for refrigeration, check manufacturer's requirements for lubrication. Lubricate equipment only when recommended by manufacturer.

L. Final Check

1. After system is operational, conduct a complete walk-through of the system with a leak detector to make sure there are no leaks.

M. Start-Up

1. The start-up of the system will commence per the Owner's grand opening schedule. If any change to the schedule is required, notify the Owner immediately.
2. The manufacturer will supply at least one technician (manufacturer's representative) to the job site prior to the store grand opening. The manufacturer's representative will assist the Refrigeration Installer to ensure a smooth, timely and complete start-up of the system.
3. Refer to the "Start-up" section in the installation and service manual for proper procedures.
4. Before start-up, verify that electrical installer has checked and tightened each electrical connection, including factory pre-wired components.
5. During start-up of equipment check defrost, fan, light, and compressor circuits for amperage draw and correct if outside design parameters.
6. Check and record superheat.
7. Confirm heat reclaim is working.
8. Check refrigerant levels.
9. Check oil levels.
10. Check adjustments on regulating valves.
11. Adjust adjusting valves on equipment.
12. In new stores, operate case for 24 hours prior to stocking product.
13. Prior to store Grand Opening, provide Owner's store manager a copy of the final Defrost Schedule.

N. Grand Opening Day Service

1. Provide a competent service technician in the store for four hours the morning of the store grand opening. Record fixture temperatures and submit to Owner. Make any adjustments as necessary.
2. The Owner will check fixture temperatures and defrost periods before opening of the store for business. Make any re-adjustments as requested by the Owner.

O. Adjustments of Controls

1. Refrigeration systems shall be completed and operating at product temperatures specified.
2. Make the following adjustments in accordance with the Owner's (Kroger Maintenance and Energy) specifications:
 - a. Set compressor controls to required set points and verify proper case temperatures.
 - b. Make final adjustments.
 - c. Start-up and adjust temperature of self-contained equipment.
3. Set refrigerated circuit, suction temp, condensing temp, condenser control, and heat reclaim set points to Owner's maintenance guideline. Do not alter set points. Immediately notify the Owner if any portion of the system fails to operate at the guideline set points.
4. Set length and number of defrost cycles in accordance with Owner's recommendations. Whenever practical, set defrost cycles to occur other than during store business hours. Defrost cycles, except time-off, are to be staggered to avoid demand peaks.
5. Refrigeration Valves:

- a. Check and adjust bulb location, verify position, and securely fasten clamp prior to start-up.
 - b. Check and adjust superheat settings after 48 hours of operation, whether or not a problem is detected. Set superheat prior to a defrost time and when the system is operating near the normal fixture operating temperature. (suggested guideline).
 - c. Valves must fully feed evaporator and meet case specifications. Before attempting to adjust the valve, verify that the evaporator is either clear of, or only lightly covered with, frost and that the fixture is within **10 degrees F (5.5 degrees C)** of its expected operating temperature. Set all super-heats in the store during start-up and maintain and provide Owner with a log of superheat settings and adjustment for each valve. No exceptions allowed.
 - 1) Superheat to be adjusted as follows:
 - a) Low temperature superheat settings: **4 degrees F to 6 degrees F (-2.2 degrees C to 3.3 degrees °C)**.
 - b) Medium temperature superheat settings: **6 degrees F to 8 degrees F (3.3 degrees C to 4.4 degrees C)**.
 - c) Record temperature difference in Attachment K.
 - d. After the expansion valves have been adjusted, check suction temperature **8 inches (200 mm)** from the compressor suction service valve for proper temperature of return gas to compressors. When the system is operating at a design temperature, superheated suction gas at the compressor should be **40 degrees F (4.4 degrees C)**, plus or minus **10 degrees F (5.5 degrees C)**, above the saturated suction temperatures of the compressor for low temperature units. For medium temperature units, superheated suction gas at the compressor should be **25 degrees F (4 degrees C)**, plus or minus **10 degrees F (5.5 degrees C)**, above the saturated suction temperatures of the compressor.
6. Case manufacturer will provide case installed temperature probe (two per refrigeration system) for temperature monitoring only.

P. Refrigeration Lubricant Testing

1. Conduct full spectrum testing for acid, moisture, or other contaminants of refrigeration lubricant after start-up. Submit test results to the Owner's project manager no later than 1 week after startup. If test results are found to be contaminated, replace refrigeration oil as necessary until contamination problems are resolved. The Owner reserves the right to send oil samples to a testing agency if there are any discrepancies in test results provided by the Refrigeration Installer and test results provided by others.

Q. Self-Contained Equipment Installation

1. Check self-contained refrigerated equipment for proper operation and correct temperature settings. Fixture set and electrical hook-up will be by others.
2. Check fixture plan layout, refrigeration equipment plan, and any Addenda for self-contained equipment. Follow manufacturer's specifications for start-up and checking.

R. Temperature Performance

1. Ensure that the equipment maintains the following performance temperatures, and the systems are installed in accordance with the manufacturer's installation instructions. All critical temperature refrigerated storage and merchandising equipment used for potentially hazardous food must maintain Food Code temperatures (currently at **41 degrees F (5 degrees C)**) or below at all times (including defrost), and be NSF-7 approved for supermarket operation. Bulk produce (one touch) not applicable. All food locations, including above or below lamps, ballast and anti-condensate heaters must comply with these requirements. Meet the following temperatures to ensure food quality, as well as food safety.

(See following page for temperature performance chart)

Temperature Performance Chart			
Fixture	Reading Location	Temperature Range (Degree F)	Temperature Range (Degree C)
Dairy, Produce, Med. Temp Nutrition, Pizza, Juice Cases, Open Beer and Wine Cases	(1) & (2)	36 - 38	2.2 - 3.3
Dairy Spot Cases Refrigerated Salad Bars	(1)	36 - 38	2.2 - 3.3
Produce Walk-in Cooler	(4)	36 - 38	2.2 - 3.3
Flower Cases	(1)	38 - 40	3.3 - 4.4
Refrigerated Bakery Cases	(2)	36 - 40	2.2 - 4.4
Produce Preparation Room	(5)	55 - 60	12.8 - 15.6
Single-Deck Meat and Cheese Cases	(1)	29 - 31	-1.7 - -0.56
Multi-Deck Fresh Meat Cases	(1) & (2)	29 - 31	-1.7 - -0.56
Five-Deck Deli Meat and Glass Door Floral Cases	(1) & (2)	34 - 36	1.1 - 2.2
Meat and Seafood Walk-in Coolers and Holding Cooler	(4)	30 - 32	-1.1 - 0.0
Meat Preparation Room	(5)	48 - 50	8.9 - 10.0
Service Meat Cases	(1)	34 - 36	1.1 - 2.2
Self-Serve Meat Cases	(1) & (2)	29 - 31	-1.7 - -0.56
Service Seafood Cases	(1)	33 - 34	0.56 - 1.1
Self-Serve Seafood Cases	(1) & (2)	34 - 35	1.1 - 1.7
Single-Deck and Multi-Deck Frozen Food	(3)	-5 - 0	-20.6 - -17.8
Glass Door Frozen Food Cases	(2)	-5 - 0	-20.6 - -17.8
Glass Door Ice Cream, End Case Ice Cream and Low Temp Nutrition Cases	(2)	-12 - -7	-24.4 - -23.3
Walk-in Freezers and Shelf-Contained Reach-in Freezers	(4)	-15 - -10	-26.1 - -21.7
Service Deli Cases	(1)	36 - 38	2.2 - 3.3
Deli and Dairy Coolers, Walk-in and Reach-in Retarders and Reach-in Refrigerators	(4)	36 - 38	2.2 - 3.3
Glass Door Beer Cases	(3)	34 - 36	1.1 - 2.2
Lobster Tank – Water Temperature	N/A	40 - 45	4.4 - 7.2
Refrig Meat Display – Deli Serving Line – Product Temperature	N/A	Max -40	Max 4.4
Reach-in Deli Refrigerated Dessert Case	(2)	36 - 38	2.2 - 3.3
Pizza Tables with Refrigeration for Ingredients	N/A	Max -40	Max 4.4
Reading Location Notes: (1) Height of product, within load limit line and the center of case, front and back, and end-to-end. (2) Center of shelf, front and back, and end-to-end. (3) Center of case end-to-end, at product edge of return flue. (4) At the wall ceiling joint. (5) At table height.			

3.8 SYSTEM IDENTIFICATION

A. Refrigeration Drawings

1. Provide framed Plexiglas cover for refrigeration schedule sheet and refrigeration floor plan.
2. Refrigeration Floor Plan
 - a. For each system or piece of equipment, show defrost time, electrical panel board, and breaker numbers.
 - b. Show location of controls and associated valves (temp sensors, solenoids and EPR's).
3. Secure framed units permanently on side of distributed refrigeration units or on compressor room or prefabricated mechanical center wall where they can be easily read.

B. Cases

1. Label: Engraved hard black plastic, 1 inch by 2 inch (25 mm by 50 mm) plate with 3/4 inch (19 mm) white lettering.
2. Label new and/or relocated equipment with reference to operating system.
3. Rivet or screw label on each case on upper left hand corner.
4. Provide case and circuit identification on an ongoing basis during the Project. Temporary tags may be used until permanent tags are available.

C. HICA and HOCA

1. Label the inside of the unit with systems refrigerant type, oil type and capacity. Paint compressor head with corresponding color of refrigerant type.
2. Provide adhesive (P-touch) labels for labeling HICA and HICO units. Place labels on electrical panels out of direct sunlight or out of the elements.
3. Paint compressor head on new and replacement compressors. Remove references to past information.
4. Label units with 2 inch (50 mm) black stenciled lettering on the outside designating system.

D. Condensing Units: Label units with 2 inch (50 mm) black stenciled lettering on the outside designating system.

E. Walk in Boxes

1. Label: Engraved hard black plastic, 1 inch by 2 inch (25 mm by 50 mm) plate with 3/4 inch (19 mm) white lettering.
2. Label walk-in boxes on the outside of the door casings above the temperature display.

F. Distributive System

1. Label: Engraved hard plastic, 1 inch by 2 inch (25 mm by 50 mm) plate with 3/4 inch (19 mm) lettering.

G. Remotely Mounted Suction stops

1. Label Circuit Identification: Brass or plastic tags attached to valves with wire tie or plastic zip ties, 1 inch (25 mm) in diameter.

3.9 GRAND OPENING DAY SERVICE

- A. Provide an experienced service technician in the store for four hours the morning of the store Grand Opening. Record fixture temperatures and submit to Owner. Make any adjustments as necessary.
- B. The Owner will check fixture temperatures and defrost periods before opening of the store for business. Make any re-adjustments as requested by the Owner.

3.10 FIELD QUALITY CONTROL

- A. Inspect work and submit to Owner a written punch list on Owner's form.
 1. Walk punch list with Owner to verify completeness.
- B. 60 Day Warranty Inspection: Within sixty to ninety days of the store opening, an acceptance walk-through will take place with the Owner, the manufacturer of the refrigeration equipment and the Installer. The Owner will produce a list of deficiencies that are to be completed prior to the store acceptance by the Owner and release of the Installer's warranty. The following tests and inspections will be run under the direction of the Owner.
 1. Inspect up to ten different Thermal expansion valve's for proper superheat setting.
 2. Inspect complete system for leaks.
 3. Inspect systems for proper temperature.
 4. Test oil for acidity.
 5. Test system for moisture content.
 6. Verify that there is no flood back present on equipment pertaining to remodel.
 7. Inspect for proper programming and controls per Controller Setpoint and Standards Document.
- C. Replace any filter and/or drier in the refrigeration system, which shows a 2 lb. or greater pressure drop across the filter or filter drier.
- D. The Installer's warranty is to remain in effect until all related systems have been formally accepted in writing by the Owner's Facility Engineering Department or their selected representatives to be running in normal condition. These tests will be run under the direction of the Owner. Tests and repairs incurred during the Installer's warranty period will be paid by the Installer.

3.11 ATTACHMENTS

- A. The following pages include:
 1. Kroger Refrigerant Management Policy.
 2. Sample forms required for the Installer's work available for downloading on the Owner's project management website:

- a. Piping Test Check Sheet.
- b. Superheat Recording.
- c. Pre-Inspection Checklist.
- d. Kroger Contractor Refrigerant Management Tracking Form.
- e. Accidental Release Report.

The Kroger Co.

Refrigerant Management Policy

2/1/2019



KROGER REFRIGERANT MANAGEMENT POLICY

3.1 INTRODUCTION

- A. Regulations in 40 CFR Part 82, that codify Section 608 of the Clean Air Act, prohibit the venting of refrigerant gas into the atmosphere. Additionally, Kroger has signed on to the US EPA's GreenChill Program, which signals our commitment to reducing refrigerant emissions from our facilities. In order to adhere to these requirements and commitments, this policy outlines the procedure and documentation for any and all refrigerant gas handling. This policy outlines the procedure and documentation necessary for any and all refrigerant gas handling.
- B. The Kroger Co. has a **ZERO TOLERANCE LEAK RATE POLICY** in that all leaks will be repaired regardless of the size of the refrigerant system and the calculated leak rate prior to adding refrigerant. This means that refrigerant will not be added to the appliance until it is repaired.
- C. The Kroger Co. has two areas of focus for this policy:
 - 1. Kroger employed, and vendor contracted technicians performing maintenance and services to Kroger owned appliances.
 - 2. Kroger employed, and vendor contracted technicians performing installations and removal of Kroger owned appliances as part of capital improvement projects.

3.2 RECORD KEEPING

- A. A record must be maintained on all appliances and updated each time any of the following occur:
 - 1. Refrigerant is added to an appliance.
 - 2. Refrigerant is removed from an appliance.
 - 3. An appliance changes location.
 - 4. A change in a system that may alter the category of the appliance thus changing the leak calculation rates.
 - 5. A new appliance is added.
 - 6. An appliance is retired.
 - 7. An appliance is mothballed (refrigerant removed but appliance not disposed).
 - 8. An accidental release of refrigerant.
 - 9. Reclaimed refrigerant handling.
 - 10. An Appliance is sold or donated.
- B. Records shall be maintained with copies of all technician certifications for 40 CFR Part 82.
- C. The Kroger Co. uses a maintenance software system to maintain records for refrigerant management. This web-based application includes refrigerant data for all appliances, refrigerant full charge for each appliance, refrigerant leakage rates, appliance installation and removal information. Full charge determination shall be documented on the appliance registration and the definitions of the acceptable determinations are in the REFRIGERANT CHARGE DETERMINATION section of this policy.

- D. Contracted maintenance and project companies must provide copies of all technician certifications to the division Maintenance Manager prior to performing any service that involves 40 CFR Part 82 work. These copies will also be maintained with contractor contact information to include the technicians name. When a contractor is completing a repair involving a leak, the technicians name must be documented in the service call notes field in the Kroger maintenance software system.
- E. All documentation necessary to meet 40 CFR Part 82 must be available at the division office location for a period of 3 years from the date of service. Documents will be archived after exceeding 3 years.

3.3 EQUIPMENT LABELING

- A. All refrigeration systems/appliances shall have a bar-coded label located at or adjacent to each appliance's nomenclature tag. This label ID is to be used for any documentation associated with the appliance.



- B. The label is to be located at the condenser or compressor section nomenclature plate.
- C. Each appliance shall have the refrigerant type clearly labeled in this same area.
- D. Retired or disposed appliances must have a Kroger Refrigerant Recovery label filled out and attached. A carbon copy of this tag shall be sent to the R&S Warehouse or the Division Maintenance Office for record keeping. In addition to the equipment tag, an appliance disposal form must be filled out and uploaded to Site Folio. If the appliance is part of a construction project, the form must be uploaded to that project. If the appliance is not associated with a construction project, the form must be uploaded to the Temp Mon project in Site Folio. Sample of both documents are included in this policy. *Text Documents/Fixturing & Store Equipment/Refrigeration Equipment/Refrigerant Management.*

3.4 KROGER/CONTRACTOR TECHNICIAN MAINTENANCE AND SERVICE

- A. The Kroger Co. has a **ZERO TOLERANCE LEAK RATE POLICY** in that all leaks will be repaired regardless of the refrigeration system and the calculated leak rate prior to adding refrigerant. This means that refrigerant must not be added to the appliance until after it is repaired.
- B. Maintenance services must be performed by service technicians that have been certified to the requirements of 40 CFR Part 82. Technicians following this regulation must use Kroger's automated maintenance program to comply with the documentation section of this policy.
- C. Upon discovery of a leak the technician must begin leak checking the system. If needed, contact with the supervisor is made and additional resources will be allocated to assist in the leak check/repair.

- D. NO SYSTEM will have refrigerant added unless it has been fully leak checked and ALL leaks repaired. This includes systems that may not apply under EPA guidelines.
- E. Following this policy may require removal of product during the leak check activity. If that is the case, proper communication is key between technician, supervisor and the store management and, if necessary, Facility Engineering management.
- F. Contracted maintenance and service, when used, shall require the contracted technician to submit a fully completed Kroger refrigerant management tracking form in Service Hub or to contact the dispatch in Facility Engineering the same day the service is performed. The actual name of the technician shall be documented in the notes field of the service call. This documentation will be necessary before payment is authorized to the purchase order.
- G. Once repaired, and using Service Hub, the proper documentation must be carried out in Service Hub including proper follow-up leak checks. This documentation must be as detailed as possible and must be complete. ALL applicable fields on the leak screens must be accurate and detailed.
- H. Follow-up leak rate calculations will automatically be performed by the maintenance system. A follow-up service call will be automatically created when the leak call action is complete. This follow up verification must be completed within 10 days of the original leak date.
- I. Preventative leak inspection requirements.
 - 1. Locations with Automatic Leak Detection Systems. ALDS locations will schedule an annual PM on the ALDS to maintain operational accuracy. This PM shall be scheduled and documented in Service HUB.
 - 2. Locations without ALDS. These locations shall schedule a quarterly leak inspection to be completed on all appliances in that location. These inspections shall be scheduled and documented in Service HUB.

3.5 KROGER/CONTRACTOR CAPITAL IMPROVEMENT PROJECTS

- A. Capital improvement work performed in Kroger locations shall have a binder labeled as "EPA Refrigerant Log Book" posted on the mechanical room door or other conspicuous location in the store for the duration of the project.
- B. The binder is to be provided by the project manager and is to be posted and maintained by the contractor responsible for the refrigerant record keeping.
- C. The binder shall have:
 - 1. A copy of this policy.
 - 2. Contractor Refrigerant Management Tracking Forms.
 - 3. Refrigerant Recovery labels.
 - 4. Contractor supplied copies of technician certifications not yet on file with Kroger.
 - 5. Instructions and contact information for contractors during the project for complying with the refrigerant management policy.
- D. The forms in the binder shall be updated daily by the installing contractor and be available for review by the project manager, Kroger technician or other authorized individuals. The input

forms from the binder shall be uploaded to Site Folio on a regular basis. Upload to: *Text Documents/Fixturing & Store Equipment/Refrigeration Equipment/Refrigerant Management*.

- E. Records for refrigerant ordered for systems during an improvement must be maintained as part of the site records for refrigerant purchases. Refrigerant ordered through any Kroger purchasing system must have copies of the purchase order placed in the binder with prices hidden by the project manager.
- F. Refrigerant purchased for systems during an improvement shall have each refrigerant tank tagged with a specific tank ID number. The tank ID number shall be documented as the purchase order number followed by sequential numbering, i.e. 1147985-1, 1147985-2, etc. These tank ID numbers shall be used to track the movement of refrigerant from each tank into each tagged refrigerated system.
- G. Prior to each system startup an authorized Kroger technician or project manager shall verify that the system has been installed, pressure tested and evacuated in accordance with the Kroger Refrigeration Installation Specifications and documented in the Piping Test Check Sheet. The authorized Kroger representative shall verify the full system charge documented on the refrigerant management tracking forms.
- H. Refrigeration systems should be charged with minimal amounts of refrigerant to allow all heat reclaim and refrigeration circuits to operate normally. Refrigerant added beyond this minimal charge shall be considered unnecessary excess which can lead to greater than necessary refrigerant loss.
- I. At system startup the total quantities of refrigerant transferred from each tank shall be documented before the end of each working day. This information shall be documented in the refrigerant management tracking form and posted in the binder. When the refrigeration system has been fully charged to the receiver level which allows all heat reclaim and refrigeration circuits to operate normally, no additional refrigerant is to be added from the refrigerant tanks tagged with tank ID numbers.
- J. In the event that refrigerant leaks are discovered after the initial pressure test, these refrigerant leaks shall be repaired, and the refrigerant required to fully charge the system to the receiver level to allow all heat reclaim and refrigeration circuits to operate shall be the responsibility of the refrigeration installer.
- K. Kroger authorized technicians shall enter the data documented on the refrigerant management tracking forms into Service Hub and will sign off that the project has been completed. At this time the Kroger technician will enter a service call for a 10 day follow-up check on the new system by a service technician.
- L. At the conclusion of the project, all forms must be signed off by a Kroger Maintenance Manager and approved by the project manager **before payment of the final retainage is made**. The log book must then be turned in to the Maintenance Manager.

3.6 REFRIGERANT CHARGE DETERMINATION

- A. In order to perform leak rate calculations, the refrigeration equipment must be labeled with the refrigerant type and amount of the full charge. The refrigerant full charge can be summarized into four categories:

1. **Manufacturers Determination:** Self-contained equipment, such as retail end displays, soda machines, package HVAC equipment; etc. have a factory nomenclature tag affixed to the equipment.
2. **Component Volumetric Calculation:** This method measures the interior dimension (ID) of all components and the conditions of the refrigerant in each. The full charge amount of refrigerant is mathematically calculated.
3. **Refrigerant Added or Evacuated:**
 - a. **New system:** When a new system is installed, the amount of refrigerant installed is the full charge amount.
 - b. **Existing System:** An existing system with an existing full charge determination may have revisions done that change the amount of the full charge.
4. **Mid-point of Established Range:** Established range based on the best available data regarding the normal operation characteristics and conditions for the appliance. Such as 80 percent of receiver holding capacity.
5. **Combination of Above**

3.7 APPLIANCE DISPOSAL

- A. Appliances that are disposed of must include all forms that are applicable to the appliance leaving the ownership of the Kroger company when:
 1. Transferring an appliance to a new owner.
 2. Transferring an appliance to a recycler.
 3. An appliance being disposed of to a waste hauler.
- B. A refrigerant management documentation form must be filled out and submitted to the project manager or Kroger maintenance manager for each appliance being disposed of. A copy of this form shall be placed in the binder and uploaded to Site Folio.
- C. Refrigerant must be recovered by a certified technician prior to disposal of appliances. A refrigerant recovery label must be completed and attached to that appliance.
- D. An operable self-contained appliance being resold may be resold with the refrigerant charge if the intent of the purchaser is not to scrap the appliance. The appliance must be tagged indicating that the appliance contains refrigerant.
- E. An appliance that is sold or disposed of will need the contact information of the purchasing person documented on the refrigerant management disposal form. Below is an image of the refrigerant recovery label to be filled out in full and placed on the appliance by the data plate. The project manager or Kroger maintenance manager shall ensure that an image of the label is taken and electronically filed for future reference and the disposal form is filled out and uploaded to Site Folio.

APPLIANCE DISPOSAL LABEL

REFRIGERANT RECOVERY	ACTION TAKEN
Date _____	Scrap ____ To R&S ____ Sell ____
From Location _____	Sold with Refrig. Yes ____ No ____
Refrigerant Type _____	Sold with Refrig. Type _____
Refrig. Recovered LBS/OZ _____	Sold with Refrig. LBS/OZ _____
Equip. Model # _____	Sold to Name _____
Equip. Serial # _____	Buyer Contact Info _____

APPLIANCE DISPOSAL FORM

Refrigerant Recovery/Equipment Disposal and Sale	
Date	
Filename	
From location	
Refrigerant	
Amount of refrigerant recovered	
Lbs.	
Ozs.	
Technician Certification #	
Recovery Machine Used	
Model	
Serial	
Equipment Description	
Model	
Serial	
Was a refrigeration component	
Equipment ID	
Scrap	
To R&S	
Sold with refrigerant content	

REFERENCES

40 CFR 82.150 through 82.169

Information on the CAA Section 608 requirements may be found at: www.epa.gov/ozone/title6/608.

Revised: 2.28.2012 – Changed reference to EPA 608 to 40 CFR Part 82

Revised 6/10/2016 – Added additional leak repair requirements in support of GreenChill program

Revised 2/1/2019 – Added/changed requirements due to EPA updates that take effect 1/1/2019.



This form is to be signed and provided to the Owner's project manager prior to the commencement of refrigeration installation work.

I, _____,
(print name)

representing the refrigeration installation company listed below, have read, understood, and will follow "The Kroger Co. REFRIGERANT MANAGEMENT POLICY DATED 2/1/2019".

Company: _____

Signature: _____

Date: _____

END OF REFRIGERANT MANAGEMENT POLICY

Superheat Recording				
DATE	SYSTEM	VALVE	READING (TD)	LOW TEMP OR MED TEMP CASE

Pre-Inspection Checklist

Note all pre-existing conditions on systems pertaining to remodel including but not limited to:
Liquid levels, oil Level, and repairs needed.

This will be completed during pre-construction meeting.

Contractor Representative

Signature

Print Name

Kroger Representative

Signature

Print Name

Kroger Contractor Refrigerant Management Tracking Form

STORE#

CONTRACTOR

PROJECT ENGINEER

DATE	SYSTEM ID ¹	REFRIGERANT ADDED			REFRIGERANT RECOVERED			INSTALLING TECH	INPUT VERIFICATION / DATE ³
		TYPE	QUANTITY	TANK ID ²	TYPE	QUANTITY	TANK ID ²		


1. System ID is a bar-coded tag adjacent to the system data plate. If one is not present for new systems contact a Kroger technician.

2. Tank ID# on the refrigerant tank. If one is not present contact a Kroger technician.

3. Kroger technician signature for approval and input into maintenance system.

DATE	SYSTEM ID*	SYSTEM MODIFICATION TYPE*			DESCRIPTION OF MODIFICATION	INSTALLING TECH

*1E: Compressor change, case rework, adding or removing self contained appliance, accidental release.

Accidental Release Report				
				
Store Number		Service Date		
Company		Technician Name		
Leak Location		Equipment/Rack ID		
Refrigerant Type		Approximate Amount of Refrigerant Lost		
Description of Event:				
Cause of event:				
What precautions will be taken to prevent this event from repeating itself:				
Who was notified of event:				
Contractor Technician Signature				

END OF SECTION 11 41 43

BLANK SHEET

SECTION 11 41 46 - EMS CONTROLS INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY

A. General:

1. This Section specifies installation of the controls for the refrigeration and building systems furnished by the Kroger Company referred to as the Owner.
2. This Section includes various store type installations. Some of the items specified in this Section will not be used on the Project. Refer to Drawings for items included in the Project.
3. The Installer is responsible for supervising their own work and meet dates shown on the installation schedule.

B. Section includes:

1. All labor, material and equipment specified in this Section and on the Drawings necessary for a complete and working installation of the controls for the Owner's refrigeration and building systems.
2. Installation of the Owner furnished items shown on the Drawings including, but not limited to the following:
 - a. Refrigeration Controls:
 - a) VFDs.
 - b) VFD bypass assemblies.
 - c) VFD filters/reactors, chokes.
 - d) Sensors and transducers.
 - e) IO boards, transformers and enclosures.
 - f) Necessary refrigeration controllers. Whole store refrigerant leak detection systems if required.
 - b. EMS/Building Controls:
 - a) HVAC controllers.
 - b) Building controller.
 - c) Building I/O board panel.
 - d) Lighting I/O panel.
 - e) Anti-Sweat panels.
 - f) I/O boards, transformers and enclosures.
 - g) Temperature sensors, sun shield, humidistats, photocells and tamper sensors.
3. Installation of Installer supplied items including, but not limited to the following:
 - 1) Installer supplied Refrigeration and EMS/Building equipment.
 - 2) Wiring from I/O boards to sensors.
 - 3) Wiring from I/O boards to VFDs, contactors and valves.
 - 4) Networking of I/O boards to refrigeration and HVAC controllers.

- 5) Networking Refrigeration and HVAC controllers to Kroger WAN.
- 6) Programming all controllers per the Kroger Co. Controller Set Points and Standards Document available on Owners electronic website.
- 7) Termination of wires to and from I/O boards and sensors.
- 8) Verification of sensor, relay and alarm function.
- 9) Sensor Calibration.
- 10) Controls installer supplied refrigeration controls items:
 - a) Wire.
 - b) Conduit / connectors.
 - c) Extension box for timer switches (if necessary).
 - d) Mounting hardware.
 - e) Miscellaneous parts (wire nuts, electrical tape, conduit fittings, labels).

- C. Modifications and additions to this Section, if required, are indicated in Section 11 41 46 - "Supplementary Refrigeration Controls Installation." If Section 11 41 46 - "Supplementary Refrigeration Controls Installation" is not included in this Project Manual, no modifications and additions to this Section are indicated. Where any portion of this Section is modified or deleted by Section 11 41 46 - "Supplementary Refrigeration Controls Installation," the unaltered portions shall remain in effect.

1.2 REFERENCES

A. Definitions

1. Certain terms and words used throughout Section shall be defined as follows:
 - a. **Owner:** The person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's Representative.
 - b. **Contractor:** The General Contractor with overall responsibility to build a complete store, on schedule, ready for operation as a complete food store.
 - c. **Installer:** The entity identified in this Section responsible for but not limited to material and installation of the controls for the refrigeration system, as identified in this Section.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Report to Owner any defaults in work furnished and installed by others that causes conditions unsuitable for Installer's Work. Failure to inspect and report unsuitable conditions shall constitute acceptance of work furnished and installed by others as fit and proper for coordination with the Installer's work.
- B. Cooperation with Other Trades: Cooperate with other installers doing work on the Project to prevent any conflict that would require moving or changing any refrigerant lines, devices, or other equipment, or require other installers to relocate devices and piping when installed according to plans and specifications.
 1. Where interference exists, notify Owner before proceeding with installation.
- C. Work Schedules

1. Typical work schedule shall consist of five 8-hour workdays ending no earlier than 3:00 p.m. local time at the store or in shifts as required in the Phase Plan or Project Schedule.
 - a. For non-local Installers, as approved by the Owner, work may be conducted in four 10-hour days provided the work day does not end prior to 3:00 p.m. local time.
2. Work Restrictions: For remodels, pre-piping of systems that require blocking a shopping pattern must be done between the hours of 10 P.M. and 7 A.M., unless receiving prior approval of the Owner.

1.4 SUBMITTALS

- A. The Owner will provide the following submittals for Owner supplied items for the refrigeration controls installer's information upon request:
 1. Product Data: For each item and accessory supplied by Owner.
 2. Shop Drawings: For special components and installations not detailed in manufacturer's product data.
- B. Closeout Submittals
 1. Operation and Maintenance Data: For equipment furnished and installed by Installer and equipment furnished by Owner to include installation, service, and operations manuals and instructions.
 - a. Collect manuals for equipment installed in this Section and place in a three ring binder. Deliver to the Owner's store manager upon completion of the Work. Refer to General Conditions for additional requirements.
 - b. The Owner will supply the Installer with receiver copies of all equipment and fixture purchase orders to include in Operation and Maintenance Manual.
 2. Record Drawings: As-built drawings showing the location of refrigeration controls.

1.5 QUALITY ASSURANCE

- A. Work, materials, and equipment shall comply with rules and regulations of authorities having jurisdiction. Continually monitor field installation for code compliance and workmanship quality. Installation shall comply with all manufacturers' recommendations.
- B. Maintain a set of Contract Documents easily accessible within the building for Owner to review and verify any discrepancies.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of other construction by field measurements before beginning Work.
- B. Inspect all equipment with respect to controls circuitry and report at once and confirm in writing any discrepancies, variances, or defects to the Contractor and Owner.\

1.7 DELIVERY, STORAGE, AND HANDLING

- A. For remodels, do not store material in the sales area. Material stored in the back room must be out of the way of the Owner's operations.

1.8 WARRANTY

- A. Installer's Warranty: Standard form in which Installer agrees to repair or replace any component that does not comply with requirements or that deteriorates or malfunctions as a result of improper installation by the Installer within specified warranty period.
 - 1. Warranty Period: 90 days from date of store Grand Opening provided installation is accepted and approved as completed in compliance with the Contract Documents by the Owner.
 - 2. Warranty Retainage: Until the end of the warranty period, 5 percent of the contract amount due the Installer will be held as a retainage unless a different retainage percentage is required by the Authority Having Jurisdiction.
 - 3. Warranty Service: During the warranty period, regardless if the service call is due to failure of equipment or failure of the installation, the Installer shall enter the service call with Service Hub, the Owner's electronic service call system. Submit service reports to the Owner at the end of the warranty period.
 - a. As part of the Installer's warranty service, the Installer shall make arrangements to have a service technician present at the store for the Grand Opening day to correct problems or make adjustments designated by the Owner, working a minimum of four hours, commencing two hours before store opening.
- B. Refer Division 00 Section "General Conditions" for general warranty information.

PART 2 - PRODUCTS

2.1 OWNER FURNISHED PRODUCTS

- A. Receive, handle, store, and protect materials, equipment, fixtures or supplies delivered to the site by the Owner for installation under this Contract. Schedule and coordinate deliveries.

2.2 EMS CONTROLS INSTALLER FURNISHED PRODUCTS

- A. Provide items required for installation that are not supplied by the Owner, including but not limited to:
 - 1. Wire.
 - 2. Conduit / connectors.
 - 3. Extension boxes.
 - 4. Mounting hardware.
 - 5. Control voltage transformers for contactor control.
 - 6. Miscellaneous parts (wire nuts, electrical tape, conduit fittings, labels, etc.).
 - 7. Any additional parts or materials required for a complete system to Owner's specifications.

- B. Unless otherwise specified, all materials and equipment items shall be new. All materials used in the Project shall be equal to approved samples in every respect. When required by the Owner, the refrigeration controls installer shall provide certificates of conformance for materials specified.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of refrigeration controls.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: For stores remaining open during construction, perform work in a manner as to provide a minimum of annoyance and interference to Owner's operations, its customers and vendors.
 - 1. No work shall be done by the Installer that will void a manufacturer's warranty.
 - 2. If during the course of the Work any piece of equipment under the scope of this Work is damaged (the damage occurring after arrival), the Installer shall notify the Owner immediately, listing the model number, serial number and the extent of the damage. The Installer will ensure the damage is corrected.

3.3 EMS CONTROLS INSTALLATION

- A. General
 - 1. Refer to the appropriate EMS Templates wiring schedule for wire specifications.
 - 2. Thoroughly examine Drawings for control device and equipment locations. Report discrepancies, conflicts, or omissions to Owner for resolution before starting rough-in work.
 - 3. The information in this Section is intended to be a guide for installing, wiring, programming, and setting up the EMS Controls System. Refer to the Owner's standard Drawings and manufacturer's installation manuals for the most current and more detailed instructions on controllers.
 - 4. Refrigeration Manufacturer Responsibilities:
 - a. Factory installation of rack, distributed case and singles system controls.
 - b. Mounting of refrigeration controllers and associated I/O boards,
 - c. Mounting and terminating rack inputs such as but not limited to suction and discharge pressures, liquid temperatures, liquid level and rack alarm.
 - d. Initial Programming: Includes programming each rack controller and case controller with general set-points only. Also includes input and output assignments, pressure control settings, and defrost and sensor control settings.
 - 5. HVAC Manufacturer Responsibilities:
 - a. Factory installation of I/O boards.
 - b. Factory installation of supply fan VFDs.

- c. Mounting and terminating inputs such as but not limited to mixed air temperature sensors and air flow switches.
- 6. The Owner will supply:
 - a. EMS building controller
 - b. EMS building panel
 - c. EMS lighting control panel
 - d. Anti-sweat control panels (Not required for case control stores).
 - e. Outdoor relative humidity sensors, temperature sensors and light level sensors.
 - f. Indoor relative humidity sensors, temperature sensors and light level sensors.
 - g. Reclaim Water temperature sensors.
 - h. Whole store refrigerant leak detection system.

B. Installation, General

- 1. Installer is responsible for work and equipment until inspected, tested, and accepted. Protect material not immediately installed. Close open ends of work with temporary covers or plugs during storage and construction to prevent entry of foreign objects.
- 2. Install low voltage wiring in metal conduit where subject to mechanical damage and at levels below 10 feet (3 m).
 - a. Conceal raceways except within mechanical, electrical, or service rooms. Maintain minimum clearance of 6 inches (152 mm) between raceway and high-temperature equipment such as flues.
 - b. Install raceway rigidly, support adequately, ream at both ends, and leave clean and free of obstructions.
 - c. Join raceway sections with couplings and according to authorities having jurisdictions.
 - d. Install insulated bushings on raceway ends and enclosure openings.
 - e. Seal top ends of vertical raceways.
- 3. Install flexible metal raceways and liquid-tight flexible metal raceways in lengths not exceeding 3 feet (1 m). Support at each end. Do not install flexible metal raceway less than 1/2 inch (13 mm) electrical trade size. Install liquid-tight flexible metal raceways in areas exposed to moisture.
- 4. Install low-voltage wiring meeting NEC Class 2 requirements.
 - a. Install sub-fuse low-voltage power circuits as required to meet Class 2 current limits.
 - a) NEC Class 2 (current-limited) wires not in raceway but in concealed and accessible locations such as return air plenums shall be UL listed for the intended application.
- 5. Install Class 1 and Class 2 wiring in separate raceways. Do not install low voltage wiring in boxes and panels containing high-voltage wiring and equipment except for the purpose of interfacing the two through relays and transformers.
- 6. Run exposed Class 2 wiring parallel to a surface or perpendicular to it and tie neatly at 10 foot (3 m) intervals. Support/anchor plenum cables from structural members. Do not

support or anchor plenum cables from ductwork, electrical raceways, piping or ceiling suspension systems.

7. Secure raceways, and conduits, with clamps fastened to structure and spaced according to authorities having jurisdiction. Do not hang or attach raceways and pull boxes to ductwork, electrical raceways, piping, or ceiling suspension systems.
8. Include one pull string in each raceway **1 inch (25 mm)** or larger.
9. Install color-coded conductors throughout.
10. Terminate control and interlock wiring related to the work of this Section. Maintain at the job site updated (as-built) wiring diagrams that identify terminations.

C. Communication Wiring

1. Install low-voltage Class 2 wiring per Kroger IS&S standards.
2. Install communication wiring in separate raceways and enclosures from other Class 2 wiring. During installation do not exceed maximum cable pulling, tension, or bend radius specified by the cable manufacturer.
3. Verify entire network's integrity following cable installation using appropriate tests for each cable. Install lightning arrestor according to manufacturer's recommendations between cable and ground where a cable enters or exits a building.
4. Install a continuous length of communication wiring without splices for each run when that length is commercially available. Runs longer than commercially available lengths shall have as few splices as possible.
5. Label communication wiring to indicate origination and destination.
6. Ground co-axial cable according to NEC regulations article on "Communications Circuits, Cable, and Protector Grounding."

D. Warning Labels

1. Affix permanent warning labels to equipment that can be automatically started by the control system. Provide labels with white lettering (12-point type or larger) on a red background. Warning labels shall read as follows:

CAUTION! This equipment is operating under automatic control and may start or stop at any time without warning. Switch disconnect to "Off" position before servicing.

2. Affix permanent warning labels to motor starters and control panels that are connected to multiple power sources utilizing separate disconnects. Provide labels with white lettering (12-point type or larger) on a red background. Warning labels shall read as follows:

CAUTION! This equipment is fed from more than one power source with separate disconnects. Disconnect all power sources before servicing.

E. Identification of Hardware and Wiring

1. Label wiring and cabling, including that within factory-fabricated panels, with control system address or termination number at each end within **2 inches (50 mm)** of termination.
2. Permanently label or code each point of field terminal strips to show instrument or item served. Label control panels with minimum **1/2 inch (13 mm)** letters on laminated plastic nameplates.

3. Label each control component with a permanent label. Label plug-in components such that label remains stationary during component replacement.
4. Label room sensors related to terminal boxes or valves with nameplates.
5. Manufacturers' name plates and UL or CSA labels shall be visible and legible after equipment is installed. Label identifiers shall match record documents.

F. Network Wiring

1. The controllers communicate to I/O boards via a RS232 / RS485 network.
2. The controllers communicate to case controls via a Modbus network.
3. Wire type and sizes per manufacturer specifications.
4. Install network wiring from the controllers to the connector plugs of any associated I/O boards.
5. Install one network loop for each refrigeration controllers I/O communication.
6. Install one Modbus network loop for each refrigeration controllers case control communication.
7. Install one network loop for all RTU's and HVAC equipment.
8. Install one network loop for all other Building and Lighting control I/O boards.
9. The network cable must be "daisy chained". "T-splicing" or a Star configuration is not allowed.
10. Check the installation carefully, then plug in the connectors.

G. I/O Board Network Addresses

1. When the controls system allows I/O addresses to be skipped, address all I/O boards and Modules per the following. This allows the use of point sharing between controllers.
 - a. Associated with Refrigeration System 'A', 1 – 5.
 - b. Associated with Refrigeration System 'B', 6 – 10.
 - c. Associated with Refrigeration System 'C', 11 – 15.
 - d. Associated with Refrigeration System 'D', 16 – 20.
 - e. Associated with Refrigeration System 'E', 21 – 25.
 - f. Associated with Refrigeration System 'F', 26 – 30.
 - g. Associated with Refrigeration System 'G', 31 – 35.
 - h. Associated with Refrigeration System 'H', 36 – 40.
 - i. Associated with Miscellaneous Refrigeration & HVAC, 41 – 49.
 - j. Associated with Miscellaneous Calculations, 50 - 59.
 - k. Associated with Lighting Control, 60 – 69.
 - l. Associated with Building Control, 70 – 99.
2. When addresses cannot be skipped, address I/O boards starting with module one first in line from the controller.

H. Controller Communications

1. Installation per Kroger IS&S standards.
2. Install a Cat. 5 cable from the computer room to the EMS Building Controller.
3. Install/pull two CAT5 communication cables and a pull string between the controller and the store computer room or IDF cabinet.
4. Leave a **50 foot (15.25 m)** loop of free cable at each end.
5. Do not plug the wire into the controller until the wire has been tested.

6. The computer room end of the cat. 5 cable to be terminated by the Owner in the store's computer room.
7. Install a Cat. 5 jumper cable from the patch panel to the first available port in the switch (hub).
8. Terminate both ends of the Cat. 5 jumper cable with RJ45 connectors.
9. Do not plug the jumper wire into the store's hub until it has been tested.
10. Use a Cat. 5 wire tester to verify proper wiring and termination of the Cat. 5 cable and jumper wire.
11. Do not plug the Cat. 5 jumper wire into the store's switch (hub) until programming is complete. When not in conduit, maintain the Cat. 5 cable at least 12 inches (305 mm) from any high voltage (110+ VAC) wiring.

I. Programming

1. Point Naming: Name points as shown on the equipment points list provided with each sequence of operation or in a manner consistent with the mechanical drawing nomenclature..
2. Software Programming: Provide system programming per the Kroger Co. Controller Set Points and Standards Document available on Owners electronic website.
3. Operator Interface: Install, initialize, start up, and troubleshoot operator interface software and functions (including operating system software, operator interface database, and third-party software installation and integration required for successful operator interface operation).

J. Control System Checkout and Testing

1. Startup Testing: Complete startup testing to verify operational control system before notifying Owner of system demonstration. Provide Owner with schedule for startup testing. Owner may have representative present during any or all startup testing.
2. Calibrate and prepare for service each instrument, control, and accessory according to the manufacturers guidelines.
3. Verify that control wiring is properly connected and free of shorts and ground faults. Verify that terminations are tight.
4. Enable control systems and verify each input device's calibration. Calibrate each device according to manufacturer's recommendations.
5. Verify that binary output devices such as relays, solenoid valves, actuators and control valves, and starters, operate properly and that normal positions are correct.
6. Verify that analog output devices such as actuators are functional, that start and span are correct, and that direction and normal positions are correct. Check control valves to ensure proper action and closure. Make necessary adjustments.
7. Prepare a log documenting startup testing of each input and output device, with technician's initials certifying each device has been tested and calibrated.
8. Verify that system operates according to sequences of operation or per Owners specifications. Simulate and observe each operational mode by overriding and varying inputs and schedules.
9. Alarms and Fail Safes: Check each alarm with an appropriate signal at a value that will trip the alarm. Trip field contacts to check logic and to ensure that components fail in the proper direction. Test actions by simulating alarm conditions to check initiating value of variable action.

K. Control System Demonstration and Acceptance

1. Test to demonstrate system operation and compliance with specification. Provide Owner with log documenting completion of startup tests. Owner will be present to observe and review system demonstration. Notify Owner at least 10 days before system demonstration begins.
2. Demonstrate actual field operation of each sequence of operation as specified. Provide at least two persons equipped with two-way communication. Demonstrate calibration and response of any input and output points requested by Owner. Provide and operate test equipment required to prove proper system operation.
3. Demonstrate compliance with sequences of operation through each operational mode.
4. Demonstrate complete operation of system interface. Trend logs for each system. Trend data shall indicate set-points, operating points, valve positions, and other data as specified.
5. Demonstrate the building fire alarm system interface.
6. Tests that fail to demonstrate proper system operation shall be repeated after installer makes necessary repairs or revisions to hardware or software to successfully complete each test.
7. Acceptance: After tests described in this Section are performed to the satisfaction of Owner, Owner will accept control system as meeting completion requirements. Owner may exempt tests from completion requirements that cannot be performed due to circumstances beyond Installer's control. Owner will provide written statement of each exempted test.

3.4 EMS REFRIGERATION CONTROLS INSTALLATION

A. Case Controls

1. Case OEM to supply installed case controls, one per evaporator.
2. Controls installer to verify installation and factory terminations of OEM case controls.
3. Controls installer to verify programming of case controllers per Owner's specifications.
4. Walk-in box OEM to supply case control enclosure and required sensors, one kit per coil.
5. Controls installer to mount walk-in box case controller, mount and wire sensors and terminate sensors at case controller. Install walk-in box case controller enclosure on top of box.
6. Controls installer to install and terminate communication loop daisy chained from the refrigeration controller to the case controllers.
7. Electrical installer to land 120 volt and/or 208 volt power at each controllers terminal blocks per the Electrical Drawings.

B. Temperature Sensors

1. Refrigeration manufacturer to provide detailed board and point sheet located in the I/O panel.
2. Label cables with system number and type (temp or term).
3. From I/O panel, pull a single pair cable for each temperature sensor to cases and walk-ins. (Per EMS and R drawings)
4. Most case sensors will be installed by the case manufacturer. All others to be installed by Controls Installer. Mount field installed sensors in the discharge air honeycomb and attached horizontally with two wire ties. For cases without honeycomb, mount a sensor in the discharge air. Ensure rack controller points match the circuit functions they are connected to.
5. Install cables in a continuous run with no splices.

6. Underground conduit is supplied and installed by the electrical installer. Conceal sales floor cable in conduit or columns.
7. Bundle together cable that is “free-wired” above the sales floor and strap every **3 feet (1 m)**. Strap the cable bundle to the ceiling truss or girders, not to the refrigeration line sets.
8. Maintain cable at fixtures off the floor under cases using clamps every **4 feet (1.2 m)**. Maintain cable away from high voltage wire installed by the electrical installer.
9. Mount walk-in box sensors in the return air of the evaporator coils.
 - a. Locate sensor at height of bottom of the evaporator, centered between the evaporator and the wall, no more than **1 foot (305 mm)** from the evaporator.
 - b. Use a **12 inch (305 mm)** piece of **1/2 inch (13 mm)** PVC EMT with **1/2 inch (13 mm)** threaded fitting and a 2 inch by 3 inch (handy box) or **4 inch (100 mm)** J box with cover plate.
 - c. Drill a **1/4 inch (6 mm)** hole down the top of the walk-in.
 - d. Feed cable through hole and “make up” connection inside the J box. Pull sensor through PVC and secure with plastic wire tie.
 - e. Fill hole inside and out with silicone sealant.
10. Mount outdoor air temperature sensors on roof, facing north. Where applicable, install a sun shield over the temperature sensor.
11. Install sensors according to manufacturer's recommendations. Mount sensors rigidly and adequately for operating environment.
12. Install liquid temperature sensors in heat reclaim water tank.

C. Refrigeration Valve Control

1. Install / pull 2 wire cable from each refrigeration valve to the corresponding rack controller output point.
2. Wire to be sized per NEC.

D. Defrost Terminations

1. Install defrost terminations for systems as specified on the refrigeration drawings and point sheets. Pull a single pair for each system and walk-in, from fixtures I/O panel.
2. Terminate Bi-Metal, thermostat, or pipe mounted temp from case to I/O panel. Wire thermostats in series (no voltage) and install thermostats and temperature sensors with DG clamps as recommended by the manufacturer.
3. Install a strap on Bi-Metal sensor on walk-in freezers (one per coil). If coils are individually circuited connect to individual inputs in the I/O panel. If coils are on the same refrigeration circuit, daisy chain the Bi-Metal sensors to one input in the I/O panel.

E. Door Alarms

1. DAC-55 Door alarm. Reference EISD-4.

F. Variable Frequency Drives - General

1. The Owner will provide all VFDs, VFD enclosures and bypass assemblies, VFD filters/reactors chokes, sensors, IO boards, transformers, and necessary refrigeration controllers.

2. Installer provides conduits, unistrut, fasteners, line voltage conductors and connections, control wiring and CAT5 network communication cable.
3. Provide crane for the purpose of lifting VFD enclosures to roof when applicable.
4. Mount VFDs and bypass panel assemblies in a location approved by the Owner.
 - a. Indoor Installations: Typically install adjacent to refrigeration system, mounted in a serviceable location no higher than **66 inches (1675 mm)** from the finished floor to the top of the bypass assembly. Allow proper clearances per NEC from structures and other equipment for both installations.
 - b. Mechanical Room Installations: Typically install in the refrigeration mechanical enclosure, mounted in a serviceable location no higher than **66 inches (1675 mm)** from the finished floor to the top of the bypass assembly. Allow proper clearances per NEC from structures and other equipment.
 - c. Outdoor Installations Mount the assembly on the condenser as close to the electrical disconnect as possible. A location on the north or west side of the condenser is preferred. Allow proper clearances per NEC from structures and other equipment.
5. The capacitive loading of the drive by the motor conductors imposes limits on the distance between any motor and the associated VFD. Contact the VFD manufacturer if the distances between the VFDs being installed and the motors served exceed **330 feet (100 m)** for any size drive specified.
6. Where controls and control system elements are permanently installed or mounted on outdoor condensers, machine room equipment or structures, install in a manner that does not obstruct refrigeration maintenance and service activities. Mount VFDs and bypass panels so that access doors can be opened at least 90 degrees.
7. Route communications, control, and power wiring between control system elements in such a way as to prevent obstruction of or damage during refrigeration maintenance and service activities.
8. Install line and load voltage conductors in metallic conduit.
9. Line and load conductors MUST be in separate conduits.
10. Do not install low voltage cable in the same conduit as line voltage wiring.
11. Bundle together low voltage cable that is "free wired" above sales area floor and strap every **5 feet (1.5 m)**. Strap the cable bundle to ceiling truss or girders.
12. Install low voltage communication wiring from board to board with no breaks or splices.
13. Install all control wiring between refrigeration system mounted I/O boards and VFD/VFD bypass panel terminal blocks.
14. Install low voltage sensor cable from the I/O board to the sensor with no breaks or splices.

G. Air-Cooled Condenser Fan VFDTD Controls Installation

1. Configuration:
 - a. Air-cooled Rooftop Condensers 2 Fans Wide by 2 Fans Long or Longer:
 - a) Condenser fan #1 shall always be the fan closest to the refrigeration manifold, on the side not being split during low ambient modes.
 - b) Condenser Fan #2 shall be the fan immediately adjacent to fan #1 on the split condenser side.
 - c) Continue to label fans on the non-split side by odd numbers, 3, 5, 7, etc.

- d) Continue to label fans on the split side by even numbers, 4, 6, 8, etc.
- e) If no split condenser exists:
 - 1) Identify Condenser Fan #1 as the first fan on the left manifold side.
 - 2) Identify Condenser Fan #2 as the first fan on the right manifold side.
 - 3) Identify Fans continuing this odd/even pattern.
- b. Air-Cooled Rooftop Condensers 1 Fan Wide by 4 Fans Long or Longer:
 - a) Condenser fan #1 shall always be the fan closest to the refrigeration manifold.
 - b) Fans shall be identified 2, 3, 4, etc. moving away from the manifold.
- 2. Install wire connections at VFD so that the incoming line feeds from the load side of the condenser disconnect provides incoming line power to the VFD, and VFD line output power conductors are connected to the air cooled condenser fan motor distribution block. Route wiring inside watertight conduits or watertight metal wireways rated specifically for the purpose of enclosing up to 480V power circuit wiring. Motor disconnect to be on the line side of the drive.
- 3. Provide line voltage wiring and connections between the VFDs and the condenser enclosures as required by the NEC and VFD manufacturer's guidelines. Refer to NEC and local electrical codes and regulations for the correct size of the conductors. In some cases a larger conductor size may be required to avoid excessive voltage drop. Use **221 degrees F (105 degrees C)** PVC-insulated cables with copper conductors having a suitable voltage rating for power connections. Connect the VFDs to the building electrical system ground. The ground wiring must conform to local regulations and codes.
- 4. Route the control wiring from the refrigeration controller I/O boards to the VFDs bypass enclosure.
- 5. Route the communication wiring from the refrigeration controller to the I/O boards located in the condenser electrical panels and the VFD bypass panel (if applicable).
- 6. Label the conductors at both ends of each cable **12 inches (305 mm)** from end of cable. Run wiring separately from the power wiring, either neatly and securely wire-tied to appropriate elements of the building structure, or in conduit or other suitable enclosure where it may be exposed to weather or damage.
- 7. Refrigeration equipment must be shut down prior to turning off condenser. If shut down is longer than 15 minutes, refrigeration system must be pumped down by qualified refrigeration technician. Complete wiring for each condenser and VFD one at a time so only one air-cooled condenser is disabled or shut off at any point.
- 8. Air-cooled condenser control circuit to be fed from the load side of disconnect.
- 9. Install one outside temperature sensor on each air cooled condenser being fitted with a VFD. Sensor will be located under fan #1 per the details located in the EMS drawings.

H. Evaporative Condenser Fan VFDTD Controls Installation

- 1. In dry climates, the evaporative condenser is shared by both refrigeration and air handler racks. A refrigeration controller, typically shared with another refrigeration rack, operates all functions on the AC rack, including cycling compressors to maintain pressure in the suction header.
- 2. Install wire connections at VFD so that the incoming line feeds from the load side of the disconnect provides incoming line power to the VFD, and VFD line output power conductors are connected to the fan motor contactor. Route wiring inside conduit or

metal wireway rated specifically for the purpose of enclosing up to 480V power circuit wiring. Motor disconnect to be on the line side of the drive.

3. Supply and install line voltage wiring and connections between the VFD and condenser enclosure as required by the NEC and VFD manufacturer's guidelines. Refer to NEC and local electrical codes and regulations for the correct size of the conductors. In some cases, a larger conductor size may be required to avoid excessive voltage drop. Use **221 degrees F (105 degrees C)** PVC-insulated cables with copper conductors having a suitable voltage rating for power connections. Connect the VFDs to the building electrical system ground. The ground wiring must conform to local regulations and codes of authorities having jurisdiction.
4. Route control wiring from the refrigeration controller I/O boards to the VFD bypass enclosure. Run wiring separately from any power wiring, either neatly and securely wire-tied to appropriate elements of the building structure, or in conduit or other suitable enclosure where it may be exposed to weather or damage.
5. If refrigeration equipment is running, shut down refrigeration equipment prior to turning off condenser. If shut down is longer than 15 minutes, the refrigeration system must be pumped down by qualified refrigeration technicians.
6. Install one humidity sensor on building, away from condenser exhaust. Run shielded cable from sensor to designated input on the I/O board located at the refrigeration system. Terminate per the control schematic drawing.
7. Install one ambient temperature sensor on building, away from condenser exhaust. Run shielded cable from sensor to designated input on the I/O board located at the refrigeration system. Terminate per the control schematic drawing. Shield sensor from the sun, in free air circulation and away from any potential source of warm air, so that it accurately senses outdoor air temperature. Locations near machine room air makeup or exhaust openings, vent stacks for heating appliances, and HVAC exhaust duct openings are not permitted.
8. Install one sump temperature sensor in sump of evaporative condenser. Run shielded cable from sensor to designated input on the I/O board located at the refrigeration system.
9. Install one drop leg temperature sensor per discharge group. Run shielded cable from sensor to designated input on the I/O board located at the refrigeration system.

I. Condenser Fan VFDTD Control Installation Completion - All

1. Program the parameters in each VFD according to the Kroger Controller's Standards Document.
2. Program the controller for VFD operation per the Kroger Co. Controller Set Points and Standards Document available on Owners electronic website.
3. Check all details of installation.
4. Check temperature sensor readings at controller. Calibrate as necessary.
5. Check speed control input terminals at all VFDs for presence of 0 - 10 V speed control signal.
6. Place VFDs in automatic operation position. Confirm they are running at full speed (60 Hz).
7. Fan motor and circuit wiring protection will be provided by fused motor disconnects, not the VFD amperage limiting feature. Set the VFD amperage limit feature to its uppermost amperage setting.
8. Start and run each VFD in manual mode as completed and verify correct fan blade rotation.
9. Start and run each VFD in bypass mode as completed and verify correct fan blade rotation.

10. When VFD installation and testing is completed, leave the VFD under control of the refrigeration controller.
11. The Fixture And Equipment Electrical Installer shall complete the Condenser Fan VFDTD Control Installation Completion Report at the end of this Section and place in the controller cabinet. Indicate the load connected to every point on each I/O board.

J. Suction Stop Solenoids in Loop Piping (when applicable).

1. In stores with loop piping, locate suction stop solenoids on refrigeration circuits near cases.
2. Provide control voltage signal from refrigeration rack controller.

3.5 EMS BUILDING CONTROLS INSTALLATION

A. Sensors

1. General

- a. Sensor cables per manufacturers specifications.
- b. Do not install the temperature and humidity sensors in the direct airflow of ventilation systems or case exhausts.
- c. Label the end of all cables with the sensor type and location, for example, "RH Sensor at Frozen Food."

2. Indoor Temperature Sensors

- a. Install one temperature sensor for each zone for HVAC control.
 - a. Mount **7 feet 6 inches (2285 mm)** AFF on sales floor.
 - b. Mount **5 feet (1526 mm)** AFF in office areas.
- b. Install one temperature sensor for each unit heater.
- c. Mount temperature sensors away from, or below humidity sensors (humidity sensors create heat).
- d. Install dedicated temperature sensor in Frozen Food for Anti-Sweat Control.
- e. Install one temperature sensor in each HVAC unit supply air.

3. Indoor Humidity Sensors

- a. Install one humidity sensor for HVAC control on sales floor per EM Drawings.
- b. Install dedicated humidity sensor in Frozen Food for anti-sweat control.
- c. Install dedicated humidity sensor in the Pharmacy for Pharmacy RTU control.
- d. Mount humidity sensors above temperature sensors (humidity sensors create heat).

4. Indoor Light Level Sensor.

- a. Install one Indoor light level sensor for sales floor lighting control when skylights are present.
- b. Sensor to be mounted in skylight per the details on the EMS drawings.

5. Outdoor Sensors

- a. Install one outdoor temperature sensor, relative humidity sensor and light level sensor.
- b. Mount sensors on roof away from equipment such as RTU's, exhausters, condensers and vents.
- c. Install one outdoor light level sensor for parking lot light control. Position the sensor facing north, away from direct sunlight. Avoid aiming at other bright light sources that may be on at night.

B. EMS Building Control Panel, Lighting Control Panel Installation, and Alarm Logger

1. Installation and supervision of low voltage field wiring.
2. Complete the following prior to arrival of perishable product:
 - a. Termination of all field wiring to the appropriate boards and points as provided.
 - b. Start-up of all controllers. Upon start-up of individual systems, troubleshooting any problem wiring (i.e. open or shorted sensors, blown fuses, etc.).
3. Final connections and check-out of the alarm system.
4. Training store personnel for alarm situations.
5. Remote communications checkout.
6. Testing of fail-safe modes by simulating power fail on the boards and loss of communications from the controller.
7. Pull low voltage sensor and communications wiring to the respective panels, according to the electrical prints, utilizing manufacturers approved cable.
8. Mount alarm logger (if required by Owner) in a location easily viewed and accessed by store personnel per Owners direction.
9. Mounting, EMS Panels
 - a. Mount with center of display **5 feet (1.5 m)** above finished floor.
 - b. Mount in the mechanical enclosure or adjacent to the electrical switchgear as directed by the Owner.
 - c. Mount panels so that access doors can be opened at least 90 degrees.
 - d. Securely mount **1/2 inch (13 mm)** plywood to wall surface for mounting of controller. Mount panels using bolts and nuts, rather than screws, to reduce the chance of wire damage from sharp fastener edges.
 - e. Do not allow debris or filings of any kind from collecting on any of the electronic components.
 - f. Locate a reliable non switched source of line voltage power for the controller.
 - g. Power connector at the controller and power up.
10. Power
 - a. EMS Controller's 120 volt power to be supplied from a dedicated circuit, from the emergency panel (generator backup).
 - b. Do not use the transformer powering the controller to power relays. A separate transformer must be installed for this purpose.
 - c. Do not apply power to the controller or any I/O cards until all wiring is complete.

C. Lighting Controls

1. General:

- a. Sales floor lights, track lights, décor, up lighting (on top of cases), case lights, parking lot lights, canopy, signage and security/wall pack lights shall be controlled with the EMS
 - b. Program and wire control points per the Kroger Co. Controller Set Points and Standards Document available on Owners electronic website.
 - c. Owner to verify operation and schedules.
2. Wiring
- a. See Owner's standard drawings for typical relay board wiring.
 - b. Install 2-wire cable from each contactor to the EMS Lighting Control Panel.
 - c. Wire contactors to the normally closed contacts of the controller relays.
3. Dimming
- a. Install Owner furnished lighting dimming panel.
 - b. Mount adjacent to the electrical switchgear or adjacent to contactors controlling the fixtures to be dimmed as directed by the Owner.
 - c. Mount panels so that access doors can be opened at least 90 degrees.
 - d. Securely mount **1/2 inch (13 mm)** plywood to wall surface for mounting of controller. Mount panels using bolts and nuts, rather than screws, to reduce the chance of wire damage from sharp fastener edges.
 - e. Do not allow debris or filings of any kind from collecting on any of the electronic components.
 - f. Locate a reliable non switched source of line voltage power for the controller.
 - g. Power connector at the controller and power up.
 - h. Install 2 wire cable from lighting dimming panel, daisy chained to controlled fixtures.

D. Anti-Sweat Controls

1. General: Keep anti-sweat heaters on until the EMS system is programmed.
2. Anti-Sweat Panels
 - a. Locate the Anti-sweat panels as close to the anti-sweat circuit breaker panel as possible.
 - b. The middle of the Anti-sweat panels shall be located **5 feet 5 inches (1.65 m)** above finished floor.
 - c. Install the control or communication wire from the EMS Building Panel to the Anti-sweat control Panels per the EMS drawings.
 - d. Do not exceed the maximum amp rating to each channel of the Anti-Sweat Panel.
 - e. Wire anti-sweat circuits "through" the Anti-Sweat Panels to the cases.
 - f. Program controller per the Kroger Co. Controller Set Points and Standards Document available on Owners electronic website.
 - g. Do not wire channels "HOT".
 - a) CAUTION: Connecting or disconnecting a circuit while current is flowing may destroy the Anti-Sweat Panel Channel.

E. Unit Heater Control

1. Install one temperature sensor per unit heater.
2. Install/pull 2-wire shielded cable (per EMS drawings) from temperature probe to the EMS controller building panel.
3. Install/pull 2-wire shielded cable (per EMS drawings) from unit heater to output in the EMS controller building panel.
4. Supply and install relay in unit heater to control the run signal via the EMS building controller.
5. Program controller per the Kroger Co. Controller Set Points and Standards Document available on Owners electronic website.

F. Water Reclaim Control

1. Install Owner furnished temperature probe at water reclaim tanks per details.
2. Install refrigeration OEM furnished reclaim valve at reclaim tanks.
3. Install/pull 2-wire shielded cable (per EMS drawings) from temperature probe to the EMS controller building panel or the refrigeration control panel of the refrigeration system providing water reclaim.
4. Install/pull control voltage cable (per EMS drawings) from heat reclaim solenoid to the EMS controller building panel or the refrigeration control panel of the refrigeration system providing water reclaim.
5. Reclaim initiated by EMS building controller using global or transmitted inputs and outputs.
6. Program per the Kroger Co. Controller Set Points and Standards Document available on Owners electronic website.

G. HVAC Reclaim Control

1. Verify refrigeration OEM supplied and installed reclaim solenoid is properly wired, powered and operational. Reclaim solenoid wired to condenser mounted I/O board. Correct any wiring issues.
2. Reclaim initiated by EMS building controller using global or transmitted inputs and outputs.
3. Program per the Kroger Co. Controller Set Points and Standards Document available on Owners electronic website.

H. Life Safety (Duct, Smoke Detectors)

1. Install a 2 conductor, 18 AWG) cable from the fire alarm panel to the EMS Building Control Panel. Terminate the wire to the normally open contacts on the HVAC relay in the fire alarm panel.

I. Irrigation Controllers

1. Install/pull 2 wire cable from the irrigation controller to the building controller I/O panel. Wire is from the auxiliary alarm contacts in the irrigation controller. Terminate on a controller input point. Controller to be programmed per divisions preferences on alerting of a leak.
2. Wire to be sized per NEC.

J. Exhaust Hood Control

1. Install/pull 4 wire cable from each exhaust hood to the building controller I/O panel.
2. Wire one pair from the auxiliary proof contacts in the exhaust hood control panel. Terminate on building control panel controller input point for hood proof.
3. Wire one pair from the control relay in exhaust hood control panel. Terminate on building control panel relay output for hood on/off control.
4. Wire to be sized per NEC.
5. Program RTUs and hood schedules per the setpoint documents.

K. Refrigerant Leak Detection Unit.

1. Install refrigerant leak detection unit in accordance with the manufacturers cut sheets and manuals.
2. Mounting, Refrigerant Leak Detection Unit (LDU):
 - a. Mount with center of display 5 feet (1.5 m) above finished floor.
 - b. Mount adjacent to the building environmental control panel as directed by the Owner.
 - c. Mount panels so that access doors can be opened at least 90 degrees.
 - d. Securely mount 1/2 inch (13 mm) plywood to wall surface for mounting of controller. Mount panels using bolts and nuts, rather than screws, to reduce the chance of wire damage from sharp fastener edges.
 - e. Do not allow debris or filings of any kind from collecting on any of the electronic components.
 - f. Locate a reliable non switched source of line voltage power for the unit.
 - g. Power connector at the unit and power up.
3. Mounting, Refrigerant Leak Detection Control Panel:
 - a. Mount adjacent to the refrigerant leak detection unit as directed by the Owner.
 - b. Mount panels so that access doors can be opened at least 90 degrees.
 - c. Securely mount 1/2 inch (13 mm) plywood to wall surface for mounting of controller. Mount panels using bolts and nuts, rather than screws, to reduce the chance of wire damage from sharp fastener edges.
 - d. Do not allow debris or filings of any kind from collecting on any of the electronic components.
 - e. Locate a reliable non switched source of line voltage power for the unit.
 - f. Power connector at the unit and power up.
4. Power
 - a. Supply leak detection and controller's 120 volt power from a dedicated circuit.
 - b. Do not use the transformer powering the controller to power relays. A separate transformer must be installed for this purpose.
 - c. Do not apply power to the controller or any I/O cards until all wiring is complete.
5. Programming
 - a. Program the LDU per manufacturer guidelines.
 - b. Document each zones location, temperature and length of tubing. These are needed in the LDU.

- c. Program the EMS system per the controller setpoint document located on Owners electronic website.
- 6. Refrigerant Leak Detection Monitoring Points
 - a. All 16 available zones of the LDU will be utilized. Do not utilize more than 16 zones.
 - b. Priority for monitoring zones:
 - a) Coolers, Freezers and Prep Rooms.
 - b) Refrigeration Compressor systems located in an enclosed space.
 - c) The return duct from an RTU drawing air from undercase returns or the largest RTU. Mounted in ductwork.
 - d) Near other grouped refrigeration compressor systems located in back rooms, mezzanines or machine rooms.
 - e) On a column, 16 inches (406 mm) above finished floor, in a j-box near the deli area refrigerated cases on the sales floor.
 - f) On a column, 16 inches (406 mm) above finished floor, in a j-box near the frozen glass door cases on the sales floor.
 - c. As priority above dictates, these locations will have tubing run from the LDU and will be terminated with the designated filter.
 - d. An additional port on the LDU is dedicated as a purge zone and must have tubing run outside the building and terminated with the designated filter end. Located this zone as to protect the sampled air from contaminants. Keep away from dock areas and exhaust.
 - e. Zones located in the dairy cooler, prep rooms and the outdoor purge zone will be mounted in a special washdown rated j-box furnished by the Owner.
 - f. Where damage may be a concern for the filter end, remove the j-box knockouts and install a cover plate.
- 7. Refrigerant Leak Detection Horn and Strobe
 - a. All individual zones will have a horn and strobe mounted near the monitored area. Where case return air is monitored, a horn and strobe will not be required.
 - b. Mounting Location: As indicated in EMS Drawing details.
 - c. Install one additional strobe only in the customer service area or managers offices as directed by Owner. This unit shall alarm any time a leak is detected by any zone.
 - d. Install one additional horn and strobe near the LDU as directed by Owner. This unit shall alarm any time a leak is detected by any zone.
 - e. Install/pull control voltage cable (per EMS Drawings) from the leak detection control panel relays OR refrigeration controller relays to each zone horn and strobe. Horn and strobe for each zone will be activated by one relay.
 - f. Horn and Strobes will operate independent of each other and will only alarm when that particular zone has been identified with a leak greater than 1000 PPM.
 - g. Program the controller to accomplish the above alarm sequence.
- 8. Refrigerant Leak Detection Tubing
 - a. Install tubing per the manufacturers guidelines.

- b. Clearly label the ends of the tubing as to which zone it serves.
 - c. Run tubing rectilinear, making only 90 degree turns.
 - d. Tubing shall follow the refrigerant line and/or the low voltage control cable for that zone.
 - e. Hang and support tubing utilizing vinyl cushion clamps designed to not crush the tubing. Use KMC Stampings Part# COV-0509Z1 or Owner approved equal. The molded clips to be supported by zip ties no less than every 8 feet (2.438 m) to avoid sagging of the tubing.
 - f. If necessary, make splices with a “high flow” fitting.
 - g. Verify in the LDU the airflows are sufficient for accurate readings.
 - h. High traffic areas, areas where the tubing may get damaged and below 8 feet (2.438 m) above finished floor, run tubing in 3/4 inch (19 mm) EMT conduit for protection.
9. Provide plastic signage to be mounted next to the horn & strobe devices.
- a. Refer to EM template drawings for example sign.
 - b. Text: Blue front and white engraved letters that read “REFRIGERANT LEAK ALARM”, “EVACUATE THIS SPACE”, “CONTACT FACILITY MAINTENANCE”.
 - c. Size: 10 inches (254 mm) wide by 8 inches (203 mm) tall with four mounting locations, one in each corner.
 - d. Mount the sign as close as possible to the horn and strobe device.

3.6 ATTACHMENTS

- A. The following pages contain:
- 1. Installer Responsibility Matrix.
 - 2. Controller Input Point Completion Report.

Installer Responsibility Matrix The Kroger Co.											
DESCRIPTION	RESPONSIBILITY										COMMENTS
	REM	RI	BEI	HVAC-M	HVAC-I	EMS-1	OWNER	FEI	RCI	IS-I	
Refrigeration Control Equipment											
CONTROLLER COMMUNICATION WIRING						F / I / T					
I/O NETWORK WIRING						F / I / T					
I/O MODULES & TRANSFORMERS IN REF SYSTEMS	F / I										
REFRIGERATION CONTROLLER UNITS	F / I										
REF SYSTEM SENSORS AND TRANSDUCERS	F / I					T					
REFRIGERATION SOLENOID VALVES		F / I									AS APPLICABLE
WALK-IN COOLER / FREEZER ANALOG TEMPERATURE SENSORS						T	F		I		RI-SEAL PENETRATIONS
REFRIGERATED FIXTURE ANALOG TEMPERATURE SENSORS	F / I					T					RI-SEAL PENETRATIONS
CONDENSER I/O MODULES & TRANSFORMERS	F / I					T					
WIRING TO REFRIGERATION FIELD SENSORS						F / I / T					
WIRING TO REFRIGERATION SOLENOID VALVES						F / I / T					AS APPLICABLE
WIRING TO REFRIGERATION SUCTION STOP SOLENOID VALVES						F / I / T					
DEFROST TERMINATION WIRING						F / I / T					
DEFROST WIRING CONDUIT								F / I			
NETWORK WIRING TO CONDENSERS						F / I / T					
SPORT II EPR VALVES	F / I										
UNDERGROUND EMS CONDUIT			F / I								

Installer Responsibility Matrix The Kroger Co.											
DESCRIPTION	RESPONSIBILITY										COMMENTS
	REM	RI	BEI	HVAC-M	HVAC-I	EMS-1	OWNER	FEI	RCI	IS-I	
PROVIDE POWER FOR ALL CONTROLS			F / I / T								SEE ARCHITECTURAL DRAWINGS
WIRING FOR HOT WATER RECLAIM CONTROL						F / I / T					
WALK-IN DOOR SWITCHES								F / I			SEE EMS DRAWINGS
LINE VOLTAGE FOR WALK-IN DOOR SWITCHES								F / I / T			
CONTROL WIRING FOR WALK-IN DOOR SWITCHES						F / I / T					
CONTROL WIRING FROM REFRIG SYSTEM TO CONDENSER VFD BYPASS PANEL						F / I / T					SEE EMS DRAWINGS
CATEGORY-5 NETWORK CABLE										F / I / T	
CASE CONTROLLERS	F / I										
WALK-IN BOX COIL CASE CONTROLLERS	F								I		
CASE CONTROL LOW VOLTAGE AND COMM WIRE						F / I / T					
WALK-IN BOX SENSOR & VALVE MOUNTING AND WIRING									F / I / T		RI-SEAL PENETRATIONS
CASE CONTROL 120V AND 208V POWER								F / I / T			
CASE CONTROLLER PROGRAMMING VERIFICATION						F					
MOUNT LEAK DETECTION UNIT (LDU)							F		I		
FURNISH & INSTALL 120V POWER TO LDU			F / I / T								
INSTALL & TERMINATE TUBING AND FILTERS TO ALL ZONES							F		I / T		

Installer Responsibility Matrix The Kroger Co.											
DESCRIPTION	RESPONSIBILITY										COMMENTS
	REM	RI	BEI	HVAC-M	HVAC-I	EMS-1	OWNER	FEI	RCI	IS-I	
MOUNT CONTROL BOARDS FOR COMM TO LDU & ALARMS						I/T	F				
FURNISH & INSTALL 120V POWER FOR LDU CONTROL BOARDS			F/I/T								
FURNISH & INSTALL CONTROL WIRE FROM LDU TO CONTROL BOARDS						F/I/T					
MOUNT ZONE HORN / STROBE DEVICES						I/T	F				
FURNISH & INSTALL COMM WIRE FROM LD CONTROL BOARDS TO ENVIRONMENTAL CONTROL PANEL						F/I/T					
FURNISH & INSTALL CONTROL WIRE FROM LD CONTROL BOARDS TO HORN / STROBE DEVICES						F/I/T					
FURNISH & INSTALL CONTROL WIRE FROM REFRIGERATION CONTROL BOARDS TO HORN / STROBE DEVICES						F/I/T					
PROGRAMMING TO IMPLEMENT LEAK DETECTION AND ALARMING.						F/I/T					
REFRIGERANT LEAK ALARM SIGNAGE						F/I/T					
ELECTRONIC REF LEAK DETECTOR (RULER ONLY)						I/T	F				
ELECTRONIC REF LEAK DETECTOR LOW VOLTAGE POWER (RULER ONLY)						F/I/T					
ELECTRONIC REF LEAK DETECTOR LOW VOLTAGE CONTROL POINTS (RULER ONLY)						F/I/T					
Lighting Control Equipment											
I/O MODULES W/ENCLOSURE AND TRANSFORMER						I/T	F				LOCATE NEAR ELECTRICAL LIGHTING PANEL
OUTDOOR LIGHT LEVEL SENSOR						I/T	F				ON ROOF, FACING NORTH
INDOOR LIGHT LEVEL SENSOR						I/T	F				
LIGHTING CONTROL CONTACTORS (EXCLUDING HA, HB, HC, LC)			I/T				F				

Installer Responsibility Matrix The Kroger Co.											
DESCRIPTION	RESPONSIBILITY										COMMENTS
	REM	RI	BEI	HVAC-M	HVAC-I	EMS-1	OWNER	FEI	RCI	IS-I	
WIRING FROM I/O OUTPUTS TO CONTACTORS						F / I / T					
WIRING FROM I/O INPUTS SENSORS						F / I / T					
CLEAN POWER/ JUNCTION BOXES I/O PANELS			F / I								
I/O NETWORK WIRING						F / I / T					
UNDERGROUND EMS CONDUIT			F / I								
DIMMING CONTROL VOLTAGE FROM I/O TO FIXTURES						F / I / T					
HVAC Control Equipment											
ENVIRONMENTAL CONTROL PANEL						I	F				
RTU I/O MODULES	F / I										
ANTI-SEAT CONTROL PANELS							F		I		NOT REQUIRED W/ CASE CONTROLS
LINE VOLTAGE TO/FROM ANTI-SWEAT CONTROL PANELS								F / I / T			NOT REQUIRED W/ CASE CONTROLS
CONTROL WIRING TO/FROM ANTI-SWEAT CONTROL PANELS						F / I / T					NOT REQUIRED W/ CASE CONTROLS
SALES AREA TEMPERATURE SENSORS						I / T	F				
RELATIVE HUMIDITY SENSORS						I / T	F				
OUTDOOR AMBIENT SENSORS						I / T	F				
WIRING TO HVAC FIELD SENSORS						F / I / T					
I/O NETWORK WIRING TO RTU I/O MODULES						F / I / T					
POWER TO ENVIRONMENTAL CONTROL PANEL			F / I / T								

Installer Responsibility Matrix The Kroger Co.											
DESCRIPTION	RESPONSIBILITY										COMMENTS
	REM	RI	BEI	HVAC-M	HVAC-I	EMS-I	OWNER	FEI	RCI	IS-I	
NETWORK WIRING TO ENVIRONMENTAL CONTROL PANEL						F / I / T					
UNDERGROUND EMS CONDUIT			F / I								
CATEGORY-5 NETWORK CABLE TO CONTROLLER AND ALARM LOGGER										F / I / T	
WIRING FROM EXHAUST HOOD CONTROL PANEL TO ENVIRONMENTAL CONTROL PANEL						F / I / T					
WIRING FROM IRRIGATION CONTROLLER TO ENVIRONMENTAL CONTROL PANEL						F / I / T					
ALARM LOGGER						I / T	F				
POWER TO ALARM LOGGER			F / I / T								

Legend	
F	Furnish
I	Install
T	Terminate
F/I	Furnish And Install
REM	Refrigeration Equipment Manufacturer
RI	Refrigeration Installer
FEI	Fixture Electrical Installer
BEI	Building Electrical Installer
HVAC-M	HVAC Equipment Manufacturer
HVAC-I	HVAC Installer
RCI	Refrigeration Controls Installer
EMS-I	Controls Installer
IS-I	Information Systems Installer

Controller Input Point Completion Report

The Kroger Co.

[illegible]

Controller Output Point Completion Report

The Kroger Co.

Contact Phone # _____

[illegible]

END OF SECTION 11 43 46

SECTION 11 41 63 - FIXTURE AND EQUIPMENT ELECTRICAL INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY:

A. General:

1. This Section specifies the electrical installation of fixtures and equipment furnished by the Kroger Company referred to as the Owner.
2. This Section includes various store type installations. Some of the items specified in this Section will not be used on the Project. Refer to Refrigeration, Fixture and Building Electrical Drawings for items included in the Project.
3. Supervision to coordinate the activities of all trades will be furnished by others. The Installer is responsible for supervising their own Work and meet dates shown on the installation schedule.

B. Section includes:

1. All labor, material and equipment specified in this Section and on the Refrigeration, and Fixture Drawings necessary for a complete and working installation of Owner's fixtures and equipment.
2. Wiring and final connections for the Owner furnished equipment and fixtures shown on the Drawings (Fixture Plan) include, but are not limited to the following:
 - a. Refrigerated cases, equipment, condensing units.
 - b. High voltage 120/208V control wiring.
 - c. Defrost wiring.
 - d. Meat and produce preparation area air cooling.
 - e. Walk-in coolers and freezers coils.
 - f. Meat preparation equipment.
 - g. Seafood preparation equipment.
 - h. Produce preparation equipment.
 - i. Non-refrigerated cases and fixtures.
 - j. Deli/bakery equipment.
 - k. Starbucks kiosk equipment final connections.
 - l. Checklanes and express checklanes.
 - m. U-Scan checklanes.
 - n. Sales area office (prefabricated, but not wired).
 - o. Shelving, including fixture electrical installer furnished and installed outlets.
 - p. Floral equipment.
 - q. Display cases and merchandisers.
 - r. Refrigerated case electrical receptacles.
 - s. Office and administrative equipment.
 - t. Interior electric signs.
 - u. Specialty department equipment, if any, and as indicated on Drawings.
 - v. All greeting card fixtures lighting.
 - w. All book store fixtures lighting.

- x. Grocery in-line refrigerated cases (plug into outlet furnished and installed by the Building Electrical Contractor at location determined).
 - 3. Wiring and conduit from specified junction boxes located at floor or in ceiling structure to equipment and fixtures as specified in this Section or shown on the Fixture Plan. The Building Electrical Contractor will supply junction boxes with electrical power wiring within close proximity to equipment and fixtures as indicated on Drawings.
 - 4. Conformance to the installation schedule.
- C. Modifications and additions to this Section, if required, are indicated in Section 11 41 63.01 "Supplementary Fixture and Equipment Electrical Installation." If Section 11 41 63.01 "Supplementary Fixture and Equipment Electrical Installation" is not included in this Project Manual, no modifications and additions to this Section are indicated. Where any portion of this Section is modified or deleted by Section 11 41 63.01 "Supplementary Fixture and Equipment Electrical Installation," the unaltered portions shall remain in effect.
- D. Work performed by others (unless noted otherwise on the Drawings):
- 1. Temporary electric service.
 - 2. Electrical distribution system.
 - 3. Drop cords with waterproof receptacles in deli and meat prep areas.
 - 4. Lighting and power system.
 - 5. Starbucks kiosk electrical panel and distribution wiring receptacles and junction boxes.
 - 6. Walk-in cooler and freezer lighting.
 - 7. Store air conditioning, heating system and associated equipment.
 - 8. Deli exhaust hood and fire extinguisher system.
 - 9. Building and parking lot signs except for final connections.
 - 10. Intrusion alarm systems.
 - 11. Fire alarm system.
 - 12. General and refrigeration work, including unloading, uncrating, and joining of refrigerated cases and placement of equipment specified on the fixture plan.
 - 13. Low voltage wiring for communication system including telephone, scanning, public address and music systems.
 - 14. Low voltage refrigerated equipment temperature monitoring and control wiring. Refer to Section 11 41 43 "Refrigeration Controls Installation."

1.2 DEFINITIONS

- A. Certain terms and words used throughout Section shall be defined as follows:
- 1. **Owner:** The person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's Representative.
 - 2. **Contractor:** The General Contractor with overall responsibility to build a complete store, on schedule, ready for operation as a complete food store.
 - 3. **Installer:** The entity identified in this Section responsible for but not limited to the final power connections to the refrigerated and non-refrigerated equipment, and the complete installation of the electrical connectors and control devices, receptacles and other wiring devices necessary for final connection of fixtures and equipment as identified in this Section.

4. **Building Electrical Contractor:** The contractor responsible for the installation of the building electrical infrastructure to which the Installer of the work of this section will make their final connections.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Report to Owner any defaults in work furnished and installed by others that causes conditions unsuitable for Installer's Work. Failure to inspect and report unsuitable conditions shall constitute acceptance of work furnished and installed by others as fit and proper for coordination with the Installer's work.
- B. Cooperation with Other Trades: Cooperate with other installers doing work on the Project to prevent any conflict that would require moving or changing any devices, or other equipment, or require other installers to relocate devices and equipment when installed according to Contract Documents.
 1. Where interference exists, notify Owner before proceeding with installation.

1.4 WORK SCHEDULES

- A. Typical work schedule shall consist of five 8-hour workdays ending no earlier than 3:00 p.m. local time at the store or in shifts as required in the Phase Plan or Project Schedule.
 1. For non-local Installers, as approved by the Owner, work may be conducted in four 10-hour days provided the work day does not end prior to 3:00 p.m. local time.
- B. Office, Pharmacy, Computer Room and Customer Care Office Moves: For remodel projects involving modification or relocation of these areas, provide a laborer to assist in the move. The Work shall occur at night and the appropriate hours necessary to perform the work shall be included in the Installer's cost.

1.5 SUBMITTALS

- A. The Owner will provide the following submittals for Owner supplied items for the Installer's information upon request:
 1. Product Data: For each item and accessory supplied by Owner.
 2. Shop Drawings: For special components and installations not detailed in manufacturer's product data.
- B. Quality Assurance Submittals:
 1. Certificates: For electrical installers, showing successful completion of an arc flash training course.
- C. Closeout Submittals

1. Operation and Maintenance Data: For equipment furnished and installed by Installer and equipment furnished by Owner to include installation, service and operation manuals and instructions.
 - a. Collect manuals for equipment installed in this Section and place in a three ring binder. Deliver to the Owner's store manager upon completion of the Work. Refer to General Conditions for additional requirements.
 - b. The Owner will supply the Installer with receiver copies of all equipment and fixture purchase orders to include in Operation and Maintenance Manual.
2. Record Drawings: As-built drawings showing the location of electrical circuits.

1.6 QUALITY ASSURANCE

- A. Work, materials, and equipment shall comply with rules and regulations of authorities having jurisdiction. Continually monitor field installation for code compliance and workmanship quality. Installation shall comply with all manufacturers' recommendations.
- B. Arc Flash Qualifications: Qualify procedures and personnel according NFPA E70
 1. Electrical installers performing work on energized panelboards, switchgear, and other electrical equipment capable of a rapid release of energy due to an arcing fault shall pass an arc flash protection training course pursuant to the requirements of OSHA 29CFR1910 332 subpart S and NFPA 70E, "Standard for Electrical Safety in the Workplace."
- C. Maintain a set of Contract Documents on the Project for Owner to review and verify any discrepancies.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of other construction by field measurements before beginning Work.
- B. Inspect all equipment with respect to electrical circuitry and report at once and confirm in writing any discrepancies, variances, or defects to the Contractor and Owner.

1.8 WARRANTY

- A. Installer's Warranty: Standard form in which Installer agrees to repair or replace any component that does not comply with requirements or that deteriorates or malfunctions as a result of improper installation by the Installer within specified warranty period.
 1. Warranty Period: 90 days from date of store Grand Opening provided installation is accepted and approved as completed in compliance with the Contract Documents by the Owner.
 2. Warranty Retainage: Until the end of the warranty period, 5 percent of the contract amount due the Installer will be held as a retainage unless a different retainage percentage is required by the Authority Having Jurisdiction.

3. Warranty Service: During the warranty period, regardless if the service call is due to failure of equipment or failure of the installation, the Installer shall enter the service call with Service Hub, the Owner's electronic service call system. Submit service reports to the Owner at the end of the warranty period.
 - a. As part of the Installer's warranty service, the Installer shall make arrangements to have a service technician present at the store for the Grand Opening day to correct problems or make adjustments designated by the Owner, working a minimum of four hours, commencing two hours before store opening.

B. Refer Division 00 Section "General Conditions" for general warranty information.

PART 2 - PRODUCTS

2.1 INSTALLER FURNISHED PRODUCTS

- A. General Product Requirements: Furnish and install products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Substitutions: Comparable products shall match the specified product in every respect. Provide certificates of conformance for comparable products when required by the Owner.

2.2 MATERIALS

- A. High Voltage (over 50 volts) Wiring: Wiring to be stranded #12 AWG minimum in size to home run wire. Wire sizes shall conform to applicable electric codes. The most current National Electric Code shall be the minimum standard.
 1. Insulation: Type THW, THWN, or THHN 600 VAC.
 2. Conductors to compressor/condensers.
 3. Other Conductors #8 or larger.
- B. Electrical Conductors: Copper.
- C. Receptacles: Generally furnished and installed by the Building Electrical Contractor for new store applications. Where specifically required by the project scope of work or directed in this Section, the Installer shall furnish and install receptacles for shelving, refrigerated case convenience outlets, cabinetry/fixtures, customer service office, and other fixtures and equipment as indicated in the Kroger Building Specifications.
 1. All other devices to be commercial grade wired 20-amp rated.
 2. Furnish and install watertight plugs for electrical drop cords per ESD-16.
 3. 120V Duplex Receptacles for All Service Areas: Hubbell, Inc.; # GF20ILA, Circuit Guard Lighted Ground Fault Circuit Interrupter Duplex Receptacle.
 4. 120V GFIC-WR Duplex Receptacles for All Wash Down Prep Areas: Hubbell, Inc.; # GFTR20I, reset type, LED indicator, tamper and weather resistant.

- D. Receptacle Covers: Stainless steel unless otherwise noted on the Drawings or specifications. Raised covers are permitted on surface mounted outlet boxes under counters.
- E. While-In-Use Receptacle Covers for All Wash Down Prep Areas: Die cast aluminum, weather resistant.
 - 1. Products:
 - a. Hubbell, Inc.; #WP826.
 - b. Intermatic, Inc; #WP1010MC.
- F. Switches:
 - 1. Product:
 - a. Disconnect Switch: Hubbell Wiring Device –Kellems, #HBL7832D.
 - b. Timer Switchs: Schneider Electric; #XB4BA42, 22mm, pushbutton, Red, #XB4BA3, 22mm, momentary , Green.
- G. Relay: Grainger; Dayton, Time delay, Dpdt, Dual Function, #4GY65
- H. Switch Cover:
 - 1. Lockable: Hubbell, Inc.; #96061.
 - 2. Weatherproof: Bell, a Hubbell Company; #5152-0 1; Single gang receptacle or toggle switch cover.
- I. Plugtrak:
 - 1. Hubbell, Inc; HBL24GB606IV 6 feet, 20 AMP Plugtrakw/outlets 6 inches O.C.
 - 2. Hubbell, Inc; HBL24GB612IV 6 feet, 20 AMP Plugtrakw/outlets 12 inches O.C.
 - 3. Hubbell, Inc; HBL2048IV Single gang device connection box.
 - 4. Hubbell, Inc; HBL20482IV Two gang device connection box.
- J. Conduit, Fittings, Flexible Conduit, Junction Boxes, and Outlet Boxes: Comply with National Electric Code.
- K. Connectors for Compressors: With adhesive insulating covers
 - 1. Products:
 - a. Thomas & Betts Corporation; Hinson Jr.
 - b. Burndy, LLC; Versitap type QPX
- L. Junction Boxes:
 - 1. Dry Areas: Furnish and install one of the following or an approved substitution:
 - a. Galvanized steel: Raco, a Hubbell Company.
 - b. Cast aluminum: Hubbell, Inc.

2. Under Cases in Preparation Areas or Other Wet Areas: Furnish and install the following or an approved substitution:
 - a. Plastic Boxes: Thomas & Betts Corp.; Carlon brand.
3. Service Case Retrofit: 6.75 inch (170 mm) by 6.75 inch (170 mm) by 4.376 inch (111 mm) PVC box with cover
- M. Plywood Backing Panels (as required): DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, 3/4-inch (19-mm) nominal thickness.
- N. Other materials and devices as specified in Part 3 and as required for a complete and operational installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of fixture and equipment electrical installation work.
- B. Examine roughing-in for fixture and equipment electrical connections to verify actual locations of electrical connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. For remodel projects perform work in a manner as to provide a minimum of annoyance and interference to Owner's operations, its customers and vendors.
- B. Confirm wiring to refrigerated equipment is properly sized and stranded. No solid wire to be used on refrigerated equipment.
- C. Do not perform any Work that voids a manufacturer's warranty.
- D. Compressor-condenser unit components are prewired at the factory. Refer to refrigerated equipment manufacturer's application data for compressor/condenser electrical loads.
- E. Seal all openings through refrigerated cases coolers and freezers for electrical wiring with polyurethane foam insulation.

3.3 COMPRESSOR ROOM ELECTRICAL INSTALLATION

- A. Conductors:

1. Refer to Drawings for Building Electrical Contractor furnished and installed compressor feeder conductors routed inside three 6 inch by 6 inch (150 mm by 150 mm) wireways in the compressor room.
 2. Install compressor connections with adhesive insulating covers.
 3. Balance the electric loads across the phases.
 4. Do not exceed electric loading of the feeder conductor circuits. Coordinate placement of the compressors with the Refrigeration Installer.
 5. Install conductors continuous from wire way tap (maximum 10 feet (3 m) per NEC) to main breaker in control panel. Do not use wires within Hussmann control panel unless this code can be met. Double taps are not permitted.
- B. Verify tightness of all electrical connections in compressor control panels, feeders, and other similar equipment.
- C. Close and secure electrical raceways in compressor room after completing connections.
- D. Install refrigeration alarm system. Furnish and install sensors, wiring, alarm, strobes and all required connections to HVAC control panel relays.
- 3.4 AIR COOLED COMPRESSOR ELECTRICAL INSTALLATION AND CONTROL WIRING
- A. Reference electrical and refrigeration Drawings and Hussmann legend sheets.
- B. Verify all conductor sizes and special requirements for all refrigeration and control wiring.
- C. Most compressor-condenser unit components are pre-wired at the factory. Refer to refrigerated equipment manufactures application data for compressor/condenser electrical loads and control specifications.
- D. Install all compressor connections, branch and feeders, to cases and panels furnished. Insure all conductors and branch circuit breakers are properly sized, and equally phased. Coordinate placement of the compressors with the Refrigeration Installer to maintain a balanced load between motor room panels. Assure feeder conductor rating is not exceeded.
- E. Check all electrical connections in compressor control panels, feeders, cases, etc.
- F. Close and secure all electrical raceways in compressor room after completing connections.
- G. When required, install and terminate one- eight wire, 22 AWG stranded conductor cable from each compressor line to the control system. Loop cable to the remainder of compressors in the line. Run cable from the closest compressor rack to the controller or alarm (conventional systems). Verify proper cable and wire requirements as required by manufacturer prior to installation. Review plans and ledger sheets for additional information.
- H. Perform the following installation items for remodel Projects when required:
1. Repair any old equipment used during a project for temporary or permanent use. It will be this installers' responsibility to supply materials and wire any equipment relocated or installed for temporary purpose as per the project schedule.

2. Furnish and install independent breakers for each case in compressor control panel for over current protection of the defrost conductors (This is typically only required when using old compressor racks with new cases).
 - a. Verify Work prior to bidding.
3. Furnish and install properly sized breakers, contactors, and relays on compressors re-applied during a remodel project.
- I. Remote Condensers: Furnish and install conduit and complete wiring to remote condensers including Variable Speed Drives (VSD's). Furnish and install a separate conduit for power wiring and a separate conduit for control wiring. (Refer to Electrical, Refrigeration Mechanical plans, and Hussmann Legend sheets.)

3.5 PROTOCOL REFRIGERATION EQUIPMENT

- A. General: Protocol units are a remote compressor unit that is placed in various locations throughout the store as indicated on the Fixture and Refrigeration Drawings. Each protocol unit is furnished with a branch circuit and compressor panel located in the front door of the unit. A main breaker is located on top. These panels are designed to feed all lights, fans, as well as defrost heaters at the cases and prep coils. These remote compressors work in conjunction with a fluid cooler, pump station and/or air cooled condenser. Refer to Hussmann Legend sheets.
- B. Feed conductors for Protocols will be routed to the Protocol location by the Building Electrical Contractor. Conduit and conductors from the rooftop condenser to the disconnect shall also be furnished and installed by the Building Electrical Contractor. Complete all wiring between these points for a complete and operational system (refer to single line diagram details in supplied building Drawings). This Work includes:
 1. Setting the Protocol transformer (if applicable for 490v applications).
 2. Installing the defrost subpanel, if applicable.
 3. Installing the VSD controller for the condenser.
 4. Wiring protocol internal disconnects.
 5. Installing all wire and conduit from the protocol primary bus to the protocol transformer, back to the protocol defrost sub-panel and VSD controller through to the disconnect for the rooftop condenser.
- C. Locate feeder and branch circuit conductors within **6 feet (1830 mm)** of each protocol unit and cases with pigtails. Extend the conductors into the protocol units and make final connections. Extend the conductors into these units and make final connections. (Refer to Electrical and Refrigeration Drawings for scope of responsibility).
 1. The same as above applies at each case and coil location.
- D. Furnish and install a control network cable for CPC "CAREL" Controller (22 AWG, 4 conductor stranded twisted shielded pair) between the Protocol P.C. work station indicated on the Fixture Drawing and each protocol unit in the conduits provided. Install RJ-11 biscuit jack at each end. Install the cables in a three home run system, that is, #1 frozen food units, #2 rear hall /prep room units, # 3 deli bakery/ floral units. Tag each cable **6 inches (152 mm)** from the connector with a tag indicating what systems are on the home run.

- E. Furnish and install a control cable for Probes and Digital Terminations (22 AWG, 4 conductor stranded twisted shielded pair) from each Protocol unit to each case on that system. Wire to defrost termination klaxon and case temperature sensor and control panel as indicated on Refrigeration plans and Hussmann legend sheets. Tag each cable **6 inches (152 mm)** from the end with its termination location.
- F. Roof Top Condensers: Furnish and install 16AWG or 18AWG control wire for suction stop/valve control, based on valve current and distance to terminations.
- G. Remote Protocol Panels
 - 1. In some cases it is required to install a remote panel furnished by Hussmann with the equipment. The Building Electrical Contractor will install panels within **6 feet (1830 mm)** of protocol unit. Refer to the Hussmann legend sheets and panel schedule for installation information.
 - 2. Connect the wiring to the remote panels from the switchgear and/or Protocol unit and complete the terminations at both.
 - 3. The defrost circuit will be controlled from the Protocol unit. Furnish and install all necessary wiring for the electric defrost and the controls associated with it. Review the Drawings and the Hussmann legend sheets and panel schedule for more information.
 - 4. Furnish and install any conduit required from the remote panel to the cases or the protocol unit. The conduit from the switchgear to the remote panel will be supplied and installed by the Building Electrical Contractor.
- H. Case solenoids: Protocol Units may have multiple refrigeration circuits. One case on each refrigeration circuit will require two #14 control wires from the Protocol unit to the case to operate the solenoid.

3.6 FULD COOLER / PUMP STATION

- A. If required for Project, install control wiring for the pump station and fluid cooler within raceways provided. (Reference Electrical, Mechanical and Refrigeration Drawings).
 - 1. When required, install 120 volt control circuit located at the pump station, to the pump station and fluid cooler per manufacturer's installation instructions.
 - 2. Install 120-volt control field wiring to fluid cooler per manufacturer's pump station installation instructions.
 - 3. Install low voltage control cable to fluid cooler from pump station per manufacturers' installation instructions.
 - 4. Furnish and install pipe and wiring for heat trace cables, controls and sensors.
 - 5. Terminate fluid cooler and pump station from circuits provided.

3.7 PARALLEL REFRIGERATION SYSTEMS

- A. Compressor Room Electrical Installation
 - 1. Panels will be installed to within approximately **20 feet (6 m)** of the motor room wire way. Furnish and install flexible metal conduit and other materials to complete the wiring of the units.

2. On Hussmann 460 volt parallel systems, the control panels require 208 volt single phase power for the control circuit. Connect control circuits from the junction box provided and check that breaker-locking devices have been installed.
3. Complete hook-up of air-cooled condensers supplied by Owner for the parallel refrigeration systems. Note that some of the condenser fans have cycling controls.

B. Heat Reclamation

1. Verify that the building HVAC control wiring energizes all units connected to the duct reclaim coil. Verify the operation of the reclaim water heater thermostat, which is to control the heat reclaim valves on (usual number) two heat reclaim valves.
2. See the R-1 plan for controls furnished. Some gas defrost systems are temperature terminated by wiring to be connected between case thermostats and the unit control panel. A liquid line solenoid near the case is wired to control case temperature. Wiring for case temperature control and defrost control thermostats is wired to the unit control panels. Thermostats shall not control liquid line solenoid valves installed more than **10 feet (3 m)** from the expansion valve. System pump down does not include pump out of liquid line back to the rack manifold solenoid valves.

3.8 PREFABRICATED MECHANICAL CENTER

- A. General: Prefabricated mechanical centers are pre-manufactured units containing parallel racks and all necessary control equipment with condensers remote, typically on the store roof. The prefabricated mechanical centers are typically not used with new store projects but can associated with remodels or expansions. Refer to building Electrical Drawings.
- B. Furnish and install defrost, power, condenser and control conduit and wiring (not supplied by Building Electrical Contractor) from prefabricated mechanical centers to refrigerated cases, condensers, coolers and freezers as per Hussman legend sheets and installation instructions. Refer to building Electrical Drawings.

3.9 REFRIGERATION START UP AND TESTING

- A. Prior to start up, verify that all electrical connections are tight.
- B. Check phase monitor for correct polarity.
- C. Check motors for proper rotation.

3.10 COMPRESSOR AND CONDENSING UNIT REMOVAL

- A. Remove existing condenser units as indicated on R1 Drawing or Scope of Work. Disconnect and remove electrical supply and terminate in wire way or junction box.

3.11 REFRIGERATED CASE ELECTRICAL INSTALLATION

- A. Installation Instructions: Instructions for installation of refrigerated cases, including necessary wiring diagrams are shipped with each case. Take possession of installation Instructions

immediately upon receipt of the cases and wire cases accordingly. Upon completion of work, turn over one bound set of case installation instructions to the Owner.

- B. Install final connections on refrigerated cases from circuited junction boxes or stub- ups at floor and walls (furnished and installed by the Building Electrical Contractor). Refer to refrigerated equipment manufacturer's application data for electrical loads and construction Drawings for junction box locations. Refrigerated cases are internally prewired. Wire and make final connections to liquid line solenoids and thermostats on all cases as per R-1 and R-2 plan. (Refer to E sheets)
 - 1. Cases can be configured for 208 volt, 1-phase single or 3-phase feeders from the defrost panel. For 3-phase systems, cases are to have manufacturer factory installed fuses. See refrigeration schedule in Shop Drawings for electrical configuration.
- C. Circuit Identification: Install PTouch type label (white label with black letters) indicating designated panel, lighting circuit, fan circuit, defrost circuit, breaker number.
 - 1. Attach label to lower front right corner just above kick plate of the first case of the system line up served by same circuits
 - 2. Attach label to lower back right corner just above kick plate of all service cases.
- D. The Building Electrical Contractor will furnish and install circuits at floor and wall junction boxes for anti-sweat heaters, fans, and lights (see Building Drawings).
 - 1. Extend circuits through wire ways supplied in refrigerated equipment and install final connection.
 - 2. Maintain case fans, anti-sweat heaters and lights on separate circuits.
 - 3. Furnish and install defrost circuits and control wiring for refrigerated equipment.
 - a. Install separate branch circuit conductors from the condensing unit to each individual case defrost circuit.
 - b. The condensing units will be supplied with multiple defrost circuit breakers, one per case. See manufacturer's legend sheets for electrical loads.
 - c. Wire defrost circuits for best possible phase balance.
 - d. Furnish and install conduit from electrical wireways in compressor room to a location within **10 feet (3 m)** of the refrigerated equipment. Verify circuit connections to equipment are in accordance with building electric panel schedules.
 - 4. Anti-Sweat Glass Door Heaters: Install the wiring from the PMAC controller to the cases for the anti-sweat glass door heaters.
 - a. Description: The anti-sweat glass door heaters are controlled at the CPC Environmental Control Panel through the PMAC controller. The PMAC controller will control groups of doors based on the number of required channels. A channel is defined as a single anti-sweat load of 16 amps or less (i.e. a quantity of doors equivalent to an anti-sweat load of 80 amps would require five channels within the PMAC). The respective loads for RL and RL Innovator door are 1.68 and 1.16 Amps per door. After calculating the required load (i.e. number of channels) based on the number of doors, install wiring through supplied conduits and terminate at both the case and the PMAC controller.

5. Case Motion Sensors: Install and make final connections to Owner's supplied motion sensors for glass door frozen cases.
 - a. Description: A motion sensor will generally control LED lighting for two cases. Motion sensors are not to be used on cases along a wall, at the end of aisles, or on glass door cases that can be seen without walking into the aisle. Confirm locations with Owner. Reference EISD-1 and supplemental Kroger guidelines and instructions for installation of motion sensors
- E. Furnish and install necessary junction boxes, conduit and wire at stub-ups for final connections to all cases and displays.
- F. Meat and Seafood Service Cases: When existing cases are not equipped with a push button automatic shut down for case cleaning, retrofit as follows:
 1. Furnish and install a 6.75 inch (170 mm) by 6.75 inch (170 mm) by 4.376 inch (111 mm) PVC junction box, drill holes in cover and install two push button, install with socket and relay to facilitate shut down of existing solenoid valve, fans, and mister pump for case cleaning. Wire water solenoid on normally open between terminal 9 and 11, and refrigeration solenoid on normally closed between 8 and 11
 2. Furnish and install the junction box on the back of a case as high as possible.
 3. Furnish and install an engraved plastic laminate tag (red background with 1/2 inch (13 mm) high white letters) above switch that reads "Warning - Turn case off by pushing red button to activate activating timer before cleaning."
- G. Coordinate with all other trades and Owner's personnel to insure continuity of compressor start-ups, testing and cleaning.
- H. Repair of Cases: All cases shall be in complete working order before Work of this Section is considered completed. Provide any repairs required to cases due to manufacturer defects. Payment for this work will be made by the manufacturer. Maintain all model and serial numbers from each case repaired to assist in manufacturer reimbursement.
- I. Barker PT Dome Cases
 1. Rack & Protocol Systems: Furnish and install a conduit with three wires from the case to the compressor room. Terminate each as follows:
 - a. If required, one wire from the upper coil electronic temperature sensor to the rack or protocol controller.
 - b. One wire from the lower coil electronic temperature sensor to the rack or protocol controller.
 - c. One wire from the supplemental time clock to the suction stop solenoid on the UPPER coil.
 2. Single Compressor System: One wire from the controller to the condensing unit for defrost control and one wire from the supplemental time clock to the suction stop solenoid on the UPPER coil.
- J. Inspect all case lights for proper operation. Replace bad bulbs or ballasts with new equipment furnished by the original equipment manufacturer (OEM). Coordinate directly with OEM.

3.12 COOLERS AND FREEZERS ELECTRICAL INSTALLATION

- A. Furnish and install wiring from respective compressor control panel through control conduit to respective cooling coils with electric defrost heaters. Check control wiring to ensure that the coils operate properly between cooling and defrost cycles. Refer to refrigerated and coil manufacturers' application data. Check sequence of defrost operation. Check coil electrical loads. Refer to fixture plan for types of coolers and freezers (Any switches required by governing codes shall have a lockable cover to prevent accidental disconnection of the circuit).
1. Connect cooler fans to circuits furnished by Building Electrical Contractor at nearby junction boxes. Furnish and install a disconnect switch with weatherproof cover and make final connections to junction box above coolers and freezers for cooling coil fan motors. Refer to coil manufacturer's electrical application data. Wire meat cooler, meat holding cooler, walk-in freezer, and deli freezer electric defrost and fan circuits from the coils to junction boxes and then through conduits furnished and installed by the Building Electrical Contractor to the compressor room.
 2. Seal all walk-in cooler or freezer conduit penetrations inside and outside panels around conduits and fill open ends of conduit both inside and outside panels.
 3. Walk-In Freezers and Meat Coolers: Furnish and install connections for defrost controls on both freezers. See EISD-82 for field wiring between coils and compressor room. Furnish and install wiring to control suction stop valve and fan relay in evaporator cabinet to shut off fans and refrigeration when door is open.
 4. Furnish and install a 120V duplex receptacle with continuous duty cover connected to GFCI breaker in grocery and deli walk-in freezer on wall behind coil housing for drain line heater tape. Furnish and install heat tape with class B, protection for freezers drains wrapped in a spiral helix around the drain line. Make final connections, with GFI protection as required by governing codes.
 5. Multiplex meat holding cooler with meat cooler to one compressor when indicated. Wire control circuits for meat cooler and meat holding cooler to respective control panel. Furnish and install one single pole relay with 208 volt coil, normally open contacts rated 10 amps at 250 volts in condensing unit panel to temperature terminate defrost on both coils. See detail EISD-83 for field wiring between compressor room and coolers.
 6. Wire liquid line solenoids and thermostats as shown on the R-1 plan and EISD-90.
 7. Rear Load Dairy Cooler: Install the display door lights on switch located beside the door and label accordingly.
 8. Seal all openings through cooler walls or ceiling.
 9. Wire any coil with electrical defrost and 208 volt fans to the compressor rack for which the system originates. On Protocol stores, wire to protocol unit serving these coils
 10. Walk-in freezer: Furnish and install wiring and make connections for defrost controls on both all freezers. See EISD-401-402-or 404, for field wiring between coils and compressor room.
 11. Walk-in Door Monitor: Install Owner furnished unit shipped with each cooler and freezer door on insulated wall panel above door per EISD-4, Furnish and install conduit, wiring to make final connections to fans and suction stop valves and control wiring to EMS. Refer to installation guide for additional information.

3.13 PREPARATION ROOM AIR CONDITIONING ELECTRICAL INSTALLATION

- A. Install final connection to prewired refrigeration coils to electrical junction boxes above ceiling.

- B. Manual lift solenoids and thermostats will be furnished and installed by the Refrigeration Installer. Thermostats and solenoids will be located above ceiling near cooler ceiling. Furnish and install necessary materials (including switch) to wire thermostats, solenoids, fans and switch in accordance with Drawings.
- C. Refer to construction Drawings and manufacturer's application data for circuit loads.
- D. Any switches required by governing codes shall have a lockable cover to prevent accidental disconnection of the circuit.

3.14 FRONT END AND CHECKOUT

- A. Checklanes: Install power pole furnished by Owner to top of register stand at right/rear corner up to and secure to building structural steel. Furnish and install electrical power supply wiring from junction boxes in structural steel to junction boxes supplied in bottom of checklanes and make final 120 V connections to prewired checkout counters and cash register stands. Power outlets for cash registers are to be on separate circuits from check lane belts, refer to building Electrical Drawings. Inspect power belt on checkout counters for proper rotation.
- B. Checklane Light: Install lane light on power pole and feed power cord through power pole. Plug power cord for light into designated outlet under checklane belt stand identified for lane light. See ESD-62.
- C. U-Scan: Install power poles furnished by checklane manufacturer from floor up to and secure to building structural steel. Furnish and install electrical power supply wiring from junction boxes in structural steel to junction boxes supplied in bottom of checklanes and make final 120 V connections to prewired checkout counters and cash register stands. Power outlets for cash registers are to be on separate circuits from check lane belts, refer to building Electrical Drawings. Inspect power belt on checkout counters for proper rotation.
 - 1. Furnish and install the following under each U-Scan unit:
 - a. (1) 4 plex receptacle.
 - b. (1) 4 plex isolated ground (CR panel)
- D. U-Scan Lanelight: Install (1) 120V duplex receptacle and light switch in surface mounted shallow switch/receptacle box mounted on power pole feeding U-Scan unit. Furnish and install electrical power supply wiring from junction boxes in structural steel to light switch and from switch to 120V duplex receptacle. Install lane light on power pole and feed power cord through power pole and plug into outlet. See ESD-62A
- E. Install (1) 120V duplex receptacle on rear of checklane belt and U-Scan unit turned horizontally for vendor supplied refrigerated cases as indicated on Fixture Plan. Furnish and install electrical power supply wiring from junction boxes in ceiling structure with designated electrical circuits for 120V duplex receptacle.
- F. U-Scan Supervisor Station: Tap closest U-Scan for general purpose and isolated ground. Furnish and install 4 plex receptacles for u-scan supervisor station.

- G. Temporary Checkout Equipment: Furnish and install electrical connections and assist in installing communications cables to temporary checkout equipment.

3.15 DELI/BAKERY, MEAT, SEAFOOD AND PRODUCE PREPARATION EQUIPMENT ELECTRICAL INSTALLATION

- A. General: Install final connections on equipment shown on the Fixture Plan, listed in the legend, found in any contract addendum, or as designated by the Owner.

1. Most large equipment will require direct wiring to junction boxes or conduit furnished and installed by the Building Electrical Contractor.
2. Other equipment will require the addition of a plug to match the receptacle.
3. Some equipment will be supplied with plug and ready to plug into receptacle.

B. Deli/Bakery Equipment

1. Equipment is prewired by manufacturer.
2. After assembly of oven by others, provide final electrical connections and check for proper operation. Verify that all elements are operating. Oven may be gas or electric.
3. Provide two 120V duplex receptacles where indicated in the serving line area and one receptacle on the cake decorating booth.
4. Mount 120V duplex receptacles for deli drink counter below counter. Cut holes in rear of cabinet for access. Relocate in field if required.
5. Provide 120V duplex receptacles for pressure fryer warming lights.
6. Provide one 20A 120V duplex receptacle and circuit for seven-section menu boards.
7. Provide 208V tandem slot receptacle for 208V toaster. Drill hole in stainless island counter and mount receptacle below counter. Add rubber grommet around hole.
8. Make all final connections to all equipment on drink bar.
9. Make final connections to Bakery rack oven and dishwasher from disconnect or j-box furnished and installed by the Building Electrical Contractor.
10. Plug in, and check operation all equipment indicated on Fixture Plan.
11. Make connections for equipment under exhaust hoods with shunt-trip control (hood, breakers and automatic fire extinguisher equipment installed by others).
12. When a Starbucks coffee kiosk is shown on Fixture Plan, make final connections to fixtures, counters, lights and equipment.
13. For equipment on tables not located against wall, convert plugs on equipment to twist lock plugs to match drop cords fed from GFCI breakers associated with each piece of equipment.

C. Meat and Seafood Equipment

1. Check all equipment for proper operation and proper motor rotation. Modify plug on all three-phase equipment if required for correct rotation, not in-house electric circuit.
2. Inspect plugs supplied with meat slicers and tenderizer. Provide twist lock plug and waterproof cover to connect to waterproof overhead drop cord receptacle when equipment is shown on table not located against prep room wall.
3. Make all final connections to all new or relocated equipment per plan that may include but not limited to self-contained ice-maker, seafood steamer, wrappers, lobster tank, slicers, computer desk, service case humidity systems, etc.

4. Make all final connections to all refrigerated meat and seafood cases using Sealight 'flexible' conduit.
5. For equipment on tables not located against wall, convert plugs on equipment to twist lock plugs to match drop cords fed from GFCI breakers associated with each piece of equipment.
6. When electric is fed from overhead drop cords to meat saws, grinder, wrappers or belt sealers, convert plugs on equipment to twist lock plugs to match drop cords fed from GFCI breakers associated with each piece of equipment.

D. Produce Equipment

1. Wall outlets, junction boxes, and disconnects furnished by building electrical contractor.
2. Provide 120V duplex receptacle above for corner produce corner wall case to TV/VCR and RES strobe lights for thunder and lighting effects.
3. Salad Bar: When indicated on plans, furnish and install materials as required to complete electrical installation of salad bar and lighted salad bar canopy. Furnish and install a 120V duplex receptacle at one end of salad bar for scale (if not provided).
4. Install a receptacle for the produce case misting system. Verify exact location with Owner.
5. Install and wire speakers and strobe light furnished on top of cases at equal distances hiding the strobe behind the speaker for thunder and lighting effects.
6. Wire other new or relocated equipment per plan that may include but not limited to self-contained ice maker, sink disposer, wrappers, r/o filter equipment, computer desk, etc.
7. Install three GFIC 120V duplex receptacles on top of wall cases for case cleaning.

3.16 SALES AREA EQUIPMENT ELECTRICAL INSTALLATION

- A. Install fluorescent fixtures (supplied by Owner) in cosmetic display valence. Provide electrical connections from fixtures to junction box on floor duct under shelving. Use same circuit as used for receptacle on shelving. Provide D35 lamps in fixtures.
- B. Install single lamp 8 foot or 4 foot, 3 or 2 tube t-8 electronic fluorescent fixtures (furnish and install lamps) as required with 35k lamps as required for all Hypermaxi shelving and shelving with overhead canopies. Furnish and install three 4 Plex 120V receptacles mounted in canopy for promotional use. Refer to Fixture Plan. Fixtures Supplied by Owner.
- C. Provide one 120V duplex receptacle for each coffee mill (Minimum two coffee mills). Refer to fixture plan for coffee mill location. Verify location of coffee mills with Owner before installing.
- D. Interior Signs: Connect to designated electrical circuit or tap closest circuit of required voltage for indoor signs. For exposed structure installations provide white power cord from the power supply junction box to sign. Verify circuit is not overloaded per N.E.C.
- E. Digital Photo Center: Provide and install three 4 Plex 120V receptacles and connect digital photo center equipment.
- F. Customer Service Office and Accounting Room: Provide 120V duplex receptacles for lottery, ticket master, western union and other machines in prefabricated office (maximum of 6 outlets).

Provide 16 feet (4.88 m) of plug mold strip, connect currency counters and other countdown equipment to circuits powered from emergency generator. See Owner for locations.

- G. Furnish and install all isolated and dedicated outlets required in prefabricated sales area office to circuits provided. Refer to Fixture plan and Owner for locations.
- H. Produce Weigh Station: When indicated on the Fixture Plan provide 120V duplex receptacles on produce island cases. Install on at least two cases.
- I. Island Cases: Provide a flush mounted 120V duplex receptacle as high as possible on the kick plate in each end of the kick rail of all island cases, connect two receptacles per breaker. Connect to junction box as shown on the electrical drawings.
- J. Glass Door End Cases - Provide one general-purpose 120V duplex receptacle in the kick rail of each glass door end case, connect two receptacles per breaker.
- K. Provide at least three 120V duplex receptacles on the back of each case in the deli self-serve cases in front of salad prep area, above stainless tables.
- L. Customer Coffee Station: Provide 120V duplex receptacle in customer rest area counter for coffee maker. Install inside of cabinet and drill hole in counter top with 2 inch (50 mm) minimum color matching grommet for routing of electric cords.
- M. Floral Workstation: Provide two 120V duplex receptacles in workstation. Provide light switch for lighted display.
- N. Floral Slat Wall and Bases: Install and wire fluorescent lighting as required. Provide 3500 k lamps.
- O. Hexagon Hot Chicken Display Case: Provide 120V duplex receptacle mounted on kick plate.
- P. Book, Magazine, and Greeting Card Light Fixtures: Provide final connection to light fixtures when supplied.
- Q. Cosmetic/General Merchandise/HBC: Provide final connection and install light fixtures with T8 lamps and case displays. Lamps to be sp35 series.
- R. In-Line Refrigerated Cases: Extend circuiting from appropriate junction box under shelving and make final connections to self-contained 'in line' display cases as shown on merchandising plan. Each case requires circuits as follow:
 - 1. 4 Foot Case: One 30 AMP 120V.
 - 2. 8 Foot Case: One 30 AMP 120/208V.
 - 3. 12 Foot Case: Two 30 AMP 120/208V .
- S. Install dual temperature control switches (minimum of 3) in island frozen dual-temperature island cases through thermostats.
- T. Wine Shop: When indicated, plug in wine chiller to outlet.
- U. Nutrition Shop: Provide 4 plex 120V receptacles in nutrition shop for power cords for nutrition information center equipment.

- V. Customer Service Office: Install 1-1/4 inch (32 mm) minimum diameter hole in customer service office floor for Sensormatic security system cables,
- W. Bread Shelving Canopy: Install fluorescent light fixtures with T8 lamps in shelf mounted canopy, provide sp35 series lamps. Wire fluorescent canopies, furnished and installed by others on grocery shelving b-lines where indicated on Fixture or Merchandising Plan. Make final electrical connections from fixtures to junction box on floor duct under island shelving. Provide power switch in electrical box mounted in canopy and conceal all j-boxes.
- X. Technology IDF Equipment: Furnish conduit, wire, and outlet and install two (2) 120V duplex receptacles on isolated ground circuit in Rx and backroom for Technology IDF cabinet. Mark panel accordingly. Exact location to be determined by Owner and store personnel.
- Y. Refrigerated Dog Food Cases: Provide one 120V duplex receptacle for two cases. Refer to Fixture Plan for location.
- Z. Vacuum Displays: Provide a minimum of 8 feet (2440 mm) long plug molding on shelving for promotional display area. Provide a minimum of two rows of electrical plug molding on top of shelving for lamp displays. Quantity of plug in molding shall be commensurate with number of electrical circuits provided.
- AA. Lamp Deck: Provide plug mold, with outlets on 6 inch (150 mm) centers, under top shelves, both sides for entire length of lamp display shelving indicated on Fixture Plan.
- BB. Shelving Electric: Furnish and install EMT conduit thru holes in shelving base shoes and mount receptacle box to shelving base shoes. Furnish and install wiring fed from under floor raceway or from overhead junction box mounted in structural steel thru ridged EMT conduit to shelving. See EISD-2 for detail for electric fed from overhead.

3.17 MISCELLANEOUS EQUIPMENT ELECTRICAL INSTALLATION

- A. Signs: Provide final electrical connections to Owner supplied signs, including but not limited to signs for restaurants, cheese shop, fragrance area, film sign, video sign, nutrition and service cosmetics accent lighting.
- B. Cleaning Area: Install Owner supplied battery charger for battery operated equipment.
- C. Install fly grids per fixture plan. Relocate as required to meet board of health inspection.
- D. Pharmacy Counter Equipment: Install 20 feet (6 m) long electrical plug mold on backsplash of front pharmacy counter and island work counter. Each counter space will require 75 percent coverage for general-purpose power. Route cabling concealed at counter to behind each device or equipment. Provide 2-1/8 inch (60 mm) grommets behind each piece of equipment.
- E. Pharmacy Showcase: When indicated, make final connection to fluorescent light fixtures in pharmacy display shelving, installer is to supply lamps for fixtures.
- F. Specialty Department Equipment: Make final electrical connections to specialty department equipment as shown on the Fixture Plan.

- G. Water Purification Machine: Provide 120V duplex receptacle for water purification machine on sales area.
- H. Provide 120V isolated grounded receptacle adjacent to "ALTECH" HVAC control panel for modem.
- I. ECR Room Computer Racks: Provide an isolated ground dedicated circuit 4 plex outlets on each side of the new rack system.

3.18 EQUIPMENT TESTING

- A. Verify proper operation of all lights, motors, heating elements, and other items that are part of equipment to be furnished and installed by Installer. Correct problems as necessary.
- B. Equipment shall be 100 percent operational before work of this Section is considered complete.
- C. Complete the baler installation/operational checklist and submit to Owner. Checklist is shipped with baler.

END OF SECTION 11 41 63

SECTION 20 05 29 - HANGERS AND SUPPORTS FOR FACILITY SERVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Hangers and supports for the following facility services piping and equipment:
 - a. Fire suppression
 - b. Plumbing
 - c. Heating, ventilating, and air conditioning
 - d. Electrical
 - e. Electronic safety and security

1.2 DEFINITIONS

- ##### A. Terminology:
- As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.3 SUBMITTALS

A. Product Data:

1. Trapeze hangers.
2. Steel slotted channel systems.
3. Cable strut support systems.
4. Equipment supports.

- ##### B.
- Refer to Division 26 Section "Lighting" for lighting fixture hangers.

1.4 QUALITY ASSURANCE

- ##### A. Welding:
- Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX.
- ##### B.
- Comply with NFPA-70.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple pipes, raceways, lighting, and other equipment capable of supporting combined weight of supported systems, system contents, and test water.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Manufacturers:
 - 1. AAA Technology & Specialties Co., Inc.
 - 2. Bergen-Power Pipe Supports.
 - 3. B-Line Systems, Inc.; a division of Cooper Industries.
 - 4. Carpenter & Paterson, Inc.
 - 5. Empire Industries, Inc.
 - 6. ERICO/Michigan Hanger Co.
 - 7. Globe Pipe Hanger Products, Inc.
 - 8. Grinnell Corp.
 - 9. GS Metals Corp.
 - 10. National Pipe Hanger Corporation.
 - 11. PHD Manufacturing, Inc.
 - 12. PHS Industries, Inc.
 - 13. Piping Technology & Products, Inc.
 - 14. Tolco Inc.

2.2 SUPPORTING DEVICES (ELECTRICAL SYSTEMS):

- A. Provide supporting devices which comply with manufacturer's standard materials, design and construction, in accordance with published product information and as required for complete installation; and as herein specified. Where more than one type of supporting device meets requirements, selection is Contractor's option.
- B. Supports: Provide supporting devices of types, sizes and materials indicated; and having the following construction features:
- C. Clevis Hangers: For supporting rigid metal conduit; galvanized steel; with **1/2-inch (13-mm)** diameter hole for round steel rod; approximately **54-lbs. (25-kg)** per 100 units.
- D. Riser Clamps: For supporting rigid metal conduit; black steel; with two (2) bolts and nuts, and **4-inch (101.6-mm)** ears; approximately **510-lbs. (231-kg)** per 100 units.
- E. C-Clamps: Malleable iron; **1/2-inch (13-mm)** rod size; approximately **70-lbs. (32-kg)** per 100 units.
- F. Beam Clamps: Malleable iron, **1-1/4-inch by 3/16-inch (32-mm by 5-mm)** stock; **5/16-inch (8-mm)** cross bolt; approximately **22-lbs. (10-kg)** per 100 units for **1-inch (25.4-mm)** size.

- G. One-Hole Conduit Straps: For supporting 3/4-inch (19-mm) rigid metal conduit, galvanized steel; approximately 7-lbs. (3-kg) per 100 units.
- H. Two-Hole Conduit Straps: For supporting 3/4-inch (19-mm) rigid metal conduit, galvanized steel; 3/4-inch (19-mm) strap width; and 2-1/8-inch (54-mm) between center of screw holes.
- I. Conduit Clamps: For supporting electrical metal tubing or rigid steel conduit; galvanized stamp steel, with bolt, approximately 7-lbs. (3-kg) per 100 units. Heat-treated spring steel clamps not permitted.
- J. Hexagon Nuts: For 1/2-inch (13-mm) rod size; galvanized steel; approximately 4 lbs. (2-kg) per 100 units.
- K. Round Steel Rod: Black steel; 1/2-inch (13-mm) diameter; approximately 67 lbs. (30-kg) pounds per 100-ft. (30.5-m).
- L. Anchors: Provide anchors of types, sizes and materials indicated, with following construction features:
 - 1. Lead Expansion Anchors: 1/2-inch (13-mm); approximately 38 lbs. (17-kg) per 100 units.
 - 2. Toggle Bolts: Springhead; 3/16-inch by 4-inch (5-mm by 102-mm); approximately 5-lbs (2-kg) per 100 units.
 - 3. Wood Screws: Cadmium-plated, with machine or flat heads; size.
 - 4. Sheet Metal Screws: Cadmium-plated, with machine, pan heads or hex-drive heads; size.
 - 5. Threaded Studs: Cadmium-plated, set by a power charge, and provided with lock washers and nuts; size.
 - 6. Nylon Anchors: Nail-type.
- M. Building Support Systems: Provide one of the following or a combination of both:
 - 1. U-Channel Support Systems: 12 gage, 0.108-inch (2.743-mm), hot-dip galvanized steel, of types and sizes indicated; construct with 9/16-inch (14-mm) diameter holes, 8-inches (203-mm) o.c. on top surface, with standard plated finish and with the following fittings, which mate and match with U-channel:
 - a. Fixture Hangers
 - b. Channel Hangers
 - c. End Caps
 - d. Beam Clamps
 - e. Wiring Studs
 - f. Thinwall Conduit Clamps
 - g. Rigid Conduit Clamps
 - h. Conduit Hangers
 - i. U-Bolts
 - 2. Cable Strut Support Systems (Lighting Only): System consisting of wire rope spanning between structural members connected with proprietary fasteners.
 - a. Manufacturer: Gripple, Inc.

- b. Performance Requirements: Design, fabricate and construct wire rope hanger and support system to manufacturer's recommendations utilizing manufacturer's regular production components, parts and assemblies.
- c. Wire Rope: 7-by-19, 1/8 inch or 1/4 inch diameter as required by lengths and loads, made from stainless steel wire complying with ASTM A 492, Type 304 or galvanized steel complying with ASTM A 603.
 - 1) Length: Per manufacturer or Engineer of Record's recommendation.
- d. Cable Strut Fastener: one-piece die cast Type ZA2 zinc two-channel housing, encasing a series of Type 302 stainless steel springs with serrated self-locking steel wedges, adjustable by means of a setting key; sizes as required to accommodate design loads.
 - 1) Product: Gripple, Inc.; D3 or D6 depending on wire diameter.
- e. C-Clip Hanger: ZA2 Zinc; Capable of accommodating design load.
 - 1) Product: Gripple, Inc.; C-Clip, 1/8 inch or 1/4 inch as required for cable strut.

2.3 SUPPORTING DEVICES (FIRE SUPPRESSION, PLUMBING, AND HVAC PIPING AND EQUIPMENT)

A. Steel Pipe Hangers and Supports

- 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.
- 2. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.
- 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
- 4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

B. Trapeze Pipe Hangers: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

C. Metal Framing Systems:

- 1. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.
- 2. Coatings: Manufacturer's standard finish, unless bare metal surfaces are indicated.
- 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.

D. Thermal-Hanger Shield Inserts

- 1. Description: ~~100-psig-~~ (690-kPa-) minimum, compressive-strength insulation insert encased in sheet metal shield.
- 2. Insulation-Insert Material for Cold Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with vapor barrier.

3. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate.
4. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
5. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
6. Insert Length: Extend **2 inches (50 mm)** beyond sheet metal shield for piping operating below ambient air temperature.

E. Fastener Systems

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
2. Mechanical-Expansion Anchors: Insert-wedge-type zinc-coated steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

F. Equipment Supports: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

G. Copper Pipe Hangers

1. Description: MSS SP-58, Types 1 through 58 copper-coated-steel, factory fabricated components.
2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel or stainless steel.

2.4 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
1. Properties: Nonstaining, noncorrosive, and nongaseous.
 2. Design Mix: **5000-psi (34.5-MPa)**, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

- A. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Refer to Division 26 Section "Lighting" for installation of building attachments for lighting fixtures.
 2. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.

3. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction to attach to top flange of structural shape.
4. Side-Beam or Channel Clamps (MSS Type 20): For attaching to top flange of beams, channels, or angles.
5. Center-Beam Clamps (MSS Type 21): For attaching to center of top flange of beams.
6. Welded Beam Attachments (MSS Type 22): For attaching to top of beams if loads are considerable and rod sizes are large.
7. C-Clamps (MSS Type 23): For structural shapes.
8. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb (340 kg).
 - b. Medium (MSS Type 32): 1500 lb (680 kg).
 - c. Heavy (MSS Type 33): 3000 lb (1360 kg).
9. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
10. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

B. Electrical Systems

1. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
2. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
3. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 - a. Secure raceways and cables to these supports with two-bolt conduit clamps.
4. Spring-steel clamps designed for supporting single conduits without bolts may be provided for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.
5. Hang racks with two or more conduits by hangers suspended from roof trusses and joists/joist girders only at panel points, at top cord only, unless otherwise indicated.

C. Fire Suppression, Plumbing, and HVAC Piping and Equipment

1. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.
2. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.
3. Provide hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.
4. Provide nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
5. Provide padded hangers for piping that is subject to scratching.
6. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

- a. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, **NPS 1/2 to NPS 30 (DN 15 to DN 750)**.
 - b. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of **120 to 450 deg F (49 to 232 deg C)** pipes, **NPS 4 to NPS 16 (DN 100 to DN 400)**, requiring up to **4 inches (100 mm)** of insulation.
 - c. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, **NPS 3/4 to NPS 24 (DN 20 to DN 600)**, requiring clamp flexibility and up to **4 inches (100 mm)** of insulation.
 - d. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, **NPS 1/2 to NPS 8 (DN 15 to DN 200)**.
 - e. U-Bolts (MSS Type 24): For support of heavy pipes, **NPS 1/2 to NPS 30 (DN 15 to DN 750)**.
 - f. Pipe Saddle Supports (MSS Type 36): For support of pipes, **NPS 4 to NPS 36 (DN 100 to DN 900)**, with steel pipe base stanchion support and cast-iron floor flange.
 - g. Single Pipe Rolls (MSS Type 41): For suspension of pipes, **NPS 1 to NPS 30 (DN 25 to DN 750)**, from 2 rods if longitudinal movement caused by expansion and contraction might occur.
 - h. Complete Pipe Rolls (MSS Type 44): For support of pipes, **NPS 2 to NPS 42 (DN 50 to DN 1050)**, if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
7. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
- a. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, **NPS 3/4 to NPS 20 (DN 20 to DN 500)**.
 - b. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, **NPS 3/4 to NPS 20 (DN 20 to DN 500)**, if longer ends are required for riser clamps.
8. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
- a. Steel Turnbuckles (MSS Type 13): For adjustment up to **6 inches (150 mm)** for heavy loads.
 - b. Steel Clevises (MSS Type 14): For **120 to 450 deg F (49 to 232 deg C)** piping installations.
9. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
- a. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 - b. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction to attach to top flange of structural shape.
 - c. Side-Beam or Channel Clamps (MSS Type 20): For attaching to top flange of beams, channels, or angles.
 - d. Center-Beam Clamps (MSS Type 21): For attaching to center of top flange of beams.

- e. Welded Beam Attachments (MSS Type 22): For attaching to top of beams if loads are considerable and rod sizes are large.
 - f. C-Clamps (MSS Type 23): For structural shapes.
 - g. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - 1) Light (MSS Type 31): 750 lb (340 kg).
 - 2) Medium (MSS Type 32): 1500 lb (680 kg).
 - 3) Heavy (MSS Type 33): 3000 lb (1360 kg).
 - h. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 - i. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
10. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
- a. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 - b. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 - c. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
11. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
- a. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches (32 mm).
 - b. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.
 - c. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to absorb expansion and contraction of piping system from base support.
12. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.
13. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.
14. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

3.2 HANGER AND SUPPORT INSTALLATION

A. Electrical Systems

- 1. Coordinate with other electrical work, including raceway and wiring work, as necessary to interface installation of supporting devices with other work.
- 2. Install supporting devices and attachments, in accordance with manufacturer's written instructions and with recognized industry practices.

- a. Comply with requirements of NEC and NECA for installation of supporting devices.
 - b. Arrange for grouping of parallel runs of horizontal conduits to be supported together on trapeze-type hangers, where possible.
 - c. Install supports with spacings in compliance with NEC requirements.
 - d. Wire or perforated metal strap is not acceptable for hanger supports or securing raceways to supporting devices.
 3. Supports and Anchors: Securely and rigidly fasten equipment in place with pipe hangers, wall brackets, clamps, approved hangers, threaded C-clamps, with retainers or ceiling trapeze.
 - a. Hangers, clamps and support fittings to be malleable iron.
 - b. Fasten with wood screws or screw-type bolts on concrete or brick; by machine screws, welded threaded studs, steel or malleable iron clamps on steel work.
 - c. Nail-type nylon anchors and threaded studs, driven in by powder charge, and provided with lock washers and nuts, may be provided in lieu of expansion bolts or machine or wood screws.
 - d. Anchors shall not be welded to steel structures, or attached to roof or floor deck.
 - e. Cut holes in reinforced concrete beams or in concrete joists without cutting reinforcing bars. Holes not used, to be filled.
 4. Install supporting devices securely and rigidly in place.
 5. Conduits supported, using suspended ceiling system, will not be permitted.
- B. Fire Suppression, Plumbing, and HVAC Piping and Equipment
1. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
 2. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.
 - a. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
 - b. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.
 3. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.
 4. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
 5. Fastener System Installation:
 - a. Install powder-actuated fasteners in concrete after concrete is placed and cured for 28 days. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 - b. Install mechanical-expansion anchors in concrete after concrete is placed and cured for 28 days. Install fasteners according to manufacturer's written instructions.

6. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
7. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
8. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
9. Install lateral bracing with pipe hangers and supports to prevent swaying.
10. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, **NPS 2-1/2 (DN 65)** and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
11. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
12. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.
13. Insulated Piping: Comply with the following:
 - a. Attach clamps and spacers to piping.
 - 1) Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - 2) Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - 3) Do not exceed pipe stress limits according to ASME B31.1 for power piping and ASME B31.9 for building services piping.
 - b. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - c. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - d. Shield Dimensions for Pipe: Not less than the following:
 - 1) **NPS 1/4 to NPS 3-1/2 (DN 8 to DN 90): 12 inches (305 mm)** long and **0.048 inch (1.22 mm)** thick.
 - 2) **NPS 4 (DN 100): 12 inches (305 mm)** long and **0.06 inch (1.52 mm)** thick.
 - 3) **NPS 5 and NPS 6 (DN 125 and DN 150): 18 inches (457 mm)** long and **0.06 inch (1.52 mm)** thick.
 - 4) **NPS 8 to NPS 14 (DN 200 to DN 350): 24 inches (610 mm)** long and **0.075 inch (1.91 mm)** thick.
 - 5) **NPS 16 to NPS 24 (DN 400 to DN 600): 24 inches (610 mm)** long and **0.105 inch (2.67 mm)** thick.
 - e. Pipes **NPS 8 (DN 200)** and Larger: Include wood inserts.
 - f. Insert Material: Length at least as long as protective shield.
 - g. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.3 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make smooth bearing surface.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.4 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work.

3.5 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

3.6 PAINTING

- A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

END OF SECTION 20 05 29

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SECTION 21 10 00 - WATER-BASED FIRE SUPPRESSION SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. **Existing system to remain.** Modify only as required due to demolition and new work.
 - 1. This section is for a completely new fire suppression system. Use for new work or as a guide to modify the existing system.
- B. Section Includes:
 - 1. Wet-Pipe Sprinkler System(s): Automatic sprinklers attached to piping containing water that is connected to water supply. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.
 - 2. Dry-Pipe Sprinkler System(s): Do not use unless approved by Kroger Manager of Architecture and Engineering Services or specifically allowed by this specification section. Submit all requests in writing, through the RFI process, with sufficient documentation provided including allowable deviations.

1.2 DEFINITIONS

- A. Owner's Fire Suppression Consultant:
 - 1. Telgian Corporation, kroger@telgian.com.

1.3 REFERENCES

- A. American Society of Civil Engineers (ASCE)
 - 1. ASCE 7-10, 2010 Edition – Minimum Design Loads for Buildings and Other Structures
- B. American National Standards Institute (ANSI)
 - 1. ANSI/AWWA C-151/A21.51, 2009 Edition – Ductile-Iron Pipe, Centrifugally Cast
 - 2. ANSI/AWWA C-110/A21.10, 2008 Edition – Ductile-Iron and Gray-Iron Fittings
 - 3. ANSI/AWWA C-111/A21.51, 2006 Edition – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
- C. FM Global (FM):
 - 1. Approval Guide, Latest Edition
 - 2. FM Data Sheet 2-8N, installation of Sprinkler Systems
 - 3. FM Data Sheet 2-2, installation of Suppression Mode Sprinklers
 - 4. FM Data Sheet 8-9, General Storage

D. National Fire Protection Association (NFPA):

1. NFPA 13, 2010 Edition – Installation of Sprinkler Systems
2. NFPA 20, Installation of Fire Pumps
3. NFPA 24, 2010 Edition – Standard for the Installation of Private Fire Service and their Appurtenances.
4. NFPA 25, 2010 Edition – Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems
5. NFPA 291, 2010 Edition – Recommended Practice for Fire Flow Testing and Marking of Hydrants.

E. Underwriters Laboratory (UL):

1. UL Fire Protection Directory – Latest Edition.

1.4 SUBMITTALS

1. Submittal Procedures: Provide Submittals complete, accurate, and in full compliance with Division 00 Section "General Requirements" and the following for proper and timely approval:
 - a. Furnish Drawings accurately to scale on sheets of uniform size and include all necessary data, as required by NFPA 13, 2010 section 22.1.3.
 - b. Provide Submittals to authorities having jurisdiction (AHJ) per their requirements. Obtain reviews and approvals as required by AHJ's.
 - c. Within 15 calendar days of award of prime contract, submit to Telgian, via Owner's Project Management Website (PMW), as specified herein. Allow 15 day turn-around on submittals sent to Telgian from the day of receipt.
 - d. Submit electronic sets of detailed shop drawings, seismic calculations, hydraulic calculations, and material data sheets for the complete sprinkler system to Owner's Insurance Underwriter's Engineers, for approval. Provide all data required by NFPA and the authorities having jurisdiction in electronic form via Owner's PMW.
 - e. Respond in writing to submittal package review comments within 15 days of receipt. Include with re-submittals an item by item response letter from the Contractor. Additionally changes or additions to the drawings must be clearly indicated by a change/revision delta and clouded.
 - f. Approval of submittals by authorities having jurisdiction and Telgian is required prior to beginning fabrication and installation.
 - g. Final system acceptance shall be based upon final inspection and tests and approval by Telgian and the authority having jurisdiction.
 - h. Maintain two copies of approved documents on job site.

B. Product Data: For sprinkler components proposed (including but not limited to: new equipment, piping, hangers, valves, etc).

C. Shop Drawings: Include the following::

1. Narrative description of the building and fire sprinkler systems, located on the first sheet of the shop drawings, including at a minimum the following information:

- a. Total square footage of the building.
 - b. Confirmation that the building is provided with sprinkler coverage throughout facility.
 - c. Number of sprinkler system risers.
 - d. Size (pipe diameter) of each sprinkler riser.
 - e. Size (pipe diameter) of underground lead in supplying the risers.
 - f. Types of system(s); grid, tree, loop, etc.
 - g. Size and type of mains and branch lines for each system (i.e. "System one consists of 6 inch sch. 10 supply main, 4 inch sch. 10 front main, 3 inch sch. 10 rear main and 2 inch sch. 40 branch lines").
 - h. Scope of work for the Project.
2. Site plan with flow and test hydrants identified. Include the underground piping from the base of riser to the water test hydrants and the elevation of the test hydrant relative to the base of riser.
 3. Hydraulic placard data for new and existing systems.
 4. Ceiling elevations and elevation/section views of areas being affected by the Project. Provide additional elevation views where needed to show bulkheads and soffits for clarity.
 5. Full height cross section of areas of the building affected by the Project.
 6. Identification of room uses. Include any exterior pre-fabricated mechanical equipment room and trash compactors and drive through pharmacy canopies.
 7. Installation detail of the dry sprinklers and temperature of enclosures to verify the selected length of the dry heads.
 8. Make, model and location of any backflow prevention device that services the fire sprinkler systems. Devices must comply with the requirements of this specification.
 9. Identification of the ASCE 7-10 seismic design category (obtained from Drawings).
 10. When required by ASCE 7-10, seismic bracing is to be in accordance with the specifications, ASCE 7-10 and NFPA 13
 - a. Provide seismic separation assemblies per NFPA 13, and indicate the method used and its location.
 - b. Flex fittings are to be located where required.
 - c. Show the location of seismic components including (but not limited to) bracing (longitudinal, lateral, 4-way, etc.), and restraints.
 - d. Show branch line vertical piping restraints.
 - e. Indicate by note gap requirements between the fire service lead-in stub up and concrete floor and where piping penetrates walls.
 - f. Include seismic calculations.
 11. Location of valves, including pressure relief valves.
 12. Note indicating control valves shall be accessible and provided with a tamper switch, and locked open.
 13. Interior and exterior wall penetration detail, including methods of sealing penetration (for fire proofing, weather proofing, etc.) and escutcheons.
- D. Engineering Calculations: Provide hydraulic calculations for all new and existing systems.
- E. Project Closeout Submittals:

1. Maintenance Data: Provide one set of components of system, servicing requirements, inspection data, and owner's manuals.
2. Training Requirements: Provide operational training to Owner. Include system control operation, fire pump (if provided) manual and abort functions, trouble procedures, auxiliary functions and emergency procedures. Provide one set of operations and maintenance literature and instructions provided by the manufacturer for installed equipment and devices along with a current copy of NFPA 25.
3. Contractors Material Test Certificates: Provide one set of completed Underground, Aboveground, and Fire Pump (if provided) Contractor's Material Test Certificates.
4. As-Built Shop Drawings: Provide two sets of as-built shop drawings indicating installed location of components, including (but not limited to) all piping, sprinklers, hangers, valving, inspector's test stations, auxiliary drains, and hose stations. As-built drawings must include all corrections noted during the site observation process and reflect all revisions, addenda, and construction change directives implemented on the project. Approved as-built drawings are required for Project Closeout.
5. Contractor's Record Letter of Conformance for Fire Suppression: Upon satisfactory Fire Protection Site Observation (FP Observation), complete the Record Letter of Conformance (form provided at the end of this specification), obtaining all signatures (subcontractor and Contractor) and submit original for payment per Contract Documents.
6. At Project completion, present as-built drawings to the Store Manager enclosed in a plastic pipe tube (fixed cap at one end and a threaded-cap on the other end) for storage permanently mounted in the riser room.
7. System Zone Drawing: Indicate sprinkler zone coverage. Title drawing "Fire Protection Sprinkler System Zoning." Indicate the location of risers, control valves, inspector's test drains, and valves. Submit to Telgian, via PMW, for approval. Upon approval, install in a wood frame with plexiglas cover on wall adjacent to Risers.
8. Installers Warranty Information and Certificate.
9. In addition to the copies of Documents delivered to the Store Manager, distribute two additional copies of documents as indicated below:
 - a. Deliver copies of the as-built shop drawings and Contractor's Record Letter of Conformance for Fire Suppression and Contractor's Material Test Certificates (Underground, Overhead, and Fire Pump) in electronic form (*.pdf or *.plt) to Telgian via PMW.

1.5 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed.

1. Provide a sprinkler cabinet(s) containing spare sprinklers, wrenches and equipment in accordance with NFPA. The stock of spare sprinklers shall include all types and ratings installed but not less than a total of six. Permanently mount cabinet in the sprinkler riser room.

1.6 DESIGN REQUIREMENTS - GENERAL

- A. Provide a complete fire sprinkler system throughout the building covering all remodeled areas as required herein and by local jurisdictions, including but not limited to internal and external canopies, attic spaces, loading docks, walk-in refrigerated boxes, trash compactor chute,

concealed spaces having combustible construction, prefabricated mechanical center (refrigeration equipment) and vendor kiosks (i.e. Starbucks Coffee, Papa Murphy's Pizza) and The Little Clinic when indicated on the Drawings. Field verify that all of these areas are protected by fire sprinklers, and if not, provide protection complete in all respects and in complete operating condition including underground connection to water main with all necessary controlling equipment.

- B. Fire sprinklers and piping shall not be routed underneath skylights.
- C. The sprinkler system shall be hydraulically designed and installed in accordance with the referenced editions of NFPA standards and all State and Local Ordinances. The minimum requirements for all components, materials, and methods shall be in accordance with NFPA and as listed by Underwriter's Laboratories, Inc. or FM Global, and the requirements of the Owner, prior to the start of work.
 - 1. Pipe schedule systems are not allowed, except as allowed by NFPA 13.
- D. Include design, hydraulic calculations, piping layout drawings, details and other drawings necessary for fabrication and installation of the fire protection system, and required changes or revisions thereof necessary to obtain approval from Telgian and authority having jurisdiction.
- E. No extra charges will be allowed for changes to drawings, piping, etc., required to conform to NFPA Standards, the Owner requirements, authority having jurisdiction requirements, Telgian requirements or with conflict with other trades.
- F. Any deviations from the specifications need to be approved by the Owner (Kroger Manager of Architecture and Engineering Services). Documentation of the allowable deviations will need to be provided in the submittals.
- G. Hydraulic Calculations
 - 1. Provide hydraulic calculations performed in accordance with NFPA for each system affected by the remodel. All areas affected by the remodel must be hydraulically calculated to prove that they comply with construction document requirements.
 - 2. Perform hydraulic calculations beyond the sprinkler system riser to the water flow test calculated effective point.
 - 3. Provide water flow test information with static, residual and pitot pressure readings in accordance with NFPA 291 recommended procedures. Provide the location and elevation of the static and residual hydrants. Provide the time and date of test. Compile flow test results on the preliminary and final drawings submitted to the Owner's underwriter for approval. If required, calculate available water flow and residual pressure at base of riser.
 - 4. Conduct flow tests within six months prior to design submittal.
 - 5. The minimum available flow and pressure at the base of the riser for sprinkler system design shall be provided so that a fire pump is not required. The typical volume and pressure required at the base of the fire sprinkler riser to accomplish this is 600 gpm at 35-psi residual pressure. Values shall be verified based on fire sprinkler water demand for the specific site.
 - 6. Include check valve, and back flow prevention devices (as required by state or local authorities) in calculation for wet sprinkler system. An allowance for friction head losses through these devices must be made in hydraulic calculations.

7. Select the hydraulically most demanding area in accordance with NFPA. For grid style pipe arrangement, provide information to demonstrate the peaking of the demand when compared to areas immediately adjacent along the same branch lines.
 8. The Contractor shall verify with the water purveyor that the water system can provide required fire sprinkler water demand (600 gpm minimum) with a minimum duration of 60 minutes.
 9. Provide a 10 percent safety factor including hose streams in all calculations. Safety factor is calculated based on reducing the supply curve (static and residual pressures) by 10 percent of the static pressure.
- H. Provide either a backflow prevention valve in water supply line or check valve in system riser. Backflow prevention design must meet the requirements of the local authorities having jurisdiction, water purveyor, and Contract Documents. Verify backflow prevention valve meets current jurisdictional requirements. If no backflow prevention valve is required, verify each riser is provided with a swing check valve. Retrofit if necessary.
- I. Provide each sprinkler system with fire department connection with check valve and ball drip. The fire department connection shall be easily accessible and clearly labeled.
- J. The fire department connection location shall be approved by the authority having jurisdiction. Hose threads shall be the same as those of the public fire department.

1.7 DESIGN REQUIREMENTS, BUILDING

- A. Complete design including seismic bracing shall comply with NFPA 13 and State and Local building codes.
- B. Conceal all piping including piping for auxiliary drains above ceilings and in walls of finished areas or where subject to view by customers. Piping may be exposed in dock and backroom storage areas.
- C. Base sprinkler system design density on Ordinary Hazard Group II occupancy for all areas (i.e. retail sales, back stock, exterior canopies, kiosks, attics, combustible concealed spaces, etc.), unless noted otherwise in contract documents. Minimum design density for standard sprinklers shall be 0.20 gpm per square foot over the hydraulically most remote 1500 square feet. If extended coverage heads are used, the minimum design density shall be 0.20 gpm per square foot over the hydraulically most remote 2000 square feet. In either case, provide a hose stream allowance of 250 gpm.
- D. Where merchandise storage and display exceeds a height of 12 feet, the sprinkler system design density shall be at least 0.39 gpm per square foot over the most remote 2000 square feet based on storage of Class IV commodity to a height up to 15 feet.
- E. Where merchandise storage and display exceed a height of 12 feet, the maximum area of coverage per individual sprinkler shall not exceed 100 square feet and the sprinkler shall have a minimum K factor of 11.2.
- F. Individual sprinkler system shall not exceed 52,000 square feet.

- G. Provide each riser with two pressure indicating gauges, one on the system side and one on the supply side of each system. Provide each riser with an inside control valve and main drain. Route piping from the main drain connection to direct water discharge outside the building.
- H. If overhead doors open in horizontal position, provide sprinklers below door when the door is in a horizontal position. Install a k-factor sprinkler head consistent with roof level sprinklers. Sprinklers shall be listed and approved for this hazard area.
- I. Provide sprinklers in soffit areas only where required. When sprinklers are required in soffits, positioned a maximum of 1-foot from the front (Sales Area) edge of soffit.
- J. Where quick response sprinklers are installed, all sprinklers within a compartment (Refer to NFPA 13 definition of a compartment) shall be quick-response.
- K. Anti-freeze systems shall not be used.
- L. Interior areas subject to freezing temperatures shall be protected by dry pendent sprinklers.
 - 1. Interior dry pipe systems shall not be used except in areas that are subject to freezing, such as concealed combustible spaces.
 - 2. Dry pipe systems shall not be used for coolers, retarders, and freezers. Protect coolers, retarders and freezers with dry-pendent sprinklers supplied from wet pipe systems. Where structure of building does not provide sufficient installation space for dry pendent sprinklers, use dry-sidewall sprinklers to protect the cooler, retarder or freezer. Any other alternate must be approved by Owner (Kroger Manager of Architecture and Engineering Services). All requests shall be in writing with sufficient documentation provided. Requests should be through the RFI process. Written documentation of the allowable deviations will need to be provided in submittal information.
- M. Where exterior areas are subject to freezing temperatures and require fire sprinkler protection, they shall be protected by dry sidewall sprinklers.
 - 1. Where exterior areas are protected by fire sprinklers, utilize dry sidewall brass heads below exterior ceilings, with matching polished brass escutcheon plates. Dry sidewall brass sprinklers shall be used to protect as much of the exterior canopy as possible, complying with all requirements of NFPA 13. Dry-pipe system shall only be used to protect the area of canopy beyond reach of dry sidewall heads. Supply dry sidewall sprinklers from wet type system with piping concealed in stud walls inside the building. If necessary, "build out" stud walls to conceal dry sidewall sprinklers on the interior of the store. For areas beyond the reach of dry sidewall sprinklers, provide protection by means of dry pipe system.
 - 2. Provide protection under exterior canopies including, but not limited to sidewalk, entrance and pick-up canopies.
 - 3. For drive thru pharmacy or bank canopies, provide fire sprinkler protection only where required by code or authorities having jurisdiction.
 - 4. Base under canopy sprinkler system design density on Ordinary Hazard Group II occupancy.
 - 5. Provide condensate drain and air compressor in easily accessible location approved by Owner.
 - 6. The valves, compressor, trim and the water supply pipe shall be protected against freezing. Valve rooms shall be lighted and heated. Heat tape shall not be used.

Coordinate location, support, access, and electrical needs with all parties. If any equipment (i.e. valves, air compressors, etc.) are located above a ceiling, or elevated more than 7 feet above finish floor, an access ladder shall be provided and permanently mounted to facilitate inspection and testing. Location of all equipment and access (i.e. ladders, platforms, etc.) shall be approved by Owner.

7. For Remodel, Expansion, and Takeover projects where it is not possible to utilize dry sidewall sprinklers supplied from an interior wet pipe system to protect exterior areas, a dry pipe system shall be utilized. Piping should be concealed above the ceiling.
 - a. If it is not possible to conceal piping, piping may be installed exposed in the "corner" adjacent to the exterior wall and sidewall sprinklers utilized, minimizing the operational and aesthetic impact of the installation.
 - b. As a last resort, if it is not possible to conceal piping, or utilize sidewall sprinklers with piping exposed in the "corner" adjacent to the exterior wall, then exposed piping with upright or pendent sprinklers may be considered. Contractor proceeds at risk with this option. If there is any other way to accomplish protection, and it is identified by any party prior to the expiration of the warranty period, the Contractor will be required to modify the installation at their cost. All costs of permits, inspections, plan reviews, design, installation, labor and supplies necessary to make the corrections will be the responsibility of the Contractor.

1.8 QUALITY ASSURANCE

- A. Fire suppression system installer and their employees shall maintain all jurisdictional (local, state and federal) licenses, registrations, and certifications for the design, fabrication and installation of systems required by Contract Documents.
- B. Qualifications (Installer): Company specializing in performing work of this Section with minimum three years experience and a minimum of a NICET Certified Engineering Technician (Level III) Fire Sprinkler Designer on staff responsible for project.
- C. Qualifications (Welder): Company specializing in performing work of this Section with minimum three years experience and a minimum of a NICET Certified Engineering Technician (Level III) Fire Sprinkler Designer on staff responsible for project.
- D. Provide certificate of compliance from Authorities Having Jurisdiction indicating approval of field acceptance tests.

1.9 WARRANTY

- A. Workmanship and Material Warranty: Standard form in which fire suppression system installer agrees to repair or replace components of fire suppression system that fail for any cause, other than misuse within specified warranty period.
 1. Installation shall be warranted to be in accordance with plans and specifications, as approved by the Owner's insurance broker.
 2. Warranty Period: One year from date outlined in General Conditions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials, devices and equipment shall be new and listed by U.L. and/or approved by Factory Mutual (FM) for use in fire protection systems.

2.2 FIRE PROTECTION – BELOW GROUND – PIPE, FITTINGS AND CONNECTIONS

A. Exterior:

1. Piping and fitting to be bituminous seal coated.
2. Ductile Iron Pipe: ANSI A21.51; AWWA C151; Class 50.
3. Ductile Iron Mechanical Joint Fittings: ANSI 21.10; AWWA C110.
4. Mechanical Joints: Rubber gaskets ANSI 21.51; AWWA C111.

2.3 FIRE PROTECTION – ABOVE GROUND – PIPE, FITTINGS AND CONNECTIONS

A. Wet Pipe Systems:

1. Pipe: Schedule 40 black steel pipe or Schedule 10 (lightwall or thinwall FM approved)
2. Fittings and Connections: Butt welded or seamless, jointed with cast iron or malleable iron, flanged fittings, standard weight malleable iron fittings or by means of grooved type couplings and matching fittings, and have a minimum working pressure of 175 psig.
 - a. Threaded fittings allowable on use with Schedule 40 steel pipe only, do not use on Schedule 10 or lightwall pipe.
3. Mechanical tees and strap-o-let type bolt-on and gasketed fitted fittings, shall not be used.

B. Dry Pipe Systems

1. Pipe: Schedule 40 black steel pipe or Schedule 10 pipe, galvanized, zinc coated internally and externally.
2. Fittings and Connections: Same as wet pipe systems except galvanized. Black steel fittings will only be allowed in interior of building if the space is conditioned.
 - a. Threaded fittings allowable on use with Schedule 40 steel pipe only, do not use on Schedule 10 pipe.
3. Mechanical tees and strap-o-let type bolt-on and gasketed fitted fittings, shall not be used.
4. Dry-pipe system must be specifically allowed by this specification section or approved by Owner (Kroger Manager of Architecture and Engineering Services).

2.4 SPRINKLERS

- A. Provide white polyester coated sprinklers with matching semi-recessed escutcheons. Sprinklers shall be rated at 155 degrees F quick response throughout finished areas receiving a lay-in or

gypsum ceiling except when near heat source, then high temperature rated sprinklers shall be provided.

- B. Sprinkler escutcheon plates and recessed fittings shall be part of a listed and approved sprinkler assembly.
- C. Flexible Piping Systems: At Contractor's option, UL listed and FM approved flexible piping connections to sprinklers may be used for both suspended and sheetrock ceilings when suitable for their intended use.
 - 1. Description: Fully welded (non-mechanical fittings), braided, leak-tested sprinkler drop with a minimum internal corrugated hose diameter of 1 inch, lengths of 2 ft to 6 ft., and a one-piece multi-port ceiling bracket with removable attachment hub and self-securing integrated snap-on clip-ends for attachment to ceiling grid without the need for a screw fastener.
 - 2. Acceptable Products:
 - a. FlexHead Industries, Inc; FlexHead Series 2000; (800) 829-6975.
 - b. Victaulic Company; VicFlex; (610) 559-3300.

2.5 VALVES

- A. Control Valves: Provide each individual water control valve for each system, either an interior valve or an exterior wall mounted valve. OS&Y and Butterfly valves are acceptable.
 - 1. Gate Valves shall be O.S. &Y type, iron body, bronze mounted, double disc parallel seat type, UL/FM psi non-shock.
- B. Check Valves: Provide flanged, iron body, bronze mounted swing check valve, with rubber faced disc, and 175 psi cold water working pressure.
 - 1. Acceptable Manufacturers:
 - a. Mueller Industries, Inc.
 - b. Clow Valve Company
 - c. Keystone Valves, a division of Tyco/Flow Control
- C. Angle and Globe Valves: Shall be bronze, threaded valves.
- D. Backflow Prevention Device: Provide backflow prevention device for the water supply system as required by the authority having jurisdiction and water providers.
 - 1. Acceptable Manufacturers:
 - a. FEBCO, a subsidiary of Watts Water Technologies, Inc.
 - b. Ames fire and Waterworks, a subsidiary of Watts Water Technologies, Inc.
 - c. Watts Water Technologies, Inc.
- E. Valves on Underground Piping: Conform to the American Water Works Association requirements for working pressure of 175 psi. Provide underground valves with approved locking type post indicators

2.6 VALVE PITS

- A. When required, construct valve pits in accordance with the local governing authority.
- B. Provide galvanized, traffic type, gratings and covers when located in drive aisles or parking lots.

2.7 MAINTENANCE AIR COMPRESSORS

- A. Subject to compliance with requirements, provide tank mounted UL Listed or FM approved air compressor system.
 - 1. Provide electric, air-cooled, oil-less compressor.
 - 2. Power: 240 volt, three phase, 60 Hz. Hard wire per NEC and manufacturer's requirements.

2.8 ALARM SYSTEM

- A. Acceptable Manufacturers:
 - 1. Potter Electric Signal Company.
 - 2. Grinnell Fire Protection; a Tyco International Company.
- B. Sprinkler alarm system shall consist of the following Basis-of-Design equipment:
 - 1. Water Flow Indicator: Grinnell Fire Protection, a Tyco International Company; Autocall Type WF-5.
 - 2. Vane Type Waterflow Alarm Switch with Retard: Potter Electric Signal Company; VSR series
 - 3. High/Low Pressure Switches (if required): Potter Electric Signal Company; PS40A
 - 4. Outside Screw and Yoke Valve Supervisory Switch: Potter Electric Signal Company; OSYSU series
 - 5. Control Valve Supervisory Switch: Potter Electric Signal Company; PCVS series
- C. Water Flow Indicator (Type WF-5 or VSR): Contains two sets of normally open 120 volt contacts. One set of contacts shall activate fire alarm system. The other set of contacts shall activate a 120 volt outside horn-strobe or bell.
- D. Provide sprinkler alarm system wiring in accordance with the electrical section of the specifications.
- E. Owner's Central Station Alarm Monitoring: Include the following conditions to be alarmed and monitored:
 - 1. Supervisory air pressure on dry-pipe systems.
 - 2. Sprinkler system water flow.
 - 3. Valve Supervision for all system valves including but not limited to supply mains, pits, branch and OS & Y valves.
- F. Alarm System Equipment: Refer to Division 28 Section "Fire Alarm/Security System" for the following:

1. Products: Contact Bosch Pre-Sales at 800-289-0096 for assistance with locating qualified installation resources.
 - a. Bosch Security Systems, Inc.; D9412GV2 or D7412GV2
 - b. Bosch Security Systems, Inc.; D7024 or FPD7024
2. Alarm Horn

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify the adequacy of water pressure is sufficient to supply fire sprinkler systems. Include in Bid all costs necessary for a complete system including service entrance, fire pump, water supply upgrade, or interior system modification (new mains, revised branch lines, new sprinklers, etc.). No additional payments will be made to achieve compliance with Code or authorities having jurisdiction.
- B. Fabricate and install system and equipment in accordance with NFPA 13 and manufacturer's instructions.
- C. Welding of pipe shall be in accordance with NFPA 13.

3.2 INSTALLATION, GENERAL

- A. Coordinate system components (i.e. piping, sprinklers, valves, supports, bracing, electrical equipment, etc.) with all trades. No additional payments will be made to correct conflicts arising from lack of coordination.
- B. Piping extending from the main building into the prefabricated mechanical center shall be installed and insulated as indicated in Division 23 Section "HVAC Insulation" and in accordance with Drawings.
- C. Owner does not require fire sprinkler protection inside or below Pharmacy drive through canopies if they are constructed of non-combustible or limited combustible construction, as defined by NFPA 13. Verify construction and materials, as well as jurisdictional requirements. Meet the more restrictive of the jurisdictional and Owner requirements.
- D. Install electrical equipment in conformance with the latest edition of the National Electric Code (NEC) and authorities having jurisdiction.

3.3 PIPING AND SYSTEM COMPONENT INSTALLATION, SUPPORT AND BRACING

- A. Locate the main riser for system as shown on Drawings.
- B. Pipe hanger and support devices shall be per NFPA 13. Support vertical piping at each floor.

- C. Support piping larger than 4 inch by a minimum of two joists, with pipe support centered between joists and hanger spacing of 6-foot maximum. Attach hangers to the top cord of joists/joist girder within 6-inches of panel points.
- D. Install horizontal runs for mains and branches as close as practical to the bottom cord of roof joists taking into account allowance for system piping drainage.
- E. Do not install pipes less than 7.5-feet above finished floor.
- F. Where pipe is exposed to elements and subject to moisture exposure, paint exposed pipe threads to prevent corrosion. Remove cutting oil and grease prior to painting. Reference Division 09 Section "Painting" for guidance on paint type and application.
- G. Design and install seismic-restraint for sprinkler systems per the adopted Building Code and NFPA 13.
- H. Arrange system for flushing as required by NFPA standards.
- I. Install auxiliary drains where needed to remove water from low points in piping. Show water discharge point on the Submittal Drawings and take into account pedestrian sidewalks and walk ways, traffic flow. Confirm proper water discharge and drainage so that no immediate or long term damage will be caused when operating these drains.
- J. Keep interior of pipe free from dirt and other foreign material as installation progresses. Plug open ends when work is stopped. Join lengths with couplings in accordance with pipe manufacturer's instructions.
- K. Provide underground piping, system components and pipe restraints per NFPA 24. Support barrel of pipe for entire length on compacted bedding. Excavate for couplings, fittings and valves.
- L. For underground pipe, provide concrete thrust blocks as required by NFPA 24. Place concrete between undisturbed soil and fittings. Do not cover coupling flanges or other joints with concrete. Do not use retaining type clamps.

3.4 SPRINKLERS

- A. Sprinklers installed above high temperature areas (such as ovens) shall be rated at 286-degrees F.
- B. Provide brass sprinkler heads in the following locations:
 - 1. At the roof deck level in backroom areas
 - 2. Below stairways unless enclosed by walls and inaccessible.
 - 3. Unfinished areas.
 - 4. Above suspended ceiling when required.
 - 5. Above prep room ceilings that abut the backroom and behind full height wall in back room areas without ceilings. These heads shall not be subjected to obstructions of water flow discharge due to roof supporting structure.

6. At the roof deck level in the space above coolers and freezers unless the cooler or freezer is surrounded by a solid wall that extends the full height to the underside of the roof truss.
 7. At the roof deck level in the space above suspended ceilings for the food preparation areas in the backroom portion of the store.
- C. Provide sprinklers in electrical rooms.
- D. Install recessed white heads and concealed piping in all areas with ceiling or soffit height less than 7 feet. See Drawings for additional information.
- E. Protect sprinklers installed below 10 feet above finished floor, such as in backrooms and under stairwells, or in any other accessible area where they might receive mechanical damage with head guards.
- F. Install sprinklers to protect concealed areas containing combustible construction, such as covered canopy, store facade and roof deck supports.
- G. Install sprinklers above and below stairways if open or accessible. The area beneath a stairway is considered accessible unless it is completely enclosed noncombustible construction with drywall and no access doors are provided.
- H. Provide brass sprinkler heads above and below ductwork or other obstructions which is over 4 feet wide.
- I. Install high temperature rated sprinklers in the backroom, storage areas, back corridors and areas above and in the coolers/freezers.
- J. Provide a dry sidewall, 286-degree F, 1/2-inch sprinkler in the chute leading to the trash compactor in a location/manner to avoid physical damage to the sprinkler.
- K. Do not use interior dry pipe systems except in areas that are subject to freezing, such as concealed combustible spaces.
- L. Where Dry-Pipe systems have been specifically allowed by this specification section or approved by the Owner (Kroger Manager of Architecture and Engineering Services), the installation shall comply with all requirements of the Contract Documents, Owner and authorities having jurisdiction. Provide condensate drain and air compressor in easily accessible location approved by Owner. Pipe drains to a location approved by Owner.
1. Protect dry-pipe system and water supply pipe against freezing. Provide light and heat in valve rooms. Do not use heat tape.
 2. Dry-pipe system design operating area shall be increased 30 percent in accordance with NFPA-13.
 3. Dry-pipe systems shall not exceed a 750 gallon capacity.
 4. Do not use grid style pipe arrangement for dry-pipe systems.
- M. Align and install sprinklers in straight lines in both directions in coordination with lighting and air conditioning ceiling fixtures, and with the grid ceiling where they occur, subject to approval of the Owner before installation.

3.5 VALVES, DRAINS AND INSPECTORS TEST CONNECTIONS

- A. Valve Supervision: Install tamper switches and lock valves open with unbreakable locks and sturdy chain.
- B. Coordinate with the electrical trades for installation of electric sprinkler operated flow and alarm bell, if required. Verify during bid period which system is required so there will be no additional cost to the Owner.
- C. Provide necessary system interfaces and related fire sprinkler system devices for alarm notification for sprinkler system water flow or discharge to the Fire Alarm Panel equipped with Central Station Monitoring by KCAC.
- D. Provide shut off valve with tamper switch and water flow indicator for branch line to refrigeration equipment center when refrigeration equipment center is indicated on plans.
- E. Provide a sprinkler system test connection for each system. Locate the test connection at the sprinkler riser, easily accessible and arranged to discharge outside the building.
- F. Arrange main drains, inspectors test connections, backflow preventer assemblies, to discharge outside the building. Show the water discharge point on the submittal drawings and take into account pedestrian sidewalks and walk ways, traffic flow. Confirm proper water discharge and drainage so that no immediate or long term damage will be caused when operating these drains.

3.6 SIGNS AND IDENTIFICATION

- A. Attach a placard (hydraulic sign) to each sprinkler system riser to indicate the design basis and water demand. Recreate and install if missing from existing systems. Provide labor, equipment, design and engineering necessary to create or recreate these placards. No additional payments will be made to achieve compliance with this requirement.
- B. Provide red enamel steel identification signs on all alarm, control, dry, drain and test valves, etc., to identify their purpose and function as required by NFPA or authority having jurisdiction. Provide lettering size and style selected by the Owner and from NFPA suggested styles.
- C. Post a suitable sign adjacent to supply valves giving adequate instructions in the operation.
- D. System Zone Drawing: Indicate sprinkler zone coverage. Title drawing "Fire Protection Sprinkler System Zoning". Indicate the location of shut-off inspector's test drains and valves. Provide in a wood frame with plexiglas cover and mount on wall adjacent to Risers.

3.7 CUTTING AND PATCHING:

- A. Except as otherwise specified, perform cutting and patching provide openings with lintel and supports as required for installation of fire suppression system including paving, floors and walls. Patch with the same materials, workmanship and finish matching surrounding construction. Trim rings are to be provided (coordinate finish of trim rings with Owner).
- B. Seal pipe penetrations through fire rated walls or floors to achieve fire resistance equivalent to fire separation required. Provide wall plates at all penetrations.

3.8 TESTING AND COMMISSIONING:

- A. General: Schedule, coordinate, and conduct tests required by Authorities Having Jurisdiction and Telgian. Modify, replace or retest as required by Authorities Having Jurisdiction and / or Telgian.
- B. Flush, test, and inspect sprinkler system according to NFPA 13 "Systems Acceptance" Chapter. Test the systems, including the underground water mains, and the aboveground piping and components to assure that equipment and components function as intended. Pressure test the systems in accordance with NFPA 13 and NFPA 24. Have available copies of as-built drawings. Perform tests in such a manner as to prevent water damage or staining of building and property.
 - 1. Under Ground Fire Protection Piping:
 - a. Test per NFPA 24.
 - b. Flush underground mains and lead-in connections thoroughly to remove foreign material before connection is made to above ground system piping. Minimum flow rate shall not be less than the maximum water flow demand rate of the system and not less than necessary to provide a velocity of 10 feet per second. Continue flushing for sufficient time to ensure thorough cleaning. Provide proper disposal of water from flushing operation.
 - c. Perform Hydrostatic tests per NFPA 24.
 - 2. Above Ground Fire Protection Piping:
 - a. Test per NFPA 13.
 - b. Inspect welds and verify welder's qualifications per Authorities Having Jurisdiction.
 - c. Perform Hydrostatic tests per NFPA 13.
 - d. Furnish water for tests. Repair any leaks or cracks developing as a result of these tests to the satisfaction of the Telgian.
 - e. In addition to the hydrostatic test, conduct an air pressure leakage test at 40 psi for 24 hours on dry-pipe systems.
 - 3. Backflow Prevention Assembly Forward Flow Test.
 - 4. Operation of control valves and flowing of inspector's test connections to verify operation of alarm devices including alarm switches. After operation of control valves has been completed, assure that control valves are in the open position.
 - 5. Main Drain flow test.
- C. Fire Sprinkler System Construction Follow Up: Telgian will conduct a Fire Sprinkler Site Observation (FP Observation). The purpose of the FP Observation is to determine if the fire sprinkler systems are in general conformance with Contract Documents and shop drawings. Coordinate with Telgian for the time and date of the FP Observation. Begin scheduling for the FP Observation with Telgian one month prior to possession with FP Observation being conducted one to two weeks prior to possession. FP Observation shall occur prior to possession. A representative sample checklist is available upon request. Utilize Site Folio and the kroger@telgian.com via email address to contact Telgian to schedule the visit.
 - 1. FP Observation: Telgian will meet the Contractor, and Sprinkler Contractor representatives at the scheduled time. A representative of the Contractor and fire

suppression system installer shall be present during the FP Observation. At scheduled time, Contractor/Sprinkler Contractor shall be ready to initiate FP Observation as outlined herein. Prior to initiating, the following information shall be reviewed and copies provided to Telgian:

- a. Completed Contractor's Material and Test Certificate for Underground Piping. Provide the completed Contractor's Material And Test Certificate For Underground Piping provided at the end of this Section. All portions of the certificate shall be completed. If Completed form is not available certifying underground has been properly flushed, hydro tested, and leak tested, Acceptance tests cannot be performed, requiring all parties to reschedule test. Rescheduling may take up to four weeks, and may result in Contractor being back charged for Telgian's additional time and expenses. It is critical that completed Contractor's Material and Test Certificate for Underground Piping certifying proper flushing, hydro testing, and leak testing has been accomplished.
 - b. Contractor's Material and Test Certificate for Aboveground Piping (By System). As a minimum, the form shall contain information indicated in sample form shown in NFPA 13.
 - c. Sprinkler Zone Map.
 - d. Approved Shop Drawings.
 - e. Fire Pump Factory Test Curve (if applicable).
2. After these documents have been reviewed, the FP Observation of the installed systems will be conducted. Telgian will conduct and document a site observation of the fire sprinkler systems (and fire pump as applicable). At the conclusion of this Observation, an exit interview will be conducted with the Contractor to review and identify issues that need correction prior to acceptance of the system.
 3. Deficiencies noted as a result of the Owner's insurance inspection must be promptly corrected in accordance with the warranty.
- D. If any portion of the FP Observation is required to be repeated or rescheduled due to non-compliance with contract documents or code, unpreparedness of site or equipment for testing on scheduled date, and/or unsatisfactory results obtained, and a revisit is required, contractor is advised that rescheduling may take up to four weeks and may result in Contractor being back charged for Telgian's additional time and expenses as well as owner supplied equipment representatives time and expenses required to be present for testing (i.e., fire pump).

3.9 COMPLETION:

- A. Remove all debris, materials and equipment from the premises upon completion of work. Piping to be cleaned, ready for painting. Repair any areas damaged or stained as a result of the testing.
- B. System shall be fully operational two weeks prior to fixture date as established by the Owner's Representative.
- C. Notify Telgian via PMW and using the kroger@telgian.com via email upon completion of installation and opening date.

CONTRACTOR'S RECORD LETTER OF CONFORMANCE
SECTION 21 10 00
FIRE SUPPRESSION

Project Location: _____ Date: _____

(City & State)

Project Number: _____ Store Number: _____

Statement of Conformance:

This Record Letter of Conformance is provided as a Record Document. The undersigned hereby declares that the fire sprinkler system(s) including fire pump(s) and water storage tanks (hereafter referred to as the "Systems") is installed and is in general conformance with the Contract Documents and shop drawings and submitted product data. The "Systems" have been provided and placed in operational condition in accordance with the manufacturer's published instructions and the Contract Documents. To be accepted, all signatures must be original ink signatures (copies are not allowed).

FIRE SPRINKLER SUBCONTRACTOR:

(Subcontractor Signature)

(Subcontractor name and address) Phone Number: () _____

CONTRACTOR:

(Contractor Signature)

(Contractor name and address) Phone Number: () _____

END OF SECTION 21 10 00

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Piping materials and installation instructions common to most piping systems.
2. Excavating and backfilling associated with piping systems.

1.2 DEFINITIONS

A. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.

1. The Kroger Company will supply many plumbing related items directly from the manufacturer. The Owner will provide equipment and the Contractor will install.
2. Comply with requirements in Division 00 Section "General Conditions."

B. **Finished Spaces:** Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspace, and tunnels.

C. **Exposed, Interior Installations:** Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

D. **Exposed, Exterior Installations:** Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

E. **Concealed, Interior Installations:** Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.

F. **Concealed, Exterior Installations:** Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 SUBMITTALS

A. Unless otherwise specified and in addition to provisions of Division 00 Section "General Conditions," submit drawings having each sheet, and each page of a brochure, marked with identification and containing information described below. Submittals are to be complete, partial submittals will not be accepted.

B. Identification:

1. Include project name and Architect's job number. If pages are securely bound in brochure, this is needed on cover only.
2. Identification by specification section and article under which equipment or material is described, and by name, number and intended use as designated by contract drawings and specifications.

3. When more than one item of equipment is covered by a single drawing or catalog cut, each project equipment item must be separately identified thereon with clear delineation as to which model or catalog number or performance data applies to each project item.

C. Information:

1. Include manufacturer's model number or catalog number, size and other data as requested.
2. Maintenance Manuals: Organize each maintenance manual with index and thumb-tab marker for each section of information; bind in 2-inch (51-mm) 3-ring, vinyl-covered binder, with pockets for folded sheets, properly labeled on spine and face of binder.

1.4 QUALITY ASSURANCE

- A. Application: Comply with applicable requirements and recommendations of standards published by listed agencies and trade associations, except to extent more detailed and stringent requirements are indicated or required by governing regulations.

- B. Listing of Associations, Standards and Abbreviations Specific to Plumbing Work (in addition to standards specified in individual work sections), conform to following applicable standards:

1. AABA - Associates Air Balance Council
2. AGA - American Gas Association
3. AMCA - Air Movement & Control Association
4. ARI - Air/Conditioning and Refrigeration Institute
5. ASC - Adhesive and Sealant Council
6. ASHRAE - American Society of Heating, Refrigeration & Air Conditioning Engineers
7. ASME - American Society of Mechanical Engineers
8. ASPE - American Society of Plumbing Engineers
9. ASSE - American Society of Sanitary Engineering
10. AWS - American Welding Society, Inc.
11. AWWA - American Water Works Association, Inc.
12. AAGI - Compressed Air and Gas Institute
13. CISPS - Cast Iron soil Pipe Institute
14. EPA - Environmental Protection Agency
15. FM - Factory Mutual System
16. MCA - Mechanical Contractor's Association of America
17. NIST - National Institute for Standards and Technology
18. (NBS) (formerly National Bureau of Standards)
19. NEC - National Electrical Code by NFPA
20. NEMA - National Electrical Manufacturer's Association
21. NFPA - National Fire Protection Association
22. NSF - National Sanitation Foundation
23. OSHA - Occupational Safety and Health Administration (U.S. Department of Labor)
24. PDI - Plumbing and Drainage Institute
25. SMACNA - Sheet Metal & Air Conditioning Contractors National Associations, Inc.
26. TIMA - Thermal Insulation Manufacturers Association
27. UL - Underwriter's Laboratories, Inc.

- C. Symbols: Except as otherwise indicated in drawing legends, refer to "ASHRAE Handbook of fundamentals" for definitions of symbols used on the drawings to show plumbing work.

- D. Manufacturers: Firms regularly engaged in the manufacture of products of quality, types and sizes required; and which have been in satisfactory use of not less than four years in similar service, except as otherwise noted in specific sections of this division.
- E. Installer's Qualifications: Firm with at least three years of successful installation experience on projects with work similar to this project and meet applicable regulatory agencies requirements.
- F. Compatibility: Provide products which are compatible with other products of the plumbing work and with other work requiring interface with the plumbing work. Provide products with the proper or correct power characteristics, fuel-burning characteristics and similar adaptations for this project. Coordinate the selections from among options (if any) for compatibility of products.
- G. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX.
- H. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- I. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
 - 1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
 - 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- J. Electrical Characteristics for Plumbing Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

1.5 DESCRIPTIONS

- A. "Kroger Supplied" and "Contractor Supplied" equipment is described in Division 00 Section General Conditions." Unless the Drawings indicate that it Kroger supplied, the Contractor is responsible for supplying the equipment as shown on Drawings.
- B. Section specifies provisions for plumbing work, including:
 - 1. Certain adaptive expansions of requirements specified in Division 00 Section General Conditions", uniquely applicable to plumbing work.
 - 2. General performance requirements within plumbing work (all Division 22 Sections) as a whole.
 - 3. General work to be performed as plumbing work, because of its close association with plumbing work.
- C. Examine all Drawings, and available soil reports. Visit site and become acquainted with all conditions which may affect execution of work.

- D. Provide work in accordance with state and local codes, regulations and/or ordinances, and meet approval of authorities having jurisdiction. Provide only new material and as specified.
- E. Furnish to Owner, a Certificate of Final Approval from governing authority prior to Owner's final acceptance, where applicable.
- F. Comply with all requirements for permits and licenses, and pay all associated costs.

1.6 PERFORMANCE REQUIREMENTS

- A. General Outline: The facilities and systems of the plumbing work include all Division 22 Sections.
- B. Design supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.7 COORDINATION OF PLUMBING WORK

- A. Refer to Division 00 Section "General Conditions" for general coordination requirements applicable to entire work. The Contract Documents are diagrammatic in showing certain physical relationships which must be established within plumbing work, and in its interface with other work, including utilities, control and electrical work, and that such establishment is Contractor's exclusive responsibility.
- B. Arrange plumbing work in a neat, well organized manner, with piping and similar services running parallel with primary lines of the building.
- C. Give right-of-way to piping which may slope for drainage.
- D. Locate operating and control equipment properly to provide easy access, and arrange entire plumbing work with adequate access for operation and maintenance.
- E. Advise other trades of openings required in their work for the subsequent move-in of large units of plumbing work (equipment).
- F. Strictly adhere to invert elevations for all underground piping. Pitch piping evenly between pipe junctions and where indicated on the drawings. Piping, not installed at invert elevations indicated on the drawings, shall be removed and re-laid at Contractor's expense.
- G. Coordination of Drawings: For locations where elements of plumbing (or combined plumbing and electrical) work must be sequenced and positioned with precision in order to fit into the available space, provide coordination drawings (shop drawings) showing the actual physical dimensions (at accurate scale) required for the installation. Prepare coordination drawings prior to purchase/fabrication/installation of any of the elements involved in the coordination. Submittals are not required by the Owner or the Architect, unless otherwise noted.

PART 2 - PRODUCTS

2.1 Compatibility: Provide products which are compatible with other products of the plumbing work and with other work requiring interface with the plumbing work. Provide products with the proper or correct power characteristics, fuel-burning characteristics and similar adaptations for this project. Coordinate the selections from among options (if any) for compatibility of products.

2.2 **PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Protect products against dirt, water, chemical and mechanical damage. do not install damaged products.
- B. Deliver products to site in factory fabricated containers, with the manufacturer's label clearly visible. Handle carefully to avoid damage to components, enclosure and finish, and in strict accordance with manufacturer's instructions.
- C. Store products in clean dry place in original containers, protected from weather and construction traffic.

2.3 **JOINING MATERIALS**

- A. Refer to individual Division 22 Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.
- C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- E. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.
- F. Welding Filler Metals: Comply with AWS D10.12.
- G. Solvent Cements for Joining Plastic Piping:
 - 1. ABS Piping: ASTM D 2235.
 - 2. CPVC Piping: ASTM F 493.
 - 3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
 - 4. PVC to ABS Piping Transition: ASTM D 3138.

2.4 **DIELECTRIC FITTINGS**

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.

- C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.
- D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 300-psig minimum working pressure as required to suit system pressures.
- E. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.
- F. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

2.5 PLUMBING SLEEVE SEALS

- A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.
- B. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
- C. Pressure Plates: Carbon steel. Include two for each sealing element.
- D. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.6 SLEEVES

- A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
 - 1. Underdeck Clamp: Clamping ring with set screws.
- E. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.
- F. PVC Pipe: ASTM D 1785, Schedule 40.
- G. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

2.7 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.
- C. One-Piece, Cast-Brass Type: Polished chrome-plated with set screw.
- D. Split-Casting, Cast-Brass Type: Polished chrome-plated with concealed hinge and set screw.

2.8 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
 - 1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
 - 2. Design Mix: 5000-psi, 28-day compressive strength.
 - 3. Packaging: Premixed and factory packaged.

2.9 PLUMBING SYSTEM IDENTIFICATION:

- A. Signs:
 - 1. Stencil-Painted Identification: Lettering size not less than 1-1/2-inches (38-mm).
 - 2. Engraved Plastic-Laminate Signs: Sufficient size to convey adequate information at each location. Comply with recognized industry standards for color and design.
 - 3. Operational Tags: Plasticized card stock, with pre-painted or hand printed, to convey the message; example: "DO NOT CLOSE THIS VALVE EXCEPT WHEN BURNER IS OFF". Provide proper and adequate information on operation and maintenance of plumbing systems.

PART 3 - EXECUTION

3.1 PLUMBING DEMOLITION

- A. Refer to Division 00 Section "General Conditions" for general demolition requirements and procedures.
- B. Disconnect, demolish, and remove plumbing systems, equipment, and components indicated to be removed.
 - 1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - 2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - 3. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - 4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - 5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - 6. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 EXCAVATING AND BACKFILLING FOR PIPING SYSTEMS

- A. See Division 31 Section "Earth Moving" for excavation and backfilling for exterior underground piping installations and Division 33 Sections for site utilities.
- B. Excavate and backfill utility trenches for piping systems as specified in Division 31 Section "Earth Moving" and as follows:
 - 1. Perform all excavation and backfilling required for installation of piping systems. Consult with utilities prior to beginning excavation.
 - 2. Comply with codes of authorities having jurisdiction. Provide slope sides, shore and brace as required for stability.
 - 3. Remove all materials encountered in obtaining indicated lines and grades as shown on Drawings. No extras will be allowed due to variations of proportion and the variation of materials.
 - 4. Lay piping on a bed of sand **6 inches (152 mm)** deep well tamped into place and properly graded to permit the pipe to have an even bearing throughout its entire length. Install sand around the piping and to a point **6 inches (152 mm)** above the piping.
 - 5. Pipe Trench Backfill: Above granular pipe fill, place inert soil, approved by the geotechnical engineer, in **4 to 6 inch (100 to 150 mm)** thick lifts uniformly compacted to 95 percent Standard Proctor density (ASTM D-698).
 - a. Owner will test trench backfill to confirm that adequate compaction is being achieved. Submit **50 pound (23 kg)** bag of proposed trench fill to Owner's geotechnical engineer four days before use, for approval and Standard Proctor laboratory testing.

3.3 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 22 Sections specifying piping systems:
 - 1. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
 - 2. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
 - 3. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
 - 4. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
 - 5. Install piping to permit valve servicing.
 - 6. Install piping at indicated slopes.
 - 7. Install piping free of sags and bends.
 - 8. Install fittings for changes in direction and branch connections.
 - 9. Install piping to allow application of insulation.
 - 10. Select system components with pressure rating equal to or greater than system operating pressure.
 - 11. Install escutcheons for penetrations of walls, ceilings, and floors.

12. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
13. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and plumbing sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing plumbing sleeve seals.
 - a. Install steel pipe for sleeves smaller than 6 inches in diameter.
 - b. Install cast-iron "wall pipes" for sleeves 6 inches and larger in diameter.
 - c. Plumbing Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble plumbing sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
14. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using plumbing sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing plumbing sleeve seals.
 - a. Plumbing Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble plumbing sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
15. Verify final equipment locations for roughing-in.
16. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.
17. Where a pipe slot is indicated for a group of pipes passing through a wall, set a rectangular frame of structural angles, welded in the slot, at each side of wall. Close each side of opening with two No. 16 USG galvanized steel plates cut to fit the pipes and/or pipe insulation closely, and fasten to angle frame. For slots in exterior walls, slip flanged ferrules of sheet metal on pipes when they are installed, with flanges inside the closure plates at exterior wall face, caulk ferrules and plates to make weathertight joint, and pack space between closure plates with rock wool or glass fiber. At slots in fire walls, pack as specified above, but omit ferrules and caulking. Escutcheons are by Division 22.
18. Pipe Sleeves:
 - a. For pipes passing through brick or concrete walls, or concrete floor slabs, provide steel pipe sleeves, two (2) sizes larger than the pipe for which they are intended. Coordinate setting of sleeves as construction progresses. Set sleeves flush with finished line of walls and floors.
 - b. Caulk sleeves through foundation walls to make them watertight.

3.4 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 22 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402, for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
 - 3. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
 - 4. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
 - 5. PVC Nonpressure Piping: Join according to ASTM D 2855.
 - 6. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.
- J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
- K. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.
- L. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
 - 1. Plain-End Pipe and Fittings: Use butt fusion.
 - 2. Plain-End Pipe and Socket Fittings: Use socket fusion.
- M. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.5 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
 - 1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 - 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
 - 3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
 - 4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.6 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- C. Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations. Install equipment to allow right of way for piping installed at required slope.

3.7 INSTALLATION OF EQUIPMENT AND PIPING

- A. Follow manufacturer's suggested procedure for protection of equipment which will be idle for an extended period of time prior to start-up
- B. Mount and align equipment in strict accordance with manufacturer's recommendations and in accordance with procedures described below. In case of conflict, these procedures govern. Where structural or miscellaneous steel is not drilled, drill in field as directed.
- C. Lubricate all equipment as required and in accordance with manufacturer's recommendations. Furnish required lubricants.
- D. Neatly cut all openings in roof decks as needed for equipment and pipe penetrations.
- E. Suspended Equipment and Piping:
 - 1. Provide structural steel and steel rod hangers. Weld (with approval of Architect where attaching to building steel) structural steel hangers or bolt with hex head machine bolts and with spring lock washers under nuts.
 - 2. For suspension from concrete, provide steel or malleable iron inserts in poured concrete construction, as specified for pipe hangers and supports, and expansion shields, toggle bolts or lag screws, in other construction. Use electric drill with carbide bit for drilling concrete blocks.
 - 3. For suspension from structural steel, use beam or channel clamps with locking clips.
 - 4. Do not support plumbing components from ceiling grids.

5. Do not suspend hangers from roof decks.
 6. Suspend from roof trusses and joists/joist girders only at panel points, at top cord only, unless otherwise indicated.
 7. Provide additional supports wherever needed, and structural steel members attached to building frame to provide additional points of support where required. Do no drilling or building structural and miscellaneous steel, except as directed or indicated.
- F. Equipment Set on Structural Steel: For bolting equipment directly to structural steel, provide machine bolts, lock washers and nuts.
- G. Floor-Mounted Equipment: Set and level equipment on foundation. Grout in place, using non-ferrous grout. Provide wedges and shims for leveling.
- H. Accurately align equipment prior to operation.
- I. Refer to Division 00 Section "General Conditions" for general close-out requirements. Maintain daily log of operational data on plumbing equipment and systems through the close-out period; record hours of operation, assigned personnel, fuel consumption and similar information; submit copy to Owner.
1. Turn Over of Operation: Upon substantial Completion, turn over prime responsibility for operation of plumbing equipment and systems to Owner. However, until time of final acceptance, respond promptly with consultation and services, as required. Provide one operating engineer, who is completely familiar with the work, to consult with and continue training Owner's personnel.

3.8 CONCRETE BASES

- A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
1. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit.
 2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of the base.
 3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
 4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 5. Install anchor bolts to elevations required for proper attachment to supported equipment.
 6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
 7. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete and reinforcement steel and/or mesh as specified in Division 03 Section "Cast-In-Place Concrete Slabs."

3.9 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to Division 05 Section "Metal Fabrications" for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor plumbing materials and equipment.

- C. Field Welding: Comply with AWS D1.1.

3.10 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor plumbing materials and equipment.
- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

3.11 PLUMBING SYSTEM IDENTIFICATION

- A. Provide engraved plastic-laminate signs at locations of major equipment units, primary control devices, emergency equipment, dangerous elements of plumbing work and similar places. Mount permanently in an appropriate and effective location.
- B. Operational Tags: Provide proper and adequate information on operation and maintenance of plumbing systems.

3.12 INSPECTION

- A. Installer must examine areas and conditions under which products are to be installed. Notify Owner, in writing, of conditions detrimental to proper completion of work. Starting of installation constitutes acceptance.

3.13 CUTTING AND PATCHING

- A. Comply with Division 00 Section "General Conditions" for cutting and patching of other work, to accommodate the installation of plumbing work. Except as individually authorized by the Owner or the Architect, cutting and patching of plumbing work to accommodate the installation of other work is not permitted, other than necessary penetrations of plumbing sheet metal work for electrical conduit and similar purposes.

3.14 TRIMMING

- A. Inspect pipe supports, in occupied and equipment spaces for sharp angles which protrude into path of occupants and may cause injury. Trim such protrusions or cover with a suitable spongy material to prevent such injuries.

3.15 TOUCH-UP

- A. Touch-up with zinc dust-zinc oxide primer galvanized or steel equipment which has been welded or otherwise scarred. Provide additional finished equipment of paint type and color to match original.

3.16 SYSTEM TESTS

- A. Perform all system tests in the presence of Owner. Notify Owner of all system's tests at least 48 hours in advance.

3.17 SYSTEM INSPECTION

- A. All systems are to be inspected by Owner before covering, enclosing or concealing of work. Notify Owner of all systems which are to be covered, enclosed or concealed at least 48 hours in advance.

3.18 GROUTING

- A. Mix and install grout for plumbing equipment base bearing surfaces, pump and other equipment base plates, and anchors.
 - 1. Clean surfaces that will come into contact with grout.
 - 2. Provide forms as required for placement of grout.
 - 3. Place grout, completely filling equipment bases.
 - 4. Place grout on concrete bases and provide smooth bearing surface for equipment.
 - 5. Place grout around anchors.

END OF SECTION 22 05 00

SECTION 22 07 00 - PLUMBING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Insulation of plumbing piping.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.
1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

PART 2 - PRODUCTS

2.1 FLEXIBLE ELASTOMERIC INSULATION

- A. Polyolefin: Unicellular, polyethylene thermal plastic insulation. Comply with ASTM C 534 or ASTM C 1427, Type I, Grade 1 for tubular materials.
1. Products:
 - a. Armacell, LLC; Tubolit SS.
 - b. Nomaco Insulation; IMCOLOCK and NOMALOCK.
- B. Insulation shall be listed and labeled per ASTM E 84 for plenum installations employing slip on techniques.

2.2 INSULATION FOR HANDICAP ACCESSIBLE FIXTURES

- A. Handicap Lavatory P-Trap and Angle Stop Assembly Insulation:

1. Basis of Design: Brocar; Trap Wrap Protective Kit 500R.
2. Provide smooth abrasion resistant exterior cover with minimum 1/8-inch (3-mm) wall over cushioned foam insert. Provide fasteners out of sight.

2.3 PIPING INSULATION MATERIALS:

- A. Exposed Exterior Piping: Encase pipe fittings insulation with 1-piece premolded PVC fitting covers, minimum 10 mil thick. fastened as per manufacturer's recommendations.
 1. Basis of Design: Johns Manville, Performance Materials Division; "Zeston",

2.4 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated and approved by insulation manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION AND INSPECTION:

- A. Examine areas and conditions under which mechanical insulation is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.
- B. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- C. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

3.2 PLUMBING PIPING SYSTEM INSULATION:

- A. Insulation Omitted: Omit insulation on chrome-plated exposed piping, unions, balance cocks, flow regulators, fire protection piping within main building only and pre-insulated equipment.
 1. Exception: Handicap lavatory piping to be completely insulated.
- B. Piping:
 1. Application Requirements: Insulate the following piping systems:
 - a. Potable Pre-Heat Water Piping (from Water Heater)
 - b. Potable Hot Water Piping
 - c. Potable Cold Water Piping
 - d. Horizontal storm piping, roof drain pans, and vertical piping from roof drain pans to first horizontal bend.
 - e. Waste piping above ceilings that receive condensate.

3.3 INSTALLATION OF PIPING INSULATION:

- A. Install insulation products in accordance with manufacturer's written instructions, and in accordance with recognized industry practices, to ensure that insulation serves its intended purpose and as follows:
 - 1. Insulate domestic cold water piping, associated fittings and valves with 1/2-inch (13-mm) wall thickness insulation only when piping is located above ceilings or in other unconditioned spaces.
 - 2. Insulate domestic hot and hot water return piping, associated fittings and valves with 1-inch (25 mm) wall thickness insulation.
 - 3. Insulate hot water piping below floor with 3/8-inch (9.5-mm) wall thickness insulation.
 - 4. Insulate reclaim hot water piping with 1-inch (25 mm) wall thickness insulation.
 - 5. In geographical areas subject to freezing, insulate horizontal above floor storm drain and roof drain pans with 1/2-inch (13-mm) wall thickness insulation.
 - 6. Insulate waste piping above ceilings that receive condensate with 1/2-inch (13-mm) wall thickness insulation.
 - 7. Insulate waste piping, supply piping, stops, and valves under handicap accessible plumbing fixtures.
- B. Install insulation on pipe systems subsequent to installation of heat tracing, painting, testing and acceptance of tests.
- C. Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with single cut piece to complete run. Do not use cut pieces or scraps abutting each other.
- D. Clean and dry pipe surfaces prior to insulation. Butt insulation joints firmly together to ensure complete and tight fit over surfaces to be covered.
- E. Cover valves, fittings and similar items in each piping system with equivalent thickness and composition of insulation, as applied to adjoining pipe run. Install factory molded, precut or job fabricated units (at Installer's option), except where specific form or type is indicated.
- F. Extend piping insulation, without interruption, through walls, floors and similar piping penetrations, except where otherwise indicated.
- G. Provide continuous insulation through hangers, straps and all other supporting members.

3.4 PROTECTION AND REPLACEMENT:

- A. Replace damaged insulation, which cannot be repaired satisfactorily.
- B. Protection: Provide adequate protection for insulation work during remainder of construction period, to avoid damage and deterioration.

3.5 PENETRATIONS

- A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated):
Install insulation continuously through walls and partitions.
- B. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
- C. Insulation Installation at Floor Penetrations:
 - 1. Pipe: Install insulation continuously through floor penetrations.
 - 2. Seal penetrations through fire-rated assemblies.

3.6 FLEXIBLE ELASTOMERIC INSULATION INSTALLATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- B. Insulation Installation on Pipe Flanges:
 - 1. Install pipe insulation to outer diameter of pipe flange.
 - 2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
 - 3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as pipe insulation.
 - 4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- C. Insulation Installation on Pipe Fittings and Elbows:
 - 1. Install mitered sections of pipe insulation.
 - 2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- D. Insulation Installation on Valves and Pipe Specialties:
 - 1. Install preformed valve covers manufactured of same material as pipe insulation when available.
 - 2. When preformed valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 - 3. Install insulation to flanges as specified for flange insulation application.
 - 4. Secure insulation to valves and specialties and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

END OF SECTION 22 07 00

SECTION 22 11 00 - FACILITY WATER DISTRIBUTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Potable water system including but not limited to the following:
 - a. Water piping.
 - b. Water filters.
 - c. Valves.
 - d. Check valves
 - e. Hose bibbs.
 - f. Backflow preventers.
 - g. Flow restrictors.
 - h. Immersion temperature sensor.
 - i. Thermometers
 - j. Expansion tanks.
 - k. Water hammer arresters.
 - l. Access panels.
 - m. Vacuum breakers.
 - n. Water pressure-reducing valves.
 - o. Balancing valves.
 - p. Thermostatic mixing valves
 - q. Drain valves.
 - r. Trap-seal primer valves.
 - s. Piping protection
 - t. Flushing, Cleaning and Disinfecting
 - u. Testing
 - v. Excavation and Backfilling (within building).
2. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply the following items:
 - 1) Immersion temperature sensor.
 - 2) Water Filters.
 - b. Comply with requirements in Division 00 Section "General Conditions."

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

- C. Operation and maintenance data.
- D. The Owner will provide the submittals for Owner furnished products for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."

1.3 QUALITY ASSURANCE

- A. NSF Compliance:
 - 1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.
 - 2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

PART 2 - PRODUCTS

2.1 WATER PIPING

- A. Piping, Fittings, and Valves Material Usage (unless otherwise required by Authorities Having Jurisdiction):
 - 1. Interior Above Floor: CPVC
 - a. Provide Type "L" Copper in rated walls around exhaust hoods.
 - 2. Interior Under Floor: PEX tubing or Type "K" soft copper tubing.
 - 3. RO Water Distribution Piping: PEX tubing.
- B. Materials:
 - 1. CPVC: ASTM F 441/F 441M, Schedule 40.
 - a. CPVC Socket Fittings: ASTM F 438 for Schedule 40.
 - b. CPVC Threaded Fittings: ASTM F 437, Schedule 80.
 - c. CPVC Piping System: ASTM D 2846/D 2846M, SDR 11, pipe and socket fittings.
 - 2. Copper
 - a. Type "L": ASTM B 88, hard drawn copper tubing, with wrought copper bronze fittings and 95/5 tin/antimony or 94/6 tin/silver solder or copper pressure seal fittings (Contractor's option).
 - b. Type "K": ASTM B 88, soft copper tubing of one continuous piece, where possible, with wrought copper fittings and 15 percent silver alloy brazed joints.
 - c. Copper, Pressure-Seal Fittings (Contractor Option to Solder-Joint Fittings): ASME B16.22.
 - 1) Products:

- a) Elkhart Products Corporation; Xpress.
- b) Viega, LLC; ProPress.
- 2) **NPS 2 (DN 50)** and Smaller: Wrought-copper fitting with EPDM O-ring seal in each end.
- 3) **NPS 2-1/2 to NPS 4 (DN 65 to DN 100)**: Bronze fitting with stainless-steel grip ring and EPDM O-ring seal in each end.

3. PEX Tube and Fittings

- a. PEX Distribution Piping: ASTM F 876 and ASTM F 877, SDR 9 tubing.
- b. Tubing Colors:
 - 1) Hot Water: Red.
 - 2) Cold Water: Blue.
 - 3) Reverse Osmosis (RO) Water: White.
 - 4) Sterilox Solution: White with blue stripe.
- c. Fittings for PEX Tube: ASTM F 1807, metal-insert type with copper or stainless-steel crimp rings and matching PEX tube dimensions.
- d. Manifold: Multiple-outlet, plastic or corrosion-resistant-metal assembly complying with ASTM F 877; with plastic or corrosion-resistant-metal valve for each outlet.
- e. Installation Accessories: Snap-in clips, plastic pipe clamps, suspension pipe clamps and plastic PEX bend supports.

2.2 WATER FILTERS (OWNER SUPPLIED/CONTRACTOR INSTALLED)

- A. Water filters that are lost or damaged are to be replaced by Contractor at no cost to Owner as follows:
 - 1. Manufacturers: Provide products by 3M as distributed by Cincinnati Ice Machine Co., 513-861-9000.
 - 2. Single Combi Oven: Single Manifold Filter System: 3M; Single Manifold Filter System part #CIKR1CF with wall mounting, shut off valve, gauge and one HF95-S-SR filter.
 - 3. Two Combi Ovens: Twin Manifold Filter System: 3M; Twin Manifold Filter System, part #CIKR2CF with wall mounting, shut off valve, gauge, and two HF95-S-SR filters.
 - 4. Seafood Ice Machines, Seafood Steamer, Seafood Case Mister: Triple Manifold Filter System: 3M; Triple Manifold Filter System, part no. TRM3XXHF95S with wall mounting, shut off valve, gauge, and three HF95-S-SR filters.
 - 5. Beverage Bar: Dual Port Complete Water Filter System: 3M; one port for beverage and one for ice machine, tea and coffee. Part No. CIDF1XX95CL95S.
 - 6. Bakery Proofer and Produce Ice Machine: Twin Manifold Filter System: 3M; part no. TM2XXH95S.
 - 7. Produce Misting System: RO Filtration System; 3M; part no. CISGLP200CLBP (replaces Steralux and Prodew systems).

2.3 VALVES

- A. Bronze or Brass Valves:

1. Manufacturers: Provide the Basis-of-Design product indicated or comparable products by one of the following:
 - a. Cincinnati Valve Co, Lunkenheimer Valves.
 - b. Powell Valves
 - c. Walworth Co.
2. Basis-of-Design Product:
 - a. Ball Valves: Powell Valves; Figure 4201T
 - b. Check Valves: Wilkins, a Zurn Company; model 40XL2 In-line single check valve.

B. CPVC Valves

1. Manufacturers:
 - a. American Valve, Inc.
 - b. Asahi/America.
 - c. NIBCO, Inc.
 - d. Spears Manufacturing Company.
 - e. Thermoplastic Valves, Inc.
2. CPVC Union Ball Valves:
 - a. Standard: MSS SP-122.
 - b. Pressure Rating and Temperature: [125 psig (860 kPa)] [150 psig (1035 kPa)] at 73 deg F (23 deg C).
 - c. Body Material: CPVC.
 - d. Body Design: Union type.
 - e. End Connections for Valves NPS 2 (DN 50) and Smaller: Detachable, socket or threaded.
 - f. End Connections for Valves NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Detachable, socket or threaded.
 - g. Ball: CPVC; full port.
 - h. Seals: PTFE or EPDM-rubber O-rings.
 - i. Handle: Tee shaped.
3. CPVC Ball Check Valves:
 - a. Pressure Rating and Temperature: [125 psig (860 kPa)] [150 psig (1035 kPa)] at 73 deg F (23 deg C).
 - b. Body Material: CPVC.
 - c. Body Design: Union-type ball check.
 - d. End Connections for Valves NPS 2 (DN 50) and Smaller: Detachable, socket or threaded.
 - e. End Connections for Valves NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Detachable, socket or threaded.
 - f. Ball: CPVC.
 - g. Seals: EPDM- or FKM-rubber O-rings.

4. CPVC Non-Union Ball Valves:

- a. Standard: MSS SP-122.
- b. Pressure Rating and Temperature: [125 psig (860 kPa)] [150 psig (1035 kPa)] at 73 deg F (23 deg C).
- c. Body Material: CPVC.
- d. Body Design: Non-union type.
- e. End Connections: Socket or threaded.
- f. Ball: CPVC; full or reduced port.
- g. Seals: PTFE or EPDM-rubber O-rings.
- h. Handle: Tee shaped.

2.4 HOSE BIBBS

A. Manufacturers: Provide the Basis-of-Design products by the Woodford Manufacturing Co. or comparable products by one of the following:

1. Jay R.Smith Co. Division of Smith Industries, Inc.
2. Tyler Pipe, Wade Division
3. Zurn Plumbing Products Group

B. Basis-of-Design Product:

1. Interior Hose Bibbs (HB): Woodford Manufacturing Co.; Model 24P-CH, chrome-plated brass.
2. Yard Hydrants, When Used Inside Building: Woodford Manufacturing Co.; Model Y-95, key actuated. Provide weep in bottom of box.
3. Exterior Hose Bibs (WB): Woodford Manufacturing Co.; Model B-65 wall hydrant with chrome finish on brass casting. Conceal within interior partitions.
4. Exterior Hose Reel Wall Faucet: Woodford Manufacturing Co.; Model 19, freezeless, anti-siphon and resetting pressure relief valve.
5. Roof Hydrant (RH): MAPA Products; Model MPH-24-FP pedestal hydrant, complete system with freezeless roof hydrant, double check valve backflow preventer, and mounting system.

2.5 BACKFLOW PREVENTERS

A. Manufacturers: Provide the Basis-of-Design product by the Watts Water Technologies, Inc. or a comparable product by one of the following:

1. Cla-Val Automatic Control Valves
2. Hershey-Beeco Company
3. Rockwell International
4. Zurn Plumbing Products Group

B. Basis-of-Design Product:

1. Backflow Preventer for Interior Hose Bibbs Including Prep Room Hose Bibb Connections: Watts Water Technologies, Inc.; #9D.

2. Backflow Preventer for Coffee Machines, Ice Machines, Seafood Steamer and Water Machine: Watts Water Technologies, Inc.; No. #SD3.
3. Reduced Pressure Principle Backflow Preventer for carbonators (such as soda fountain) (ASSE 1013): Watts Water Technologies, Inc.; No. 009-QT. Copper shall not be used downstream from the backflow.
4. Backflow Preventer for Pharmacy Reverse Osmosis (RO) Water Filtration Dispensing System: Watts Water Technologies, Inc.; No. LF719QT-S, 1/2 inch (15 mm).

2.6 FLOW RESTRICTOR

- A. Basis-of-Design Product: American Standard; 2591.017, 0.5 gpm flow restrictor/aerator.

2.7 IMMERSION TEMPERATURE SENSOR (OWNER SUPPLIED/CONTRACTOR INSTALLED)

- A. Refer to Division 01 Section "Vendor Contact List" for information on immersion temperature sensor.

2.8 THERMOMETERS

- A. Liquid filled with 2-inch scale divisions, 40 to 240 degrees F range, installed in threaded well in water line.

2.9 EXPANSION TANKS

- A. Basis-of-Design Product: Amtrol, Inc.; AST #12 Extrol Expansion Tank where required by authority having jurisdiction on water heaters.

2.10 WATER HAMMER ARRESTORS (WHA)

- A. Manufacturers: Provide the Basis-of-Design product by the Sioux Chief Manufacturing Company, Inc. or a comparable product by one of the following:
 1. Jay R.Smith Co. Division of Smith Industries, Inc.
 2. Precision Plumbing Products, Inc.
 3. Tyler Pipe, Wade Division.
 4. Zurn Plumbing Products Group
- B. Basis-of-Design Product: Sioux Chief Manufacturing Company, Inc.; 650/660 Series Piston Type, Copper.

2.11 ACCESS PANELS

- A. Provide flush metal access panels, where valves occur in inaccessible locations, as specified in Division 08 "Access Doors and Frames."

2.12 VACUUM BREAKERS

A. Pipe-Applied, Atmospheric-Type Vacuum Breakers:

1. Manufacturers:
 - a. Watts Water Technologies, Inc.
 - b. Zurn Plumbing Products Group; Wilkins Div.
2. Standard: ASSE 1011.
3. Size: NPS 1/4 to NPS 3, as required to match connected piping.
4. Body: Bronze.
5. Inlet and Outlet Connections: Threaded.

B. Hose-Connection Vacuum Breakers:

1. Manufacturers:
 - a. Watts Water Technologies, Inc.
 - b. Woodford Manufacturing Company.
 - c. Zurn Plumbing Products Group.
2. Standard: ASSE 1011.
3. Body: Bronze, nonremovable, with manual drain.
4. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.

2.13 WATER PRESSURE-REDUCING VALVES

A. General: Provide water pressure regulators where necessary to limit the incoming water pressure to 80 psi inside the building.

B. Pressure Reducing Valves (PRV's).

1. Basis-of-Design Product: Watts Water Technologies, Inc.; No. #U5B.

C. Water Regulators:

1. Manufacturers:
 - a. Honeywell Water Controls.
 - b. Watts Water Technologies, Inc.
 - c. Zurn Plumbing Products Group.
2. Standard: ASSE 1003.
3. Pressure Rating: Initial working pressure of 150 psig (1035 kPa).

2.14 BALANCING VALVES

A. Memory-Stop Balancing Valves:

1. Manufacturers:
 - a. Crane Co.; Crane Valve Group.
 - b. Hammond Valve.
 - c. Milwaukee Valve Company.
 - d. NIBCO INC.
 - e. Red-White Valve Corp.
2. Standard: MSS SP-110 for two-piece, copper-alloy ball valves.
3. Pressure Rating: 400-psig minimum CWP.
4. Size: NPS 2 or smaller.
5. Body: Copper alloy.
6. Port: Standard or full port.
7. Ball: Chrome-plated brass.
8. Seats and Seals: Replaceable.
9. End Connections: Solder joint or threaded.
10. Handle: Vinyl-covered steel with memory-setting device.

2.15 THERMOSTATIC MIXING VALVES

A. (TMV) Point of use Water-Temperature Limiting Devices for Public Hand Washing Lavatories:

1. Manufacturers: Provide the Basis-of-Design product by Symmons Industries, Inc. or a comparable product by one of the following:
 - a. Honeywell Water Controls.
 - b. Watts Water Technologies, Inc.
 - c. Zurn Plumbing Products Group; Wilkins Div.
2. Basis-of-Design Product: Symmons Industries, Inc.; 5-210-CK Maxline thermostatic mixing valve.
3. Size: 3/8 inch compression inlets/outlet and integral checks.
4. Body: Brass with dual stainless steel strainers.
5. Adjustment: Vandal-resistant cap/temperature adjustment handle.
6. Finish: Rough brass.
7. Certification: Dual certified to ASSE 1017/1070. (.5 - 5 GPM)
8. Pressure Rating: 125 psig.
9. Accessories: Check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.

B. (MTMV) Master Thermostatic Mixing Valve (Hot water system mixing valve):

1. Manufacturers: Provide the Basis-of-Design product by Powers Controls, a Watts Water Technologies Company, or a comparable product by one of the following:
 - a. Honeywell Water Controls.
 - b. Watts Water Technologies, Inc.
 - c. Zurn Plumbing Products Group; Wilkins Div.

2. Basis-of-Design Product: Powers Controls, a Watts Water Technologies Company; Series MM, size valve for water line size indicated on Drawings.
3. Material: Bronze body with corrosion-resistant interior components.
4. Finish: Chrome plated.
5. Construction: Paraffin actuation, single-seat design for virtual shut down in the event of cold-water failure, and triple-duty check stops with screens.
6. Accessories: Check stops on hot- and cold-water supplies, and adjustable, temperature-control handle.
7. Flow Rate: Minimum 0.5 gpm (3 gpm to ASSE 1017) to 28 gpm at 20 psi pressure drop.
8. Certification: ASSE 1017 and certified to CSA B125.
9. Approach Temperature: 5 degrees F (3 degrees C).
10. Pressure Rating: 125 psig.

2.16 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
2. Pressure Rating: 400-psig minimum CWP.
3. Size: NPS 3/4.
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
6. Seats and Seals: Replaceable.
7. Handle: Vinyl-covered steel.
8. Inlet: Threaded or solder joint.
9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

2.17 TRAP-SEAL PRIMER VALVES

A. Manufacturers: Provide the Basis-of-Design product by Sioux Chief Manufacturing Company, Inc., or a comparable product by one of the following:

1. MIFAB, Inc.
2. PPP Inc.
3. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
4. Watts Water Technologies, Inc.

B. Basis-of-Design Product: Sioux Chief Manufacturing Company, Inc.; TP 695-01

C. Standard: ASSE 1018.

D. Pressure Rating: 125 psig minimum.

E. Body: Heavy Zamace

F. Inlet and Outlet Connections: NPS 1/2 threaded, union, or solder joint.

G. Gravity Drain Outlet Connection: NPS 1/2 threaded or solder joint.

- H. Performance: Trap prime up to eight drains.

2.18 PIPING PROTECTION

- A. Protection Sleeve for Underground Copper Piping: Polyethylene sleeve manufactured from virgin material conforming to ASTM D 1248.
 - 1. Basis-of-Design Product: Northtown Company; Polywrap-C.
 - 2. Tensile Strength: MD-3400 psi, TD-2800 psi.
 - 3. Density: 924
 - 4. Elongation: MD-300 percent, TD-500 percent.
 - 5. Color: [Natural][Blue][Orange].

PART 3 - EXECUTION

3.1 GENERAL

- A. Appropriate compression shutoff valve and ground joint unions shall be used at each fixture and piece of equipment to facilitate removal of equipment.
- B. Adapters used for screwed valves and any connection to steel shall be insulated to prevent electrolysis.
- C. Use dielectric unions where dissimilar metals are joined together.

3.2 INSTALLATION

- A. Install backflow preventers in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.
 - 1. Locate backflow preventers in same room as connected equipment or system.
 - 2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe to floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are not acceptable for this application.
 - 3. Do not install bypass piping around backflow preventers.
- B. Install check valves on both the hot and cold water supply lines under sinks equipped with overhead sprayers in addition to the faucets for service sinks.
- C. Install water pressure regulators on equipment as indicated on the drawings with inlet and outlet shutoff valves. Install pressure gages on inlet and outlet.
- D. Install balancing valves in locations where they can easily be adjusted.
- E. Install Owner supplied immersion temperature sensor for connection to the environmental control system.

- F. Install temperature-actuated water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.
 - 1. Install thermometers and water regulators if specified.
 - 2. Install cabinet-type units recessed in or surface mounted on wall as specified.
- G. Install water hammer arresters in water piping according to PDI-WH 201.
- H. Install supply-type, trap-seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent, and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
- I. Install piping protection for underground copper piping by slipping piping protection over the barrel length. Overlap joints a minimum of six inches. Repair any damage to piping protection with tape or piping protection material cut and wrapped around the pipe and secured in place.
- J. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping and specialties.
- K. Equipment Nameplates and Signs:
 - 1. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit.
 - 2. Nameplates and signs are specified in Division 22 Section "Common Work Results for Plumbing."
 - 3. Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
 - a. Intermediate atmospheric-vent backflow preventers.
 - b. Reduced-pressure-principle backflow preventers.
 - c. Double-check backflow-prevention assemblies.
 - d. Water pressure-reducing valves.
 - e. Primary, thermostatic, water mixing valves.
 - f. Supply-type, trap-seal primer valves.

3.3 EXCAVATION

- A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earth Moving."
- B. Remove excavating debris, materials and equipment promptly from the premises upon completion.

3.4 TESTING

- A. The entire water distribution system shall be tested and proven tight under air or water pressure of fifty percent more than the maximum pressure of each system but in no case less than 100 pounds.

- B. Combination domestic and sprinkler service piping shall be tested and proven under a water pressure of 200 psi. for two hours.
- C. Test temperature at sink locations to comply with 110 degrees F (43.3 degrees C) delivered temperature.
- D. Perform systems tests in the presence of the Plumbing Inspector and Owner. Notify Owner of systems tests at least 48 hours in advance.
- E. Test each reduced-pressure-principle backflow preventer according to authorities having jurisdiction and the device's reference standard.

3.5 ADJUSTING

- A. Set field-adjustable pressure set points of water pressure-reducing valves.
- B. Set field-adjustable flow of balancing valves.
- C. Set field-adjustable temperature set points of temperature-actuated water mixing valves.

3.6 FLUSHING AND CLEANING

- A. Upon completion of testing, flush all domestic water piping until water shows no discoloration. Clean all valves, strainers, etc.
- B. After flushing and cleaning, disinfect pipe by the use of chlorine or chlorine compounds in amounts to produce a concentration of 50 parts per million. At the end of six (6) hours, flush all piping until chlorine residual is less the two (2) parts per million.
 - 1. Provide any additional system cleaning and disinfecting as required by state or local codes.
- C. Prepare and submit reports of purging and disinfecting activities.

3.7 PIPING INSTALLATION

- A. Basic piping installation requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. Install under-building-slab copper tubing according to CDA's "Copper Tube Handbook."
- C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section "Common Work Results for Plumbing."
- D. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside the building at each domestic water service entrance.

- E. Install domestic water piping level with 0.25 percent slope downward toward drain and plumb.
- F. Install PEX piping with loop at each change of direction of more than 90 degrees.

3.8 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.
- C. Copper-Tubing, Pressure-Sealed Joints (Contractor Option to Solder-Joint Fittings): Use proprietary crimping tool and procedure recommended by copper, pressure-seal-fitting manufacturer. Install per ASTM B16.18 or ASTM B16.22
 - 1. Mechanically formed tee-drill fittings are only acceptable where new piping is connected to existing piping.
- D. PEX Piping: Join according to ASTM F 1807.
- E. Extruded-Tee Connections: Form tee in copper tube according to ASTM F 2014. Use tool designed for copper tube; drill pilot hole, form collar for outlet, dimple tube to form seating stop, and braze branch tube into collar.

3.9 HANGER AND SUPPORT INSTALLATION

- A. Seismic-restraint devices are specified in Division 20 Section "Vibration and Seismic Controls for Facility Services."
- B. Pipe hanger and support devices are specified in Division 20 Section "Hangers and Supports for Facility Services." Install the following:
 - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
 - a. 100-feet (30.5-m) and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100-feet (30.5-m): MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100-feet (30.5-m): MSS Type 49, spring cushion rolls, if indicated.
 - 3. Multiple, Straight, Horizontal Piping Runs 100-feet (30.5-m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Install supports according to Division 20 Section "Hangers and Supports for Facility Services."
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced 1 size for double-rod hangers, to a minimum of 3/8-inch (9.5-mm).

- F. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4 and Smaller: **84 inches (2-m)** with **3/8-inch (9.5-mm)** rod.
 2. NPS 1-1/2: **108 inches (2.7-m)** with **3/8-inch (9.5-mm)** rod.
 3. NPS 2: **10-foot (3-m)** with **3/8-inch (9.5-mm)** rod.
 4. NPS 2-1/2: **11-foot (3.35-m)** with **1/2-inch (13-mm)** rod.
 5. NPS 3 and NPS 3-1/2: **12-foot (3.7-m)** with **1/2-inch (13-mm)** rod.
 6. NPS 4 and NPS 5: **12-foot (3.7-m)** with **5/8-inch (16-mm)** rod.
 7. NPS 6: **12-foot (3.7-m)** with **3/4-inch (19-mm)** rod.
- G. Install supports for vertical steel piping every **15 feet (4.5-m)**.
- H. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 3/4 and Smaller: **60 inches (1.5-m)** with **3/8-inch (9.5-mm)** rod.
 2. NPS 1-1/4: **72 inches (1.8-m)** with **3/8-inch (9.5-mm)** rod.
 3. NPS 1-1/2 and NPS 2: **96 inches (2.4-m)** with **3/8-inch (9.5-mm)** rod.
 4. NPS 2-1/2: **108 inches (2.7-m)** with **1/2-inch (13-mm)** rod.
 5. NPS 3 to NPS 5: **10-foot (3-m)** with **1/2-inch (13-mm)** rod.
 6. NPS 6: **10-foot (3-m)** with **5/8-inch (16-mm)** rod.
- I. Install supports for vertical copper tubing every **10 feet (3-m)**.
- J. Install vinyl-coated hangers for PEX piping with a maximum horizontal spacing and minimum rod diameters of **32 inches (813 mm)** with **3/8-inch (9.5 mm)** rod
- K. Install hangers for vertical PEX piping every **48 inches (1220 mm)**.
- L. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.10 CONNECTIONS

- A. General: Install piping to all mechanical equipment requiring water, including equipment supplied by Owner and equipment supplied and installed by Owner.
- B. Install piping adjacent to equipment and machines to allow service and maintenance.
- C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to water-service piping with shutoff valve, and extend and connect to the following:
1. Booster Pumps: Cold-water suction and discharge piping.
 2. Water Heaters: Cold-water supply and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.

3. Plumbing Fixtures: Cold- and hot-water supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 22 Section "Commercial Plumbing Fixtures."
4. Equipment: Cold- and hot-water supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.11 FIELD QUALITY CONTROL

A. Inspect domestic water piping as follows:

1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
 - a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

B. Test domestic water piping as follows:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

END OF SECTION 22 11 00

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SECTION 22 13 00 - FACILITY SANITARY SEWERAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Soil and waste systems including connections to sanitary mains as indicated on the Drawings. Work includes, but is not limited to:
 - a. Providing and paying for permits and taps for facility sanitary sewerage.
 - b. Excavation and backfilling.
 - c. Sanitary waste, drain and vent piping.
 - d. Floor sinks.
 - e. Floor drains.
 - f. Hub drains.
 - g. Trench drains.
 - h. Area drain.
 - i. Trap seal.
 - j. Cleanouts.
 - k. Grease interceptors.
 - l. Plumbing fixture connections.
 - m. Mechanical equipment connections.
 - n. Food preparation sinks and disposer connections.
 - o. Testing.

1.2 SUBMITTALS

- A. Shop Drawings for Grease Interceptor. Submit to local officials having jurisdiction for approval prior to purchase.
- B. Field quality-control inspection and test reports.

1.3 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; and "NSF-drain" for plastic drain piping.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding **10-foot head of water (30 kPa)** minimum working pressure, unless otherwise indicated:

2.2 SANITARY, DRAIN AND VENT PIPING:

- A. Copper Piping **2-1/2 inches (63.5 mm)** and Under: ASTM B 88.62, Type "M" copper.
- B. Plastic Piping:
 - 1. Polyvinyl chloride (PVC) Pipe: ASTM D 2665, Schedule 40 DWV.
 - a. PVC Socket Fittings: ASTM D 2665, socket type, made to ASTM D 3311, drain, waste, and vent patterns.
 - 2. ABS Pipe: ASTM D 2661, Schedule 40, solid wall.
 - a. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.
 - 3. Protect plastic piping above slab in stock rooms from damage with guards or concrete curbs.
- C. Exposed vent piping will not be permitted in sales area or customer vision areas below bottom elevation of decor.
- D. Grinder Pump/Sewage Ejector Discharge
 - 1. Polyethylene pressure piping, ASTM F 714, SDR 21.
- E. Collect vent piping where practical so roof will be pierced a minimum number of times. Vent sizes and heights above roof per governing codes. Vents piercing roofs flashed per roofing manufacturer's requirements. Provide wire basket strainer in top of all vents.

2.3 DRAINS:

- A. Manufacturers:
 - 1. Canplas Industrial Products
 - 2. Josam Company
 - 3. Jay R Smith Mfg. Co., Div. of Smith Industries
 - 4. Oatey Company
 - 5. Sioux Chief Manufacturing Company, Inc.
 - 6. Tyler Pipe; Wade Division
 - 7. Watts Regulator Company; A Division of Watts Water Technologies, Inc.
 - 8. Zurn Industries, Inc.

- B. FD1 - Light Duty Floor Drain: PVC body, with 5.5-inch (140-mm) round nickel bronze adjustable grate.
 - 1. Basis of Design: Sioux Chief Manufacturing Company, Inc.; Finish Line, adjustable drainage system, 832-35PNR.
- C. FD1M - Light Duty Floor Drain (Mezzanine Installation): PVC body, weep holes and clamping collar for liner, with 5.5-inch (140-mm) round nickel bronze adjustable grate.
 - 1. Basis of Design: Sioux Chief Manufacturing Company, Inc.; Finish Line, adjustable drainage system, 833-35PNR.
- D. FD2 - Heavy Duty Stainless Steel Floor Drain: Smooth antimicrobial PVC gray colored body, with 8-1/2-inch (216-mm) round stainless steel ring and pinned grate, 4,500 lbs. (2,041 kg) load rating, and stainless steel sediment basket.
 - 1. Product: Sioux Chief Manufacturing Company, Inc.; 0860-4PKW. Specify store number and address when ordering.
 - a. No substitutions allowed.
- E. FD4 - Floor Sink, Round: Heavy duty PVC body with Schedule 40 hub connection, with 8-1/2-inch (216-mm) round PVC half grate strainer and stainless-steel mesh debris basket.
 - 1. Use: For case drains, when floor sinks versus hub drains are required by code. Square FD5 floor sinks to be used for case drains only when required by authority having jurisdiction.
 - 2. Product: Sioux Chief Manufacturing Company, Inc.; Model 860-4P2W, Gray. Specify store number and address when ordering.
 - a. Provide Sioux Chief Manufacturing Company, Inc.; Model 860-W4P2W, White, only when required by authority having jurisdiction.
 - b. No substitutions allowed.
- F. FD5 - Floor Sink, Square: Heavy Duty PVC body with Schedule 40 hub connection, nominal 10-1/4 inch (260 mm) square, with PVC half grate and stainless steel mesh debris basket.
 - 1. Use: Required for Starbucks Kiosk.
 - 2. Product: Sioux Chief Manufacturing Company, Inc.; Model 0861-G4PW2, Gray. Specify store number and address when ordering.
 - a. Provide Sioux Chief Manufacturing Company, Inc.; Model 861-4PW2, White, only when required by authority having jurisdiction.
 - b. No substitutions allowed.
- G. FD6 - Heavy Duty Cast Iron Floor Drain: smooth PVC body, with 8-1/2-inch (216-mm) round cast iron ring and grate, 5,000 lbs. (2,268 kg) load rating, and PVC sediment basket.
 - 1. Basis of Design: Sioux Chief Manufacturing Company, Inc.; 860-4PiU.

2.4 TRENCH DRAINS

A. Manufacturers

1. ABT Polydrain, Inc.
2. ACCO Drain, Inc.
3. Hubbell Polycast
4. Quartzite Polycast
5. Zurn Industries, Inc.

B. TD1 - Trench Drains: Black Painted Ductile Iron Grate for cooler door and backroom door way application, ~~56,000 lb.~~ (25,400 kg) grate load rating. See Drawings for sizes.

1. Basis of Design: Zurn Industries, Inc.; Z-806, polymer drain with ductile iron grates.

C. TD2-Trench Drains: Reinforced Slotted Galvanized Steel Grate, ~~28,000 lb~~ (12,700 kg) grate load rating load, for service department walkway application: See Drawings for sizes.

1. Manufacturers

- a. ABT Polydrain, Inc., Product #2420
- b. Zurn Industries, Inc., Product # Z886 RFG

2.5 TRAP SEALS

A. General: May be used in place of trap primers to prevent emission of sewer gases where permitted by authorities having jurisdiction.

B. Material: Provide one of the following:

1. Commercial grade UV and Ozone resistant ABS plastic housing with proprietary EPDM rubber diaphragm and soft rubber sealing gasket.
 - a. Product: Rectorseal; SureSeal
2. Smooth, soft, flexible, elastomeric PVC material molded into shape of duck's bill, open on top with curl closure at bottom.
 - a. Product: ProSet Systems, Inc; Trap Guard.

C. Size: As required to fit drain opening as recommended by manufacturer.

2.6 CLEANOUTS (CO)

A. Interior and Exterior Traffic Area Floor Cleanouts:

1. Product: Sioux Chief Manufacturing Company, Inc.; Model 834-4DNRH heavy duty nickel bronze cleanout cover. Specify store number and address when ordering.
 - a. No substitutions allowed.

2. Size: 4-inch (102-mm) top adjustable to finish floor, regardless of piping size in which floor cleanouts are installed.
 3. Load Rating: Provide cleanout covers with a minimum load rating of 15,000 lbs. (6803 kg).
- B. Wall Cleanouts: 4-inch (102-mm) cleanout cover kit, with brass plug and stainless steel polished top.
1. Basis-of-Design: Sioux Chief Manufacturing Company, Inc.; 873 series.
- C. Exterior Non-Traffic Area Cleanouts: 4-inch (102-mm) adjustable heavy-duty cleanout in concrete pad at grade with 6-1/2 inch (165 mm) heavy-duty all ductile-iron ring and cover with polypro cleanout plug and 4-inch (102-mm) PVC pipe connection.
1. Basis-of-Design: Sioux Chief Manufacturing Company, Inc.: 834-4PiR

2.7 GREASE INTERCEPTOR

- A. Provide new Grease Interceptor per the plumbing drawings.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. General:
1. Do not run sanitary piping under freezers and avoid running sanitary piping under coolers if at all possible. Run indirect system vents separately through roof independent from sanitary system vents.
 2. Do not install exposed vent piping in sales area below 14-feet (4.3-m) or customer vision areas. Coordinate location to be grouped with other piping and conduit extending to roof.
 3. Collect vent piping where practical so roof will be pierced a minimum number of times without increasing depth of wall. Vent sizes and heights above roof per governing codes. Vents piercing roofs flashed per roof manufacturer's recommended details. Provide wire basket strainer in top of all vents.
 4. Do not run sanitary vent piping in return air shaft wall. If no other option is available, cast iron, steel, or copper vent piping may be run in return air shaft wall upon approval of the Owner.
- B. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.
- C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section "Common Work Results for Plumbing."

- D. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Wall penetration systems are specified in Division 22 Section "Common Work Results for Plumbing."
- E. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- F. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- G. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
 - 1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
 - 2. Horizontal Sanitary Drainage Piping: 1 percent downward in direction of flow.
 - 3. Horizontal Grease Waste Piping: 1 percent downward in direction of flow where permitted by code. When required by 2018 and later International Plumbing Code only, 2 percent downward in direction of flow.
 - 4. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- H. Install ABS soil and waste drainage and vent piping according to ASTM D 2661.
- I. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.
- J. Install underground PVC soil and waste drainage piping according to ASTM D 2321.
- K. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
- L. Install grease interceptor outside, underground as indicated on the on the Drawings. Backfill interceptor with pea gravel or equivalent backfill approved by manufacturer.
 - 1. Ensure that all federal, state, and local codes are followed.
 - 2. For installations where the subsurface water level may rise above the bottom of the tank at any time, install anti-buoyancy concrete slab as indicated on the Drawings and per manufacturer's recommended installation instructions.
 - 3. Coordinate any required pavement or concrete slabs over grease interceptors per manufacturer requirements in traffic bearing locations.

- M. Underground piping servicing fixtures discharging 140 Degree F. (60 Degree C.) or hotter provide trap and first 20 lineal feet of pipe cast iron prior to connecting to underground PVC piping.

3.2 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.
- C. PVC Nonpressure Piping Joints: Join piping according to ASTM D 2665.

3.3 HANGER AND SUPPORT INSTALLATION

- A. Pipe hangers and supports are specified in Division 23 Section "Hangers and Supports for Facility Services." Install the following:
 - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
 - a. 100-feet (30.5-m) and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100-feet (30.5-m): MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100-feet (30.5-m), if Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100-feet (30.5-m) or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Install supports according to Division 23 Section "Hangers and Supports for Facility Services."
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch (9.5-mm) minimum rods.
- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/4: 72 inches (1.8-m) with 3/8-inch (9.5-mm) rod.
 - 2. NPS 1-1/2 and NPS 2: 96 inches (2.4-m) with 3/8-inch (9.5-mm) rod.
 - 3. NPS 2-1/2: 108 inches (2.7-m) with 1/2-inch (13-mm) rod.
 - 4. NPS 3 to NPS 5: 10-foot (3-m) with 1/2-inch (13-mm) rod.
 - 5. NPS 6: 10-foot (3-m) with 5/8-inch (16-mm) rod.
- F. Install supports for vertical copper tubing every 10-foot (3-m).
- G. Install hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/2 and NPS 2: 48 inches (1.2-m) with 3/8-inch (9.5-mm) rod.
2. NPS 3: 48 inches (1.2-m) with 1/2-inch (13-mm) rod.
3. NPS 4 and NPS 5: 48 inches (1.2-m) with 5/8-inch (16-mm) rod.
4. NPS 6: 48 inches (1.2-m) with 3/4-inch (19-mm) rod.

- H. Install supports for vertical PVC piping every 48 inches (1.2-m).
- I. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.4 CONNECTIONS

- A. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- B. Connect drainage and vent piping to the following:
1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 4. Mechanical Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.
 5. Food Prep Equipment: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code, to equipment supplied by Owner and equipment supplied and installed by Owner.
 6. Non-Refrigerated Fixtures and Equipment: Drain lines from non-refrigerated fixtures and equipment to building system shall be as specified in Section 11 41 33 "Fixtures and Equipment Plumbing Connections."
 7. Refrigerated Equipment: Drain lines from refrigerated equipment to building system shall be supplied and installed as specified in Section 11 41 34 "Fixtures and Equipment condensate drain Connections."

3.5 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction.
 - 1. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 - 2. Prepare reports for tests and required corrective action.

3.6 TESTING:

- A. The entire soil, waste and vent system shall be tested per code and to the satisfaction of the Plumbing Inspector and the Owner. Cover no work until it has been approved. The minimum requirements shall be as follows:
- B. Water pressure: 10-foot head of water (30 kPa) of water for 15 minutes without loss of water.
- C. Air pressure: 5 psi. for 15 minutes without loss of air.
- D. Entire soil and waste systems to be inspected for debris and flushed prior to pouring of concrete floor slab.
- E. Perform all systems tests in the presence of an authorized representative of the Owner. Notify the Owner of all systems tests at least 48 hours in advance.

3.7 CLEANUP:

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 22 13 00

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SECTION 22 42 00 - COMMERCIAL PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply the following commercial plumbing fixtures complete with drain and faucet as indicated on Drawings:
 - 1) Lavatories: (LOCATED IN FOOD PREPARATION AREAS).
 - 2) Deli Dept. product sink.
 - 3) Break room sink.
 - 4) Bakery Prep sink.
 - 5) Produce Prep product sink.
 - 6) Three-compartment sink (Sushi).
 - b. Comply with requirements in Division 00 Section "General Conditions."
2. Contractor supplied items: Contractor furnished/Contractor installed.
 - a. Other commercial plumbing fixtures not provided by Owner and as specified in Part 2.
 - b. Fasteners and other items not provided by Owner necessary for a complete installation.
3. Contractor installed items:
 - a. All Commercial plumbing fixtures and accessories.
 - b. Provide installation and final connections.

- B. Refer to Division 06 Section "Miscellaneous Carpentry" for solid surface counters with integral sink bowls.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Closeout Submittals:
1. Operation and Maintenance Data: For flushometer valves and electronic sensors to include in operation and maintenance manuals.

- C. Direct Buy Submittals: The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."

- 1. Product Data: For each Direct Buy product indicated.

1.3 QUALITY ASSURANCE

- A. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- B. ANSI Standard: Comply with ANSI Z358.1 "Standard for Plumbed and Portable Eyewash Stations" for eyewash stations.
- C. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Water Flow and Consumption Rates: Comply with requirements in Public Law 102-486, "Energy Policy Act," for water flow and consumption rates for plumbing fixtures.
- C. Accessibility Requirements: For accessible commercial plumbing fixtures, comply with the DOJ's "2010 ADA Standards for Accessible Design" or ICC A117.1 and requirements of authority having jurisdiction.

2.2 DIRECT BUY PLUMBING FIXTURES:

- A. Refer to Division 01 Section "Vendor Contact List" for contact information on plumbing fixtures, faucets and accessories provided by Owner.
 - 1. Provide drains, p-traps with clean outs, and associated fittings and piping for a complete installation of direct buy owner furnished products.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install per manufacturer's instructions and recommendations.

- B. Install accessible wall-mounted fixtures at handicapped/elderly mounting height according to ICC/ANSI A117.1.
- C. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.
- D. Install back-outlet, wall-mounting fixtures onto waste fitting seals and attach to supports.
- E. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.
- F. Install wall-mounting fixtures with tubular waste piping attached to supports.
- G. Install counter-mounting fixtures attached to countertop.
 - 1. Install countertop undermount stainless-steel fixtures with brackets, bracket bolts, and mildew resistant silicone sealant as recommended by solid surface countertop and fixture manufacturer.
- H. Install fixtures level and plumb according to roughing-in drawings.
- I. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
- J. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- K. Sensor Faucets: Install transformer and wiring from transformer to each hardwired unit. Coordinate location of mixing valves and transformers for proper access.
- L. Install traps on fixture outlets.
 - 1. Exception: Omit trap on fixtures with integral traps.
 - 2. Exception: Omit trap on indirect wastes, unless otherwise indicated.
- M. Install escutcheons at piping wall and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings.
- N. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color.
- O. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Section 220719 "Plumbing Piping Insulation."

3.2 CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

3.3 FIELD QUALITY CONTROL

- A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.
- B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.
- C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.
- D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.
- E. Install fresh batteries in sensor-operated mechanisms.

3.4 PROTECTION

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 42 00

SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Piping materials and installation instructions common to most piping systems.

1.2 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspace, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.
- F. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
1. The Kroger Company has in place to purchase many HVAC related items directly from the manufacturer. The Owner will provide equipment and the Contractor will install.

1.3 SUBMITTALS

- A. Unless otherwise specified and in addition to provisions of the General Conditions, submit drawings having each sheet, and each page of a brochure, marked with identification and containing information described below. Submittals are to be complete, partial submittals will not be accepted.
- B. Identification:
1. Include project name and Architect's job number. If pages are securely bound in brochure, this is needed on cover only.

2. Identification by specification section and article under which equipment or material is described, and by name, number and intended use as designated by contract drawings and specifications.
3. When more than one item of equipment is covered by a single drawing or catalog cut, each project equipment item must be separately identified thereon with clear delineation as to which model or catalog number or performance data applied to each project item.

C. Information:

1. Include manufacturer's model number or catalog number, size and other data as requested.
2. Maintenance Manuals: Organize each maintenance manual with index and thumb-tab marker for each section of information; bind in 2-inch (51-mm) 3-ring, vinyl-covered binder, with pockets for folded sheets, properly labeled on spine and face of binder.

1.4 QUALITY ASSURANCE

- A. Application: HVAC work shall comply with applicable requirements and recommendations of standards published by listed agencies and trade associations, except to extent more detailed and stringent requirements are indicated or required by governing regulations.

- B. Listing of Associations, Standards and Abbreviations Specific to HVAC Work (in addition to standards specified in individual work sections), conform to following applicable standards:

1. AABA - Associates Air Balance Council
2. AGA - American Gas Association
3. AMCA - Air Movement & Control Association
4. ARI - Air/Conditioning and Refrigeration Institute
5. ASC - Adhesive and Sealant Council
6. ASHRAE - American Society of Heating, Refrigeration & Air Conditioning Engineers
7. ASME - American Society of Mechanical Engineers
8. ASPE - American Society of Plumbing Engineers
9. ASSE - American Society of Sanitary Engineering
10. AWS - American Welding Society, Inc.
11. AWWA - American Water Works Association, Inc.
12. CAGI - Compressed Air and Gas Institute
13. CISPS - Cast Iron soil Pipe Institute
14. EPA - Environmental Protection Agency
15. FM - Factory Mutual System
16. MCA - Mechanical Contractor's Association of America
17. NIST - National Institute for Standards and Technology
18. (NBS) (formerly National Bureau of Standards)
19. NEC - National Electrical Code by NFPA
20. NEMA - National Electrical Manufacturer's Association
21. NFPA - National Fire Protection Association
22. NSF - National Sanitation Foundation
23. OSHA - Occupational Safety and Health Administration (U.S. Department of Labor)
24. PDI - Plumbing and Drainage Institute

- 25. SMACNA- Sheet Metal & Air Conditioning Contractors National Associations, Inc.
 - 26. TIMA - Thermal Insulation Manufacturers Association
 - 27. UL - Underwriter's Laboratories, Inc.
- C. Symbols: Except as otherwise indicated in drawing legends, refer to "ASHRAE Handbook of fundamentals" for definitions of symbols used on the drawings to show mechanical work.
- D. Manufacturers: Firms regularly engaged in the manufacture of products of quality, types and sizes required; and which have been in satisfactory use of not less than four years in similar service, except as otherwise noted in specific sections of this division.
- E. Installer's Qualifications: Firm with at least three years of successful installation experience on projects with work similar to this project and meet applicable regulatory agencies requirements.
- F. Compatibility: Provide products which are compatible with other products of the plumbing work, and with other work requiring interface with the plumbing work. Provide products with the proper or correct power characteristics, fuel-burning characteristics and similar adaptations for this project. Coordinate the selections from among options (if any) for compatibility of products.
- G. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX.
- H. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- I. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
- 1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
 - 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- J. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.
- 1.5 DESCRIPTIONS
- A. "Kroger Purchased" and "Contractor Purchased" equipment is described in Division 00 Section General Conditions." Unless the Drawings indicate that it Kroger purchased, the Contractor is responsible for purchasing the equipment as shown on Drawings.
- B. Section specifies provisions for HVAC work, including:
- 1. Certain adaptive expansions of requirements specified in Division 00 Section General Conditions", uniquely applicable to HVAC work.

2. General performance requirements within HVAC work (all Division 23 Sections) as a whole.
 3. General work to be performed as HVAC work, because of its close association with HVAC work.
- C. Examine all Drawings, and visit site and become acquainted with all conditions which may affect execution of work.
 - D. Provide work in accordance with state and local codes, regulations and/or ordinances, and meet approval of authorities having jurisdiction. Provide only new material and as specified.
 - E. Furnish to Kroger Representative, a Certificate of Final Approval from governing authority prior to Kroger Representative's final acceptance, where applicable.
 - F. Comply with all requirements for permits and licenses, and pay all associated costs.
 - G. Provide piping specialties and condensate drain piping for air conditioning units.

1.6 COORDINATION OF HVAC WORK:

- A. Refer to Division 00 Section General Conditions" for general coordination requirements applicable to entire work. The Contract Documents are diagrammatic in showing certain physical relationships which must be established within HVAC work, and in its interface with other work, including utilities, control and electrical work, and that such establishment is Contractor's exclusive responsibility.
- B. Arrange HVAC work in a neat, well organized manner, with piping and similar services running parallel with primary lines of the building.
- C. Give right-of-way to piping as required for slope.
- D. Locate operating and control equipment properly to provide easy access, and arrange entire HVAC work with adequate access for operation and maintenance.
- E. Advise other trades of openings required in their work for the subsequent move-in of large units of HVAC work (equipment).
- F. Coordination of Drawings: For locations where elements of HVAC (or combined HVAC, plumbing, fire protection and electrical) work must be sequenced and positioned with precision in order to fit into the available space, provide to Contractor coordination drawings (shop drawings) showing the actual physical dimensions (at accurate scale) required for the installation. Prepare and submit to the Contractor coordination drawings prior to purchase/fabrication/installation of any of the elements involved in the coordination.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Compatibility: Provide products which are compatible with other products of the HVAC work, and with other work requiring interface with the HVAC work. Provide products with the proper or correct power characteristics, fuel-burning characteristics and similar adaptations for this project. Coordinate the selections from among options (if any) for compatibility of products.

2.2 SUBSTITUTIONS AND EQUIPMENT SELECTION:

- A. First listed manufacturer shown in Specifications and Drawings was used for design basis, layout, performance and indication of style and appearance.
- B. Equipment selected from this list of manufacturers, other than design basis, must be compatible with the facility and meet requirements of the Contract Documents.
- C. If any changes are required to the Work scope, due to the selected equipment being different from the design basis equipment, Contractor is responsible for coordinating increases or decreases in Work scope, paying Contractor's cost increases and any consultant fees.

2.3 CONDENSATE PIPING

- A. Drain Piping: Provide condensate drain piping from HVAC units as required to complete the system. Provide piping of Schedule 40 PVC. Trap and pipe as required.

2.4 PIPING SPECIALTIES

- A. Provide factory fabricated drainage piping, fittings and specialties recommended by manufacturer.
- B. Pipe Escutcheons: Provide pipe escutcheons with inside diameter close to outside diameter of pipe or outside diameter of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls or ceilings; and pipe sleeve extension, if any. Unless other indicated, furnish pipe escutcheons with nickel or chrome finish for occupied areas, prime paint finish for unoccupied areas.

2.5 FABRICATED PIPING SPECIALTIES:

- A. Pipe Sleeves: Provide pipe sleeves of one of the following:
 - 1. Sheet Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams or welded longitudinal joint.
 - 2. PVC Pipe: Fabricate from Schedule 40, PVC

2.6 BASIC SUPPORTS AND ANCHORS:

- A. General: Provide supports and anchors in accordance with the following listing:
1. Adjustable steel clevises, for horizontal piping hangers and supports.
 2. Two bolt-riser clamps, for vertical-piping clamps.
 3. Concrete inserts, c-clamps, malleable beam clamps and steel brackets for building attachments.

2.7 HVAC SYSTEM IDENTIFICATION:

- A. Provide identification for HVAC equipment including but not limited to:
1. RTU's
 2. Exhaust Fans
 3. Supply Fans
 4. Hoods
 5. Air Handlers
- B. Text: Description, unit number, and location.
1. Example: "RTU-5 PHARMACY".
- C. Interior Identification: Provide either of the following interior identification methods:
1. For open structure, provide stencil-painted identification with lettering size not less than **1-1/2-inches (38-mm)** located in an easily visible location such as on the ductwork entering building from the roof.
 2. Where ceilings conceal the unit from sight, identify location with an engraved hard black plastic tag, **1 inch by 2 inch (25 mm by 50 mm)** plate with **3/4 inch (19 mm)** white lettering, pop riveted to the ceiling suspension grid directly below the location of the RTU or other piece of equipment.
- D. Exterior Identification (For equipment that does not have identification applied at the factory)
1. Stencil-Painted Identification: Lettering size not less than **1-1/2-inches (38-mm)**.
 2. Engraved Plastic-Laminate Signs: Sufficient size to convey adequate information at each location. Comply with recognized industry standards for color and design.
 3. Operational Tags: Plasticized card stock, with pre-painted or hand printed, to convey the message; example: "DO NOT CLOSE THIS VALVE EXCEPT WHEN BURNER IS OFF". Provide proper and adequate information on operation and maintenance of HVAC systems.

PART 3 - EXECUTION

3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 23 Sections specifying piping systems.

1. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
2. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
3. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
4. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal and clearance for light fixtures.
5. Install piping to permit valve servicing.
6. Install piping at indicated slopes.
7. Install piping free of sags and bends.
8. Install fittings for changes in direction and branch connections.
9. Install piping to allow application of insulation.
10. Select system components with pressure rating equal to or greater than system operating pressure.
11. Install escutcheons for penetrations of walls, ceilings, and floors.
12. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.

a. Pipe Sleeves:

- 1) For pipes passing through brick or concrete walls, or concrete floor slabs, provide steel pipe sleeves, two sizes larger than the pipe for which they are intended. Coordinate setting of sleeves as construction progresses. Set sleeves flush with finished line of walls and floors.
 - 2) Caulk sleeves through foundation walls to make them watertight.
13. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and HVAC sleeve seals. Select sleeve size to allow for **1-inch (25-mm)** annular clear space between pipe and sleeve for installing HVAC sleeve seals.
- a. Install steel pipe for sleeves smaller than **6 inches (150 mm)** in diameter.
 - b. Install cast-iron "wall pipes" for sleeves **6 inches (150 mm)** and larger in diameter.
 - c. HVAC Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble HVAC sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
14. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using HVAC sleeve seals. Select sleeve size to allow for **1-inch (25-mm)** annular clear space between pipe and sleeve for installing HVAC sleeve seals.
- a. HVAC Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble HVAC sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

15. Verify final equipment locations for roughing-in.
16. Refer to equipment specifications in other Sections for roughing-in requirements.
17. Where a pipe slot is indicated for a group of pipes passing through a wall, set a rectangular frame of structural angles, welded in the slot, at each side of wall. Close each side of opening with two No. 16 USG galvanized steel plates cut to fit the pipes and/or pipe insulation closely, and fasten to angle frame. For slots in exterior walls, slip flanged ferrules of sheet metal on pipes when they are installed, with flanges inside the closure plates at exterior wall face, caulk ferrules and plates to make weathertight joint, and pack space between closure plates with rock wool or glass fiber. At slots in fire walls, pack as specified above, but omit ferrules and caulking.

3.2 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems:

1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
3. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
4. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
5. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - a. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - b. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
6. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators.
7. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
8. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - a. Comply with ASTM F 402, for safe-handling practice of cleaners, primers, and solvent cements.
 - b. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
 - c. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
 - d. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
 - e. PVC Nonpressure Piping: Join according to ASTM D 2855.

- f. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.
- 9. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.
- 10. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
 - a. Plain-End Pipe and Fittings: Use butt fusion.
 - b. Plain-End Pipe and Socket Fittings: Use socket fusion.
- 11. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.3 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
 - 1. Install unions, in piping **NPS 2 (DN 50)** and smaller, adjacent to each valve and at final connection to each piece of equipment.
 - 2. Install flanges, in piping **NPS 2-1/2 (DN 65)** and larger, adjacent to flanged valves and at final connection to each piece of equipment.
 - 3. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.4 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components unless otherwise indicated.
- C. Install HVAC equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.
- E. Follow manufacturer's suggested procedure for protection of equipment which will be idle for an extended period of time prior to start-up
- F. Mount and align equipment in strict accordance with manufacturer's recommendations and in accordance with procedures described below. In case of conflict, these procedures govern. Where structural or miscellaneous steel is not drilled, drill in field as directed.
- G. Lubricate all equipment as required and in accordance with manufacturer's recommendations. Furnish required lubricants.
- H. Neatly cut all openings in roof decks as needed for equipment, duct and pipe penetrations.

I. Suspend Equipment, Piping and Ductwork:

1. Provide structural steel and steel rod hangers, rigid in appearance. Weld (with approval of Architect where attaching to building steel) structural steel hangers or bolt with hex head machine bolts and with spring lock washers under nuts.
2. For suspension from concrete, provide steel or malleable iron inserts in poured concrete construction, as specified for pipe hangers and supports, and expansion shields, toggle bolts or lag screws, in other construction. Use electric drill with carbide bit for drilling concrete blocks.
3. For suspension from structural steel, use beam or channel clamps with locking clips.
4. Do not support HVAC components from ceiling grids.
5. Do not suspend hangers from roof decks.
6. Suspend from roof trusses and joists/joist girders only at panel points, at top cord only, unless otherwise indicated.
7. Provide additional supports wherever needed, and structural steel members attached to building frame to provide additional points of support where required. Do no drilling of building structural and miscellaneous steel, except as directed or indicated.

J. Hanger Rods and Hanger Spacing: 8-feet to 10-feet (2.4-m to 3-m) spacing maximum, provide auxiliary angles spanning between joints, as required. Comply with current A.S.M.E. code for pressure piping. Piping 5-inches (127-mm) size and larger to be supported by a minimum of two joists, with pipe center between joists.

K. Insulated Pipe: Fit pipe hangers over outside diameter of insulation; provide sheet metal saddles 16 gage, 6-inches (152-mm) long by 1/3 of the circumference.

1. Select supports for a minimum safety factor of five.

L. Rooftop Mounted Equipment Set on Structure:

1. Weld or bolt equipment to roof curbs or structural supports. For bolting equipment directly to structural supports, provide machine bolts, lock washers and nuts.

M. Floor-Mounted Equipment:

1. Set and level equipment on foundation. Grout in place, using non-ferrous grout. Provide wedges and shims for leveling.
2. Accurately align equipment prior to operation.

N. Maintain daily log of operational data on HVAC equipment and systems through the close-out period; record hours of operation, assigned personnel, fuel consumption and similar information; submit copy to Kroger Representative.

O. Turn Over of Operation: Upon substantial Completion, turn over prime responsibility for operation of HVAC equipment and systems to Kroger's personnel. However, until time of final acceptance, respond promptly with consultation and services, as required. Provide one operating engineer, who is completely familiar with the work, to consult with and continue training Kroger personnel.

3.5 INSTALLATION OF CONDENSATE PIPING:

- A. Install pipes and pipe fittings in accordance with recognized industry practices which will achieve permanently leakproof piping systems. Install piping with a minimum of offsets.
- B. Accurately cut pipe to measurements established at the site and work into place without springing or forcing. Install piping with sufficient flexibility to adequately provide for expansion and contraction due to temperature fluctuation inherent in its work operation.
- C. Do not conceal piping in walls or partitions nor underground or under the floor. Where pipe passes through building structure, pipe joints are not to be concealed, but located where they may be readily inspected.
- D. Discharge condensate water to comply with requirements of local jurisdiction.
- E. Run pipes to be insulated as shown as required with sufficient clearance to permit application of insulation.
- F. Use cadmium plated or galvanized nuts and bolts with self locking type nut or double nut on pipe clamps. Use double nuts or self locking nuts on hanger rods for piping support.
- G. Connect condensate drain piping to HVAC equipment in manner shown, and comply with equipment manufacturer's instructions where not otherwise indicated.

3.6 CONCRETE BASES

- A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
 - 1. Construct concrete bases of dimensions indicated, but not less than **4 inches (100 mm)** larger in both directions than supported unit.
 - 2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on **18-inch (450-mm)** centers around the full perimeter of the base.
 - 3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
 - 4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 5. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
 - 7. Use **3000-psi (20.7-MPa)**, 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Cast-in-Place Concrete Slabs."

3.7 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to Division 05 Sections "Structural Steel" and "Metal Fabrications" for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment.

- C. Field Welding: Comply with AWS D1.1.

3.8 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor HVAC materials and equipment.
- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

3.9 HVAC SYSTEM IDENTIFICATION

- A. Provide stencil-painted identification on rooftop equipment when not provided by manufacturer.
- B. Provide engraved plastic-laminate signs at locations of major equipment units, primary control devices, emergency equipment, dangerous elements of HVAC work and similar places. Mount permanently in an appropriate and effective location.
- C. Operational Tags: Provide proper and adequate information on operation and maintenance of mechanical systems.

3.10 INSPECTION

- A. Installer must examine areas and conditions under which products are to be installed. Notify Kroger Representative, in writing, of conditions detrimental to proper completion of work. Starting of installation constitutes acceptance.

3.11 CUTTING AND PATCHING

- A. Comply with Division 00 Section "General Conditions" for cutting and patching of other work, to accommodate the installation of HVAC work. Except as individually authorized by the Architect, cutting and patching of HVAC work to accommodate the installation of other work is not permitted, other than necessary penetrations of HVAC sheet metal work for electrical conduit and similar purposes.

3.12 TRIMMING

- A. Inspect ductwork, pipe supports, in occupied and equipment spaces for sharp angles which protrude into path of occupants and may cause injury. Trim such protrusions or cover with suitable spongy material to prevent such injuries.

3.13 TOUCH-UP

- A. Touch-up with zinc dust-zinc oxide primer galvanized or steel equipment which has been welded or otherwise scarred. Provide additional finished equipment with paint type and color to match original.

3.14 AIR FILTER MEDIA

- A. Provide necessary filter changes for equipment operated during building construction. Replace each set of filters with clean filters at time of project close-out.

3.15 SYSTEM TESTS

- A. Perform system tests in the presence of Kroger Representative. Notify Kroger Representative of system's tests at least 48 hours in advance.

3.16 SYSTEM INSPECTION

- A. Systems are to be inspected by Kroger Representative before covering, enclosing or concealing of work. Notify Kroger Representative of systems which are to be covered, enclosed or concealed at least 48 hours in advance.

END OF SECTION 23 05 00

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SECTION 23 09 13 - INSTRUMENTATION AND CONTROL DEVICES FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply the following instrumentation and control devices for HVAC
 - 1) Thermostats
 - b. Comply with requirements in Division 00 Section "General Conditions."
 2. Contractor supplied items:
 - a. Anchors and tension plates, and other items not provided by Owner necessary for a complete installation.
 - b. Locking thermostat covers.
 3. Contractor installed items:
 - a. Provide all work shown on Drawings including:
 - 1) Final connection of HVAC controls
 - 2) Thermostats
 - 3) All associated items as required to make systems installation complete and operable.
 - 4) Coordination of Work installed by other Contractors
- B. This Section includes control equipment for HVAC systems and components, including control components for heating and cooling units.

1.2 SUBMITTALS

- A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
1. Product Data: For each control device indicated.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Refer to Division 01 Section "Vendor Contact List" for contact information on HVAC controls.

2.2 THERMOSTAT COVERS

- A. Room Thermostat Cover Construction: Manufacturer's standard locking covers.
 - 1. Basis of Design: Better Engineered Controls; Sentinel Model BTG-54VL (Metal Beige).
 - 2. Provide thermostat guards for manager's office and vestibule thermostats.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Contractors are responsible for coordinating delivery, proper storage (if necessary), installation, startup and the first year of labor warranty. Installation includes: replacement of missing and/or damaged materials final connections to HVAC.

3.2 ELECTRICAL WIRING AND CONNECTION INSTALLATION

- A. Install raceways, boxes, and cabinets according to Division 26 Section "Raceway and Boxes."
- B. Install building wire and cable according to Division 26 Section "Low Voltage Electrical Power Conductors and Cables."
 - 1. Conceal cable up to 14 feet above finish floor or above Décor elevation, except in mechanical rooms and areas where other conduit and piping are exposed.
 - 2. Install exposed cable in raceway.
 - 3. Install concealed cable in raceway.
 - 4. Bundle and harness multiconductor instrument cable in place of single cables where several cables follow a common path.
 - 5. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
 - 6. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
 - 7. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.

3.3 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections.

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.
2. Test and adjust controls and safeties.
3. Test each point through its full operating range to verify that safety and operating control set points are as required.
4. Test each control loop to verify stable mode of operation and compliance with sequence of operation.
5. Test each system for compliance with sequence of operation.
6. Test software and hardware interlocks.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel or Owner's authorized maintenance company to adjust, operate, and maintain HVAC instrumentation and controls.

END OF SECTION 23 09 13

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SECTION 23 74 13 - AIR CONDITIONING/AIR-HANDLING UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply the following equipment:
 - 1) Split system cooling and heat pump units.
 - b. Comply with requirements in Division 00 Section "General Conditions."
2. Contractor supplied items:
 - a. Fasteners and other items not provided by Owner necessary for a complete installation.
3. Contractor installed items:
 - a. Split system cooling and heat pump units.

1.2 SUBMITTALS

- A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
1. Product Data: Manufacturer's technical data for each air conditioning/air-handling unit, including rated capacities, dimensions, required clearances, characteristics, furnished specialties, and accessories.
 2. Shop Drawings: Equipment assemblies and dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - a. Wiring Diagrams: Power, signal, and control wiring.
 3. Installation Manual: Manufacturers complete manual for installation of unit.

1.3 QUALITY ASSURANCE

A. ARI Compliance:

1. ARI 210/240 and ARI 340/360 for testing and rating energy efficiencies for air conditioning/air-handling units.
2. ARI 270 for testing and rating sound performance for air conditioning/air-handling units.

B. ASHRAE Compliance:

1. ASHRAE 15 for refrigerant system safety.
2. ASHRAE 33 for methods of testing cooling and heating coils.
3. ASHRAE/IESNA 90.1 for minimum efficiency of heating and cooling.

C. NFPA Compliance: NFPA 90A and NFPA 90B.

D. UL Compliance: UL 1995.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4 WARRANTY

- A. Contractor shall be responsible for handling manufacturer warranty service during the 90 day warranty period. Contractor shall be responsible for following all warranty procedures and notifying Owner of all warranty repairs.

PART 2 - PRODUCTS

2.1 COOLING AND HEAT PUMP UNITS (Supplied by Owner)

- A. Refer to Division 01 Section "Vendor Contact List" for contact information on duct-free split system cooling and heat pump units.
1. See Drawings for schedule of equipment.

2.2 CONTROLS

- A. Control equipment and sequence of operation are indicated on Drawings.

2.3 ROOF CURBS

- A. Provide curbs for air conditioning/air-handling units as specified in Division 07 Section "Manufactured Curbs."

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install split system cooling and heat pump units in accordance with manufacturer's installation instructions.

B. Installation Includes:

1. Curbs, provision of crane for placement of equipment, making connections to HVAC controller and initial balancing, filters and racks at time of start up and all filter changes during construction.
2. Wiring including connections to HVAC controller(s), connections to smoke detectors; and testing and balancing.
3. Replacement of missing and/ or damaged materials after acceptance of equipment.
4. Final connection to EMS panel.

C. Roof Curb: Install on roof structure level and secure, according to NRCA's "Low-Slope Membrane Roofing Construction Details Manual," Illustration "Raised Curb Detail for Rooftop Air Handling Units and Ducts." Install air conditioning/air-handling units on curbs and coordinate roof penetrations and flashing with roof construction. Secure air conditioning/air-handling units to upper curb rail with restraint brackets, and secure curb base to roof framing or concrete base as indicated on Drawings.

D. Install condensate drain, minimum connection size, with trap and drain as required by authorities of local jurisdiction.

E. Control Wiring: Electrical installer shall provide control wiring. HVAC installer shall provide final connections.

3.2 CLEANING AND ADJUSTING

- A. Clean up work. Touch-up with matching paint all damaged factory finishes.
- B. Fully charge all rooftop equipment with refrigerant and ensure proper oil levels.
- C. Provide new filters on the day building is turned over to Owner for grand opening.

END OF SECTION 23 74 13

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SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sleeves for raceways and cables.
2. Sleeve seals.
3. Grout.
4. Common electrical installation requirements.
5. Contractor arc-flash study requirements.

B. Types of electrical connections specified in this section include, but are not necessarily limited to, the following:

1. Distribution Equipment
2. Grounding System
3. Motors
4. Motor Starters
5. Starters for Hood fans
6. Light Fixtures
7. Fire Alarm Equipment
8. Temperature Control Wiring
9. Emergency Equipment
10. HVAC Equipment
11. Water Heaters.
12. Sprinkler and Fire Alarm System
13. Disposers
14. Installation of operator controls for bascart door.

C. Related Work

1. HVAC work: Provide conduit for wiring for HVAC equipment in accordance with the drawings and specifications.
 - a. Refer to Division 23 Section "Instrumentation and Control Devices for HVAC" for work performed by HVAC installer.
 - b. Refer to Division 26 Section "Low Voltage Electrical Power Conductors and Cables" for wiring.
2. Temperature control work to include conduit and wiring for smoke detector. Installation in ductwork included in Division 23 Sections. Refer to Division 23 Section "Instrumentation and Control Devices for HVAC" for work performed by HVAC installer.
3. Sprinkler alarm system shall be wired complete. Provide a "lock-on" device on the circuit breaker supplying the alarm system. Identify circuit breaker with a sign reading:

"FIRE ALARM - DO NOT DISCONNECT". Sprinkler/ fire alarm shall be interlocked with HVAC control system(s) to stop the motors in the event of sprinkler-flow or fire alarm activation.

4. Premise Alarms: Provide conduits and outlet boxes for premise alarms indicated on the drawings or as required. Refer to Drawings.
5. Other conduit and wiring shown on the Drawings for energy management, refrigeration and temperature control.
6. Elevator work: Provide a set of auxiliary contacts connected to the disconnect for elevator controller required to activate battery lowering device to return elevator car to first floor to meet code.

1.2 SUBMITTALS

- A. Product Data: For sleeve seals.
- B. Certificates: For electrical installers, showing successful completion of an arc-flash training course.

1.3 QUALITY ASSURANCE

- A. Arc-Flash Qualifications: Qualify procedures and personnel according NFPA E70
 1. Electrical installers performing work on energized panelboards, switchgear, and other electrical equipment capable of a rapid release of energy due to an arcing fault shall pass an arc-flash protection training course pursuant to the requirements of OSHA 29CFR1910 332 subpart S and NFPA 70E, "Standard for Electrical Safety in the Workplace."

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Sleeves for Rectangular Openings: Galvanized sheet steel.
 1. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
 - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE SEALS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Advance Products & Systems, Inc.; 337-233-6116
 - b. Calpico, Inc.; 650-588-2241
 - c. Metraflex Co.; 800-621-4347
 - d. Pipeline Seal and Insulator, Inc.; 800-423-2410
 2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
 3. Pressure Plates: Carbon steel or Stainless steel. Include two for each sealing element.
 4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating or Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.4 ELECTRICAL CONNECTIONS FOR EQUIPMENT

- A. Manufacturers:
1. AMP Products Corp.; 800-468-2023
 2. Burndy Corp.; 800-346-4175
 3. Ideal Industries, Inc. 800-435-0705
 4. Thomas and Betts Corp.; 800-816-7809

2.5 MATERIALS AND COMPONENTS FOR CONNECTIONS FOR EQUIPMENT:

- A. For each electrical connection indicated, provide a complete assembly of materials, including but not necessarily limited to, pressure connectors, terminals (lugs), electrical insulating tape, cable ties, solderless connectors and other items and accessories as needed to complete splices and terminations of the type indicated.
- B. Metal Conduit, Tubing and Fittings: Provide metal conduit, tubing and fittings of the type, grade, size and weight (wall thickness) required for each service.
1. Raceways to be as specified in Division 26 Section "Raceway and Boxes."
- C. Conductors: Unless otherwise indicated, provide conductors for electrical connections as specified in Division 26 Section "Low Voltage Electrical Power Conductors and Cables."

- D. Connectors and Terminals: Provide electrical connectors and terminals as recommended by the connector and terminal manufacturer for the intended application.
- E. Electrical Connections Accessories: Provide electrical insulating tape, connectors and cable ties as recommended for the type job designated by the accessories manufacturers.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Fasten electrical components securely to structural support steel. Do not fasten to metal deck.
- B. Comply with NECA 1.
- C. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- D. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- E. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- F. Right of Way: Give right of way to piping systems installed at a required slope. Work shall be coordinated between trades prior to installation.
- G. General Contractor to run conduits and install control wiring between control components, switches and operator for bascart door as indicated on Drawings and Shop Drawings.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.

- G. Size pipe sleeves to provide **1/4-inch (6.4-mm)** annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry
 - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
- J. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- K. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for **1-inch (25-mm)** annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- L. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for **1-inch (25-mm)** annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

- A. Install to seal exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

END OF SECTION 26 05 00

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SECTION 26 05 19 - LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply the following items:
 - 1) Building wires and cables rated 600 V and less.
 - 2) Building wires and cables rated higher than 600V as identified on Drawings.
 - b. Comply with requirements in Division 00 Section "General Conditions."
2. Contractor supplied items:
 - a. Energy management system (EMS) control wiring:
 - b. Multiconductor Portable Cable (SO cord).
 - c. Connectors, splices, and terminations rated 600 V and less.
 - d. Sleeves and sleeve seals for cables.
3. Contractor installed items:
 - a. Building wires and cables.
 - b. EMS control wiring.
 - c. Multiconductor Portable Cable (SO cord).
 - d. Connectors, splices, and terminations rated 600 V and less.
 - e. Sleeves and sleeve seals for cables.

B. Security wiring is specified in Division 28 Section "Fire Alarm/Security System."

C. Direct Buy Wiring Quantity Determination:

1. Complete the Electrical Wire (Cuts) Order Form (See attached sample form at the end of this Section). Order may be broken down into a maximum of two deliveries, additional deliveries are at Contractor's expense. Submit via email to the Direct Buy Wire Supplier:

Graybar Electric
CIOHKroger@gbe.com
Attention Renee Miller
2. Include wiring from Division 26 Section "Grounding And Bonding For Electrical Systems."
3. Report any discrepancies between the Electrical Wire (Cuts) Order Form and actual product received to the Direct Buy Wire Supplier and copy Kroger within the allotted time frame as established by the Direct Buy Wire Supplier. Coordinate delivery

schedule, cut lengths, colors, location and date with the Direct Buy Wire Supplier. Upon receipt, the electrical wire becomes the property of the Contractor.

4. Notify Direct Buy Wire Supplier of any delivery date change with copies to Kroger's Procurement Department and Kroger's Project Manager. Notification must take place a minimum of two weeks prior to requested delivery date and change must be a minimum of plus or minus two weeks.
5. Adjustments may be made between the Electrical Wire Bid Takeoff Form and the Electrical Wire (Cuts) Order Form as long as the adjustments do not exceed the value of the total wire price originally calculated on the Electrical Wire Bid Takeoff Form. Provide at no additional cost to the Owner, any additional electrical wire; equal in quality to Kroger supplied wiring, required to complete the project. Kroger will pay for pricing increases in wire due to inflation.
6. Manage any warranty claims directly with the Direct Buy Wire Supplier and copy Kroger.

1.2 SUBMITTALS

- A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
 1. Product Data: For each type of Owner furnished product.
- B. Provide the following submittals for Owner's and Architect's review:
 1. Product Data: For each type of Contractor furnished product.
 2. Field quality-control test reports.
 3. Electrical Wire (Cuts) Order Form: Submit as defined above.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES (OWNER SUPPLIED)

- A. Refer to Division 01 Section "Vendor Contact List."
 1. Building Wires: Conductors, conductor insulation, and multi-conductor cable to comply with NEMA WC70. Except where copper conductors are specifically noted on Drawings for 100 ampere and larger feeders, aluminum alloy AA-8000 compact stranded conductors will be installed.
 2. Metal Clad Cable (Type MC) to comply with National Electrical Code (NEC) and authorities having jurisdiction.

2.2 CONDUCTORS AND CABLES (CONTRACTOR SUPPLIED)

- A. Multiconductor Portable Cable (SO Cord): Comply with NEMA WC 70/ICEA S-95-658 for Type SO with ground wire.

1. Manufacturers:

- a. Allied Wire and Cable, Inc.
- b. General Cable Technologies Corporation.
- c. Southwire Company, LLC.

2. Description: Stranded bare copper conductor, separator, CPE Rubber or EPR insulation, suitable fillers, separator and CPE jacket with a temperature range of minus **40 degrees F (40 degrees C)** to plus **140 degrees F (60 degrees C)**.

- a. Provide stainless-steel, wire-mesh, strain relief device at terminations.

3. Color: Black.

2.3 ENERGY MANAGEMENT SYSTEM (EMS) CONTROL WIRING: (CONTRACTOR SUPPLIED)

A. Manufacturers:

1. Anixter; 800-264-9837
2. Beldon CDT, Inc., 800- 235-3361
3. Walker; Division of Butler Manufacturing; 816-968-3000
4. Harvey Hubbel Incorporated; 203-882-4900

- B. Basis of Design: Beldon CDT, Inc., 800- 235-3361

2.4 CONNECTORS AND SPLICES (CONTRACTOR SUPPLIED)

A. Manufacturers:

1. AMP, Inc.; 800-468-2023
2. Burndy Corp.; 800-346-4175
3. Eagle Electric Manufacturing Co., Inc.
4. Ideal Industries, Inc.; 800-435-0705
5. Joslyn Manufacturing and Supply Co.; 317-848-5127
6. OZ/Gedney Co.; 847-268-6000
7. Pyle National Co.; 804-798-8390
8. Thomas and Betts Co.; 800-816-7809

- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.5 SLEEVES FOR CABLES (CONTRACTOR SUPPLIED)

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

2.6 SLEEVE SEALS (CONTRACTOR SUPPLIED)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:

1. Advance Products & Systems, Inc.; 800-315-6009
2. Calpico, Inc.; 800-255-1032
3. Metraflex Co.; 800-621-4347
4. Pipeline Seal and Insulator, Inc.; 713-747-6948

- B. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and cable.

1. Refer to Division 26 Section "Common Work Results for Electrical" for more information on sealing materials.

2.7 CONNECTIONS: (CONTRACTOR SUPPLIED)

- A. Provide UL type factory fabricated, connectors of sizes, ampacity ratings, materials, types and classes for applications and for services indicated. Where not indicated, provide proper selection as determined by Installer to comply with project's installation requirements, NEC and NEMA standards. Select from following, those type, classes, kinds and styles of connectors to fulfill project requirements.

1. Type:

- a. Pressure
- b. Crimp
- c. Threaded

2. Class:

- a. Insulated
- b. Non-insulated

3. Kind:

- a. Copper (for copper to copper connection)
- b. AL/CU Dual-Rated for use with aluminum and copper conductors (for copper to aluminum connection and for aluminum to aluminum connection). Properly wire brush conductor surface and utilize Listed anti-oxidation joint compound. Wipe away excess compound. All connection/termination materials shall be UL Listed and Labeled for the specific application and applied accordingly.

4. Style:

- a. Butt Connection
- b. Elbow Connection
- c. Combined "T" and Straight Connection
- d. "T" Connection
- e. Parallel Connection
- f. Tap Connection

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Metal-Clad Cable (Type MC): Type MC cable may be used to the extent permitted by the National Electrical Code (NEC) and by authorities having jurisdiction. Install in strict compliance with NEC Article 330, including all references therein to other articles and sections of NEC, and in strict compliance with all other authorities having jurisdiction and the following:
- 1. See Division 26 Section "Raceways and Boxes for Electrical Systems" for information related to flexible metal conduit.
 - 2. Unlimited length of MC cable may be used for branch circuits where entire run is concealed, such as in walls, above accessible ceilings, or in unoccupied attic areas.
 - 3. Do not use MC cable where subject to physical damage, such as unfinished areas at heights of 5 feet (1.52 m) above finished floor or less.
 - 4. Where metal clad (Type MC) cable branch circuit is visible, limit installation of cable to 25 feet (7.62 m) maximum length from junction boxes to connect to devices as required.
 - a. Install exposed MC cable runs parallel with walls or structural elements and tight to structural elements where possible. Vertical runs shall be plumb; horizontal runs level and parallel or perpendicular with structure, as appropriate. Groups shall be racked together neatly with both straight runs and bends parallel and uniformly spaced.
 - b. Install only Type MC cable with stranded #12 and #10 copper conductors, Type THHN insulation twisted and covered with polyester tape.
 - c. Connect paired lighting units (those sharing ballasts as in a master satellite system) with 25 feet (7.62 m) fixture whips unless directed otherwise through unit manufacturer's recommendations.
 - 5. MC cable (aluminum alloy) may be installed for feeder applications from switchboard to panelboards or disconnects for feeders 100A or larger as sized on the Drawings.
 - a. Feeders: Provide aluminum alloy AA-8000 compact stranded conductors for 100 ampere and larger feeders unless noted otherwise on the Drawings.
 - b. Comply with the routing of conduit as described in Article "Installation of Conductors and Cables" of this Section. Failure to do so may result in a shorter cable run and larger potential fault current (for which the system may not be designed).
 - c. Do not use MC cable for underground applications.
 - d. See Division 26 Section "Raceways and Boxes for Electrical Systems" for allowable/limiting lengths.

- e. Feeder and subfeeder descriptions shown on Drawings are based on traditional conduit/wire type installation; however, the Contractor may, at it's option, run feeder MC cable (20 feet (6 m) maximum length) from service entrance switchboard or distributions panels to panelboards rated 100 A or larger.
- B. Branch circuit MC cable is permitted in limited use conditions only as indicated in this Article. Homeruns to departments or areas where a large number of branch circuits are being installed shall be in conduit. From junction boxes installed above the ceiling in a space, MC shall be permitted to connect to devices as required.
- C. Do not install conductors of sizes less than indicated. Minimum size for branch circuits shall be No. 12 AWG; for #12; for Class 1 remote control and signal, circuits to be No. 14 stranded; for Class 2 low-energy remote control and signal, circuits to be No. 16 AWG stranded conductors.
- D. EMS Control Conductors:
1. Provide wiring for CPC Systems applications:

Description	Wire Type	
	Plenum	Non-Plenum
WAN Connection	#24-8 Cat-5 Cable	#24-5 Cat-8 Cable
RS-485 Network	1 #22-2 Shielded Cable	#22-2 Shielded Cable
Analog/Digital Temperature Sensor/Input	#22-2 Shielded Cable	#22-2 Shielded Cable
Defrost Termination Sensor	#22-2 Shielded Cable	#22-2 Shielded Cable
Relative Humidity Sensor	#22-3 Shielded Cable	#22-2 Shielded Cable
Low Light Sensor	#22-4 Shielded Cable	#22-4 Shielded Cable
Outdoor Temperature Sensor/Drop Leg Sensor	#22-2 Shielded Cable	#22-2 Shielded Cable
Lighting Control	#14 Twisted Pair per Lighting Contactor (Plenum Rated)	#14 Twisted Pair per Lighting Contactor
Refrigeration Solenoid Valve	#14 Twisted Pair (Plenum Rated)	#14 Twisted Pair
HVAC Staging Control	2-#16-10 Multi-Conductor Cable (Plenum Rated)	2-#16-10 Multi-Conductor Cable
Unit Heater Control	#14 Twisted Pair (Plenum Rated)	#14 Twisted Pair
Line Voltage in Conduit	Per NEC and Mfr's Guidelines	Per NEC and Mfr's Guidelines

2. Provide the following wiring for Danfoss System applications:

Description	Wire Type	
	Plenum	Non-Plenum

W.A.N. Connection	Belden #1533P #24-8 Category-5 Cable or approved equal	Belden #1533R #24-8 Category-5 Cable or approved equal
RS-485 Network	Windy City Wire #043006AL Shielded cable or approved equal	Windy City Wire #043006AL Shielded cable or approved equal
Echelon Network	Belden #88760 #18-2 Shielded Cable or approved equal	Belden #8760 #18-2 Shielded Cable or approved equal
Analog/Digital Temperature Sensor/Input:	Belden #88760 #18-2 Shielded Cable or approved equal	Belden #8760 #18-2 Shielded Cable or approved equal
Defrost Termination Thermostat (Dry Contact):	Belden #88760 #18-2 Shielded Cable or approved equal	Belden #8760 #18-2 Shielded Cable or approved equal
Relative Humidity/Temp Sensor:	Belden #88770 #18-3 Shielded Cable or approved equal	Belden #8770#18-3 Shielded Cable or approved equal
Light Level Sensor:	Belden #88770#18-3 Shielded Cable or approved equal	Belden #8770 #18-3 Shielded Cable or approved equal
0 – 10V Signal	Belden #88760 #18-2 Shielded Cable or approved equal	Belden #8760 #18-2 Shielded Cable or approved equal
Lighting Control	#14 Twisted Pair Per Lighting Contactor (Plenum Rated)	#14 Twisted Pair Per Lighting Contactor
Refrigeration Solenoid Valve (208V)	Per NEC and Manufacturer's Guidelines	
HVAC Staging Control	2-#16-10 Multi-Conductor Cable (Plenum Rated)	2-#16-10 Multi-Conductor Cable
Unit Heater Control	#14 Twisted Pair (Plenum Rated)	#14 Twisted Pair
Line Voltage In Conduit	Per NEC and Manufacturer's Guidelines	
Drive Healthy	Belden #88760#18-2 Shielded Cable or approved equal	Belden #8760 #18-2 Shielded Cable or approved equal
Drive Enable	Belden #88770 #18-3 Shielded Cable or approved equal	Belden #8770 #18-3 Shielded Cable or approved equal

E. Color Coding:

- Wire #10 AWG and smaller to be factory color-coded. Where factory color is not available for sizes larger than #10 AWG, mark conductors on each end with **1-inch (25.4-mm)** band of colored pressure sensitive plastic tape.
- Color for each phase and neutral to be consistent throughout the system color code to be as follows:

	<u>208Y/120V System</u>	<u>277/480V System</u>
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Grounding Conductor	Green	Green
Isolated Grounding Conductor	Green with Yellow Stripe	

- The same color to be used for each phase throughout system of feeders, subfeeders and branches.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. General: Install electrical cables, wires and wiring connectors as indicated in compliance with applicable requirement so NEC, NEMA, UL and NECA's "Standard of Installation", and in accordance with recognized industry practices.
- B. Provide circuitry conductors, cable, wire and connectors required on the project for:
 - 1. Power Distribution
 - 2. Lighting
 - 3. Appliances
 - 4. Equipment
 - 5. Motor Branches
 - 6. HVAC Control
 - 7. EMS wiring
- C. Sprinkler/Fire Alarm
- D. Coordinate wire/cable installation work including electrical raceway and equipment installation work, as necessary to properly interface installation of wires/cables with other work and in accordance with proper phasing.
- E. Swab out all raceways before any wires are pulled.
- F. Install UL Type XHHW wire for underground service, underground feeder, and underground branch circuit conductors as well as other exterior branch circuits.
- G. Install UL Type THHN or THWN wiring in conduit, for feeders and branch circuits in all interior building areas above grade.
- H. Pull conductors simultaneously where more than one is being installed in same raceway. Use pulling compound or lubricant, where necessary; compound used must not deteriorate conductor or insulation. Use pulling means including, fish tape, cable rope and basket weave wire/cable grips that will not damage cables or raceway.
- I. Where outlets only are indicated, 12-inch (305-mm) conductor leads to be provided for connection of Owner's equipment. All conductors to be identified at terminals and junctions with circuit numbers.
- J. Cord Drops for Outlet and Equipment Connections (SO Cord):
 - 1. Install to suit application for the following uses:
 - a. Cord drops to prep room equipment per ESD-16.
 - b. Cord drops to electrical outlets in prep areas per ESD-16A.
 - c. Cord drops to mobile refrigerated display cases.
 - d. Do not use cord drops for permanent power to building light fixtures.
- K. Class 1 Control Circuits: Type THHN-THWN wiring.

- L. Class 2 Control Circuits: Type THHN-THWN wiring.

3.3 SPLICES AND TAPS:

- A. For splice and tap connections for wire sizes #10 AWG and smaller, provide joints in conductors by twisting the conductors and then connector in sizes and quantity of conductors as catalog rated by manufacturer. In no case will wire nuts be permitted. Connector to be Scotchlok Type Y, R, G or B.
- B. For splicing wire sizes larger than #10 AWG, provide UL-listed insulated copper compression connectors. Provide AL/CU-rated connectors only where aluminum conductors are specifically noted on drawings for feeders rated 100A or greater.. Compression to be either indent or crimp type hydraulic. Burndy Type YS for splices. Tap connections larger than #8 AWG to be copper mechanical connectors Burndy Type KVS and Type QPX. Keep conductor splices to a minimum.
- C. Install splices and tapes which possess equivalent, or better, mechanical strength and insulation ratings than conductors being spliced.

3.4 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- D. Route cables perpendicular and parallel to the building architectural lines/surfaces/structural members, keeping offsets to a minimum and following surface contours where possible.
 - 1. Maintain a uniform elevation for cable runs wherever possible.
 - 2. Support/Anchor cables at maximum 6-foot (1.8 m) intervals and within 12 inches (305 mm) of box or outlet without sag.
 - 3. Install cables in a manner that prevents overheating.
 - 4. Fasten cables directly to the structural steel using factory clamps/clips specifically designed for the respective cable. Do not attach cables to metal deck.
- E. Install exposed runs of cables down walls to surface mounted panelboards by one of the following methods:
 - 1. Within a partition chase wall (constructed by the electrical installer in manner approved by Architect).
 - 2. Within appropriately sized steel raceway(s)
 - 3. Within a custom fabricated heavy-gage painted sheet metal chase approved in advance by the Owner's Representative.

- F. Install chases and wireways in a manner that fully conceals and protects cables, prevents any overheating of cables and is approved by the local authority having jurisdiction.
- G. Seismic-restraint devices are specified in Division 20 Section "Vibration and Seismic Controls for Facility Services."
- H. Support cables according to Division 20 Section "Hangers and Supports for Facility Services" and Division 20 Section "Vibration and Seismic Controls for Facility Services."
- I. Identify and color-code conductors and cables according to Division 26 Section "Electrical Identification."
- J. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A (copper) and UL 486B (aluminum).
- K. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (305 mm) of slack.

3.5 SLEEVE-SEAL INSTALLATION

- A. Install to seal underground exterior-wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for cable material and size. Position cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.6 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
- B. Tests and Inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test and service entrance and feeder conductors for compliance with requirements.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- C. Test Reports: Prepare a written report to record the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- D. Remove and replace malfunctioning units and retest as specified above.

3.7 ELECTRICAL WIRE (CUTS) ORDER FORM

- A. Complete the Electrical Wire (Cuts) Order Form (following this page) and submit via email to the Direct Buy Wire Supplier as specified in Part 1. Kroger will e-mail a copy of the electronic form to each of the Invited Bidders.

(The Electrical Wire (Cuts) Order Form immediately follows this page)

ELECTRICAL WIRE (CUTS) ORDER FORM			
Store Information		MEP Engineer	
Store #		Company Name	
Street			
Street/City/Zip		General Contractor	
Kroger PM		Company Name	
PM Phone		Contact Name	
		Contact Phone	
Takeoff Date			
Store Type	Gross SF	Electrical Subcontractor	
New Store	0	Company Name	
Expansion Remodel - Existing	0	Street	
Expansion Remodel - New	0	City/State/Zip	
WIW Remodel (With-In-Wall)	0	Contact Name	
Total		Contact Phone	
<div style="display: flex; justify-content: space-between;"> <div> <p>Order of Shipment (Priority): _____</p> <p>Circuit # (Marked on Each Reel) _____</p> <p>Size/Color/Type _____ Put Up: _____</p> <p>Size/Color/Type _____ Put Up: _____</p> <p>Size/Color/Type _____ Put Up: _____</p> <p>Size/Color/Type _____ Put Up: _____</p> <p>Parallel (yes or no) _____ Parallel with Circuit # _____</p> </div> <div style="width: 50%;"></div> </div>			
<div style="display: flex; justify-content: space-between;"> <div> <p>Order of Shipment (Priority): _____</p> <p>Circuit # (Marked on Each Reel) _____</p> <p>Size/Color/Type _____ Put Up: _____</p> <p>Size/Color/Type _____ Put Up: _____</p> <p>Size/Color/Type _____ Put Up: _____</p> <p>Size/Color/Type _____ Put Up: _____</p> <p>Parallel (yes or no) _____ Parallel with Circuit # _____</p> </div> <div style="width: 50%;"></div> </div>			

ELECTRICAL WIRE (CUTS) ORDER FORM			
<div style="margin-bottom: 10px;">Order of Shipment (Priority): _____</div> <div><div style="display: flex; justify-content: space-between;"><div style="width: 60%;">Circuit # (Marked on Each Reel) _____ Size/Color/Type _____ Size/Color/Type _____ Size/Color/Type _____ Size/Color/Type _____ <div style="display: flex; justify-content: space-between; margin-top: 10px;">Parallel (yes or no) _____Parallel with Circuit # _____</div></div><div style="width: 35%; text-align: right;"><div style="display: flex; justify-content: flex-end; margin-bottom: 5px;">Put Up: _____</div><div style="display: flex; justify-content: flex-end; margin-bottom: 5px;">Put Up: _____</div><div style="display: flex; justify-content: flex-end; margin-bottom: 5px;">Put Up: _____</div><div style="display: flex; justify-content: flex-end; margin-bottom: 5px;">Put Up: _____</div></div></div></div>			
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<div style="margin-bottom: 10px;">Order of Shipment (Priority): _____</div> <div><div style="display: flex; justify-content: space-between;"><div style="width: 60%;">Circuit # (Marked on Each Reel) _____ Size/Color/Type _____ Size/Color/Type _____ Size/Color/Type _____ Size/Color/Type _____ <div style="display: flex; justify-content: space-between; margin-top: 10px;">Parallel (yes or no) _____Parallel with Circuit # _____</div></div><div style="width: 35%; text-align: right;"><div style="display: flex; justify-content: flex-end; margin-bottom: 5px;">Put Up: _____</div><div style="display: flex; justify-content: flex-end; margin-bottom: 5px;">Put Up: _____</div><div style="display: flex; justify-content: flex-end; margin-bottom: 5px;">Put Up: _____</div><div style="display: flex; justify-content: flex-end; margin-bottom: 5px;">Put Up: _____</div></div></div></div>			
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END OF SECTION 26 05 19

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Methods and materials for grounding systems and equipment.
2. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply the following items:
 - 1) Insulated and bare conductors.
 - b. Comply with requirements in Division 00 Section "General Conditions."
3. Contractor supplied items:
 - a. Connectors and grounding electrodes.
 - b. Other items as required for a complete installation.
4. Contractor installed items
 - a. Insulated and bare copper conductors.
 - b. Connectors and grounding electrodes.

B. Direct Buy Wiring Quantity Determination:

1. Complete the Electrical Wire (Cuts) Order Form (in Division 26 Section "Low Voltage Electrical Power Conductors and Cables"). Order may be broken down into a maximum of two deliveries, additional deliveries are at contractor's expense. Submit via email to the Direct Buy Wire Supplier:

Graybar Electric
CIOHKroger@gbe.com
Attention Renee Miller
2. Include with wiring in Division 26 Section "Low Voltage Electrical Power Conductors and Cables."
3. Report any discrepancies between the Electrical Wire (Cuts) Order Form and actual product received to the Direct Buy Wire Supplier and copy Kroger within the allotted time frame as established by the Direct Buy Wire Supplier. Coordinate delivery schedule, cut lengths, colors, location and date with the Direct Buy Wire Supplier. Upon receipt, the electrical wire becomes the property of the Contractor.
4. Notify Direct Buy Wire Supplier of any delivery date change with copies to Kroger's Procurement Department and Kroger's Project Manager. Notification must take place a

minimum of two weeks prior to requested delivery date and change must be a minimum of plus or minus two weeks.

5. Adjustments may be made between the Electrical Wire Bid Takeoff Form and the Electrical Wire (Cuts) Order Form as long as the adjustments do not exceed the value of the total wire price originally calculated on the Electrical Wire Bid Takeoff Form. Provide at no additional cost to the Owner, any additional electrical wire; equal in quality to Kroger supplied wiring, required to complete the project. Kroger will pay for pricing increases in wire due to inflation.
6. Manage any warranty claims directly with the Direct Buy Wire Supplier and copy Kroger.

1.2 SUBMITTALS

- A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
 1. Product Data: For each type of Owner furnished product.
- B. Provide the following submittals for Owner's and Architect's review:
 1. Product Data: For each type of Contractor furnished product.
 2. Field quality-control test reports.
 3. Electrical Wire Order Form: Submit as defined above.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with UL 467 for grounding and bonding materials and equipment.
- C. Coordination Meeting: Between electronic equipment installers, electrical installers and Contractor before start of Work.

PART 2 - PRODUCTS

2.1 CONDUCTORS (OWNER SUPPLIED)

- A. Refer to Division 01 Section "Vendor Contact List."
 1. Products will comply with NEC, and established industry standards.
 2. Insulated Conductors: Owner will supply wire or cable insulated for 600 V unless otherwise required by applicable code or authorities having jurisdiction. Unless otherwise specified, service entrance conductors, feeder and subfeeders rated 100 ampere and larger will be compact stranded AA-8000 aluminum alloy.
 3. Bare Copper Conductors: Owner will supply bare copper conductors complying with the following:

- a. Solid Conductors: ASTM B 3.
- b. Stranded Conductors: ASTM B 8.
- c. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
- d. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
- e. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
- f. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

2.2 CONNECTORS (CONTRACTOR SUPPLIED)

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Bolted pressure-type, with at least two bolts.
 1. Bolted Connectors for Copper Conductors: Copper or copper alloy
 2. Bolted Connectors for Aluminum Conductors: Aluminum alloy AA-8000 compact stranded conductors.
 3. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES (CONTRACTOR SUPPLIED)

- A. Ground Rods: Copper-clad steel; 3/4 inch (19 mm) in diameter by 10 feet (3 m) long.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches (600 mm) below grade.
- C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- D. Conductor Terminations and Connections:
 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.

2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

- A. Provide a separate grounding conductor for branch circuits and feeders from the load side terminals of the device or equipment to the source grounding bar (i.e. at the panelboard or switchboard). Mechanical grounding (i.e. grounding connecting the device or equipment to the junction box or conduit) will not be permissible. Other applications in addition to that required by NFPA 70 are listed below:
 1. Flexible raceway runs.
 2. Metal-clad cable runs.
 3. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
 4. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.
- B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- D. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
- E. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
- F. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 6 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring cabinet, and central equipment location.

1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6-by-50-by-300-mm) grounding bus. Coordinate with equipment installers for locations requiring grounding.
 2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- G. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
1. Fasten cables directly to the structural steel using factory clamps/clips specifically designed for the respective cable. Do not attach cables to metal deck.
- B. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade, unless otherwise indicated.
1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
 3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.
- D. Grounding and Bonding for Piping:
1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.

3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve. Retain and edit paragraph below to exceed NFPA 70 requirements, and comply with NFPA 70 recommendations for a higher standard of safety or electromagnetic interference suppression if needed.

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells.
 - a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.

B. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).

C. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

1. Cost to reduce ground resistance shall be at Contractor's expense.

END OF SECTION 26 05 26

SECTION 26 05 33 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes
 - 1. Raceways, electrical conduits, fittings, boxes, enclosures, power poles, drop reel cords, and cabinets for electrical wiring.
- B. Provide electrical raceway work as indicated by drawings and schedules, including:
 - 1. Electrical Metallic Tubing
 - 2. Flexible Metal Conduit
 - 3. Liquid-Tight Flexible Metal Conduit
 - 4. Intermediate Metal Conduit
 - 5. Wireway
 - 6. In Floor Duct System
 - 7. Rigid Non-Metallic Conduit
- C. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - 1. The Kroger Company will supply the following items for the Contractor to install:
 - a. Drop Cord Reels

1.2 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, details, and attachments to other work.
- C. The Owner will provide the submittals for Owner furnished products for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

- A. Electrical Metallic Tubing (EMT): ANSI C80.3 and UL 797, galvanized or zinc coated steel.
 - 1. Fittings: Galvanized or zinc coated steel, set-screw type.
 - a. Do not use die-cast fittings.
- B. Intermediate Metal Conduit (IMC): Heavy wall, full weight, zinc-coated, threaded type (galvanized after cutting/threading) conforming to ANSI C80.1 and UL 6. Provide zinc coating fused to inside and outside walls
 - 1. Threaded Fittings: Galvanized or zinc coated steel.
 - 2. Provide for the following applications:
 - a. Conduit installed embedded in concrete or masonry.
 - b. Conduits which turn up from below grade or below slab (including the 90 degree fittings which connect to conduits 24-inches (610-mm) below grade/slab).
 - c. Other applications as indicated in Contract Documents or as otherwise required for special physical protection (nearby vehicular/equipment traffic, site maintenance equipment, etc.).

2.2 RIGID NONMETALLIC CONDUIT AND DUCTS

- A. General:
 - 1. The Owner will only allow limited use of nonmetallic (PVC-Schedule 40) conduit material to underground installations.
 - 2. PVC-Schedule 40 conduit and PVC attachment hardware is required in areas that are exposed to moisture such as coolers, freezers and refrigerated prep areas where conduits cannot be installed in stud wall behind insulated panels. Transition from PVC conduit to EMT conduit upon leaving the cooler/freezer. Provide conduit seal-off at the transition from PVC to EMT to prevent air transfer. Install seal-off no more than 12 inches (305 mm) from freezer/cooler exterior wall.
 - 3. Where underground conduits project out of the concrete slab, change from PVC to IMC at the bottom of the floor slab.
 - 4. Unless noted otherwise in Contract Documents, provide for all horizontal conduit runs below grade and for other applications as indicated in Contract Documents.
- B. Underground Plastic Conduits/Ducts: Heavy wall, Schedule 40, PVC, 90 degrees C, conforming to NEMA TC-2, UL listed and labeled for direct burial or concrete encasement and in conformity with NEC Article 354.
 - 1. Basis of Design Product: Carlon Electrical Products; Plus 40, Heavy Wall EPC Type EB-35
- C. Nonmetallic Conduit/Duct Accessories

1. General: Provide conduit/duct accessories of types, sizes, and materials, complying with manufacturer's published product information, which mate and match conduit and tubing.
2. Duct Spacers ("Chairs"):
 - a. Base Spacers Basis of Design Product: Carlon Electrical Products; #S288*L series.
 - b. Intermediate Spacers Basis of Design Product: Carlon Electrical Products; #S289*L series
3. Horizontal Elbows For Service Entrance Conduits:
 - a. Bend: Maximum 45 degree,
 - b. Radius: Minimum **24-inches (610-mm)**. Provide larger minimum radius if directed in field.
 - c. Provide multiple units as required to obtain required offset (i.e. provide two 45 degree elbows to obtain a 90 degree offset).
4. Other Elbows:
 - a. Bend: Maximum 90 degree.
 - b. Radius: Minimum **24-inches (610-mm)**. Provide larger minimum radius if directed in field.
5. Provide all other couplers, adapters, "O" rings, sealing, etc. as required. Provide miscellaneous fittings that have been specifically designed and manufactured for their particular application.

2.3 FLEXIBLE METAL CONDUIT

- A. See Division 26 Section "Low Voltage Electric Power Conductors and Cables" for MC Cable for low voltage electric power conductors and cables.
- B. General:
 1. Comply with FS WW-C-566 and UL 1
 2. Form from continuous length of spirally wound, interlocked zinc-coated or galvanized (inside & outside) strip steel.
 3. Conduit Fittings: Threadless hinged clamp type and insulated throats.
 4. Straight Terminal Connectors: One piece body, female end with clamp and deep slotted machine screw for securing conduit, and male threaded end provided with locknut.
 5. Do not use 45 degree or 90 degree terminal angle connectors for flexible or water-tight flexible metal conduit in locations which will not be fully accessible after completion of construction.
 6. Provide full size insulated green ground wire for all applications, regardless of length.
 7. Provide flexible metal conduit for the following applications:
 - a. Final **24-inches (610-mm)** of connection to motors or control items subject to movement or vibration.
 - b. Conduits within movable partitions.

- c. See Division 26 Section "Low Voltage Electric Power Conductors and Cables" for fixture whips.
- C. Liquid-Tight Flexible Metal Conduit: Single strip, flexible, continuous, interlocked, and double-wrapped steel; galvanized inside and outside.
 - 1. Liquid-Tight Jacket: Flexible polyvinyl chloride (PVC). Provide smooth-wall type jackets (not a corrugated look) for finished area furniture whip (and similar) applications.
 - 2. Liquid-Tight Flexible Metal Conduit Fittings: FS W-F-406, Type 1, Class 3, Style G. Provide cadmium plated, malleable iron fittings with compression type steel ferrule and neoprene gasket sealing rings, with insulated throat.
 - 3. Straight Terminal Connectors: One piece body, female end with clamp and deep slotted machine screw for securing conduit, and male threaded end provided with locknut.
 - 4. Terminal Angle Connectors (45 degree or 90 degree): Two-piece body construction with removable upper section, female end with clamp and deep slotted machine screw for securing conduit, and male threaded end provided with locknut.
 - 5. Do not use 45 degree or 90 degree terminal angle connectors for flexible or water-tight flexible metal conduit in locations which will not be fully accessible after completion of construction.
 - 6. Provide full size insulated green ground wire for all applications, regardless of length.
 - 7. Provide liquid-tight flexible metal conduit for final connections to equipment subject to moisture or corrosive conditions.

2.4 RACEWAY ACCESSORIES:

- A. Provide conduit joints with standard conduit couplings, (no running-threads) cadmium plated. Schedule 40 PVC conduit is also permitted for use in masonry or concrete.
- B. Provide conduit and tubing accessories of types, sizes and materials complying with manufacturer's published product information which mate and match conduit and tubing.
- C. Conduit Bodies: Provide galvanized cast metal conduit bodies of types, shapes and sizes as required to fulfill job requirements and NEC requirements. Construct conduit bodies with threaded conduit entrance ends, removable covers, either cast or of galvanized steel and corrosion resistant screws.
- D. Conduit Fittings, General:
 - 1. Construct locknuts for securing conduit to metal enclosure with sharp edge for digging into metal and ridged outside circumference for proper fastening.
 - 2. Bushings for terminating conduits smaller than 1-1/4-inch (32-mm) are to have flared bottom and ribbed sides, with smooth upper edges to prevent injury to cable insulation.
 - 3. Provide insulated type bushings for terminating threaded conduits. Bushings are to have flared bottom and ribbed sides. Provide phenolic insulating ring molded into bushing in upper edge.
 - 4. Bushing of standard or insulated type to have screw type grounding terminal.
 - 5. Miscellaneous fittings such as reducers, chase nipples, 3-piece unions, split couplings and plugs to be specifically designed for their particular application.

- E. Liquid-Tight Flexible Metal Conduit Fittings: Provide cadmium plated, malleable iron fittings with compression type steel ferrule and neoprene gasket sealing rings, with insulated, or non-insulated throat.
- F. Conduit Seal Compound:
 - 1. Products
 - a. OZ-/Gedney Division; General Signal Co.; Neer #DC
 - b. 3M Corp.; Scotchfill Electrical Insulating Putty.

2.5 METAL WIREWAYS:

- A. Provide electrical wireways of types, grades, sizes and number of channels for each type of service as indicated. Provide complete assembly of raceway including, but not limited to, couplings, offsets, elbows, expansion joints, adapters, holddown straps, end caps and other components and accessories as required for complete system.
- B. Lay-In Wireways: Construct lay-in wireways with covers, in accordance with UL 870 and with components UL listed, including lengths, connectors and fittings.
- C. Select units to allow fastening cover closed without use of parts other than standard lengths, fittings connectors. Construct units to be capable of sealing cover in closed position with sealing wire. Provide wireways without knockouts.
- D. Connectors: Provide wireway connectors suitable for lay-in conductors, with connector covers permanently attached which removal is not necessary to utilize lay-in feature.
- E. Finish: Protect sheet metal parts with rust inhibiting coating and baked enamel finish. Plate finish hardware to prevent corrosion. Protect screws installed toward inside wireway with spring nuts to prevent wire insulation damage.
- F. Wireways to be square duct of standard lengths factory finished ANSI-49 gray with hinged cover lengths and removal cover. Metal to be not less than 0.0740-inches (2-mm) thick.
- G. Wireways and all fittings to be UL Listed File No. E6625, provided without knockouts and complete with all 2-piece universal hangers and connectors.

2.6 IN-FLOOR RACEWAY SYSTEM:

- A. In-Floor Raceway System: (In-floor systems are only used in under shelving units and sometimes at the checklanes. Refer to drawings for exact locations on use.)
 - 1. Basis of Design Product: Walkerdut Systems, Inc. a Wiremold Company; Walkerdut.
 - 2. Provide with "after-set" type method.
 - 3. Fabricate raceway with blank sections, size #4/0.
 - 4. Provide inserts to allow for a minimum 2-1/2-inch to 3-inch (63.5-mm to 76-mm) of concrete floor over under-floor raceway duct.
 - 5. Size junction box per Drawings. Boxes shall be selected per anticipated floor finish conditions.

6. Provide sealing compound for waterproofing joints

2.7 SURFACE RACEWAYS

- A. General: Use surface raceways only where indicated on the Drawings or as approved by Kroger Representative.
- B. Surface Metal Raceways: Galvanized steel with snap-on covers. Raceway shall be provided with an ivory finish.
 1. Manufacturers:
 - a. Thomas & Betts Corporation.; 800-816-7809
 - b. Wiremold/Legrand, Walker Systems Division 800-621-0049

2.8 BOXES, ENCLOSURES, AND CABINETS

- A. Provide electrical boxes and fittings as required by the National Electric Code (NEC) and as necessary for ease of installation, including
 1. Outlet boxes
 2. Junction boxes
 3. Pull boxes
 4. Conduit bodies
 5. Bushings
 6. Locknuts
 7. Seals
- B. Low Voltage System (Premise Alarm, Telephone, Fire Alarm, Data.): Provide conduits and outlet boxes for premise alarms indicated on the Drawings or as required.
 1. Provide conduit when alarm wiring is to be installed down a column and unfinished walls in backroom areas.
- C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- D. Nonmetallic Outlet and Device Boxes: NEMA OS 2.
- E. Metal Floor Boxes: Cast metal, fully adjustable, rectangular.
- F. Nonmetallic Floor Boxes: Nonadjustable, round.
- G. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- H. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.
- I. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 2. Nonmetallic Enclosures: Plastic
- J. Cabinets:
1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 2. Hinged door in front cover with flush latch and concealed hinge.
 3. Key latch to match panelboards.
 4. Metal barriers to separate wiring of different systems and voltage.
 5. Accessory feet where required for freestanding equipment.
- K. Interior Outlet Boxes: Provide galvanized steel interior outlet wiring boxes, of the type, shape and size, including depth of box, to suit each respective location and installation.
1. Provide with stamped knockouts in back and sides, and with threaded holes with screws for securing box covers or wiring devices.
 2. Boxes Recessed in Furred Walls: Not less than 4-inches (102-mm) square minimum.
 3. Provide single or double gang plaster cover as required for device.
 4. Interior Outlet Box Accessories: Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes being used and meeting requirements of individual wiring situations. Choice of accessories is installer's option.
- L. Interior Outlet Boxes under Cases in Preparation Areas or Other Wet Areas: Provide nonmetallic interior outlet wiring boxes, of the type, shape and size, including depth of box, to suit each respective location and installation.
1. Basis of Design Product: Thomas & Betts Corp.; Carlon brand.
- M. Surface Mounted and Weatherproof Outlet Boxes: Provide corrosion resistant cast metal outlet wiring boxes, of types, shapes and sizes, including depth of boxes, with threaded conduit ends, face plates suitably configured for each application, including face plate gaskets and corrosion resistant fasteners. In wet locations provide an enclosure that is weatherproof whether or not the plug cap is inserted.
1. Basis of Design Product: TayMac Corp.; MX3200
- N. Pull and Junction Boxes: Provide necessary junction and pull boxes, whether shown on drawings or not, which may be required for pulling or splicing cables to make the conduit system practical.
1. Construct boxes of code gage galvanized steel sized to turn or support cables.
 2. Provide covers with brass screws.
 3. Provide hinged covers on boxes larger than 24-inches by 24-inches (609-mm by 609-mm).
- O. Cooler/Freezer Timer Switch Box Extension Adapter: Provide steel, 1-gang, deep flush-type extension adapter to extend flush wall box factory installed in the insulated panel to accommodate timer switch and wiring.

1. Basis of Design Product: Wiremold/Legrand; 500 and 700 Series, Flush-Type Extension, V5751.
2. Depth: 1-3/4 inches (45 mm).
3. Color: Ivory.

2.9 POWER POLES

A. Power Poles Other Than Checklanes:

1. Power and/or data poles shall be provided only where indicated in the construction documents.
2. General Use Tele-Power Poles: Multiple service aluminum modular type, small frame with rounded end panels, number of compartments (2 or 3), etc. as required for each application.
 - a. Basis of Design: Wiremold/Legrand; Vista series
 - b. Determine specific configurations and applications in field.
 - c. Finish Color: As directed by Owner.
 - d. Provide factory fittings and accessories as required for a complete bonded installation.
 - e. Provide a total of four duplex receptacles as specified under Division 26 Section "Wiring Devices" or furniture feed for powered systems furniture connection. Coordinate requirements with furniture vendor.

2.10 PROMOTIONAL ISLAND ELECTRICAL FEEDS

- ### A. Drop Reel Cords: Refer to Division 01 Section "Vendor Contact List" for information on Owner supplied drop reel cords.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- #### A. In addition to other contract document requirements, the following special requirements shall be strictly enforced.
1. Install wiring for systems in conduit sized per NEC, minimum 3/4-inch (19-mm) dia. unless otherwise indicated.
 2. Install wiring for different power voltages in raceway systems separate from each other .
 3. Install wiring, with the exception of voice and data, for the various electrical systems in raceway systems separate from each other.
 - a. Low Voltage Systems:
 - 1) In stores with ceilings, run free air above the ceiling unless space above ceilings is an air plenum in which case plenum rated cable shall be used.
 - 2) In stores without ceilings, run in structure with j-hooks or other standard installation methods.

- 3) Low voltage systems wiring is required to be in conduit stub ups above ceiling or to structure in all cases.
 4. Install normal system power feeders and branch circuits in separate raceways from emergency system power.
 5. Do not install conduits within slabs.
 6. Provide steel conduit and fittings indoors above the slabs.
 7. Provide conduit fittings with insulated throats or plastic bushings for conduits 2-inches (51-mm) and larger where insulated throats are not readily available.
 8. Provide conduit runs exceeding 100-feet (30.5-m) in length or having in excess of three 90 degree turns with pull boxes.
- B. Don not exceed a conduit fill of 40 percent or per NEC, whichever is less.

3.2 RACEWAY APPLICATION

- A. Hanger and support devices are specified in Division 20 Section "Hangers and Supports for Facility Services."
- B. Use liquid-tight flexible conduit for connection of motors and for other electrical equipment where subject to movement or vibration, and also where subjected to one or more of following conditions:
1. Exterior location.
 2. Moist or humid atmosphere where condensate can be expected to accumulate.
 3. Corrosive atmosphere.
 4. Subjected to water supply.
 5. Subjected to dripping oil, grease and/or water.
- C. Cut conduits straight, properly ream and cut threads for heavy wall conduit deep and clean.
- D. Size conduits to meet NEC, except not conduit smaller than 3/4-inch (19-mm) trade size, except for switch legs or where expressly noted otherwise.
- E. Fasten conduit terminations in sheet metal enclosures by two locknuts and terminate with bushing. Install locknuts inside and outside enclosure.
- F. Conduits are not to cross pipe shafts or ventilating duct openings.
- G. Keep conduits a minimum distance of 6-inches (152-mm) from parallel runs of flues, hot water pipes or other sources of heat. Wherever possible, install horizontal raceway runs above water and steam piping.
- H. Support riser conduit at each floor level with clamp hangers.
- I. Use of running threads at conduit joints and terminations is prohibited. When required, use a 3-piece union or split coupling.
- J. Complete electrical raceway installation before starting installing cables/wires within raceways.
- K. Concealed Conduits:

1. Conceal conduit in sales area or within customer view to a point 14-ft (4.27-m) above finish floor, above décor height line.
2. Install concealed raceways parallel with or at right angles to ceilings, walls and structural members.
3. Metallic raceways installed underground are to have factory applied epoxy or coal-tar coating. Field paint conduit threads with corrosion inhibiting compound before couplings are assembled. Draw up coupling and conduit sufficiently tight to ensure watertightness.
4. For slabs on grade, install conduits minimum of 3-inches (76-mm) below bottom of concrete slabs.
5. Install exterior underground conduits minimum 24-inches (610-mm) below finished grade.
6. Conduits in Concrete Slabs: Do not install conduits within concrete slabs.

L. Exposed Conduits:

1. Install exposed conduits and extensions from concealed conduit systems neatly, parallel with, or at right angles to walls of building.
2. Install exposed conduit work as not to interfere with ceiling inserts, lights or ventilation ducts or outlets.
3. Support exposed conduits by use of hanger, clamps or clips. Support conduits on each side of bends within 3-feet (1-m) of connection to junction box, outlet box, cabinet or fitting, and on spacing not to exceed 10-feet (3-m).
4. Above requirements for exposed conduits also apply to conduits installed in space above hung ceilings and in crawl spaces.
5. Provide minimum intermediate metal conduit (IMC) for exposed conduits in the back room or dock area below a height of 15-feet (4.6-m).

M. Non-Metallic Conduits:

1. Install solvent-cemented joints in accordance with recommendations of manufacturer.
2. Install PVC conduits underground or under floor slab only in accordance with local utility practices.

N. Conduit Seals: See manufacturers details for requirements and coordinate with Division 07.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Division 31 Section "Earth Moving" for pipe less than 6 inches (150 mm) in nominal diameter.
2. Install backfill as specified in Division 31 Section "Earth Moving."
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Division 31 Section "Earth Moving."

4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.
 - a. For stub-ups at equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of **60 inches (1500 mm)** from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
 - b. For stub-ups at equipment not mounted outdoors (i.e. branch circuits), transition from PVC to RMC below grade.
5. Warning Planks: Bury warning planks approximately **12 inches (300 mm)** above direct-buried conduits, placing them **24 inches (600 mm)** o.c. Align planks along the width and along the centerline of conduit.

3.4 INSTALLATION OF BOXES:

- A. Install raceway junction boxes flush with finished concrete floor.
- B. Install electrical boxes and fittings where indicated complying with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in compliance with recognized industry practices to ensure that products fulfill requirements.
- C. Coordinate installation of electrical boxes and fittings with wire/cable and raceway installation work.
- D. Provide weatherproof outlets for interior and exterior locations as indicated on Drawings by "WP."
- E. Provide weather-resistant outlets for exterior locations as indicated on Drawings by "WR."
- F. Provide die cast aluminum junction boxes located under service cases fed by under floor rigid steel or PVC conduit raceway systems. Seal around entire perimeter of box with clear silicone sealant after securing box to floor slab.
- G. Provide knockout closures to cap unused knockout holes where blanks have been removed.
- H. Install boxes and conduit bodies in those locations to ensure ready accessibility of electrical wiring.
- I. Install boxes and conduit bodies in accordance with proper work phasing of the work.
- J. Avoid using round boxes where conduit must enter box through side of box, which would result in difficult and insecure connections where fastened with locknut or bushing on rounded surface.
- K. Fasten boxes rigidly to substrates or structural surfaces to which attached, or solidly embed electrical boxes in concrete or masonry. Supports and anchors to be in accordance with Division 20 Section "Hangers and Supports for Facility Services."
- L. Install cooler/freezer timer switch box extension adapter on all cooler/freezer panel switch boxes to extend box to accommodate timer switch and wiring.

- M. Provide electrical connections for installed boxes.
- N. Provide hangers and brackets for junction and pull boxes, and coordinated properly with conduit hangers or fastenings to maintain proper alignment and prevent distortion of box. See Division 20 Section "Hangers and Supports for Facility Services" for supports.
- O. The Owner reserves the right to change the location of any outlet a distance of **6-feet (1829-mm)** in any direction from plan location before the work is actually roughed in at no additional charge.

3.5 INSTALLATION OF POWER POLES

- A. Install per manufacturer's instructions.
- B. Mount power poles to structure above with galvanized steel channel and mount to floor or fixture.
 - 1. Provide junction boxes in structure with flexible conduit into pole and down to electronic equipment as required per the Drawings.

3.6 INSTALLATION OF DROP REEL CORDS

- A. Mount where indicated to bottom of structural steel beam or joist as recommended by drop reel cord manufacturer.

END OF SECTION 26 05 33

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Identification for conductors and communication and control cable.
2. Warning labels and signs.
3. Equipment identification labels.

B. Provide electrical identification for the following:

1. Buried conduit warnings.
2. Electrical power, control and auxiliary system conductors.
3. Operational instructions and warnings.
4. Danger signs.
5. Equipment and system identification signs.

1.2 QUALITY ASSURANCE

A. Comply with ANSI A13.1.

1.3 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Manufacturers

1. W. H. Brady Co.; 800-541-1686
2. Panduit Corp.; 800-777-3300
3. Ideal Industries, Inc.; 800-435-0705

2.2 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

- A. Marker Tape: Vinyl or vinyl -cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

2.3 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70, 29 CFR 1910.145, and NEC.
- B. Labels: Configured for display on front covers, doors, or other access to electrical service equipment.
- C. Warning label and sign shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION – "WORKSPACE CLEARANCE WILL VARY BASED UPON EQUIPMENT VOLTAGE. CONFORM TO NEC 110.26 WORKSPACE CLEARANCE REQUIREMENTS."

PART 3 - EXECUTION

3.1 APPLICATION

- A. Clearly label branch circuit conduits and boxes with a permanent felt tip marker.
- B. Auxiliary Electrical Systems Conductor and Cable Identification: Use marker tape to identify field-installed alarm, control, signal, sound, intercommunications, voice, and data wiring connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and cable pull points. Identify by system and circuit designation.
 - 2. Use system of designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
- C. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply self-adhesive warning labels. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.
 - 1. Equipment with Multiple Power or Control Sources: Apply to door or cover of equipment including, but not limited to, the following:
 - a. Power transfer switches.
 - b. Controls with external control power connections.

2. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.
- D. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
1. Labeling Instructions:
 - a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with **1/2-inch- (13-mm-)** high letters on **1-1/2-inch- (38-mm-)** high label; where 2 lines of text are required, use labels **2 inches (50 mm)** high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label, drilled for screw attachment.
 - c. Elevated Components: Increase sizes of labels and legend to those appropriate for viewing from the floor.
 2. Equipment to Be Labeled:
 - a. Panelboards, electrical cabinets, and enclosures.
 - b. Electrical switchgear and switchboards.
 - c. Transformers.
 - d. Motor-control centers.
 - e. Disconnect switches.
 - f. Enclosed circuit breakers.
 - g. Motor starters.
 - h. Push-button and pilot lights.
 - i. Power transfer equipment.
 - j. Contactors.
 - k. Energy management system
 - l. Panelboards
 - m. Premise alarm panels

3.2 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

- E. Attach nonadhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.
- F. Color-Coding for Phase and Voltage Level Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.
 - 1. Color shall be factory applied.
 - 2. Colors for 208/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - 3. Colors for 480/277-V Circuits:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.

END OF SECTION 26 05 53

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply distribution panelboards and lighting and appliance branch-circuit panelboards indicated on drawings for:
 - 1) Power Distribution Panelboards
 - 2) Lighting and Appliance Panelboards
 - b. Comply with requirements in Division 00 Section "General Conditions."
2. Contractor supplied items:
 - a. Branch-circuit breakers for existing panelboards unless branch-circuit breaker is noted on drawings as existing to remain.
 - b. Accessories as required for a complete installation.
3. Contractor installed items:
 - a. Distribution panelboards and lighting and appliance branch-circuit panelboards.
 - b. Branch-circuit breakers for existing panelboards unless branch-circuit breaker is noted on drawings as existing to remain.
4. Panels, accessories and installation as required for a complete system.
5. Equipment does not have to match existing equipment.

1.2 SUBMITTALS

- A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
1. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
 2. Shop Drawings: For each panelboard and related equipment.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 PANELBOARDS

- A. Refer to Division 01 Section "Vendor Contact List" for information on panelboards.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Mount top of trim **74 inches (1880 mm)** above finished floor, unless otherwise indicated.
- C. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
- D. Install overcurrent protective devices and controllers.
 - 1. Set field-adjustable switches and circuit-breaker trip ranges.
- E. Install filler plates in unused spaces.
- F. Stub four **1-inch (27-GRC)** empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four **1-inch (27-GRC)** empty conduits into raised floor space or below slab not on grade.
- G. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Identification for Electrical Systems."
- H. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- I. Connect wiring according to Division 26 Section "Low Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

B. Perform the following field tests and inspections and prepare test reports:

1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
3. Set field adjustable circuit breaker “trip” ratings in compliance with manufacturer’s recommendations.

END OF SECTION 26 24 16

BLANK SHEET

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Receptacles, standard, GFCI, and associated device plates.
2. Switches.
3. Wall plates.
4. Occupancy sensors.
5. Plugmold pre wired raceway.

B. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.

1. The Kroger Company will supply the following items for the Contractor to install.
 - a. Occupancy sensors
 - b. Lighting controller and contactors
 - c. Building environmental control
 - d. Cooler and Freezer lighting switches
2. Comply with requirements in Division 00 Section "General Conditions."
3. Contractor supplied items: Accessories as required for a complete installation
4. Contractor installed items: Control devices listed above.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. The Owner will provide submittals for Owner supplied products for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
- B. USB Charging Electrical Duplex Outlet: Duplex receptacle with two USB charging ports, LED in use indicator light, 125 V, 20 A: Comply with 2014 NEC Article 406.12 tamper resistant NEMA 5-20R and UL 94.
 - 1. Basis-of-Design Product: Cooper, #TR7746W-BOX.
 - 2. Location: Receptacles in Starbucks, restaurant, and sushi seating areas, employee conference and break room as indicated.
 - 3. Color of Receptacle: Ivory.
- C. Commercial Grade Blade Receptacles: Duplex, straight blade receptacles, 2-pole, 3-wire, grounding, with green hexagonal equipment ground screw. 20 amp, 125 volt, with metal plaster ears; design for side and back wiring with spring loaded, screw activated pressure plate, with NEMA configuration 5-20R, unless otherwise indicated.
 - 1. Manufacturers:
 - a. Hubbell Incorporated Wiring Device-Kellems; (203) 882-4800
 - b. Leviton Mfg. Company Inc.; 800-323-0920
 - c. Bryant Electric, a Division of Hubbell Incorporated; 800-323-2792
 - d. Pass & Seymour/Legrand Wiring Devices & Accessories; 800-611-7277
- D. Color of Receptacles:
 - 1. Ivory, unless otherwise noted.
 - 2. Orange: For isolated ground.
 - 3. Red: For emergency
- E. Locking Receptacles (other than 20 amp, 120 volt): NEMA configuration of proper size for loads indicated on plans or as required for equipment served.
- F. Provide outlets with standard plate, blank, receptacle, switch or cord hole, as required by outlet symbol. Multiple devices mounted on one piece gangplates of appropriate design. No sectionalized plates permitted. Provide plates throughout building of same manufacturer and design.

2.2 PRE-WIRED RACEWAY

- A. Pre-Wired Raceway: With grounded outlets at **6-inches (152-mm)** o.c.
 - 1. Basis-of-Design: The Wiremold Company; Series 2000; 800-621-0049.
 - a. Where duplex and GF receptacles are indicated, provide The Wiremold Company; Series V3000; 800-621-0049.

2. Raceway Color: Ivory.
3. Outlet Color: Ivory.

2.3 GFCI RECEPTACLES

- A. General Description: Straight blade, feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A. Provide with an indicator LED showing that the unit is working properly when lit, and LED off when tripped.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
 1. Basis of Design Product: Hubbell Incorporated; #GFR5352IA.
- C. GFCI Convenience Receptacles with Weatherproof Receptacle Covers
 1. Product:
 - a. Hubbell Incorporated, #WP826; (203) 882-4800.
 - b. Intermatic Incorporated #WP1010MC; (815)-675-7000.
 2. Receptacles in Meat Preparation Room, Produce Prep and Salad Bar Prep Room, and Seafood Department: GFI type with weatherproof “while-in-use” gray die cast metal covers.
 3. Outdoor receptacles: For vending machines, GFI type with weatherproof “while-in-use” gray die cast metal covers.
- D. Weather Resistant GFCI Convenience Receptacles with Weatherproof Receptacle Covers.
 1. Products:
 - a. Hubbell Incorporated; GFTR20I.
 - b. Legrand North America, Inc.; Pass and Seymour brand, 2095TRWRI.
 - c. Cooper Industries; TWRVGF20V.
- E. Receptacles in Deli, Bakery and Floral Department: GFI type without covers.
- F. Receptacles on Interior Building Columns:
 1. Basis of Design Manufacturer: Hubbell Incorporated; (203) 882-4800.
 - a. 1 Gang Aluminum 3 Outlet Box Gray Hubbell #5320-0.
- G. Color of Receptacles: Ivory, unless otherwise noted.

2.4 WATER TIGHT RECEPTACLES

- A. Watertight receptacles up to, and including, 20 amp (120 volt); coordinate with above:

1. Basis of Design: Hubbell Incorporated; (203) 882-4800. For ampacities larger than the 20 amp, provide Hubbell "Water tight Safety Shroud Twist Lock System" of equivalent.
 - a. Wall Twist Lock Receptacle: Hubbell #HBL2320SW (matching male plug #HBL2311SW).
 - b. Connector Receptacle: Hubbell #HBL2313SW (matching male plug #HBL2311SW).
2. Watertight receptacles: Self-closing covers for wall mounted or interlocking type receptacles and connector cover type if cord mounted receptacles.

2.5 SWITCHES

- A. Comply with NEMA WD 1 and UL 20.
- B. Switches, 120/277 V, 20 A:
 1. Snap: Heavy-duty flush quiet toggle switches, 20 amps, 120-277 volts AC, with mounting yoke insulated from mechanism, with plaster ears, switch handle and back wired clamp pressure plate screw terminals.
 2. Basis of Design: Hubbell Incorporated; (203) 882-4800.
 - a. Standard: #1221
 - b. 3-Way: #1223
 - c. 4-Way: #1224.
 3. Color: Ivory, unless noted otherwise.
- C. Pilot Light Switches, 20 A:
 1. Pilot Light: Heavy-duty flush toggle switches, 20 amps, 120-277 VAC, with pilot light handle illuminated when switch is on.
 2. Basis of Design: Hubbell Incorporated; (203) 882-4800.
 - a. Single-Pole: #1221-PL
 - b. 2-Pole: #1222-PC
 - c. 3-Way: #1223-PL
 3. Color: Ivory, unless noted otherwise.
- D. Single-Pole, Double-Throw, Momentary Contact, Center-Off Switches, 120/277 V, 20 A; for use with mechanically held lighting contactors.
 1. Basis of Design: Hubbell Incorporated; #HBL1557; (203) 882-4800.
 2. Color: Ivory, unless noted otherwise.
- E. Cooler and Freezer lighting switches: Refer to Division 01 Section "Vendor Contact List" for information on occupancy sensors.

2.6 OCCUPANCY SENSORS

- A. Refer to Division 01 Section "Vendor Contact List" for information occupancy sensors.

2.7 WALL PLATES

- A. General: Match physical configuration of corresponding wiring devices. (single hole for simplex, two holes for duplex, etc.).
- B. Wall Plates: Provide standard plate, blank, cord hole, switch and duplex outlet wall plates for wiring devices, of types, sizes and ganging, and cutouts, as indicated. Construct with stainless steel screws for securing plates to devices.
 - 1. Material and Finish:
 - a. Brush finished, Type 302, stainless steel.
 - b. Cast metal gasketed, approved for wet locations, with weather-resistant, while-in-use gray die cast metal cover.
 - c. Stamped steel covers for "FS" and "FD" single gang devices boxes.
- C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with NEMA Type 3R weather-resistant die-cast aluminum with lockable cover.

2.8 MISCELLANEOUS

- A. Lighting Controller and Contactors: Refer to Division 01 Section "Vendor Contact List" for information on lighting controller and contactors.
- B. Wiring between lighting controller and contactors to be provided and installed by Contractor.
- C. Building Environmental Control: Refer to Division 01 Section "Vendor Contact List" for information on building environmental control.
 - 1. The control will be through contactors which turn the power on/off to the lighting panels
- D. Contactors: Mechanically held of proper capacity, with coil clearing contacts. Wire contactors with a relay to properly engage and release the contactor based on one channel switching. See Drawings for proper wiring at the contactor.
- E. Control outside sign and lighting circuits with a photocell control wired through the building environmental control.
- F. Control lighting circuits as indicated on Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
- B. Coordination with Other Trades:
 - 1. Insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
 - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 - 4. Install wiring devices after wall preparation, including painting, is complete.
- C. Conductors:
 - 1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
 - 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 - 4. Existing Conductors:
 - a. Cut back and pigtail, or replace damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtail existing conductors is permitted provided the outlet box is large enough.
- D. Device Installation:
 - 1. Exterior receptacles to be ground-fault interrupter type.
 - 2. Install wiring devices, as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices to fulfill project requirements.
 - 3. Coordinate with other work, including painting, electrical boxes and wiring work, as necessary to interface installation of wiring devices with other work.
 - 4. Owner reserves the right to change location of any outlet a distance of 6-feet (1.8-m) in any direction from plan location, before work is actually roughed-in, at no extra charge.
 - 5. Install wiring devices only in electrical boxes, which are clean, free from excess building materials, dirt and debris.
 - 6. Install brush finish stainless steel wall plates in indoor areas having flush devices, except where marked "WP".
 - 7. Install watertight receptacles in areas marked "WP" with weatherproof "while in use" gray die cast metal covers.
 - 8. Install wiring devices after wiring work is completed.

9. Install wiring devices per proper work phasing.
 10. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for wiring devices. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A. Use properly scaled torque, indicating hand tool.
- E. Upon installation of wall plates and receptacles, advise other trades regarding proper and cautions use of convenience outlets. At time of Substantial Completion, replace those items which have been damaged, including those burned and scored by faulty plugs.
- F. Receptacle Orientation: Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
- G. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical. Group adjacent switches under single, multigang wall plates.

3.2 IDENTIFICATION

- A. Comply with Division 26 Section "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
1. Test Instruments: Use instruments that comply with UL 1436.
 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.
- B. Tests for Convenience Receptacles:
1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new, and retest as specified above.

END OF SECTION 26 27 26

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SECTION 26 28 00 - LOW VOLTAGE CIRCUIT PROTECTIVE DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply overcurrent protective devices for new panelboards and switchboards required by drawings, schedules, and section including:
 - 1) Circuit Breakers
 - 2) Shunt trip breakers
 - b. Comply with requirements in Division 00 Section "General Conditions."
2. Contractor supplied items:
 - a. Remodels and Additions: Circuit breakers and fused switches for existing panelboards and switchboards.
 - b. Accessories, including fuses, as required for a complete installation.
3. Contractor installed items:
 - a. Overcurrent protective devices including fuses,

1.2 SUBMITTALS

- A. For Owner supplied items, the Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
1. Product Data: For each overcurrent type indicated.
 2. Operation and maintenance data.
- B. Selective Coordination Study And Fuse Curves.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NEMA FU 1.
- C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CIRCUIT BREAKERS AND SHUNT TRIP BREAKERS

- A. Refer to Division 01 Section "Vendor Contact List" for information on circuit breakers supplied by the Owner.
- B. Circuit breakers, shunt trip breakers, and ancillary components shall be of the types, sizes, ratings and electrical characteristics indicated, which comply with manufacturer's standard design, materials, components and construction, in accordance with published product information, and as required for a complete installation.

2.2 FUSES:

- A. General: Provide fuses as specified.
- B. Except as otherwise indicated, provide fuses of same manufacturer and of types, sizes and ratings, and electrical characteristic indicated, which comply with manufacturer's standard design, materials, components and construction, in accordance with published product information, and with industry standards and configurations.
- C. For 601 amps and larger circuits: NEMA Class "L" fuses in current ratings indicated.
 - 1. Cooper Bussmann, Inc.: KRP-C; 636-394-2877
 - 2. Ferraz Shawmut, Inc.; A4BY; 800-526-9067
 - 3. Reliance: LCU
- D. For use with switches rated 600 amps and smaller: Class "R" Fuses: Provide NEMA Class RK-1, dual-element (low-peak) types 200,000 amp interrupting rating, with time delay of ten seconds at 500 percent of rating,
 - 1. Cooper Bussmann, Inc.: LPNRK; 636-394-2877
 - 2. Ferraz Shawmut, Inc.; A2DR; 800-526-9067
 - 3. Reliance: LENR or NCLR

PART 3 - EXECUTION

3.1 INSTALLATION OF OVERCURRENT PROTECTIVE DEVICES:

- A. Install overcurrent protective devices, as indicated, in accordance with manufacturer's written instructions and with recognized industry practices, to ensure that overcurrent protective devices comply with requirements.
- B. Do not install fuses until equipment is ready to be energized.
- C. Conduct final test and inspections prior to energization of the equipment.
- D. Clean, tighten, and inspect electrical connections and inspect grounding conductors.

END OF SECTION 26 28 00

SECTION 26 28 16 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply the following items for the Contractor to install.
 - 1) Equipment Disconnects
 - 2) Appliance Disconnects
 - 3) Motor Circuit Disconnects
 - b. Wiring circuit and motor switches are indicated on Drawings and Schedules, and as required by National Electrical Code (NEC).
 - c. Comply with requirements in Division 00 Section "General Conditions."
2. Contractor supplied items:
 - a. Accessories as required for a complete installation.
3. Contractor installed items:
 - a. Equipment Disconnects
 - b. Appliance Disconnects
 - c. Motor Circuit Disconnects

1.2 SUBMITTALS

- A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
1. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.
 2. Shop Drawings: Diagram power, signal, and control wiring.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 WIRING CIRCUIT AND MOTOR SWITCHES

- A. Refer to Division 01 Section "Vendor Contact List" for information on the following items:

1. Prefabricated switches.
2. Molded-case circuit breakers and switches.
3. Insulated case circuit breakers.
4. Enclosures.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Coordinate circuit and motor disconnect switch installation work with electrical raceway and cable work, as necessary to interface installation of wiring devices with other work. Interface installation with required phasing of work.
- B. The Owner will supply the disconnect, or shut off switch for the following items. The Contractor is to make final connections:
 1. Spit systems
- C. Install disconnect switches for use with motor driven appliances, and motors and controllers within sight of controller position, unless otherwise indicated. Contractor to make final electrical connections.

3.2 FIELD QUALITY CONTROL

- A. Prepare for acceptance testing as follows:
 1. Inspect mechanical and electrical connections.
 2. Verify switch and relay type and labeling verification.
 3. Verify rating of installed fuses.
- B. Perform the following field tests and inspections and prepare test reports:
 1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 3. Insulated Case Circuit Breakers:
 - a. Switchboard/Circuit Breaker manufacturer to provide adjustable settings for insulated case circuit breakers larger than 1,200A, including the switchboard's main (GFCI) circuit breaker and the mobile generator connection's circuit breaker. Refer to Drawings for any additional breakers that may require adjustment.
 - b. Apply manufacturer's settings to insulated case circuit breakers and complete the applicable information on sticker located on switchboard enclosure's deadfront cover, verifying compliance with manufacturer's settings.

END OF SECTION 26 28 16

SECTION 26 29 00 - LOW VOLTAGE CONTROLLERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Company will supply the following items for the Contractor to install.
 - 1) Full voltage non-reversing combination motor starters
 - 2) Manual motor starters
 - 3) Exhaust systems motor starters
2. Contractor supplied items:
 - a. Motor starter overload protection.
 - b. Accessories as required for a complete installation.
3. Contractor installed items:
 - a. Full voltage non-reversing combination motor starters.
 - b. Manual motor starters.
 - c. Exhaust systems motor starters.
 - d. Motor starter overload protection.

1.2 SUBMITTALS

- A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
1. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.
 2. Shop Drawings: Diagram power, signal, and control wiring

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.
- C. Motors will be provided with overcurrent protection, motor disconnect and motor overload protection as required by NEC.

- D. Single-phase motors will be provided with NEMA Type A fusible disconnect, with lockable handle for circuit protection, except where circuit to motor is already individually protected by overcurrent protective device and disconnect in panelboard located within sight of and not more than 50-feet (15.25-m) from motor.
- E. Starters will be in NEMA Type 1 enclosures.
- F. Three-Phase Motors:
 - 1. Combination circuit breakers or separate disconnect and magnetic starters for 3-phase motors will be provided in NEMA 12 enclosure.
 - 2. Combination fused disconnect switch and enclosed magnetic across-the-line starters, as indicated, will be provided in NEMA 12 enclosure.
 - 3. Starters will be provided with circuit protection, ambient compensated thermal overload protection.

PART 2 - PRODUCTS

2.1 MOTOR STARTERS

- A. Refer to Division 01 Section "Vendor Contact List" for information on the following items:
 - 1. Full voltage non-reversing combination motor starters
 - 2. Manual motor starters
 - 3. Exhaust system motor starters

PART 3 - EXECUTION

3.1 INSTALLATION OF MOTOR STARTERS:

- A. Coordinate with other work, including motor and electrical wiring/cabling work, as necessary to interface installation of motor starters with other work.
- B. Install fuses in fusible disconnects.
 - 1. Refer to Division 26 Section "Low Voltage Circuit Protective Devices" for responsibility of fuse provisions.
 - 2. Provide fuse size per drawings; if fuse size is not indicated on drawings, size fuses per nameplate data, not to exceed 125 percent of motor full load amps for 1.15 service factor motors, and 115 percent for 1.00 service factor motors. Fuses above 600 amps rating for motors shall be sized up to 150 percent of motor full load amps. Refer abnormal motor starting conditions to Owner's representative.
 - 3. Provide thermal overload protection for motor starters furnished by Owner which are not part of the OEM equipment. Overload protection should be selected based on full load amp draw of motors.

END OF SECTION 26 29 00

SECTION 26 50 00 - LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. **KROGER DIRECT BUY PROGRAM:** Owner supplied/Contractor installed.
 - a. The Kroger Co. will supply the following items:
 - 1) Integrated LED fixtures (high bay fixtures include standard V hangers).
 - 2) Fluorescent type fixtures (to have TLED lamps installed in the field).
 - 3) Emergency lighting.
 - 4) LED lamps for lighting fixtures.
 - b. Comply with requirements in Division 00 Section "General Conditions."
2. Contractor supplied items:
 - a. Lighting fixture support components, accessories and other items not provided by Owner necessary for a complete installation.
 - 1) Do not supply fixture support components for suspended lighting fixtures over island cases.
3. Contractor installed items:
 - a. General Lighting
 - b. Outdoor Lighting
 - c. Local Lighting
 - d. Emergency Lighting
 - e. Lamps for lighting fixtures
4. Contractor removal and disposal of fluorescent lamps.
5. Contractor removal and disposal of PCB containing lighting ballasts.

1.2 SUBMITTALS

- ##### A. The Owner will provide the following submittals for the Contractor's review. The Contractor shall review and return submittals as specified in Division 00 Section "General Conditions."
1. Product Data: For each type of lighting fixture.
 2. Shop Drawings: Showing details of nonstandard or custom lighting fixtures.
 3. Product Certificates: For each type of ballast for bi-level and dimmer-controlled fixtures, signed by product manufacturer.

- B. Landfill Records (For Fluorescent Lamp and Lighting Ballast Disposal): Indicate receipt and acceptance of hazardous wastes by a landfill facility with an EPA ID number licensed to accept hazardous wastes.

1.3 PERFORMANCE REQUIREMENTS

- A. Owner provided light fixtures will meet the following requirements:
 - 1. Integrated LED: Comply with UL2549.
 - 2. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
 - 3. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.
- C. Emergency Lighting Units: Self-contained units complying with UL 924.

PART 2 - PRODUCTS

2.1 INTERIOR LIGHTING

- A. Refer to Division 01 Section "Vendor Contact List" for Light Fixture and Lamp Package.
- B. Includes lights mounted on the building exterior walls.

2.2 EXTERIOR LIGHTING

- A. Refer to Division 01 Section "Vendor Contact List" for Site Lighting Package.
- B. Wiring: Provide schedule 40 PVC conduit and Type XHHW wire for parking lot lighting system. Provide sealed conduit to prevent moisture penetration.
 - 1. Transition to rigid galvanized steel IMC just prior to emergence through grade.

2.3 EMERGENCY LIGHTING UNITS

- A. Refer to Division 01 Section "Vendor Contact List" for Light Fixture and Lamp Package.

2.4 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Comply with Division 20 Sections "Hangers and Supports for Facility Services" and "Vibration and Seismic Control for Facility Services" for steel channel and angle supports and cable strut support system building attachments.
- B. Single-Stem Hangers: **1/2-inch (13-mm)** steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- C. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, **12 gage (2.68 mm)**.
- D. Wire Rope: 7-by-19, diameter as indicated, made from stainless steel wire complying with ASTM A 492, Type 304 or galvanized steel complying with ASTM A 603.
 - 1. Wire-Rope Fittings: Connectors of types indicated, fabricated from stainless steel, and with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.
 - a. Manufacturers:
 - 1) Duro Dyne Corporation.
 - 2) Gripple, Inc.
- E. Rod Hangers: **3/16-inch (5-mm)** minimum diameter, cadmium-plated, threaded steel rod.
- F. Lay In and Troffer Light Fixture Support Clips: Comply with NEC Article 410-16 "Means of Support"
 - 1. Provide for round or rectangular head tee bar.
 - 2. Basis of Design: ERICO International Corporation; Caddy #515; 800-853-0878.
- G. Comply with all local building codes "Means of Support."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify if PCB ballasts exist in light fixtures to be removed. If PCB light fixture ballasts exist, then follow requirements in PCB ballast handling and disposal requirements below.

3.2 INSTALLATION OF LIGHTING FIXTURES:

- A. Coordinate with other electrical work, as appropriate to properly interface installation of interior lighting fixtures with other work and to properly interface with project work phasing.
- B. Building Attachment: Fasten fixtures securely to building structure. Install hangers to top cord of joists/joist girder at panel points. Do not fasten hangers to metal deck. Where hangers do not align with structure, install steel angle, U-channel strut, or cable strut system sized to carry load of light fixture(s), spanning across a minimum of two structural members. Rest or bolt U-

channel or angle to the top of the top cord of joists/joist girder at panel points and between flutes of steel deck. Install cable strut system over top cord of joists and between flutes of steel deck per manufacturer's written instructions. Length that cable strut may span over multiple structural members must be approved by manufacturer and Project Engineer.

- C. Install fixtures level and plumb.
- D. Install four support clips, one in each corner, to fixtures installed in tee-bar ceilings.

3.3 REUSE OF EXISTING LIGHTING FIXTURES

- A. Clean and relamp all fixtures to be reused.
- B. Repair damaged or inoperable fixtures.
- C. Provide quantities and types of damaged fixtures to Owner's Representative for replacement.

3.4 GROUNDING FOR EXTERIOR LIGHTING

- A. Ground metal poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."
 - 1. Install grounding electrode for each pole, unless otherwise indicated.
 - 2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.
- B. Ground nonmetallic poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."
 - 1. Install grounding electrode for each pole.
 - 2. Install grounding conductor and conductor protector.
 - 3. Ground metallic components of pole accessories and foundations.

3.5 REMOVAL OF FLUORESCENT LAMPS

- A. Fluorescent Lamp Removal: Remove fluorescent lamps in accordance with local or state regulations and Federal Regulation 40 CFR 273 and as follows:
 - 1. Do not break mercury containing fluorescent lamps or high intensity discharge lamps.
 - 2. Contain any lamp in containers or packages that are structurally sound, adequate to prevent breakage, and compatible with the contents of the lamps. Such containers and packages must remain closed and must lack evidence of leakage under reasonably foreseeable conditions.
 - 3. Immediately clean up and place in a container any lamp that is broken and place in a container any lamp that shows evidence of breakage, leakage, or damage that could cause the release of mercury or other hazardous constituents to the environment. Containers must be closed, structurally sound, compatible with the contents of the lamps and must lack evidence of leakage, spillage of damage that could cause leakage or releases of

mercury or other hazardous constituents to the environment under reasonably foreseeable conditions.

4. Store lamps in containers or packages that prevent breakage and manage lamps in a way that prevents the release of any component of the lamp to the environment.
5. Dispose of fluorescent Lamps off site in accordance with EPA, DOT, and local regulations at a permitted site.

3.6 REMOVAL OF PCB CONTAINING LIGHTING BALLASTS

- A. PCB Ballast Handling And Disposal: Remove PCB containing ballast in accordance with local or state regulations and Federal Regulation 40 CFR 761 and as follows:

1. General: High power factor fluorescent light ballasts manufactured before 1978 and some HID ballasts contain PCB compounds in their capacitors. Inspect ballasts in light fixtures to be removed and remove from the Project site.
2. If the PCB content is not stated on the ballast label, the ballast shall be handled as a PCB ballast.
3. Before removal, inspect PCB ballasts for leaks. If ballast appears to be leaking (evidenced by potting compound leaking out or by an oily film on the ballast surface) the ballast must be handled per EPA and requirements of authorities having jurisdiction. Remove the ballast from the fixture and placed in an approved drum. Wear protective gloves, eye protection, and protective clothing as necessary.
 - a. If the fixture has also been contaminated, clean to less than 10 micrograms/100 square centimeters contamination before disposal. Utilize an approved PCB abatement company for cleaning process.
4. Do not expose PCBs to open flames or other high temperature sources since toxic decomposition by-products may be produced.
5. Place ballasts in US DOT approved type 17C or type 17H drums(barrels).
6. Place barrels in storage with the cover that came with the barrels, in location as designated by Owner. Do not place barrels where they are exposed to weather.
7. Label and mark the PCB storage drums with EPA approved PCB labels and the storage area with signs, marks and lines to meet the regulations of authorities having jurisdiction.
8. Provide approved PCB absorbent materials to be stored immediately adjacent to the drum storage area. Do not place loose absorbent material in the drums.
9. Dispose of PCB containing light ballasts off site in accordance with EPA, DOT, and local regulations at a permitted site.

3.7 ADJUST AND CLEAN:

- A. Install parabolic fixtures w/ protective film. Remove protective film when building is dust free.
- B. Clean lighting fixtures of dirt and debris upon completion of installation.
- C. Protect installed fixtures from damage during remainder of construction period.

3.8 FIELD QUALITY CONTROL:

- A. At time of Substantial Completion, replace lamps in lighting fixtures which are observed to be noticeably dimmed or with black ends on tubes after Contractor's use and testing, as judged by The Owner's Representative.

END OF SECTION 26 50 00

SECTION 28 10 00 - SECURITY AND ACCESS CONTROL SYSTEM - SUPERMARKET

PART 1 - GENERAL

1.1 SUMMARY

- A. **Existing system to remain.** Modify only as required due to demolition and new work.
 - 1. This section is for a completely new security alarm system. Use only as a guide for new work or to modify the existing system.
- B. Section includes
 - 1. Complete security alarm system including:
 - a. Devices.
 - b. Programming.
 - c. Testing and setup of owner provided monitoring.

1.2 REFERENCE STANDARDS

- A. The system and all components shall be listed by Underwriters Laboratories, Inc. under the following standards as applicable. Not all the standards will apply to all projects. Refer to Drawings for more information:
 - 1. UL 609, 1610, and 1635.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation Conference: At least two weeks prior to the start of field work, conduct a web-based conference in conjunction with the Project site (if available) to review the installers schedule along with the project plans and specifications. The Contractor will oversee the meeting and shall take minutes to be distributed to all attendees within 72 hours.
 - 1. Attendees: General Contractor, electrical contractor, alarm installer, MEP designer of the contract drawings, Owner's construction representative, and Kroger Central Alarm Control (KCAC) Representative (Alarm Monitoring for the Owner).
 - 2. Agenda
 - a. Review the contact drawings and specs with any approved changes to the installer's shop drawings.
 - b. Schedule for installation and timing of alarm monitoring by KCAC.
 - c. Any local jurisdiction requirements
 - d. Programming and communication requirements.

1.4 SUBMITTALS

- A. Product Data: For security system components.
- B. Kroger Central Alarm Control Monitoring Data Form: Installer must coordinate the completion of the form included in Part 3 at least 14 days prior to monitoring of the system with Owner (Kroger Project Manager, Store Manager & Asset Protection Department). Kroger's UL approved monitoring center supports security and fire alarm for all Owner needs.
- C. Qualification Data: For Installer (if not prequalified) and installer's subcontractors.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Experienced, Bosch Certified installer, prequalified by the Owner (typically an installer in good standing with the Kroger Division Construction Manager and Asset Protection Manager). The following installers have been approved to install the Security system. Each installer has an approved list of subcontractors that are on file with the Owner:
 - 1. Consolidated Fire Protection Services (CFP)
 - a. Contact: Steve Schwartz.
 - b. Title: CFP Construction Manager.
 - c. Email: krogergc@cfpfire.com.
 - d. Cell: (949) 289-0327.
 - 2. Protection 1/ADT
 - a. Contact: James Finley.
 - b. Title: Acct. Manager.
 - c. Email: jfinley@adt.com.
 - d. Cell: (910) 619-4700.
 - 3. Vector Security
 - a. Contact: Chris Ehmig.
 - b. Title: Acct. Manager.
 - c. Email: caehmig@vectorsecurity.com.
 - d. Cell: (571) 364-1472.
 - 4. Securitas
 - a. Contact: Tony Moe
 - b. Title: National Account Manager.
 - c. Email: tony.moe@securitates.com.
 - d. Cell: (612) 414-1852.
 - e. Office: (704) 281-2627.
 - 5. ATS (Fred Meyer/QFC)
 - a. Contact: Matthew Brines.
 - b. Email: mbrines@atsdata.com.

c. Phone: 503-684-9611.

- B. Installing and programming technicians shall be individually certified by security system manufacturer.

1.6 WARRANTY

- A. Alarm Control Panel and Component Warranty: Manufacturer agrees to repair or replace control panel and components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELS

- A. Main Security Alarm Control Panel: Bosch Security and Safety Systems; Model B9512G. (typically bought in Bosch package B9512G-C-C with transformer, lock and key set, enclosure, and cellular backup).

1. Locate main security alarm control panel in ECR room or as indicated on the Drawings.
2. Main intrusion panel B9512G will work in conjunction with an additional pre-built custom interface panel, per owner requirements. See Drawings.
3. Devices are connected to this panel and grouped through system programming into the areas listed below (1 through 12):

Area	Description	Instruction
1	Perimeter/24 Hour Doors	Supervised open / close
2	Fred Meyer Jewelry	Supervised open / close
3	Cash Office/Accounting	Supervised open / close
4	Pharmacy	Supervised open / close
5	DSD/Food/Common Freight	Supervised open / close
6	Home Freight	Supervised open / close
7	Refrigeration	Supervised open / close
8	Click List	Supervised open / close
9		Unsupervised
10	Liquor (Standalone panel if not adjacent to main store)	Supervised open / close
11	Compactor	Supervised open / close
12	Home Shop (King Soopers)	Supervised open / close

4. Under no circumstance is the installer to change the store areas.
5. In the event the store does not have one of the areas identified in the description, the installer is to label this area as "open."
6. Digital Communications: Provide system capable of communicating with a digital receiver such as the Bosch/Radionics D6600 receiver.

7. Remote programming access codes must remain at the factory default code. IT IS FORBIDDEN FOR INSTALLERS TO INSERT THEIR OWN CODES OR A DEALER LOCKOUT CODE.

2.2 ACCESSORY DEVICES

A. Input Modules (B208 or D9127U):

1. Provide as required to interface "non-addressable" devices into the system as shown on the Drawings (i.e. Door contacts, motion/glass break sensors, etc.).
 - a. Provide electrical conduit for wall mounted applications, and for ceiling mounted applications if the above-ceiling space acts as a plenum return. (Refer to Division 26 Section "Common Work Results for Electrical.")
 - b. Provide B299 Expansion Modules when D9127U POPITS are used with B9512G control panel. One B299 accommodates up to 100 POPITS and can be used on the SDI2 data bus up to 1000 feet (30.5 m) from panel. B208 Input Modules provide eight inputs and can be connected directly to the SDI2 data bus and located up to 1000 feet (30.5 m) from panel.
 - c. Provide B600 Retrofit Module when reusing legacy modules such as D8125 Zone Expansion Modules, D8129 Octo-relay Modules and D8128 Octo-input Modules.
 - d. D9127T tampered POPITs are not allowed.

B. Products:

1. Bosch Security Systems; B308 Octo-Relay.
2. Advanced Sourcing; ASRB1 Relay DPDT 2A.
3. Honeywell Intrusion; 712BNP 7Ah, 13V Battery.
4. Bosch Security Systems; D122 Dual Battery Harness.

2.3 PLUG-IN CELL MODULE

A. Product: Bosch B444-V for use with Verizon cellular network.

B. Description:

1. WAN Network is required for intrusion and duress/panic system, programmed to report to the Owner's UL LISTED CENTRAL STATION (KCAC).
2. UL station will be the Owner's central alarm control monitoring company (KCAC). COMPLETE THE CENTRAL ALARM CONTROL MONITORING DATA FORM INCLUDED AT THE END OF THIS SECTION.

C. WAN network:

1. Coordinate installation of network jacks, switch port, and certified cabling install for applicable control panels with the Kroger Technology Office prior to installation to prevent delays.

2. Verify Ethernet (CAT5e/CAT6) cables are run properly and labeled correctly. Identify both ends at the panel and switch. As certain ports may be programmed differently be sure to connect to the port recommended by the Kroger Technology Office.
3. Install B444-V for each control panel;
4. The use of DHCP is required. The MAC address must be entered into the system prior to install by the division office, coordinated from step 1. If not, the panel will not come online.
5. Verify KCAC has the network account programmed into their receivers; ensure signals are being received.
6. The following settings are required:

IP Communicator Options	
Module Enclosure Tamper	No
IPv6 Mode	No
IPv4 DHCP/Auto-IP Enable	Yes
UPnP Enable	Yes
HTTP Port Number	80
ARP Cache Timeout (sec.)	600
Web/USB Access Enable	No
Firmware Upgrade Enable	No
TCP/UDP Port Number	7700
TCP Keep-Alive Time (sec.)	45
Port 77EE Configuration	No
RPS Over Network	Yes
RPS Address Verification	No
Encryption Enabled	No
Panel Programming Enable	Yes
Web Access Password	KCAC Standard Pw
Panel Wide->Answer	Yes
RPS Port Number	7700
Receiver Supervision Time (seconds)	300
Poll Rate (seconds)	210
Ack Wait Time	15
Retry Count	5

2.4 LOCKABLE METAL CABINET

- A. Product: Bosch Security Systems; B8103 Universal Enclosure (UL Approved)
 1. Color:
 - a. Main Panel: White.
 - b. Secondary Panel(s): Gray
- B. Lock and Key Set: Bosch Security Systems; D101.

2.5 TRANSFORMER ENCLOSURE KIT

- A. Product: Bosch Security Systems; D8004 Enclosure (UL Approved)
 - 1. Color: Gray
- B. Provide for applications that require a remote transformer.

2.6 CIRCUITS AND WIRING

- A. Separate alarm wiring from any open conductors, power, or Class 1 circuits. Do not place in any conduit, junction box or raceway containing these conductors, per NEC Article 760-55.
- B. Wire:
 - 1. Product: Honeywell; Genesis 11191101 18/4 Stranded Unshielded Cable, or approved substitution.
 - 2. Provide wiring meeting local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the alarm system. Provide number and size of conductors as recommended by the alarm system manufacturer, but not less than **18 AWG (1.02 mm)** and a minimum of 4 twisted conductors.
 - 3. Color: Match the exposed material as close as possible.
 - a. Exposed Structural Steel/Metal Decking: Black.
 - b. Light Colored Painted Ceilings: White.
 - 4. Field wiring shall be electrically supervised for open circuit and ground fault. (Class B).
- C. Terminal Boxes, Junction Boxes, and Cabinets: UL listed for use and purpose.

2.7 KEYPADS

- A. Product: Bosch Security Systems; B921C Two-line Capacitive Keypad with Inputs (SDI2).
 - 1. Provide B56 mounting box, if keypad is surface mounted to concrete or block.
 - 2. Provide separate keypads for each area of the system, per the location shown on the drawings
 - 3. Unless otherwise noted on Drawings, mounting height is **60 inches (1524 mm)** above finished floor to center of keypad.

2.8 DOOR CONTACTS

- A. Perimeter Main Entry Sliding Doors, Click List Sliding Doors, Etc.: Honeywell Intrusion; 951WG.
 - 1. Color:
 - a. Clear Aluminum, White, or Light-Colored Materials: White.
 - b. All other Materials: Brown.

2. Rare Earth Magnet: George Risk Industries Inc. (GRI); MM-600.
 - B. Overhead Doors For Receiving, DSD, and Pharmacy Grilles (Alternate For Entry Doors, Trash Compactor Door): United Technologies Corporation; 2202A-IL
 1. Alternate for Overhead Door Track: United Technologies Corporation; 2315AL.
 - C. Overhead Rolling Steel Door/Curtain Door: United Technologies Corporation; 2302A-IL.
 - D. Cash Office and Pharmacy Doors (Typically Hollow Metal Single Man Doors): United Technologies Corporation; 1078W.
 - E. Roof Hatch or Pharmacy Grille: Honeywell 960/Ademco 2505AL or Nascom N200AUMM/ST.
 - F. Trash Compactor: UTC/Ademco 2505AL.
- 2.9 SAFE CONTACT
- A. Product: Potter Electric; HSC-1
- 2.10 MOTION SENSORS
- A. Product: Bosch Security Systems; ISC-PDL1-WA18G
 1. Location: Install on wall **80 inches (2032 mm)** above finished floor to provide a curtain of protection just inside the potential access point in locations shown on the Drawings.
 2. Gimbal Mount Bracket: Provide Bosch Security Systems B928 gimbal mount bracket as required to adjust sensor's position.
- 2.11 GLASS BREAK DETECTORS (typically vestibules, Click List, and exterior glass walls)
- A. Products:
 1. Honeywell, Intellisense; FG1625.
 2. Bosch; DS1101i.
 - B. Standard Coverage: **25 feet (7.6 m)** from glass to each unit.
- 2.12 AUDIBLE SOUNDERS
- A. Roof Hatch and DSD Area: UTC Fire & Security; Honeywell 747.
 - B. Emergency Exit Doors: Honeywell Intrusion/System Sensor, SpectraAlert Advance Piezo Multi-tone Chime MHW mini horn (emergency exit doors).
 - C. Main Interior Siren: W Box Technologies; 30WCSIREN 30W Compact Dual Tone Siren.

- D. Main Exterior Siren: Amseco; SSX52 Armored Exterior Siren.

2.13 POWER SUPPLIES

- A. Product: Altronix; SMP3ET with BC100 and TP1640 12V Power Supply for motion sensors, glass breaks, sounders, and interface panel.

2.14 DOOR BELL

- A. Door Bell Button: Viking; DB40BN.
- B. Surface Mount Enclosure: Viking; VE-3X5.
- C. Signal Bell: Amseco/Potter Electric; MBA-10G12PV2.
 - 1. Bell Diameter: 10 inches (254 mm).
 - 2. Color: Gray.

2.15 TAMPER SWITCH

- A. Product: Bosch; D110 Enclosure Tamper Switch (main panel, interface can, and power supply enclosure)

2.16 SECURITY MONITORING DEVICES

- A. Provide in selective equipment as indicated on Drawings. The equipment typically monitored using the security system includes but is not limited to the following (security system monitoring devices not required in elevators):
 - 1. CPC refrigeration failure (Ruler stores only, currently not on FAST alert system).
 - 2. Generator fault indicator.
 - 3. Mechanical Room or House per division requirements
- B. Monitoring of the specialized equipment will require coordination with the equipment manufacturers. Provide supplemental equipment needed to monitor this equipment for a complete and operational system.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install equipment at heights and locations as specified below or in Part 2 of this Section.
- B. Existing security alarm systems should remain in operation during remodel projects to insure protection. Any outages to be coordinated with Owner in advance.

- C. If existing raceways, cables and outlet boxes are suitable for re-use, they may be reused after demonstrating to Owner that they have been tested and proven to be suitable. Include any existing material used in the three-year warranty.

3.2 INSTALLATION

A. Panel: Interface Panel Special Features:

1. Fire Exits: The installer will program all non-customer perimeter exit doors as fire exits. If opened, a sounder will activate at the door and will report to the central station. These doors will also sound an alarm tone at the main keypads (address 1). If a fire door is opened while the system is unarmed, it is a local alarm only, it does not report to the central station.
2. Not-Set Points: The installer will program the cash office and pharmacy, when disarmed to "not-set" points. Once these areas are individually armed, their "not-set" points will be programmed to return to normal allowing the main area to be armed. This will prevent store personnel from exiting stores without ensuring the cash office and pharmacies are armed. If while the main area is armed, the cash office or pharmacy is disarmed, an alarm situation will occur.
3. Receiving and Compactor Areas. The installer will program the receiving area so that it is set up to restrict and log access to overhead and DSD doors outside of the "free access" time of 5:00 a.m. to 12:00 p.m. (alternate time frames for "free time" may exist in certain stores), Monday through Saturday (normal DSD delivery times). The compactor will be set to restrict and log access at all times. While in "restricted mode," the system operates as follows:
 - a. Entering a valid passcode at the receiving or compactor keypad disarms the area, allowing access to the required door. If door is not opened within 2 minutes after a valid passcode is entered, the Area will automatically re-arm and the passcode will need to be entered again. Once a single door is opened, the area is automatically re-armed, returning protection to the unused doors. This procedure must be repeated for each door if multiple doors are to be opened. The door(s) may be left open for as long as necessary, but when closed will automatically return to armed-status and will require re-entry of a code to open again.
 - b. If a door is opened without first entering a valid code, the siren assigned to that area will sound. The keypads assigned to the main area (address 1) will also annunciate the alarm, alerting the manager to the violation.
 - c. Summary points in the interface panel ensure that when the main system is armed, an alarm in either area results in a signal to the central station.

B. Circuits and Wiring:

1. Install equipment in accordance with the NEC, as shown on the Drawings, and as recommended by the manufacturer. Refer to Division 26 Section "Low Voltage Electrical Power Conductors and Cables" for additional recommendations.
2. Place alarm wiring in conduit when installed down a column and unfinished walls in backroom areas.
3. Install wiring/cable runs that are located above ceiling grid with bridle rings and tie wrapped every 25 feet (7.62 m). Under no circumstance is the installer to allow any

cable to rest on any ceiling grid. Securely fasten wiring/cabling that is exposed every **10 feet (3 m)** in joist space and **5 feet (1.5 m)** in all other areas.

4. Run wiring/cable runs to any overhead door, roof hatch, back-stock emergency exit, or compactor door in conduit.
5. Conceal wiring/cable in finished areas, no exceptions.
6. Run wiring/cabling in joist space parallel with or perpendicular to the structural joists/steel.
7. Install any corners/turns involving cable runs at 90-degree angles and place in a neat and orderly fashion.
8. Wiring/cabling runs must be a minimum of **24 inches (610 mm)** from hot water or steam pipes.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing.

3.4 DEMONSTRATION AND TECHNICAL SUPPORT

- A. Engage a manufacturer certified service representative to train Owner's personnel to operate the security/intrusion alarm system.
 1. Provide onsite training and User Guide documentation at no cost to Owner. Training includes but is not limited to:
 - a. How to arm and disarm the Intrusion system.
 - b. How to check point status and identify faults on the Intrusion system.
 - c. How to silence a trouble signal on the Intrusion system.
 - d. How to identify communication, A/C power, and battery failures on the Intrusion system.
 2. Provide 24 hour/7 days per week/365 days per year technical support for one year at no cost to Owner.

3.5 RECORD DRAWINGS

- A. Provide Owner record drawings noting any "as-built" changes to the work.

3.6 ATTACHMENTS

- A. Kroger Central Alarm Control Monitoring Data Form. (Complete at least 14 days prior to any system going live.)

(See following pages)

Kroger Central Alarm Control Monitoring Data Form

To schedule Conversion/Programming Audit, call 503-797-5411

Please E-mail this completed form to:
alarmprogramming@kroger.com

KCAC Programming and Conversion Coordinators
KCAC Programming 503-797-5411
Mon-Fri 0600-1700 Pacific Time
KCAC Monitoring 1-800-982-2749

All fields marked with * must be completed to enable monitoring service PLEASE TYPE/PRINT

*Is this a Brand New Location? Y/N: _____ Grand Opening Date: _____

*Store Name: _____ *Division #: _____ *Store _____

*Address: _____ *Zone/District _____ *Time Zone _____

*City: _____ *State: _____ *Zip: _____

*Township (if required for Dispatch): _____

*Does your jurisdiction require an alarm permit? _____ If Yes, permit # _____

*Store Main Phone Number: _____

*Pharmacy Phone #: _____ *RX Dr.'s line _____

*Fuel kiosk direct phone # _____ or Fuel kiosk extension # _____

Fuel Separate Address from Main Store? _____

*Liquor direct phone # _____ or Liquor extension # _____

*Local Fire Dispatch phone # (Not 911): _____

*Local Police Dispatch phone # (Not 911): _____

Secondary Police and/or Fire Dispatch # if available: _____

*Business Hours: _____ *Are Associates inside 24 hours a day? _____

Please indicate the stores schedule for all areas monitored on the burglary system.

PLEASE TYPE/PRINT

Area	Store Hours (Open)	Store Hours (Closed)	Day(s) of the Week
<i>EXAMPLE: Main Store (All Customer Doors)</i>	<i>2330 hours (11:30 PM)</i>	<i>0600 hours (6:00 AM)</i>	<i>All Days</i>
MAIN STORE			ALL DAYS
CASH OFFICE			ALL DAYS
CLICK LIST			ALL DAYS
HOME SHOPPING			ALL DAYS
FREIGHT-RECEIVING-FREE TIME			MONDAY-FRIDAY
FREIGHT-RECEIVING-FREE TIME			SATURDAY
FUEL			ALL DAYS
JEWELRY			MONDAY-FRIDAY
JEWELRY			SATURDAY-SUNDAY
LIQUOR			MONDAY – THURSDAY
LIQUOR			FRIDAY
LIQUOR	/	/	SATURDAY/SUNDAY
PHARMACY			MONDAY – FRIDAY
PHARMACY			SATURDAY
PHARMACY			SUNDAY

Emergency Call List: These people will be notified if no one is contacted at the store or in an emergency

STORE

*1st Responder/Store Manager Name: _____ EUID: _____

Home # _____ Cell #: _____

*2nd Responder (Name & Position) _____ EUID: _____

Home # _____ Cell #: _____

*3rd Responder (Name & Position) _____ EUID: _____

Home # _____ Cell #: _____

*4th Responder (Name & Position) _____ EUID: _____

Home # _____ Cell #: _____

*5th Responder (Name & Position) _____ EUID: _____

Home # _____ Cell #: _____

*6th Responder (Name & Position) _____ EUID: _____

Home # _____ Cell #: _____

PHARMACY

*1ST Responder/Pharmacy Manager: _____ EUID: _____

Home # _____ Cell #: _____

*2nd Pharmacy Responder _____ EUID: _____

Home # _____ Cell #: _____

*Pharmacy Manager _____ EUID: _____

Home # _____ Cell #: _____

*3rd Pharmacy Responder _____ EUID: _____

Home # _____ Cell #: _____

JEWELRY (If applicable)

*1st Responder/Jewelry Manager: _____ EUID: _____

Home # _____ Cell #: _____

*2nd Jewelry Responder (Name & Position) _____ EUID: _____

Home # _____ Cell #: _____

*3rd Jewelry Responder (Name & Position) _____ EUID: _____

Home # _____ Cell #: _____

	Range	Position	Descriptive
A	1-15	Store Manager Assistant Store Manager	<ul style="list-style-type: none"> Arm and disarm the main store perimeter, cash office, receiving, Compactor and liquor store. Silence sounders and test the system. Email alarmcontrol@kroger.com Add and delete system users at the store only.
B	16-30	Grocery Manager Assistant Grocery Manager/Grocery Lead MIC – Manager In Charge	<ul style="list-style-type: none"> Arm and disarm the main store perimeter, receiving, Compactor. Silence sounders and test the system.
C	31-50	Front End Manager/Lead Accountant	<ul style="list-style-type: none"> Arm and disarm the cash office.
D	51-60	Pharmacist	<ul style="list-style-type: none"> Arm and disarm the pharmacy.
E	61-90	DSD Receiver Back-up DSD Receiver	<ul style="list-style-type: none"> Disarm receiving Ex Freight, DSD, Home Side Silence sounder in receiving and at all fire exists.
F	91-99	Liquor Store Manager (if applicable)	<ul style="list-style-type: none"> Arm and disarm the liquor store. Silence sounders for the liquor store and emergency exits.
G	100-109	Click List area (if applicable)	<ul style="list-style-type: none"> Arm and disarm Click List area
H	110-120	Jewelry (if applicable)	<ul style="list-style-type: none"> Arm and disarm Jewelry area
I	120-130	Home Shopping (if applicable)	<ul style="list-style-type: none"> Arm and disarm Home Shopping area

Additional Authorized Contact List: See below for Authorized Job Titles. These associates will have Pin/Pass Codes to arm and disarm areas at the location.

These additional people will also be able to contact KCAC *Please TYPE/Print*

*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____
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*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____
*Name _____	Position: _____	EUID#: _____

PLEASE NOTE: Fire Systems are monitored 24 hours a day. The fire department is dispatched immediately on all fire alarms. If your system is being serviced or needs to be disregarded for any period of time, call KCAC prior to servicing.

Special Instructions (if any) _____

*Name and position of person completing form:

Please TYPE/Print: _____

Date: _____

Retain the original copy with the District Asset Protection Manager

END OF SECTION 28 10 00

BLANK SHEET

SECTION 28 46 00 - FIRE DETECTION AND ALARM SYSTEM - SUPERMARKET

PART 1 - GENERAL

1.1 SUMMARY

- A. **Existing system to remain.** Modify only as required due to demolition and new work.
 - 1. This section is for a completely new fire detection and alarm system. Use only as a guide for new work or to modify the existing system.
- B. Section includes
 - 1. Complete fire detection and alarm system including:
 - a. Installation drawings as required by Authorities Having Jurisdiction (AHJs) for the main grocery store area, the Fred Meyer Jewelry, and the Little Clinic, as applicable.
 - b. Devices as specified.
 - c. Wiring of devices and interconnection to HVAC units for any the required shut down of air handlers.

1.2 REFERENCE STANDARDS

- A. Equipment and installation shall comply with the current applicable provisions of the following reference standards:
 - 1. National Fire Protection Association Standards (including but not limited to):
 - a. NFPA 70 The National Electrical Code (specifically Article 760).
 - b. NFPA 72 National Fire Alarm and Signaling Code.
 - c. NFPA 101 Life Safety Code.
 - 2. Local and state building codes.
 - 3. Requirements of the Local Authority Having Jurisdiction (AHJ).
 - 4. Underwriters Laboratories, Inc.
- B. The system and all components shall be listed by Underwriters Laboratories, Inc. for use in Fire Protective Signaling Systems under the following standards as applicable. Refer to Drawings for more information:
 - 1. UL 864Control Units for Fire Protective Signaling Systems (including UUKL sublisting).
 - 2. UL 268Smoke Detectors for Fire Protective Signaling Systems.
 - 3. UL 268ASmoke Detectors for Duct Applications.
 - 4. UL 217Smoke Detectors, Single and Multiple Station.
 - 5. UL 521Heat Detectors for Fire Protective Signaling Systems.
 - 6. UL 228Door Closers-Holders for Fire Protective Signaling Systems.
 - 7. UL 464Audible Signaling Appliances.

8. UL 1638 Visual Signaling Appliances.
9. UL 1971 Signaling Devices for the Hearing Impaired.
10. UL 38 Manually Actuated Signaling Boxes.
11. UL 346 Water flow Indicators for Fire Protective Signaling Systems.
12. UL 1481 Power supplies for Fire Protective Signaling Systems.
13. UL 609, 1610, 1635 Commercial Fire.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation Conference: At least two weeks prior to the start of field work, conduct a web-based conference in conjunction with the Project site (if available) to review the installers schedule along with the project plans and specifications. The Contractor will oversee the meeting and shall take minutes to be distributed to all attendees within 72 hours.
 1. Attendees: General Contractor, electrical contractor, alarm installer, MEP designer of the contract drawings, Owner's construction representative, and Kroger Central Alarm Control (KCAC) Representative (Alarm Monitoring for the Owner).
 2. Agenda
 - a. Review the contact drawings and specs with any approved changes to the installer's shop drawings.
 - b. Schedule for installation and timing of alarm monitoring by KCAC.
 - c. Any local jurisdiction requirements
 - d. Programming and communication requirements.

1.4 SUBMITTALS

- A. Administrative:
 1. Pay application fees and obtain approval of submittals in writing from the State Fire Marshal's office and/or the local authority having jurisdiction prior to submittal to Owner for review.
 2. Submit fire alarm submittals to Owner within 30 calendar days after award of Contract.
 3. Permit Drawings and other Submittals shall be prepared by a fire alarm installer certified by the approved manufacturer of the fire alarm system.
- B. Product Data: Complete documentation for the fire alarm system showing the model number, type, rating, size, style, manufacturer's names, and manufacturer's catalog data sheets for items to ensure compliance with this Section.
- C. Shop Drawings:
 1. Complete set of permit drawings showing conduit sizes and number of conductors required to components plus detailed wiring connections required at each type of device based on the level of the fire alarm system indicated in the Contract Documents.
 2. Detailed Drawings showing the intended location of field devices and their connections to the system along with room identification and a graphic symbol legend. Prepare

submittal drawings utilizing AutoCAD Release 2009 or newer Computer Aided Drafting system. Confirm electronic drawing format with Owner.

3. Detailed wiring diagrams and riser diagrams showing color-coding of wiring per manufacturer recommendations. Include calculations showing adequate capacity of the standby batteries, where applicable, as required by prevailing codes.
- D. Kroger Central Alarm Control Monitoring Data Form: Installer must coordinate the completion of the attached form at least 14 days prior to monitoring of the system with Owner (Kroger Project Manager, Store Manager & Asset Protection Department). Kroger's UL approved monitoring center supports security and fire alarm for all Owner needs.
- E. Monitoring Data Form: If for Fire Certificate of Occupancy, General Contractor information may be substituted for Store Management until Substantial Completion. Complete per the directions and in coordination with Owner and return to the addresses shown a minimum of 30 days prior to system testing and activation.
- F. Qualification Data: For Installer (if not prequalified) and installer's subcontractors.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Experienced, Bosch Certified installer, prequalified by the Owner (typically an installer in good standing with the Kroger Division Construction Manager and Asset Protection Manager). The following installers have been approved to install the fire detection and alarm system. Each installer must submit a list of any subcontractors for prequalification by the Owner:
 1. Consolidated Fire Protection Services (CFP)
 - a. Contact: Steve Schwartz.
 - b. Title: CFP Construction Manager.
 - c. Email: krogergc@cfpfire.com.
 - d. Cell: (949) 289-0327.
 2. Protection 1/ADT
 - a. Contact: James Finley.
 - b. Title: Acct. Manager.
 - c. Email: jfinley@adt.com.
 - d. Cell: (910) 619-4700.
 3. Vector Security
 - a. Contact: Chris Ehmgig.
 - b. Title: Acct. Manager.
 - c. Email: caehmig@vectorsecurity.com.
 - d. Cell: (571) 364-1472.
 4. Securitas
 - a. Contact: Tony Moe

- b. Title: National Account Manager.
- c. Email: tony.moe@securitases.com.
- d. Cell: (612) 414-1852.
- e. Office: (704) -281-2627.

5. ATS (Fred Meyer/QFC)

- a. Contact: Matthew Brines
- b. Email: mbrines@atsdata.com
- c. Phone: 503-684-9611.

- B. Installing and programming technicians shall be individually certified by fire detection and alarm system manufacturer.

1.6 WARRANTY

- A. Alarm Control Panel and Component Warranty: Manufacturer agrees to repair or replace control panel and components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESIGN

A. General:

- 1. Provide a complete addressable fire alarm system throughout the building as shown on the drawings and in accordance with NFPA 72 and authorities having jurisdiction. Equipment shall be UL listed.
- 2. If existing raceways, cables and outlet boxes are suitable for re-use, they may be reused after demonstrating to Owner's representative that they have been tested and proven to be suitable. Include existing material, cable, etc. used in three-year warranty.

- B. The fire alarm system is designed for the minimum compliance and in accordance with the latest edition of NFPA 72. In addition, the fire alarm system design shall meet the requirements of this Section and the authority having jurisdiction (AHJ).

- C. Components, materials, and methods shall be in accordance with NFPA 72 and as listed by Underwriters Laboratories, Inc. (UL) or the requirements of the Owner.

- D. Unless prohibited by the authority having jurisdiction (AHJ). The primary monitoring/communication method for the fire alarm system shall be through a network connection (WAN). A secondary connection as required by AHJ shall provide through a cellular communication module.

- E. Advise Owner and owner UL Certified monitoring center -Kroger Central Alarm Center (KCAC), of any location not permitting network or cellular back up use.

- F. Any approved Design/Shop drawings shall be the property of the Owner.
- G. Combining of the fire alarm system and the security system in one control panel will not be permitted.

2.2 FIRE ALARM SYSTEM OPERATION

- A. When a fire alarm condition is detected by one of the system initiating devices, the following functions shall occur simultaneously.
 - 1. System point shall be shown on the keypad by type of device, location and time of day.
 - 2. The audio-visual alarm devices shall activate throughout out the building.
 - 3. The control/communicator shall notify the owner monitoring company, KCAC, (as listed in the execution portion of this specification) that an alarm condition exists.
 - 4. Shut down all air handlers, unless specifically forbidden by the authority having jurisdiction.
- B. When a trouble or supervisory condition occurs, the following functions shall occur simultaneously.
 - 1. System point shall be shown on the keypad by type of device, location, and time of day.
 - 2. A distinct trouble sound shall occur at the keypad.
 - 3. The control/communicator shall notify the owner's monitoring company (as listed in the execution portion of this specification) that a trouble or supervisory condition exists.
- C. Whenever a smoke, duct, or heat detector is tripped, alarm verification shall function and a timer shall start. After a program time delay compliant with prevailing codes, the horn strobes shall sound if the detector is still in alarm.
- D. The system shall give a warning message if the smoke or duct detector needs cleaning.
- E. The system shall be fully field-programmable with the equipment on site or using programming software.
 - 1. Other features of the system shall include the following:
 - a. Walk test (ability to place the system in a testing mode that does not send notification signals or allow exterior audible alarms)
 - b. Device Disabling: Feature pass code protected for use by manufacturer's authorized technician only. Pass code not available to end user.
 - c. Read status of any point.
 - d. Field programmable at keypad.
 - e. Multiple password protection (for remote programming).
 - f. Manual on/off for any output point.
 - g. Calibrated smoke detector test.
 - h. Low air pressure monitoring of air compressor of any dry pipe system.

2.3 MANUFACTURERS

- A. Manufacturers: Provide products by Bosch Security and Safety Systems or other manufacturers identified as Basis-of-Design in the articles below. Products to be obtained by the Owner's approved installers listed in section 1.6. (No substitutions are allowed.)

2.4 PANELS

- A. Main Fire Alarm Control Panel (FACP/FAP): Bosch Security and Safety Systems; Model B9512G (elevator recall capable when required by AHJ),
1. Locate main fire alarm control panel in ECR room or as indicated in the drawings.
 2. Digital Communications: Provide system capable of communicating with a digital receiver such as the Bosch/Radionics D6600 receiver.
 3. Remote programming access codes must remain at the factory default code. IT IS FORBIDDEN FOR INSTALLERS TO INSERT THEIR OWN CODES OR A DEALER LOCKOUT CODE.

2.5 PLUG-IN CELL MODULE

- A. Product: Bosch B444-V for use with Verizon cellular network.
- B. Description:
1. WAN Network is required for fire unless not permitted by the authority having jurisdiction (AHJ). Advise Owner and Owner's monitoring center (KCAC) of any location not permitting network use.
 2. Programmed to report to the Owner's UL LISTED CENTRAL STATION, via Network for Primary, and Cellular for Secondary when required.
 3. (KCAC 04002/31A). COMPLETE THE CENTRAL ALARM CONTROL MONITORING DATA FORM INCLUDED AT THE END OF THIS SECTION.
 4. Mounting: Plug into main panel in single equipment housing containing battery charger and battery.
- C. When use of WAN network is approved:
1. Coordinate installation of network jacks, switch port, and certified cabling install for applicable control panels with the Kroger Technology Office prior to installation to prevent delays.
 2. Verify Ethernet (CAT5e/CAT6) cables are run properly and labeled correctly. Identify both ends at the panel and switch. As certain ports may be programmed differently be sure to connect to the port recommended by the Kroger Technology Department.
 3. The use of DHCP is required. The MAC address must be entered into the system prior to install by the Owner's division office, coordinated from step 1. If not, the panel will not come online.
 4. Verify KCAC has the network account programmed into their receivers; ensure signals are being received via primary and backup.
 5. The following settings are required:

IP Communicator Options	
Module Enclosure Tamper	No
IPv6 Mode	No
IPv4 DHCP/Auto-IP Enable	Yes
UPnP Enable	Yes
HTTP Port Number	80
ARP Cache Timeout (sec.)	600
Web/USB Access Enable	No
Firmware Upgrade Enable	No
TCP/UDP Port Number	7700
TCP Keep-Alive Time (sec.)	45
Port 77EE Configuration	No
RPS Over Network	Yes
RPS Address Verification	No
Encryption Enabled	No
Panel Programming Enable	Yes
Web Access Password	KCAC Standard Pw
Panel Wide->Answer	Yes
RPS Port Number	7700
Receiver Supervision Time (seconds)	300
Poll Rate (seconds)	210
Ack Wait Time	15
Retry Count	5

- D. Equip existing conventional fire alarm systems that are being reused with a new communicator and tie to (KCAC).
1. Product: Bosch D9068 DACT.
- E. Where WAN network is not permitted or not available, provide one duplex telephone outlet connected to dedicated telephone line with long distance capability (with two RJ31X connecting block jacks) within **2 feet (610-mm)** of the Fire Alarm Panel/Digital Communicator.

2.6 LOCKABLE METAL CABINETS

- A. Product: Bosch Security Systems; D8109 Fire Enclosure (UL Approved)
1. Color: Red
- B. Lock and Key Set: Bosch Security Systems; D101

2.7 TRANSFORMER ENCLOSURE KIT

- A. Product: Bosch Security Systems; D8004 Enclosure (UL Approved)
1. Color: Gray
- B. Provide for applications that require a remote transformer.

2.8 CIRCUITS AND WIRING

- A. Provide Class B wiring system.
- B. Provide 15 percent capacity for future expansion of A/V alarm device and data loop circuits.
- C. Separate alarm wiring from any open conductors or power, or Class 1 circuits. Do not place in any conduit, junction box or raceway containing these conductors, per NEC Article 760-55.
- D. Wiring for 24-volt DC control, alarm notification, emergency communication and similar power-limited auxiliary function may be run in the same conduit as initiating and signaling line circuits. Provide circuits with transient suppression devices and design system to permit simultaneous operation of all circuits without interference or loss of signals.
- E. Wire:
 - 1. Provide new fire alarm system wiring except where existing alarm wiring in existing facility is to remain in place.
 - 2. Provide wiring meeting local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Provide number and size of conductors as recommended by the fire alarm system manufacturer, but not less than **18 AWG (1.02 mm)**.
 - a. Line Voltage Circuits: Standard 14-gauge copper wire with THHN insulation. (120V)
 - b. Low voltage Circuits: Twisted non-shielded 18 gauge minimum.
 - 3. Provide wire and cable listed and approved by a recognized testing agency for use with a protective signaling system.
 - 4. Provide wire and cable not installed in conduit with a fire resistance rating suitable for the installation as indicated in NFPA 70 (e.g., FPLR).
 - 5. Field wiring shall be electrically supervised for open circuit and ground fault.
- F. Terminal Boxes, Junction Boxes and Cabinets: UL listed for use and purpose.

2.9 MANUAL PULL STATIONS

- A. Product: Bosch Security and Safety Systems; FMM-462-D or FMM-100DATK.
- B. Location: Customer service or an AHJ approved location for building evacuation. Additional pull stations may be required based on AHJ requirements.
- C. The unit shall be dual action (i.e. requiring two motions to activate the station) and shall be addressable for connections to the fire alarm control panel(s).
- D. Unit shall meet UL 38, standard for manually actuated signaling boxes.
- E. Mount **48 inches (1220 mm)** above the finished floor and in accordance with local building codes and as called out in NFPA 72.

2.10 CEILING/WALL SMOKE DETECTORS

- A. Product: Bosch Security and Safety Systems; FAA-350 or applicable base w/applicable FCP-350-P / FCP-350-PTH sensor.
- B. Provide base for applications where auxiliary contacts are required.
- C. Supervise power as required using applicable relay base or as specified by manufacturer installation instructions.

2.11 DUCT SMOKE DETECTORS

- A. Intelligent Addressable Duct Mounted Photoelectric Smoke Detectors:
 - 1. Product: Bosch Security and Safety Systems; FCD-350-DH Photoelectric Duct Smoke Detector Head with FCD-350 Series Duct Detector Housings.
 - 2. Provide UL 268A listed unit with two LEDs that will provide local alarm indication and a remote alarm output will be required for use with auxiliary devices.
 - 3. Operating Velocities: 100 to 4000 feet/minute (30.5 to 1219-m/minute).
 - 4. Provide sampling tube per NFPA, test station and all other required accessories.
 - 5. The shutdown of air handlers shall occur via a signal from the Fire Alarm Panel should any smoke detector be activated, unless specifically forbidden by the authority having jurisdiction, in which case provide auxiliary contact as required to shut down equipment and wire into the stop circuit of all air handlers' starter.
 - 6. Provide remote key activated test station (with status/alarm/trouble indicating LEDs), on the column or wall beneath the duct detector as indicated on Drawings or as determined in field.
 - a. Product: Bosch Security and Safety Systems; D305 Remote Test Kit.
 - b. Provide electrical conduit from duct detector to remote test station for column and wall mounted applications. (Refer to Division 26 Section "Common Work Results for Electrical.")
 - c. Provide engraved (or approved machine-generated equivalent method) plate at each remote station to read: "#### Duct Smoke Detector", where #### is the RTU or AHU identification number used on Drawings.
 - d. Install test stations at 80-inches (2032-mm) above finish floor (AFF).
 - 7. Provide required power and control wiring so that upon detection of smoke, the following sequence of operations occurs where applicable:
 - a. A supervisory signal (except Ohio alarm condition) is sent by the fire alarm control panel to the monitoring central station unless AHJ requires alarm condition.
 - b. All HVAC units shut down (including applicable dampers).
 - c. Associated smoke dampers close (wired to automatically re-open on duct detector reset).

2.12 HEAT DETECTORS

- A. Addressable Heat Detectors:

1. Product: Bosch Security and Safety Systems; FAA-350 or applicable base w/applicable FCH-350-135 sensor.
2. Provide both rate of rise and fixed temperature with 135 degrees F. (57 degrees C.) alarm threshold.

2.13 FIRE ALARM NOTIFICATION DEVICES

A. General:

1. Comply with requirements of NEC and NFPA-72.
2. Provide weather resistant back boxes for units installed in refrigerated rooms and freezers to diminish the risk of damage due to condensation.

B. Horn/Strobe Units

1. Manufacturers:
 - a. Cooper Industries; Wheelock Brand.
 - b. System Sensor.
2. Comply with ANSI S3.41 temporal code, when required by authority having jurisdiction.
3. Synchronize strobe units.
4. Color: Red
5. Strobe Luminous Intensity: ADA-compliant.
 - a. Main Sales Area: Minimum 75 candela.
 - b. Smaller Areas: Minimum candela units as required to comply with ADA and the equivalent NFPA 72 requirements resulting in the minimum number of devices.
6. Mounting: Semi-flush mounting plates, ceiling or bottom of open steel structure whenever possible, wall mounted (only when required) at 80-inches (2032-mm) as shown on Drawings.
7. Provide weatherproof devices for any walk-in cooler or freezer applications.

C. Strobe-Only Units

1. Manufacturers:
 - a. Cooper Industries; Wheelock Brand.
 - b. System Sensor.
2. Comply with ANSI S3.41 temporal code, when required by authority having jurisdiction.
3. Synchronize strobe units.
4. Color: Red.
5. Luminous Intensity: ADA-compliant.
 - a. Main Sales Area: Minimum 75 candelas.
 - b. Smaller Areas: Minimum candela units as required to comply with ADA and the equivalent NFPA 72 requirements resulting in the minimum number of devices.

6. Mounting: On ceiling or to the bottom of open steel structure whenever possible, Wall mounted (only when required) at 80-inches (2032-mm) as shown on Drawings.
7. Provide weatherproof devices for any walk-in cooler or freezer applications.

2.14 ACCESSORY DEVICES

A. Remote Annunciators

1. Product: Bosch Security and Safety Systems; Model B926F Fire Keypad. Provide 1257RB (SDI only) Fire Annunciator if remote viewing of events is required with no system control.
2. Locate remote annunciator in customer service area, exact location shall be coordinated with Owner and local fire department.
3. Locate additional remote annunciator in or near the main entrance when required by the local fire department.
4. Mount remote annunciator on wall 60 inches (1524 mm) above finish floor to center of unit or as required by local fire department.

B. Fire Protection Devices

1. Fire protection tamper and flow switches will be provided by the fire protection installer.
2. Where fire protection is required for fuel center canopy, provide monitor flow/activation or tamper switches associated with either dry chemical or wet system protection.

C. Input Modules (B208 or D9127U)

1. Provide as required to interface "non-addressable" devices into the system as shown on the Drawings (i.e. Sprinkler Flow Switches, Tamper Switches, Pressure Switches, Kitchen Hoods, etc. as applicable).
 - a. Provide electrical conduit for wall mounted applications, and for ceiling mounted applications if the above-ceiling space acts as a plenum return. (Refer to Division 26 Section "Common Work Results for Electrical.")
 - b. Provide B299 Expansion Modules when D9127U POPITS are used with B9512G control panel. One B299 accommodates up to 100 POPITS and can be used on the SDI2 data bus up to 1000 feet (30.5 m) from panel. B208 Input Modules provide eight inputs and can be connected directly to the SDI2 data bus and located up to 1000 feet (30.5 m) from panel.
 - c. Provide B600 Retrofit Module when reusing legacy modules such as D8125 Zone Expansion Modules, D8129 Octo-relay Modules and D8128 Octo-input Modules.
 - d. D9127T tampered POPITs are not allowed.

D. Provide required relays for auxiliary devices including door closures and supervised control functions such as air handler shut-downs.

E. Provide alarm wiring and connection to tamper switch on emergency key cabinet (Knox box).

PART 3 - EXECUTION

3.1 GENERAL

- A. The Authority Having Jurisdiction (AHJ) shall be notified prior to installation or alteration of equipment and wiring.
- B. Existing fire alarm systems should remain in operation during remodel projects to insure protection.
- C. Should a fire alarm system need to be shut down or taken off-line for more than an hour (or as required by the AHJ), a standard fire watch must be put in place by the contractor until the system is reactivated. All system outages must have Owner's prior written permission and it will be the Contractor's responsibility to notify the local fire department, Authority Having Jurisdiction (AHJ) and owner's monitoring center (KCAC) prior to shut down. Notify KCAC when systems are being reactivated.

3.2 INSTALLATION

- A. General:
 - 1. Install equipment in accordance with the NEC, NFPA 72, local and state codes, as shown on the Drawings, and as recommended by the manufacturer. Refer to Division Section "Low Voltage Electrical Power Conductors and Cables" for additional recommendations.
 - 2. Conceal wiring, cabling, conduit, junction boxes, conduit supports and hangers from view in finished ceiling areas and remain exposed in open structure areas. Place alarm wiring in conduit when installed down a column and unfinished walls in backroom areas.
 - 3. Do not install smoke detectors prior to the system programming and test period. If construction is ongoing during this period, protect smoke detectors from contamination and physical damage.
 - 4. Flush mount fire detection and alarm system devices, control panels and remote annunciators when located in finished areas. Devices may be surface mounted when located in unfinished areas.
 - 5. Install equipment at heights and locations as specified below or in Part 2 of this Section.
- B. Connect 120VAC power for fire alarm equipment to emergency panels where applicable.
 - 1. Install a D8004 enclosure over the transformer to prevent the transformer of the fire alarm panel from being disconnected.
- C. Provide required 20A/120VAC power as required to energize components of the fire alarm system. Include home-runs for fire alarm control panels as well as home-runs and wiring for any accessory devices such as remote power supplies/panels, printer, dialer, etc. as applicable.
 - 1. This requirement applies whether or not such power work is shown on the Drawings.
 - 2. Dedicate branch circuits serving fire alarm equipment to fire alarm equipment only. Label circuit at the main power distribution panel as FIRE ALARM. Ground control panel cabinet securely to either a cold water pipe or a grounding rod.

3. Provide machine generated label at FACP and intrusion control panel indicating location of breaker box and circuit number.

D. Smoke or Heat Detector Locations:

1. Do not exceed the rated coverage of the detector.
2. Install no more than 15-feet (4.6-m) from a wall or 30-feet (9-m) apart.
3. Do not install within 3-feet (1-m) of a supply air diffuser.

E. Duct Smoke Detector Installation:

1. Duct smoke detectors are typically shown schematically at the respective air handling unit on the Drawings, but shall be installed maximizing the distances between ductwork offsets, and installed ahead of the first branch duct take-off. Coordinate with HVAC installer and fire alarm manufacturer's representative in field.
2. In fully ducted systems, install duct smoke detectors in the appropriate side of air handling equipment as required by the authority having jurisdiction. Where more than one detector is indicated associated with a particular piece of air handling equipment, there are special reasons for the additional detectors (i.e. split returns, return risers serving multiple floors, etc.); coordinate all locations for same with the HVAC installer.

F. Digital Communicator (Dialer) Installation

1. The onboard ethernet port is the primary communication via network connection.
 - a. Coordinate installation of network jacks, switch port, and certified cabling install for applicable control panels with the Kroger Technology Office prior to installation to prevent delays.
 - b. Verify that Ethernet (CAT5e/CAT6) cables are run properly and labeled correctly. Identify both ends at the panel and switch. As certain ports may be programmed differently be sure to connect to the port recommended by the Kroger Technology Office.
 - c. Utilize cellular module for backup communication purposes.
 - d. Verify that KCAC has the network account programmed into their receivers; ensure signals are being received via network and cellular module back-up.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing.
- B. Upon completion of installation, the system shall be checked and tested by a fire alarm inspector that is State-Licensed, NICET Level II Certified, or approved equivalent. Contact system manufacturer for this service if installer cannot provide on their own.
- C. After making tests and corrections, conduct a system demonstration for Owner and the authority having jurisdiction.

3.4 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project outside normal occupancy hours for this purpose.
- B. Follow-Up Tests and Inspections: After date of Substantial Completion, test the fire alarm system complying with testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for three monthly, and one quarterly, periods.

3.5 DEMONSTRATION AND TECHNICAL SUPPORT

- A. Engage a manufacturer certified service representative to train Owner's personnel to operate the fire alarm system.
 - 1. Provide onsite training and User Guide documentation at no cost to Owner. Training includes but is not limited to:
 - a. How to check point status and identify faults on the Fire system.
 - b. How to silence a trouble signal on the Fire system.
 - c. How to silence the horns on the Fire system.
 - d. How to reset the smoke and/or duct detectors on the Fire system.
 - e. How to reset a pull station on the Fire system.
 - f. How to identify phone line, A/C power, and battery fails on the Fire system.
 - 2. Provide 24 hour/7 days per week/365 days per year technical support for one year at no cost to Owner.

3.6 RECORD DRAWINGS

- A. Provide Owner record drawings noting any "as-built" changes to the work.

3.7 ATTACHMENTS

- A. Alarm Panel WAN Compatibility Matrix (For designer reference).
- B. Kroger Central Alarm Control Monitoring Data Form.

(See following pages)

Alarm Panel WAN Compatibility Matrix				
	Replace	Upgrade	B426	Onboard
BOSCH D7024	X			
BOSCH D7212	X			
BOSCH D7212GV2	X	Version 7.06+	X	
BOSCH D7212GV3 v8.00 - 8.09	X	Version 7.06+	X	
BOSCH D7212GV3 v8.10+	X	Version 7.06+	X	
BOSCH D7212GV4 v1.00 - 1.99	X	Version 7.06+		
BOSCH D7412GV2		Version 7.06+	X	
BOSCH D7412GV3 v8.00 - 8.09			X	
BOSCH D7412GV3 v8.10+			X	
BOSCH D7412GV4 v1.00 - 1.99			X	
BOSCH D9412	X			
BOSCH D9412GV2		Version 7.06+	X	
BOSCH D9412GV3 v8.10+			X	
BOSCH D9412GV4 v1.00 - 1.99			X	
BOSCH B4512	X			
BOSCH B9512G			X	X**
BOSCH B8512G				X
BOSCH FPD-7024	X		X	
BOSCH FPA-1000	X			
DETECTION SYS	X			
DSC	X			
DSC PC 1832	X			
EDWARDS	X			
EDWARDS FIRESHIELD	X			
FIRELITE	X			
FIRELITE 5210	X			
FIRELITE MS5024	X			
FIRELITE MS9050	X			
FIRELITE MS9200	X			
NAPCO	X			
NAPCO GEMP1632	X			
NAPCO GEMP3200	X			
NAPCO GEMP816	X			
NAPCO GEMP9600	X			
NAPCO MA1008E	X			
NAPCO MA3000	X			
NAPCO MS5210 UD	X			
NAPCO P1632	X			
NOTIFIER 500	X			
RSI VIDEOFIED	X			
RSI XTIP 630	X			
SIEMANS	X			
SILENT KNIGHT	X			
SILENT KNIGHT 5104	X			
SILENT KNIGHT 5208	X			
SILENT KNIGHT 5700	X			
SIMPLEX	X			

*Approved for use with on-board NIC. **B426 is required



Kroger Central Alarm Control Monitoring Data Form

To schedule Conversion/Programming Audit, call 503-797-5411

All fields marked with * must be completed to enable monitoring service PLEASE TYPE/PRINT

*Is this a Brand New Location Y/N?: _____ Grand Opening Date: _____

*Store Name: _____ *Division #: _____ *Store _____

*Address: _____ *Zone/District _____ *Time Zone _____

*City: _____ *State: _____ *Zip: _____

*Township (if required for Dispatch): _____

*Does your jurisdiction require an alarm permit? _____ If Yes, permit # _____

*Store Main Phone Number: _____

*Pharmacy Phone #: _____ *RX Dr.'s line _____

*Fuel kiosk direct phone # _____ or Fuel kiosk extension # _____

Fuel Separate Address from Main Store? _____

*Liquor direct phone # _____ or Liquor extension # _____

*Local Fire Dispatch phone # (Not 911): _____

*Local Police Dispatch phone # (Not 911): _____

Secondary Police and/or Fire Dispatch # if available: _____

*Business Hours: _____ *Are Associates inside 24 hours a day? _____

Emergency Call List: These people will be notified if no one is contacted at the store or in an emergency

*1st Responder/Store Manager Name: _____ EUID: _____

Home # _____ Cell #: _____

*2nd Responder (Name and Position) _____ EUID: _____

Home # _____ Cell #: _____

*3rd Responder (Name and Position) _____ EUID: _____

Home # _____ Cell #: _____

Jeffery A. Scott Architects, P.C.
JSA Project No. 23086

Kroger Store No. D-711
Swartz Creek, Michigan

*4th Responder (Name and Position) _____ EUID: _____

Home # _____ Cell #: _____

Name of person completing form ***Please TYPE/Print:*** _____

*Position of person completing form ***Please TYPE/Print:*** _____

Date: _____

Please E-mail this completed form to:
alarmprogramming@kroger.com
KCAC Programming and Conversion Coordinators
can be reached at 503-797-5411
Mon-Fri 0730-1700 Pacific Time
KCAC Monitoring 1-800-982-2749
Reba Phillips, KCAC Manager

END OF SECTION 28 46 00

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