

**BGC**  
**BROOKSHIRE**  
GROCERY COMPANY

**fs**

**facility services**

# SPECIFICATIONS

**A Remodel Building & Gas Station**

For

**BROOKSHIRE'S #006**

**212 East Coke Street**

F.M. Hwy. 315 at F.M. Hwy. 312

**Winnsboro, Texas**

Project #4000600-0

April, 2020

**Division of Brookshire Grocery Co.**

**430 E. Front Street, Tyler, Texas 75702**

**903/579-0500**

Set No.

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SEALS PAGE

PROJECT:

Name: Remodel of Brookshire's #006  
Location: 212 East Coke St., Winnsboro, Texas 75494  
Project No.: 4000600-0

Architect of Record

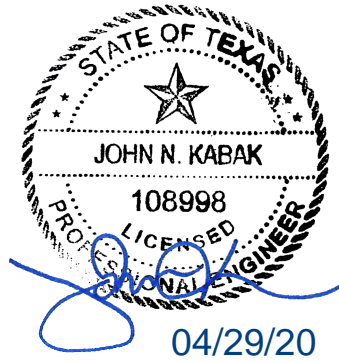
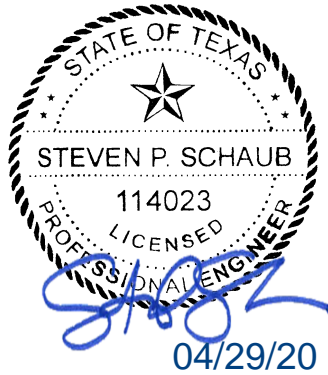
Mark S. Salopek, AIA  
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Engineers

GPD Group, Professional Corporation  
520 S. Main St., Suite 2531  
Akron, OH 44311  
GPD Group, Professional Corporation  
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Architect for Roofing  
Plans and Specifications

Daniel DeMeyer  
DryTec Moisture Protection  
Technology Consultants  
8750 N. Central Expressway, Ste, 725  
Dallas, Texas 75231



- END OF SECTION 00007 -

**SECTION 00210**  
**ROOF BID FORM**

Date:

Brookshire Grocery Company  
430 East Front Street  
Tyler, Texas 75702

1. Having carefully examined the Specifications and Plans entitled:

Building Addition Roof  
Brookshire's #006  
212 E. Coke Street  
Winnsboro, Texas 75494

for Brookshire Grocery Company, as well as the site and all conditions affecting the Work, the undersigned Bidder agrees to furnish all labor and materials necessary for the Work in accordance therewith, for the lump sum Base Bid amount of:

BASE BID: \_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

2. The undersigned agrees to furnish all labor and materials for any additional Work authorized by the Owner and for which no pre-agreed price has been fixed for the net cost of all labor and materials furnished plus \_\_\_\_\_ percent for overhead and profit.
3. The above project will be completed within \_\_\_\_\_ consecutive calendar days from date of Notice to Proceed, including overtime and weekends.
4. If the undersigned Bidder is notified of the acceptance of this bid and a contract to be awarded, he agrees to provide within the following week the required insurance coverage. In addition, he agrees to execute the contract for the above mentioned compensations on the General Contractor's standard forms.

5. Acknowledgment is hereby made of receipt of the following Addenda:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Roofing System: The undersigned Bidder has based this proposal on the following:

Roofing Manufacturer: \_\_\_\_\_  
Roofing System: \_\_\_\_\_

7. Performance and Payment Bond: Not Required.

8. Taxes:

The Base Bid amount as stated above includes all sales taxes and any other taxes, for all materials and appliances to and upon which taxes are levied.

9. UNIT PRICES:

A. Unsurfaced Modified Bitumen Ply Sheet: (Refer to Section 07565)

The undersigned agrees, if additional unsurfaced modified bitumen ply sheet is required by the Owner, then the following unit price shall be used in determining the extra cost.

Unsurfaced ply sheet, ADD per sq. ft. \$ \_\_\_\_\_

Yours truly,

\_\_\_\_\_  
Contractor – Firm Name

By: \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Phone \_\_\_\_\_

\* Seal (If bidder a corporation)

END OF SECTION 00210



SECTION 00220  
**GEOTECHNICAL INVESTIGATION REPORT**

**INVESTIGATION:**

Soil and subsurface investigations were conducted at the site, the results of which are to be found in the following report(s):

GEOTECHNICAL INVESTIGATION  
BROOKSHIRE'S FOOD STORE #006  
212 E. Coke St.  
Winnsboro, Texas

Presented to:  
BROOKSHIRE'S CONSTRUCTION  
TYLER, TEXAS

By:  
REED ENGINEERING GROUP  
DALLAS, TEXAS  
Project No. 23390  
March 5, 2020

Complete copy of this report is available for review by Invited Bidders at the Brookshire Grocery Company – Facility Services office, 430 E. Front St., Tyler, Texas or on the Project Website.

**INTERPRETATION:**

The Contractor is urged to examine the report and site and determine the character of materials and conditions to be encountered. The soil investigation data is provided for information and convenience of Contractor only. Brookshire's and the Architect disclaim any responsibility for accuracy, true location or extent of investigation prepared by others nor assumes any responsibility for the Contractor's interpretation of the data. They further disclaim any responsibility for interpretation of data by the Contractor. The soil investigation data is made a part of the Contract Documents. Where there are conflicts between this report and the Drawings or the Specifications, the Drawings and Specifications shall govern.

*- END OF SECTION 00222 -*

SECTION 00700  
**GENERAL CONDITIONS AND SAMPLE CONTRACT**

**GENERAL CONDITIONS:**

Attached are the General Conditions and Contract which, along with the Specifications and Construction Plans, will govern this project. The relevant information will be completed upon the selection of the General Contractor.

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## CONTRACT AND GENERAL CONDITIONS

PROJECT NAME: Brookshire's #006 Remodel, Winnsboro, Texas

PROJECT NUMBER: 40XXXXXXXX-XXXX  
AS OF: Month Day, Year

BETWEEN: Brookshire Grocery Company  
P.O. Box 1411, Tyler, Texas 75710  
herein after referred to as "Brookshire"

AND: Company Name  
Address, City, State Zip Code  
herein after referred to as "Contractor"

Brookshire and the Contractor agree to the following:

### ARTICLE 1 - THE WORK:

- 1.1 Contractor shall perform all the work required by the Contract Documents for as defined as Furnish and Installation of the Roofing called for in drawings and specifications enumerated in Article 6.
- 1.2 This Contract includes the Roofing as equipment, labor and insurance necessary to complete the Installation of the Roofing as equipment. Contract also includes installation per Brookshire and OSHA guidelines.
- 1.3 Materials and Installation shall be in accordance with plans and comply with all Federal, State and Local codes and regulations.

### ARTICLE 2 - TIME OF COMMENCEMENT AND COMPLETION:

- 2.1 The work to be performed under this Contract shall commence upon completion of this Contract by Brookshire.
- 2.2 Subject to authorized adjustments as described in Article 14, all equipment started by Month Day, Year and operational no later than Month Day, Year.
- 2.3 Contractor shall not be held in default due to delays in manufacturing of equipment or products not reasonably within his control.

### ARTICLE 3 - CONTRACT SUM:

- 3.1 Brookshire shall pay the Contractor in current funds for the performance of the work, subject to additions and deductions by Change Order as provided in the Contract Documents, the Contract Sum of XXX Hundred XXXXXXXX XXX Thousand XXX Hundred XXXXXXX XXXX Dollars and XX/100 Dollars (\$000,000.00), including applicable 1<sup>st</sup> Year Warranty, State and Local Sales and Use Taxes.
- 3.2 The Contract Sum is determined as follows: Lump Sum, Not to Exceed Contract Sum.
- 3.2.1 The actual cost for any Permit (s) required by Governmental Agencies shall be included in Proposal by Contractor.
- 3.3 Work week shall be determined by Brookshire.

### ARTICLE 4 - PROGRESS PAYMENTS:

- 4.1 Based upon Applications for Payment submitted by the Contractor and Certificates for Payment, Brookshire shall make progress payments on account of the Contract Sum to the Contractor as provided in the Contract Documents each month in the amount of one hundred percent (100%) of the proportional amount of the approval Application for Payment. Approved Applications for Payment shall be paid within forty-five days from the date of receipt by Brookshire.

- 4.2 If Brookshire has reason to believe that the Contractor is not complying with the payment terms of this Contract, Brookshire shall have the right to contact the Contractor's subcontractors and suppliers to ascertain if they are being paid by the Contractor in accordance with this Contract. If Brookshire determines or has reason to believe that labor, material or other obligations incurred in the performance of the Contract Work are not being paid, then Brookshire may give written notice of a potential claim or lien to the Contractor and may take any steps deemed necessary to assure that progress payments are utilized to pay such obligations. If upon receipt of notice, (a) the Contractor does not supply evidence to the satisfaction of Brookshire that the moneys owing have been paid; or (b) post a bond indemnifying Brookshire and the premises from a claim or lien, Brookshire shall have a right to withhold from any payments due or to become due to the Contractor a reasonable amount to protect Brookshire from any and all loss, damages or expense including attorneys' fees that may arise out of or relate to any such claim or lien.

**ARTICLE 5 - FINAL PAYMENT:**

- 5.1 Final Payment, constituting the entire unpaid balance of the Contract Sum, shall be paid to the Contractor when the work has been completed, the Contract fully performed, and a Final Application for Payment has been approved by Brookshire.

**ARTICLE 6 - ENUMERATION OF CONTRACT DOCUMENTS:**

- 6.1 The Contract Documents, which constitute the entire agreement between Brookshire and the Contractor, are described in Article 7 and, except for Modification issued after execution of this Contract, are enumerated as follows:  
Plans and Specifications dated xx/xx; REVISED as of: xx/xx/xxxx, posted on Brookshire's Facility Services Web Site [www.bgcprojects.com](http://www.bgcprojects.com)  
Addenda – NONE  
Business Name: Company Name, Address, City, State Zip Code.  
Proposal dated: Month Day, Year attached hereto as Exhibit D with "Exclusions" acknowledged; "Terms and Conditions" not accepted as part of this Agreement; and 30 days limitation of quotation is superseded by execution of this Agreement by Contractor.

**ARTICLE 7 - CONTRACT DOCUMENTS:**

- 7.1 The Contract Documents consist of this Contract and General Conditions, Supplementary and other Conditions, the Drawings, the Specifications, all Addenda issued prior to the execution of this Contract, and all Modifications issued by Brookshire after execution of the Contract such as Change Orders, Supplemental Instructions such as written interpretations and written orders for minor changes in the work. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the work. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all. Work not covered in the Contract Documents will not be required unless it is consistent therewith and reasonably inferable therefrom as being necessary to produce the intended results.
- 7.2 Nothing contained in the Contract Documents shall create any contractual relationship between Brookshire or the Architect and any subcontractor or sub-subcontractor.
- 7.3 By executing the Contract, the Contractor represents that he has visited the site and familiarized himself with the local conditions under which the work is to be performed.
- 7.4 The work comprises the completed construction required by the Contract Documents and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

**ARTICLE 8 - ADMINISTRATION:**

- 8.1 Brookshire' authorized representative is

Assigned, Construction Project Manager,  
Facility Group Division of Brookshire Grocery Company.  
430 E. Front Street, Tyler, Texas 75702

or such person(s) designated in writing by same as authorized representative(s) who will provide administration of the Contract and shall at all times have access to the work.

- 8.2 If the Contractor fails to correct defective work or persistently fails to carry out the work in accordance with the Contract Documents, Brookshire by a written order, may order the Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated.
- 8.3 Brookshire will be the interpreter of the requirements of the Contract Documents and have the sole authority to reject work or dictate the method of correction for deficient work.

ARTICLE 9 - APPROVAL:

- 9.1 The Contractor shall promptly submit to Brookshire all shop drawings, samples, product data, manufacturers' literature and similar submittals required by the Contract Documents. The Contractor shall prepare and deliver its submittals to Brookshire in a manner consistent with the Progress Schedule and in such time and sequence so as not to delay Brookshire or others in the performance of the Work. Brookshire will review and take appropriate action upon the Contractor's submittals. Substitution of products for those specified will be considered unless specifically noted as "No Substitutes" and/or "No Equals". Brookshire reserves the right to reject any product solely based on preference. The Contractor shall be responsible for the accuracy and conformity of its submittals to the Contract Documents. Brookshire review and approval of the submittals shall only be for general conformance with the design concept of the project and general compliance with the Contract Documents. Contractor responsibility shall include, but not be limited to, (1) dimensions which shall be confirmed and correlated at the job site; (2) fabrication processes and techniques of construction; (3) coordination of his Work with that of all other trades; and (4) the satisfactory performance of his Work. The approval of any Contractor submittal shall not be deemed to authorize deviations, substitutions or changes in the requirements of the Contract Documents unless express written approval is obtained from Brookshire authorizing such deviations, substitutions or change.

ARTICLE 10 - CONTRACTOR:

- 10.1 Contractor shall supervise and direct the work, using his best skill and attention and he shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the work under the Contract.
- 10.2 Unless otherwise specifically provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, transportation, and other facilities and services necessary for the proper execution and completion of the work, whether temporary or permanent and whether or not incorporated or to be incorporated in the work.
- 10.3 Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the work any unfit person or anyone not skilled in the task assigned to him. Obscene language or gestures, "cat-calling", etc. will not be tolerated. Contractor shall at all times enforce these requirements for all within his Contract by causing said to be brought into conformance or removed from the project.
- 10.4 Contractor warrants that all materials and equipment incorporated in the work will be new unless otherwise specified, and that all work will be of good quality, free from faults and defects, and in conformance with the Contract Documents. All work not conforming to these requirements may be considered defective.
- 10.5 Contractor warrants that all materials and equipment incorporated in the work shall be free of asbestos. All work not conforming to this requirement shall be considered defective.
- 10.6 Unless otherwise provided in the Contract Documents, the Contractor shall pay all sales, consumer, use and other similar taxes which are legally enacted at the time bids are received, and shall secure and pay for the permits and governmental fees, licenses and inspections necessary for the proper execution and completion of the work.
- 10.7 Contractor shall give all notices and comply with all laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the performance of the work, and shall promptly notify Brookshire if the Drawings and Specifications are at variance therewith.

- 10.8 Contractor shall perform the Work in a safe manner, in strict compliance with all applicable laws, ordinances and regulations, including the Occupational Safety and Health Act, and applicable state safety laws. Contractor shall be responsible for the safe execution of the Work and for the protection of persons and property from any dangers, hazards, injuries or damages associated with the Work or the premises on which the Work is being conducted and any related transportation or storage of materials.
- 10.9 The Contractor shall indemnify and hold harmless Brookshire and their agents and employees from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees arising out of or resulting from the Contractor's failure to comply with all Federal, State and Local laws, ordinances, rules, and regulations; including, but not limited to, OSHA, EPA, and Federal Immigration regulations.
- 10.10 When and if so ordered, Contractor shall stop or correct any part of the Work Brookshire deems unsafe, or not in compliance with OSHA, EPA, and Federal Immigration regulations, or otherwise improper. If Contractor neglects to take corrective measures, Brookshire may do so at the cost and expense of Contractor. Failure on the part of Brookshire to stop performance of the Work in violation of legal or safety requirements shall in no way relieve Contractor of its responsibility therefor.
- 10.11 The Contractor's employees shall use conventional fall protection systems (guardrail systems, personal fall arrest systems, or safety net systems) as per OSHA regulations. If the Contractor can demonstrate that it is infeasible or it would create a greater hazard to use conventional fall protection equipment when the Contractor's employees are engaged in leading edge work as defined by OSHA Construction Standards, Section 1926.500, Subpart M – Fall Protection, then the Contractor shall have a Fall Protection Plan prepared by a qualified person and developed specifically for the site where the leading edge work will be performed, and the plan must be maintained up to date in accordance with all OSHA regulations. The Contractor has the burden of establishing that it is appropriate to implement a Fall Protection Plan, which complies with OSHA 1926.502(k) for a particular workplace situation, in lieu of implementing the use of conventional fall protection systems.
- 10.12 Contractor's safety obligations pursuant to this Agreement may be delegated to subcontractors for their portion of the Work; however, Contractor's safety obligations and indemnification obligations to Brookshire shall not be diminished by the subcontracting of safety obligations. Contractor shall be responsible for the safe execution of the Work and for the protection of persons and property from any dangers, hazards, injuries or damages associated with the Work or the premises on which the Work is being conducted and any related transportation or storage of materials.
- 10.13 Contractor shall review, approve and submit all Shop Drawings, Product Data and Samples required by the Contract Documents. The work shall be in accordance with approved submittals.
- 10.14 Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations and shall properly restrain materials and trash from being blown away from its proper location. At the completion of the work he shall remove all his waste materials and rubbish from and about the Project. In addition, Contractor is responsible for proper disposal of waste and containers. Contractor will save Brookshire harmless from any liability as it relates to proper disposal of waste, containers or any other hazardous material used or created by Contractor. At completion of the work he shall remove tools, construction equipment, machinery and surplus materials. If in the opinion of Brookshire, the Contractor fails to satisfy clean-up requirements, or if there is a dispute as to who is responsible for clean-up, Brookshire has the right, but not the obligation, to do so and deduct the amount for such from whom Brookshire considers to be responsible for said clean-up.
- 10.15 Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save Brookshire harmless from loss on account thereof. Except to the extent such results from Brookshire's design specifications.
- 10.16 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless Brookshire and their agents and employees from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees but only to the extent arising out of or resulting from the performance of the work, provided that any such claim, damage, loss or expense (1) is attributable to

bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph. In any and all claims against Brookshire or the Architect or any of their agents or employees by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 10.9 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts. In no event shall Contractor be liable for special, consequential, incidental, indirect and punitive damages, including product loss.

#### ARTICLE 11 - SUBCONTRACTS:

- 11.1 A subcontractor is a person or entity who has a direct contract with the Contractor to perform any of the work at the site.
- 11.2 Contractor, as soon as practicable after the award of the Contract, shall furnish to Brookshire in writing the names of subcontractors for each of the principal portions of the work. The Contractor shall not subcontract the whole or portions of this Contract without written approval from Brookshire of the named Subcontractors. Contractor shall not employ any Subcontractor to whom Brookshire may have reasonable objection. Contractor shall not be required to contract with anyone to whom he has a reasonable objection. Contracts between the Contractor and subcontractors shall require each Subcontractor, to the extent of the work to be performed by the Subcontractor, to be bound to the Contractor by the terms of this Contract, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by this Contract, assumes toward Brookshire and allow to the subcontractor the benefit of all rights, remedies and redress afforded to the Contractor by this Contract.

#### ARTICLE 12 - WORK BY BROOKSHIRE:

- 12.1 Brookshire reserves the right to perform work related to the Project with their own forces, and to award separate contracts in connection with other portions of the Project or other work on the site under these or similar Conditions of the Contract. No claim for extra compensation to the Contractor will be approved for such action by Brookshire.
- 12.2 Contractor shall afford Brookshire reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall connect and coordinate his work with theirs as required by the Contract Documents.
- 12.3 Any costs caused by defective or ill-timed work shall be born by the party responsible therefor.

#### ARTICLE 13 - MISCELLANEOUS PROVISIONS:

- 13.1 Contractor shall provide evidence to the satisfaction of Brookshire's Project representative that Contractor has on the job site all Material Safety Data Sheets (MSDS) for all materials and processes necessary for the execution of this Contract prior to commencement of the Work.

#### ARTICLE 14 - TIME:

- 14.1 All time limits stated in the Contract Documents are of the essence of the Contract. Contractor shall expedite the work and achieve Completion within the Contract Time.
- 14.2 If the Contractor is delayed at any time in the progress of the work by labor disputes, fire, windstorm, flood, earthquake, unusual delays in transportation, unavoidable casualties, or any cause beyond the Contractor's control including abnormal rainfall amounts and temperatures that could not reasonably be anticipated at the project location during the construction time period allocated for the Work, or by any other cause which Brookshire determines may justify the delay, then the Contract Time shall be extended by Change Order for such reasonable time as Brookshire may determine. If the



Contractor is delayed in the progress of the Work by changes ordered in the Work by Brookshire, then Brookshire and the Contractor shall within seven (7) calendar days negotiate a Change Order for an extension to the Contract Time and, if applicable, an adjustment to the Contract Sum.

**ARTICLE 15 - PAYMENTS AND COMPLETION:**

- 15.1 Payments shall be made as provided in Article 4 and Article 5 of this Agreement. Contractor shall furnish a completed Partial Release of Lien form (Exhibit A) or Final Release of Lien form (Exhibit B), as applicable with each Application for Payment.
- 15.2 Payments may be withheld on account of (1) defective work not remedied, (2) claims filed, (3) failure of the Contractor to make payments properly to subcontractors or for labor, materials, or equipment, (4) damage to Brookshire, property, or another contractor, or (5) persistent failure to carry out the work in accordance with the Contract Documents. Brookshire shall give written notice to Contractor at the time of rejecting or reducing an application for payment stating the specific reasons for such rejection or reduction. When the above reasons for rejecting or reducing an application for payment are removed, payment will be made for amounts previously withheld. Payment to the Contractor does not constitute or imply acceptance of any portion of the Contract Work.
- 15.3 Contractor shall furnish completed forms AIA G706, 1970, Contractor's Affidavit of Payment of Debts and Claims; AIA G706A, 1970, Contractor's Affidavit of Release of Liens; and Affidavit of Payment of all state and local taxes on all materials related to this project, as an attachment to the Request for Final Payment.
- 15.4 The making of Final Payments shall constitute a waiver of all claims by Brookshire except those arising from (1) unsettled liens, (2) faulty or defective work or service discovered before or after final payment, (3) failure of the work to comply with the requirements of the Contract Documents, or (4) terms of any special warranties required by the Contract Documents. The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the contractor as unsettled at the time of the Final Application for Payment.
- 15.5 Final payment of the balance due of the Contract Amount shall be made to the Contractor within 15 days after approval of the Final Application for Payment by Brookshire. Payments received by the Contractor shall be used to satisfy the indebtedness owed by the Contractor to any person furnishing labor or materials, or both, for use in performing the Contract Work through the current period applicable to progress payments received from the Contractor before it is used for any other purpose.
- 15.6 In the same manner, payments received by the Contractor from Brookshire for work performed by Contractor's subcontractors shall be dedicated to payment of the subcontractors. Brookshire shall have the right to contact the Contractor's subcontractors and suppliers to determine if payments are being made in accordance with this Contract.
- 15.7 The Contractor and/or Contractor's subcontractors shall not assign this Contract in whole or in part without the written approval of Brookshire. Without in any way limiting the effect of the preceding sentence, the Contractor shall not assign any moneys due or to become due under this Contract without the written approval of Brookshire. Any assignment by the Contractor without the written approval of Brookshire shall be void and Brookshire will give it no effect.

**ARTICLE 16 - PROTECTION OF PERSONS AND PROPERTY:**

- 16.1 Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. He shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to (1) all employees on the work and other persons who may be affected thereby, (2) all the work and all materials and equipment to be incorporated therein, and (3) other property at the site or adjacent thereto. He shall give all notices and comply with all applicable laws, ordinances, rules, regulations and orders of any public authority bearing on the safety of persons and property and their protection from damage, injury or loss. Contractor shall promptly remedy all damage or loss to any property caused in whole or in part by the Contractor, any subcontractor, any sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, except

to the extent damage or loss attributable to the acts or omissions of Brookshire or the Architect or anyone directly or indirectly employed by either of them or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to his obligations under Contract Article 10.

#### ARTICLE 17 - INSURANCE:

- 17.1 Contractor's liability insurance shall be purchased and maintained by the Contractor in a company or companies licensed to do business in the state in which the Project is located to protect him from claims under worker's or workmen's compensation acts and other employee benefit acts, claims for damages because of bodily injury, including death, and from claims for damages, other than to the work itself, to property which may arise out of or result from the Contractor's operations under this Contract, whether such operations be by himself or by any subcontractor or anyone directly or indirectly employed by any of them. This insurance shall be written for not less than the limits of liability stated within this Contract, or required by law, whichever is the greater, and shall include contractual liability insurance applicable to the Contractor's obligations.
- 17.2 Certificates of such insurance shall be filed with Brookshire prior to the commencement of the work. Certificate(s) shall be on AIA G705, 1978, or other form containing same information.
- 17.3 Insurance shall be per the requirements as set forth in attached Exhibit C.
- 17.4 Contractor shall from the date of commencement until date of final acceptance include Brookshire Grocery Company as "Additional Insured" on all Contractors' insurance policies required by this Contract.
- 17.5 Brookshire and Contractor waive all rights against each other for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to this Article or any other property insurance applicable to the work, except such rights as they may have to the proceeds of such insurance held by Brookshire as trustee. Contractor shall require similar waivers in favor of Brookshire and the Contractor by subcontractors and sub-subcontractors.

#### ARTICLE 18 - CHANGES IN THE WORK:

- 18.1 Brookshire, without invalidating the Contract, may order changes in the work consisting of additions, deletions, or modifications, the Contract Sum and the Contract Time being adjusted accordingly. All such changes in the work shall be authorized by written Change Order signed by Brookshire' representative. No Contract Sum adjustments shall be made for any changes performed by the Contractor that have not been authorized in writing by Brookshire.
- 18.2 The Contract Sum and the Contract Time may be changed only by Change Order.

#### ARTICLE 19 - CORRECTION OF WORK:

- 19.1 Contractor shall promptly correct any work rejected by Brookshire as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed, and shall correct any work found to be defective or nonconforming within a period of one year from the Date of Substantial Completion of the Contract or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents. The provisions of this Article 19 apply to work done by subcontractors as well as to work done by direct employees of the Contractor.
- 19.2 If the Contractor's correction or removal of the Work destroys or damages completed or partially completed work of Brookshire, the Contractor, or any Subcontractors, the Contractor shall be responsible for the cost of correcting such destroyed or damaged construction. If the Contractor fails to correct defective or nonconforming Work within a reasonable time after receipt of notice from Brookshire, then Brookshire may correct such Work pursuant to Contract Article 20.
- 19.3 The Contractor shall correct any work found to be defective or nonconforming within a period of one year from the Date of Substantial Completion of the Contract or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract

Documents. The provisions of this Article 19 apply to work done by subcontractors as well as to work done by direct employees of the Contractor.

ARTICLE 20 - TERMINATION OF THE CONTRACT:

- 20.1 If Brookshire fails to make payment for a period of forty-five days, the Contractor may upon seven additional days' written notice to Brookshire terminate the Contract and recover from Brookshire payment for all work executed and for any proven loss sustained upon any materials, equipment, tools, and construction equipment and machinery, including reasonable profit and damages applicable to the Project.
- 20.2 If the Contractor refuses or fails to supply enough properly skilled workers, proper materials, or maintain the Progress Schedule, or fails to make prompt payments to its workers, subcontractors or suppliers, or disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or neglects to carry out the work in accordance with the Contract Documents, or fails to correct any work found to be defective or nonconforming with the Contract Documents, or fails to perform any provision of the Contract, the Contractor shall be deemed in default of this Contract.
- 20.3 If the Contractor defaults or persistently fails or neglects to carry out the work in accordance with the Contract Documents or fails to perform any provision of the Contract, Brookshire, after three days' written notice to commence and continue satisfactory correction of the default with diligence and promptness, then the Brookshire without prejudice to any other rights or remedies, shall have the right to any or all of the following remedies:
1. Supply workers, materials, equipment and facilities as Brookshire deems necessary for the completion of the Contractor's Work or any part which the Contractor has failed to complete or perform after written notification, and charge the cost, including reasonable overhead, profit, attorneys' fees, costs and expenses to the Contractor.
  2. Contract with one or more additional contractors to perform such part of the Contractor's work as Brookshire determines will provide the most expeditious completion of the Work, and charge the cost, including reasonable overhead, profit, attorneys' fees, costs and expenses to the Contractor.
  3. Withhold any payment due or to become due the Contractor pending corrective action in amounts sufficient to cover losses and compel performance to the extent required by and to the satisfaction of Brookshire.
  4. Terminate the Contract and take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor and may finish the work by whatever method he may deem expedient, and if the unpaid balance of the Contract Sum exceeds the expense of finishing the work, such excess shall be paid to the Contractor, but if such expense exceeds unpaid balance, the Contractor shall pay the difference to Brookshire.

ARTICLE 21 - OTHER CONDITIONS OR PROVISIONS:

- 21.1 Contractor shall bear costs for and secure all inspections, tests or approvals required by laws, ordinances, rules, regulations or orders of any public authority having jurisdiction over the work.
- 21.2 Testing called for by the Construction Documents shall be scheduled and secured by the Contractor. Testing shall be accomplished by an Independent Testing Laboratory selected by Brookshire and acceptable to the Contractor. Brookshire shall have the right to call for special testing of any material or procedure at any time to insure its conformance with the Construction Documents. Brookshire shall bear costs for all testing within this subparagraph except that repeat testing resulting from failure of scheduled or special testing shall be deducted from the contract amount.
- 21.3 Contractor shall provide evidence to the satisfaction of Brookshire's Project representative that Contractor has on the job site all Material Safety Data Sheets (MSDS) for all materials and processes necessary for the execution of this Contract prior to commencement of the Work.
- 21.4 Contractor warrants that Contractor will comply with all laws, regulations, and other obligations which pertain to the performance of the Services and its business, including without limitation, OSHA, EPA and Federal Immigration regulations. In addition to the general warranties stated in the preceding sentence, Contractor specifically warrants that Contractor will not knowingly hire or continue to employ individuals to perform the Services who are not authorized to be employed in the United

States; that Contractor will complete on behalf of each employee, including citizens of the United States, permanent residents, and temporary foreign workers, who are used to perform the Services a Form I-9, Employment Eligibility Verification to give evidence that Contractor has complied with the law and the employee's work authorization within three business days of hire; that Contractor will require any employee who will perform the Services to attest that he or she is a citizen of the United States, a lawful permanent resident, or is otherwise authorized to work for Contractor in the United States and to present documentation that constitutes acceptable documents under the law to establish the employee's identity and employment eligibility; that Contractor will physically examine the documentation establishing identity and employment eligibility presented by an employee who will perform the Services as required by law; that Contractor will in a non-discriminatory manner that is not based on the new hire's national origin, citizenship status, race or other characteristic, electronically verify the employment eligibility of employees hired to perform the Services within three business days of the employee starting work using the E-Verify system operated by the U.S. Citizenship and Immigration Services part of the Department of Homeland Security in partnership with the Social Security Administration; retain the Form I-9 for each employee who will perform the Services for the longer of three years after the date of hire or one year after the date employment ends; deliver a copy of the Form I-9 for any employee of Contractor assigned to perform the Services certified by Contractor to be true and correct within three days after Brookshire requests a copy of the form; and allow Brookshire to audit and review Contractor's employment records to verify that Contractor has complied with the requirements of law and this section.

21.5 Right to Audit.

- A. Records for all contracts, specifically including but not limited to the Contract and any other lump sum contracts (i.e. fixed price or stipulated sum contracts), unit price, cost plus or time & material contracts with or without a guaranteed maximum (or not-to-exceed amounts) related to the Project shall upon reasonable notice be open to inspection and subject to audit, scanning, and/or reproduction during normal business working hours. Such audits may be performed by any Brookshire's representative or any outside representative engaged by Brookshire for the purpose of examining such records. Brookshire or its designee may conduct such audits or inspections throughout the term of the Contract and for a period of three years after final payment or longer if required by law. Brookshire's representatives may (without limitation) conduct verifications such as counting employees at the Project site, witnessing the distribution of payroll, verifying information and amounts through interviews and written confirmations with Contractor employees, field and agency labor, subcontractors, and vendors.
- B. Contractor's "records" as referred to in this Amendment shall include any and all information, materials and data of every kind and character, including without limitation, records, books, papers, documents, subscriptions, recordings, agreements, purchase orders, leases, contracts, commitments, arrangements, notes, daily diaries, e-mails, superintendent reports, drawings, receipts, vouchers and memoranda, and any and all other agreements, sources of information and matters that may in Brookshire's judgment have any bearing on or pertain to any matters, rights, duties or obligations under or covered by any Contract Document or related to the Project. Such records shall include (hard copy, as well as computer readable data if it can be made available): written policies and procedures; time sheets; payroll registers; payroll records; cancelled payroll checks; subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, negotiation notes, etc.); original bid estimates; estimating work sheets; correspondence; change order files (including documentation covering negotiated settlements); back-charge logs and supporting documentation; invoices and related payment documentation; general ledger, information detailing cash and trade discounts earned, insurance rebates and dividends; and any other records which may have a bearing on matters of interest to Brookshire in connection with any contractor's dealings with Brookshire or the Project (all foregoing hereinafter referred to as "records") to the extent necessary to adequately permit evaluation and verification of any or all of the following:
  - (i) Compliance with contract requirements for deliverables
  - (ii) Compliance with approved plans and specifications
  - (iii) Compliance with Brookshire's business ethics expectations
  - (iv) Compliance with contract provisions regarding the pricing of change orders
  - (v) Accuracy of contractor representations regarding the pricing of invoices
  - (vi) Accuracy of contractor representations related to claims submitted by the contractor or any of his payees.

- C. In addition, to the normal paperwork documentation the Contractor typically furnishes to Brookshire, in order to facilitate efficient use of Brookshire resources when reviewing and/or auditing the Contractor's records, billings and related reimbursable cost records, the Contractor agrees to furnish the requested information in a computer (PC) readable file format(s) acceptable to Brookshire such as .pdf or Excel.
- D. Contractor shall require all payees (examples of payees include subcontractors, material suppliers, insurance carriers, etc.) to comply with the provisions of this article by including the requirements hereof in a written contract agreement between Contractor and payee. Contractor will ensure that all payees (including those entering into lump sum contracts) have the same right to audit provisions contained in the Contract and this amendment.
- E. Brookshire's authorized representative(s) shall have reasonable access to the Contractor's facilities, shall be allowed to interview all current or former employees to discuss matters pertinent to the performance of this Contract and shall be provided adequate and appropriate work space, in order to conduct audits in compliance with this article.
- F. If an audit inspection or examination in accordance with this article, discloses overpricing or overcharges to Brookshire (of any nature) by the Contractor and/or the Contractor's Subcontractors in excess of \$10,000 in addition to making adjustments for the overcharges, the reasonable actual cost of Brookshire's audit shall be reimbursed to Brookshire by the Contractor. Any adjustments and/or payments which must be made as a result of any such audit or inspection of the Contractor's invoices and/or records shall be made within a reasonable amount of time (not to exceed 90 days) from presentation of Brookshire's findings to Contractor.

This Contract entered into as of the day and year first written above.

By: \_\_\_\_\_  
 Mr. Michael Arnett,  
 EVP and CFO,  
 For: Brookshire Grocery Company.

By: \_\_\_\_\_  
 \_\_\_\_\_  
 (Print Name)  
 \_\_\_\_\_  
 (Printed Title)

For: \_\_\_\_\_

**EXHIBIT A**

**PARTIAL LIEN WAIVER, RELEASE AND AFFIDAVIT OF BILLS PAID**

STATE OF \_\_\_\_\_

§  
§  
§

**KNOW ALL MEN BY THESE PRESENTS:**

COUNTY OR PARISH OF \_\_\_\_\_

THIS PARTIAL LIEN WAIVER RELEASE AND AFFIDAVIT OF BILLS PAID is made as of the

\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by \_\_\_\_\_

(hereinafter referred to as the "Affiant").

For and in consideration of partial payment of all sums and amounts due and payable to Affiant for labor and/or materials furnished by Affiant up to and including the date hereof in connection with any work completed for or in behalf of **Brookshire Grocery Co.**, located upon the real property located at

**\*\*\* Brookshire's #006, 212 East Coke St., Winnsboro, Texas 75494 \*\*\***

and improvements located thereon (hereinafter referred to as "Property"), the receipt and sufficiency of which consideration as hereby acknowledged, Affiant hereby waives and releases any lien, claim of lien or right to perfect a lien claim which Affiant may currently or in the future have on Property relating to labor and/or materials furnished by the Affiant and/or its agents, subcontractors, suppliers, material-men and/or employees up to and including the date hereof.

Affiant does hereby agree to indemnify and hold harmless Brookshire Grocery Co. and their legal representatives, agents, assigns and successors (hereinafter referred to as "Brookshire"), from and against any and all actions and causes of action, claims, demands, liabilities, losses, damages or expenses, including, but not limited to, reasonable attorney's fees (hereinafter referred to as "Claims"), which Brookshire may sustain or incur by reason or consequence of any claims asserted by Affiant or its agents, subcontractors, suppliers, material-men and/or employees for labor and/or materials furnished as aforesaid up to and including the date hereof.

It is expressly agreed and understood that this is a partial lien waiver and release and that this instrument shall in no way release Property from any lien, claim of lien or right to perfect a lien claim which Affiant may have on Property related to labor and/or materials furnished by the undersigned after the date hereof.

Upon receipt by Affiant of check(s) in the amount of \$ \_\_\_\_\_ for payment of

Invoice(s)# \_\_\_\_\_

and when the aforesaid check has been properly endorsed and has been paid by the bank upon which it is drawn, this document becomes effective.

The undersigned hereby further certifies having authorization and empowerment to execute this instrument on behalf of Affiant and that the foregoing information is true and correct and acknowledges that Brookshire shall place material reliance on the accuracy of such information.

EXECUTED as of the date first written above.

Signature: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

This instrument was acknowledged before me on the

\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_,

My Commission Expires: \_\_\_\_\_.

Notary Public, State of \_\_\_\_\_

Signature: \_\_\_\_\_

Notary's Printed Name: \_\_\_\_\_



## EXHIBIT C

Insurance and bonding is required to be written for not less than the following, or greater if required by law:

Brookshire Grocery Co. must be listed on Certificate of Insurance as "Additional Insured".

Proof of WORKERS COMPENSATION INSURANCE Coverage must be furnished to Brookshire before commencement of work.

BID BOND is not required.

PERFORMANCE BOND and LABOR AND MATERIAL PAYMENT BOND are not required.

(1) Workers Compensation Insurance & Employers Liability Insurance

- a. State Statutory
- b. Employer's Liability \$ 1,000,000

(2) Comprehensive General Liability (including Premises-Operations; Products and Completed Operations; Property Damage - Including Completed Operations):

- a. Bodily Injury:
  - \$ 1,000,000 Each Occurrence
  - \$ 1,000,000 Aggregate, Products & Completed Operations
- b. Property Damage:
  - \$ 1,000,000 Each Occurrence
  - \$ 1,000,000 Aggregate

OR \$ 1,000,000 Combined Single Limit Bodily Injury and Property Damage

- c. Products and Completed Operations Insurance shall be maintained for a minimum period of 2 years after Final Payment and Contractor shall continue to provide evidence of such coverage to Brookshire on an annual basis during the aforementioned period.

- d. Property Damage Liability Insurance shall include coverage for the following hazards:
  - X (Explosion)
  - C (Collapse)
  - U (Underground)

e. Contractual Liability (Hold Harmless Coverage):

- 1. Bodily Injury:
  - \$ 1,000,000 Each Occurrence
- 2. Property Damage:
  - \$ 1,000,000 Each Occurrence
  - \$ 1,000,000 Aggregate

OR \$1,000,000 Combined Single Limit Bodily Injury and Property Damage

(3) Comprehensive Automobile Liability  
(Owned, non-owned, hired):

- a. Bodily Injury:
  - \$ 1,000,000 Each Person
  - \$ 1,000,000 Each Accident
- b. Property Damage:
  - \$ 1,000,000 Each Occurrence

OR \$ 1,000,000 Combined Single Limit Bodily Injury and Property Damage



**EXHIBIT D**

XXX Quote

- *END OF SECTION 00700* -

## SECTION 01000 SCOPE OF WORK

This SCOPE OF WORK is intended to serve as a means of clarification and coordination of the project requirements, timing and execution required of the Construction Manager and his Sub-Contractors referred to in the Drawings and Specifications as "Contractor" or "General Contractor", and Brookshire Grocery Company referred to in the Drawings and Specifications as "Brookshire's", "Owner", "Others", "Not-in-Contract" and like indications of work not to be by Contractor.

General Contractor shall be responsible for construction of Remodel of Brookshire's Food Store #006, Winnsboro, Texas, in compliance with the Contract Documents as follows:

### DIVISION I - GENERAL REQUIREMENTS

Codes and Authorities - All construction shall be in conformance with the Laws and Ordinances of the City of Winnsboro, State of Texas, and with the latest edition (unless edition is specifically noted or otherwise specified by the Jurisdictional Authority) of the following standards and all standards referred to within this specification:

- International Building Code - 2015
- International Fuel Gas Code - 2015
- International Mechanical Code - 2015
- International Plumbing Code - 2015
- International Fire Code - 2015
- International Energy Compliance Code - 2015
- National Electrical Code - 2014
- American Society of Heating, Refrigeration and Air Conditioning Engineers
- Occupational Safety and Hazards Act
- National Fire Protection Association

In the event of a discrepancy within the Drawings and Specifications, and/or with the minimum requirements of codes, laws and authorities, the Work shall meet the most stringent requirement.

General Contractor will take appropriate precautions to protect the general public and all who are involved with and about the work, by providing barriers, barricades, signs, and warning devices around the entire construction area at all times.

Vehicular access to the site by the Contractor shall be limited to direct access at the "Stabilized Entrance(s)" location(s) to the Brookshire's Property as indicated on the Drawings. General Contractor shall insure that no construction traffic enters or exits by crossing properties other than Brookshire's Ownership.

Entrance, exit, vehicular movement, parking, material storage, layout, i.e. all activities related to this project shall be confined to Brookshire's Ownership which is defined by property lines on the Drawings. Access to and on any other Ownerships is specifically prohibited unless related to actual Work required on those properties, or permission has been agreed to in writing with the true property owner.

No construction related vehicles will be parked on public street or highway Right-of-Ways. Traffic shall not be blocked or otherwise hampered on public right-of-ways by this work, except as may be necessitated by required construction operations within those elements.

Testing Laboratory Control: As provided in Section 01400 as applicable to all portions of the work.

Permits & Inspections: Brookshire's will furnish the Building Permit. General Contractor shall obtain all other required permits, and schedule and secure inspections required for the work from appropriate agencies; shall properly Display/Retain at the project at all times: and surrender original documents and/or transfer usury as appropriate for the benefit of continuation of the Buildings and Improvements project as required.

Permanent Utilities Security Deposits and Impact Fees, when required, shall be paid by Brookshire's. Permanent utilities bills shall be assumed by Brookshire's upon acceptance at Substantial Completion.

Cleanup shall be a continuous operation. Accumulation will not be allowed on limits of project, except within dumpsters or similar trash holding devices that shall not be overfilled. Do not allow debris to blow or otherwise move to other properties.

Any requirement of the Drawings and Specifications not specifically excluded by SCOPE OF WORK or clearly indicated as excluded within the Drawings and Specifications is work to be performed by the General Contractor.

#### DIVISION II - SITEWORK

Site Preparation: The Contractor shall examine site to ascertain present conditions. Allow for variance in existing grades indicated on the Drawings caused by normal erosion and terrain variation. All items in Division II, Sitework are by General Contractor including all Storm Water Pollution Prevention Work as indicated in the Construction Documents or as directed by inspection reports.

Topsoil, seeding and sodding: All by General Contractor.

Site Improvements: All work called for in the Drawings and specified within the limits of this property is by the General Contractor. Pavement striping and topsoil are by General Contractor.

#### DIVISION III - CONCRETE

All by General Contractor.

#### DIVISION IV - MASONRY

All by General Contractor.

#### DIVISION V - METALS

All by General Contractor.

#### DIVISION VI - WOOD AND PLASTICS

All by General Contractor.

#### DIVISION VII - THERMAL AND MOISTURE PROTECTION

All by General Contractor.

#### DIVISION VIII - DOORS AND WINDOWS

Doors, Frames, and Hardware: All exterior and interior doors, frames and hardware including automatic doors are by General Contractor.

Glazing: All glazing by General Contractor.

Storefronts: All by General Contractor.

Automatic sliding entrance doors furnished and installed by General Contractor. Furnished by Door Control Services, Inc. ONLY, (800) 356-2025, Contact: Aubrey Alderman.

Overhead doors, dock doors, dock leveler and dock seals furnished and installed by General Contractor. Furnished by Overhead Door Co. of Tyler ONLY, (903) 561-3483, Contact: Ken Townsend.

#### DIVISION IX - FINISHES

All by General Contractor with the following exceptions:

- All Gerflor materials shall be furnished by Brookshire's F.O.B. Job Site and installed by the General Contractor.

#### DIVISION X - SPECIALTIES

All by General Contractor with the following exceptions:

- Interior décor shall be furnished and installed by Brookshire's contractor.
- Exterior signage shall be furnished and installed by Brookshire's contractor.
- Fire Extinguishers and Cabinets: All by General Contractor for permanent building installation. American Fire Protection shall be proprietary contractor.

#### DIVISION XI - EQUIPMENT

All indicated on the Drawings and Specifications as incorporated in the Work shall be furnished by Brookshire's F.O.B. Job Site, unloaded and installed by General Contractor.

Examples of equipment are:

- Store Sales, Checkstands and Services Equipment. Any electrical connections by Electrical Contractor.
- Stainless Steel Tables not containing Sinks listed on the Plumbing Fixture Schedule.
- Gondolas, Storage Shelving and Product Movement Devices.

The Underground Fuel Tank shall be furnished by Brookshire's F.O.B. Job Site, unloaded and installed by Brookshire's fuel contractor.

The following equipment shall be furnished and installed by Brookshire's fuel contractor are:

- Fuel piping, fuel dispensers, and monitoring & control systems equipment. General Contractor shall furnish all electrical systems, devices and control wiring indicated on the Drawings.

Cooler and Freezer doors, wall and ceiling panels shall be furnished and installed by Brookshire's refrigeration contractor. General Contractor shall make provisions for scheduling and coordination of this trade in appropriate timing of the Work.

#### DIVISION XII - FURNISHINGS

Store Fixtures: All furnished by Brookshire's, unloaded and installed by General Contractor. Electrical and Plumbing connections to fixtures furnished by Brookshire's and indicated in the Drawings and Specifications are by General Contractor.

#### DIVISION XIII - SPECIAL CONSTRUCTION

All by General Contractor.

#### DIVISION XIV - CONVEYING SYSTEMS

All by General Contractor.

## DIVISION XV - MECHANICAL

All Heating, Ventilation and Air Conditioning (HVAC), Plumbing, and Fire Protection by General Contractor, except for RTU-1 as follows:

- RTU-1 unit shall be furnished by Brookshire's F.O.B. Job Site and installed by the General Contractor. Brookshire's will furnish unit and opening dimensional information and Contractor shall coordinate shop drawings and schedule of installation. RTU-1 shall replace existing RTU-1 and shall set on the existing curb to remain.
- General Contractor shall furnish and install all ductwork, condensate drain lines, thermostats and thermostat control wiring. Termination of thermostat control wiring at CPC shall be by Brookshire's subcontractor.
- Hood Suppression System shall be furnished and installed by General Contractor. American Fire Protection shall be proprietary contractor. General Contractor shall supply tap from nearest Automatic Sprinkler Fire branch line for each Type I hood system and coordinate schedule of installation.

Store Product Refrigeration Equipment:

- All cases and condensers shall be furnished by Brookshire's F.O.B. Job Site; unloaded and installed by Brookshire's Refrigeration Contractor.
- Brookshire's shall coordinate schedule of installation with General Contractor.
- All support racks or other devices as detailed on the Drawings are provided by General Contractor.
- Refrigeration Contractor to furnish, install and terminate all control wiring indicated on the Drawings.
- All required equipment and/or materials necessary for refrigeration equipment penetrations through roof, floor and walls shall be cut, patched and sealed by General Contractor and cost borne by Refrigeration Contractor. The General Contractor shall furnish and install all fire stopping and/or proofing as required by code and cost borne by the Refrigeration Contractor.
- Plumbing connections shall be by General Contractor.
- Electrical connections for refrigerated cases shall be furnished and installed by General Contractor.

## DIVISION XVI - ELECTRICAL

All by General Contractor as indicated on the Drawings, excluding the following by Brookshire's:

- All light fixtures shall be furnished by Brookshire's F.O.B. Job Site and installed by the General Contractor.
- Generator and Automatic Transfer Switch shall be furnished by Brookshire's F.O.B. Job Site and installed by the General Contractor.
- Computerized Lighting, HVAC, and Store Product Refrigeration Control Systems.
- Cash Registers and Computer Systems.
- Telephone System, Camera and Security Systems, except Fire Alarm System is by General Contractor.

## SUBSTANTIAL COMPLETION:

The following are the minimum requirements for Brookshire's to consider the Project substantially complete.

- All paving, curbs, sidewalks, ramps, and sitework elements complete, except for pavement markings, landscaping and irrigation.
- All permanent utilities shall be connected.
- All Building elements complete, except minor trim, touch-up, final inspections, etc.
- All Electrical Devices, Lighting, Plumbing Fixtures & Devices, HVAC complete and operating, except for Air Balancing.

- All Finish Materials applied in areas to receive Fixtures and Equipment to be furnished by Brookshire's. Building swept clean with dust and debris removed.
- Temporary fencing, utilities, and facilities not necessary for completion of the work shall be removed from the site.
- Site clean of all trash debris, excess materials, etc.
- Loading dock equipment complete and fully functional.
- Fire protection system shall be complete, tested and in operation.

Upon acceptance as substantially complete, Brookshire's shall change all building locksets and maintain control of all access to building. Contractor shall coordinate remaining work to be accomplished within a 40 hour work week as established by Brookshire's.

*- END OF SECTION 01000 -*

## SECTION 01100

### ROOF SUMMARY

#### PART 1 - GENERAL

##### 1.01 WORK COVERED BY CONTRACT DOCUMENTS:

- A. Work consists of roof for a building addition at the Brookshire's #006 facility located at 212 E. Coke Street, Winnsboro, Texas 75494.

##### 1.02 CONTRACTS:

- A. Construct work under single Lump-sum Contract.

##### 1.03 WORK SEQUENCE:

- A. Sequence and stage reroofing work in accordance with reroofing phasing plans approved by Owner and General Contractor.

##### 1.04 CONTRACTOR'S USE OF PREMISES:

- A. Confine operations at site to areas permitted by Law, Ordinances, and Permits and to Limits of Contract as shown on Contract Documents.
- B. Do not unreasonably encumber site with materials or equipment.
- C. Do not load structure with weight that will endanger structure.
- D. Assume full responsibility for protection and safekeeping of products stored on premises.
- E. Move stored products which interfere with operations of Owner.
- F. Obtain and pay for use of additional storage or work areas needed for operations.
- G. Coordinate use of premises under direction of General Contractor.
- H. Limit use of each site for Work and storage as follows:
  - 1. Restrict Work to areas indicated on Drawings.
  - 2. Store materials off site or on site in areas approved by Owner.
  - 3. Access site in areas approved by Owner.
  - 4. Restrict parking to specific areas of existing parking lots as approved by Owner.
  - 5. Restrict location of hoisting equipment to areas as approved by Owner.
  - 6. Do not allow construction traffic on existing roof membranes except as absolutely necessary to perform new work. Protect existing roof membrane from damage.
- I. Maintenance of Access and Operations:
  - 1. Do not perform operations that would interrupt or delay Owner's daily operations.
  - 2. Maintain access to existing building, facilities, parking, streets and walkways; especially fire lanes. Do not obstruct entrances or loading docks.
  - 3. Schedule operations with General Contractor in such a manner as to allow Owner operations to continue with minimum interruption.
  - 4. During period of construction, do not obstruct in any manner existing exit ways of Owner-occupied areas.
- J. Maintenance of Existing Services:
  - 1. Do not disrupt existing utility services to existing buildings.
  - 2. Maintain environmental control in existing buildings, especially temperature, humidity and dust control.
- K. Building Access:
  - 1. Contractor will not have access to building interior except as necessary to perform work and check for leaks, unless otherwise approved by Owner.

2. Access to roof construction areas shall be by way of exterior ladder or scaffolding installed on face of building in location(s) as approved by Owner.
3. Access to roof construction areas for delivery of materials shall be by way of exterior hoists on face of building in location(s) as approved by Owner.
4. When keys to locked areas are needed to perform work, obtain from staff member designated by Owner. Return keys at designated time.

**1.05 OWNER OCCUPANCY:**

- A. Owner will occupy premises during entire period of construction for the conduct of Owner's normal, daily operations. Coordinate with General Contractor in all construction operations to minimize conflict and to facilitate Owner usage.
- B. Roofing Contractor shall conduct his operations so as to insure least inconvenience to Owner's operation.
- C. Roofing Contractor shall take precautions to avoid excessive noise or vibration that would disturb Owner's operations. When directed by General Contractor, Roofing Contractor shall perform certain operations at designated time of day or night in order to minimize disturbance to Owner's operations.
- D. Roofing Contractor shall take all necessary precautions to assure a watertight condition in the operating portion of the building during construction.

**1.06 OVERTIME WORK:**

- A. Contract shall include necessary overtime work on weekends and other times as required to complete the work within the Contract Time.

**PART 2 – NOT APPLICABLE**

**PART 3 – NOT APPLICABLE**

**END OF SECTION 01100**



SECTION 01255  
**REQUEST FOR INFORMATION**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Request for Information (RFI) procedures.

**DEFINITION:**

Request for Information (RFI) – A formal process used during the construction phase to facilitate communication between the Construction Contractor, Brookshire's and/or a Consultant designated by Brookshire's with regard to requests for additional information and clarification of the intent of the Contract Documents (Drawings and Specifications).

Construction Contractor – Construction Manager or General Contractor employed by the Owner to construct the site and building as directed by the Drawings and Specifications.

**PROCEDURE:**

Subcontractors, manufacturers and suppliers shall submit request for additional information and clarification to the Construction Contractor.

Construction Contractor shall contact Brookshire's with requests for additional information or clarification by the use of the project website. Brookshire's will not accept requests for information or clarification submitted directly from subcontractors, manufacturers or suppliers. Submit one Request for Information per posted form on the website.

When an RFI is posted to the project website, the originator will need to select the following people to be notified:

- Originator
- Keith Lybrand
- Lorne Burris
- Aaron Kuntzman

Brookshire's will provide response to Construction Contractor or will submit Request for Information to the appropriate Consultant.

Brookshire's or Consultant will review formal requests from Construction Contractor with reasonable promptness and Construction Contractor will be notified by response through the project website. Brookshire's or Consultant's response shall not be considered as a Change Order or Change Directive, nor does it authorize changes in the Contract Sum or Contract Time.

Construction Contractor shall be responsible to maintain a log of Requests for Information sent to and responses from Brookshire's.

*- END OF SECTION 01255 -*

## SECTION 01300 SUBMITTALS

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### REQUESTS FOR SUBSTITUTION OF PRODUCTS:

Within 30 days after the contract has been executed, Brookshire's will consider a written request for the substitution of products in place of those specified, unless the product is specifically noted as "No substitutes" and/or "No equals", and then only under the conditions set forth below. Brookshire's reserves the right to reject any product solely on the basis of preference.

By making requests for substitutions, the Contractor:

- Represents that he has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified.
- Represents that he will provide the same warranty for the substitution that is required for the specified.
- Will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.
- Represents that should a substitution be accepted and should this substitute prove to be defective or otherwise unsatisfactory within the one year guarantee period, the Contractor shall replace the substitute material with that specified and bear all costs incurred thereby.

### PROGRESS SCHEDULE:

Within 15 days after the contract has been executed, Contractor shall submit a Critical Path Method (CPM) progress schedule, acceptable to Brookshire's, which indicates the time of starting, duration, and time of completion of the elements of construction. This schedule shall be revised monthly to reflect the changes that have occurred or are anticipated. "Bar-Chart" is not acceptable.

### SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES:

In accordance with GENERAL CONDITIONS, the Contractor shall review and approve all Shop Drawings, Product Data, and Samples. The Contractor's review represents that he has determined and verified all materials, field measurements, and related field construction criteria and that he has checked and coordinated the information contained in each submittal with the requirements of the Work and the Contract Documents.

Following his review and appropriate noting of any changes or corrections necessary, the Contractor shall post approved Shop Drawings, Product Data and Samples Correspondence to the project website and actual Samples shall be sent directly to Brookshire's to be reviewed for general arrangement, design, size, color, finish, etc.

When a shop drawing or submittal is posted to the project website, the originator will need to select the following people to be notified:

- Originator
- Keith Lybrand
- Lorne Burris
- Aaron Kuntzman

Contractor shall not be relieved of responsibility from the requirements of the Contract Documents by the review and approval of a submittal which contains deviations, unless the Contractor specifically informed Brookshire's in writing at the time of submission and Brookshire's has given written approval to the specified deviation.

All shop drawings shall have cross-references to the Drawings and Specifications and shall specifically note item(s) by the same numbers, marks, detail numbers, etc.

**SAMPLES:**

All Samples and Product Data to be submitted to Brookshire's shall contain a permanent label with the following information:

- Job Name and Project Number
- Related Specification Section
- The Manufacturer
- The Supplier
- The Model, Serial, or Series Number
- Indicate Color or range of colors for selection or confirm color when specified

**MAINTENANCE MANUALS:**

Upon completion of the work and as a condition prior to the issuance of the certificate for final payment, the contractor shall deliver to Brookshire's 2 bound copies of a maintenance manual presenting full details for the care, operation and maintenance of all equipment furnished by the Contractor. Include copies of manufacturer's warranties or guarantees.

**RECORD DRAWINGS:**

Contractor shall maintain at the site one record copy of all drawings. In the event any work is not installed as indicated on the Drawings, such work shall be carefully drawn in a legible manner on these prints.

All changes shall be accurate, up-to-date, and dimensioned. Locations and depths of all buried or concealed pipe lines, conduits, and similar items, and all work which is installed differently from the location or manner indicated by the Drawings, shall be shown on the record drawings.

Upon completion of the work and as a condition prior to the issuance of the certificate for final payment, the contractor shall deliver to Brookshire's one complete set of corrected prints, in good condition, with complete installation and every change in the work indicated thereon.

*- END OF SECTION 01300 -*

## **SECTION 01314**

### **ROOF PROJECT MEETINGS**

#### **PART 1 - GENERAL**

##### **1.01 PRE-CONSTRUCTION CONFERENCE:**

- A. A pre-construction conference will be held at each site at a time and date to be designated by the General Contractor.
- B. Representatives of the Roofing Contractor, including project superintendent, shall meet with General Contractor or his appointed representative.
- C. As a minimum, the following items will be on meeting agenda:
  - 1. Review of Contract, insurance and Schedule of Values.
  - 2. Designation of key personnel.
  - 3. Communications.
  - 4. Construction Schedule and phasing plan.
  - 5. Job site conditions and requirements:
    - a. Use of site and restrictions.
    - b. Temporary services and controls.
    - c. Existing facilities and maintenance of operation, use of site.
    - d. Construction procedures.
    - e. Daily completion procedures (night seal).
    - f. Weather restrictions.
    - g. Notification procedures.
    - h. Quality control.
    - i. Project record documents procedures.
    - j. Final inspection.
  - 6. Submittals Review.

#### **PART 2 - NOT APPLICABLE**

#### **PART 3 - NOT APPLICABLE**

**END OF SECTION 01314**

SECTION 01320  
**CONSTRUCTION PROGRESS DOCUMENTATION**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**CONSTRUCTION PROGRESS CHART:**

Progress of the Project will be monitored using bar charts. Requirements herein provide for planning and execution of the Work and are to assist the Brookshire's Project Manager in evaluating progress of the Work economically and chronologically.

Construction Contractor shall coordinate delivery of all items specified as furnished by Brookshire's with progress of the Work.

Prior to construction, the Construction Contractor shall provide a Bar Chart of all work to be performed with all information. Brookshire's will review the schedule prior to implementation. Upon approval by Brookshire's, Bar Chart shall become the "Approved Construction Bar Chart" by which the Construction Contractor shall plan, organize, direct, coordinate and execute the Work, and the basis of evaluating progress of the Work.

If, in the opinion of Brookshire's, any of the dates specified on the "Approved Construction Bar Chart" are not completed by the Construction Contractor on or before the stated time period and after 48 hours written notice to the Construction Contractor, Brookshire's may proceed to carry out the work in accordance with ARTICLE 20 of the Contract and General Conditions, except that both 7 day notices do not apply in this particular situation.

The Construction Contractor shall perform work directed by the Brookshire's Project Manager to meet the contract completion date and shall maintain the original management and supervision team to continue their office and job site duties on a full-time basis through Grand Opening and/or any other time the Construction Contractor has any work being performed on the project regardless of the date or condition of the project completion.

**CONSTRUCTION SCHEDULE:**

The Construction Contractor shall develop a detailed Construction Schedule with activity time duration in calendar days further describing his method of performing the Work. This schedule shall be a bar chart with enough detail to clearly represent work flow and areas to be completed. The Construction Contractor shall review their schedule with the Brookshire's Project Manager within 3 weeks from Notice to Proceed, or at the Pre-Construction Meeting, whichever is first. Failure of the Construction Contractor to have a construction schedule approved by Brookshire's will be considered cause to withhold progress payments.

Critical Path activities shall be indicated on the Construction Contractor's detailed construction schedule.

**SCHEDULE UPDATES:**

The Construction Contractor shall provide to the Brookshire's Project Manager regular updated reports on the Construction Schedule as determined by the Brookshire's Project Manager. The Construction Contractor shall maintain a current weekly updated detailed construction schedule in the site construction field office. Progress information to be included in the schedule updates includes actual start and finish dates, percentage complete, remaining duration or projected finish dates for all activities in progress during reporting period. Schedule updates may also include approved added activity descriptions. Updates to the schedule shall not change any dates or the contract completion dates.

Periodically, at times to be determined by Brookshire's, the Brookshire's Project Manager will visit the job site for a meeting with the Construction Contractor and Superintendent. This meeting is to review progress to date and to project upcoming work.

**RECOVERY PLAN:**

Should the "Approved Construction Bar Chart" show the Construction Contractor to be behind schedule, the Construction Contractor shall immediately devise a plan for recovery of lost time within one week and submit it to the Brookshire's Project Manager for approval. Once approved by Brookshire's, the Construction Contractor shall immediately put the recovery plan into action.

During the period covered by the recovery plan, the Construction Contractor's progress will continue to be monitored against the "Approved Construction Bar Chart". If the Construction Contractor does not recover from delay as detailed in the recovery plan, Brookshire's may exercise the option to carry out the work as specified above.

The Construction Contractor shall bear all costs and expenses related to recovery from the Construction Contractor's delay, including costs and expenses.

*- END OF SECTION 01320 -*

## SECTION 01330

### ROOF SUBMITTAL PROCEDURES

#### PART 1 - GENERAL

##### 1.01 GENERAL:

- A. Submit to the General Contractor; Shop Drawings, Product Data and Samples required by Specification sections. Submittals shall include:
  - 1. Shop Drawings of insulation and roof application for each building or site.
  - 2. A single submittal of Product Data and Samples for each specified product or system.

##### 1.02 RELATED REQUIREMENTS:

- A. Project Record Documents - Section 01700.

##### 1.03 SHOP DRAWINGS:

- A. Original drawings, prepared by Roofing Contractor, subcontractor, supplier or distributor, which illustrate some portion of the Work, showing fabrication, layout, setting or erection details, prepared by a qualified detailer. Reproduction and use of Contract Drawings are prohibited.
- B. Reproduction for submittals: Opaque prints.

##### 1.04 PRODUCT DATA:

- A. Manufacturer's standard schematic drawings:
  - 1. Modify drawings to delete information which is not applicable to project.
  - 2. Supplement standard information to provide additional information applicable to project.
- B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data:
  - 1. Clearly mark each copy to identify pertinent materials, products or models.
  - 2. Show dimensions and clearances required.
  - 3. Show performance characteristics and capacities.
  - 4. Show wiring diagrams and controls.

##### 1.05 SAMPLES:

- A. Physical examples to illustrate materials, equipment and workmanship, and to establish standards by which completed Work is judged.

##### 1.06 CONTRACTOR RESPONSIBILITIES:

- A. Review Shop Drawings, Product Data and Samples prior to submission. Initial, sign or stamp each submittal item certifying that Roofing Contractor has reviewed submittal items prior to submission for review.
- B. Verify:
  - 1. Field measurements.
  - 2. Field construction criteria.
  - 3. Catalog numbers and similar data.
- C. Coordinate each submittal with requirements of Work and of Contract Documents.
- D. Roofing Contractor's responsibility for errors and omissions in submittals is not relieved by the Architect's review of submittals.
- E. Roofing Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by the Architect's review of submittals.
- F. Notify the Architect, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.

- G. Begin no work which requires submittals until return of submittals with Architect's initials or signature indicating review and indication to proceed as noted.
- H. After Architect's review, distribute copies.

**1.07 SUBMISSION REQUIREMENTS:**

- A. Schedule submissions to General Contractor immediately after Contract Award.
- B. Submit electronic copies of Shop Drawings.
- C. Submit electronic copies of Product Datum.
- D. Submit 2 of each Sample, unless otherwise specified.
- E. Accompany submittals with transmittal letter, containing:
  - 1. Date.
  - 2. Project title and number.
  - 3. Contractor's name and address.
  - 4. The number of each Shop Drawing, Product Datum and Sample submitted.
  - 5. Notification of deviations from Contract Documents.

**1.08 RE-SUBMISSION REQUIREMENTS:**

- A. Shop Drawings:
  - 1. Revise initial drawings as required and re-submit as specified for initial submittal.
  - 2. Indicate on drawings any changes which have been made, other than those requested by the Architect.
- B. Product Data and Samples: Submit new datum and samples as required for initial submittal.

**1.09 DISTRIBUTION OF SUBMITTALS AFTER REVIEW:**

- A. Architect will retain copies of approved or corrected Shop Drawings and Product Datum.
- B. General Contractor shall distribute copies of Shop Drawings and Product Datum which carry Architect's approval, as required for construction, including Roofing Contractor's file, jobsite file, subcontractors, suppliers and fabricators.

**PART 2 - NOT APPLICABLE**

**PART 3 - NOT APPLICABLE**

**END OF SECTION 01330**



## SECTION 01351

### ROOF ALTERATIONS PROJECT PROCEDURES

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. Procedural requirements for alterations work.
- B. Selective demolition.

##### 1.02 DESCRIPTION:

- A. Summary: The procedures and administrative requirements of this Section apply to all of the following Sections of the Specifications which are involved in alterations to the existing building.
- B. Extent Notes: Cut into or partially remove portions of the existing building as necessary to make way for new construction. Include such work as:
  - 1. Cutting and removing of items shown to be cut or removed.
  - 2. Cutting or removing of items not shown to be cut or removed, but which must be cut or removed to allow the new work to proceed. Work or items which are to remain in the finished work shall be patched or reinstalled after their cutting or removing, and their joints and finishes made to match adjacent or similar work.
  - 3. Removal of existing surface finishes as needed to install new work and finishes.
  - 4. Removal of abandoned items and removal of items serving no useful purpose, such as abandoned piping.
  - 5. Repair or removal of dangerous or unsanitary conditions resulting from alterations work.

##### 1.03 ALTERATIONS, CUTTING AND PROTECTION:

- A. Extent:
  - 1. Cutting and removing work shall be performed so as not to cut or remove more than is necessary and so as not to damage adjacent work.
  - 2. Conduct work in such a manner as to minimize noise and to minimize accumulation and spread of dirt and dust.
- B. Protection:
  - 1. Protect remaining finishes, equipment, and adjacent work from damage caused by cutting, removing and patching operations. Protect surfaces which will remain a part of the finished work.
  - 2. Cover existing walls where necessary to prevent damage from products delivery and construction operations.
  - 3. During demolition, cutting and construction provide positive dust-control by completely sealing openings to Owner occupied areas with temporary seals so as to prevent spread of dust and dirt to interior areas.
  - 4. After materials are installed, properly protect Work until final acceptance.
  - 5. Any damage resulting from construction operations shall be repaired by the General Contractor without cost to the Owner.
- C. Debris:
  - 1. Remove debris promptly from the site each day in accordance with Section 01505. Removed material becomes property of the General Contractor. Load removed material directly on trucks for removal from site. Dispose of removed material legally. Do not burn on site. Do not allow debris to enter sewers.
  - 2. Do not let piled material endanger structure.

#### **1.04 PATCHING, EXTENDING AND MATCHING:**

- A. Patching:
  - 1. In areas where any portion of an existing finished surface is damaged, lifted, stained, or otherwise made to be imperfect, patch or replace the imperfect portion of the surface with matching material.
  - 2. Provide adequate support or substrate for patching.
- B. Quality:
  - 1. In the Sections of the product and execution Specifications which follow these General Requirements, no concerted attempt has been made to describe each of the various existing products that must be used to patch, match, extend or replace existing work. Obtain all such products in time to complete the Work on schedule. Such products shall be provided in quality which is in no way inferior to the existing products.
  - 2. The quality of the products that exist in the building, as apparent during pre-bid site visits, shall serve as the Specification requirement for strength, appearance, and other characteristics.
- C. Transitions:
  - 1. Where new work abuts or finishes flush with existing work, make the transition as smooth and uniform as possible. Patched work shall match existing adjacent work in texture and appearance so as to make the patch or transition invisible to the eye at a distance of 3 ft.
  - 2. Where masonry, or other finished surface, is cut in such a way that a smooth transition with new work is not possible, terminate the existing surface in a neat manner along a straight line at a natural line of division and provide trim appropriate to the finished surface.
- D. Matching: Restore existing work that is damaged during construction to a condition equal to its condition at the time of the start of the Work.

#### **1.05 REPAIR:**

- A. Replace work damaged in the course of alterations, except at areas approved by the Architect for repair.
- B. Where full removal of extensive amounts of almost-suitable work would be needed to replace damaged portions, then filling, straightening, and similar repair techniques, followed by finishing, will be permitted.
- C. If the repaired work is not brought up to the standard for new work, the Architect will direct that it be cut out and replaced with new work.

#### **1.06 SELECTIVE DEMOLITION**

- A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations.

**PART 2 – NOT APPLICABLE**

**PART 3 – NOT APPLICABLE**

**END OF SECTION 01315**

SECTION 01400  
**TESTING LABORATORY CONTROL**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

An Independent Testing Laboratory, selected by Brookshire's and to whom the Contractor has no reasonable objection, will perform professional testing and inspection services as called for in the Drawings and Specifications.

Contractor shall include in his bid scheduling of testing, interruption or delays in the work to allow for testing and analysis.

Laboratory personnel will inspect and/or test materials, assemblies, specimens, and work performed including design mixes, methods and techniques as specified and report to Brookshire's the progress thereof. Copies of reports will be furnished to the Contractor. Distribution of copies to other interested parties by the Testing Laboratory is at the discretion of Brookshire's.

If material furnished and/or work performed fails to meet requirements of Contract Documents, inspector shall promptly notify both Contractor and Brookshire's of such failures.

Testing Lab Representative is not authorized to revoke, alter, relax, enlarge, or release any requirement of Contract Documents, or to approve or accept any portion of work, unless specific authorization is given in writing to Contractor and Testing Laboratory by Brookshire's.

Lab technicians shall not act as foremen or perform other duties for the Contractor. Work will be checked as it progresses, but failure to detect any defective work or material shall not, in any way, prevent later rejection when such defects are discovered.

All testing shall be at the expense of Brookshire's with the exception of:

- testing specifically noted in the Construction Documents as furnished by Contractor;
- re-testing of unsatisfactory, failed or otherwise defective work;
- testing called for by the contractor which is not required by the Construction Documents or authorized by Brookshire's shall be at the expense of the Contractor. If the Contractor persistently fails to notify laboratory of delay or cancellation of operations for which testing has been scheduled, Brookshire's shall deduct appropriate amount for trip charges and time lost by laboratory from the Contract amount.

Brookshire's reserves the right to call for additional testing at any time to insure the quality of the work.

**REQUIREMENTS OF REGULATORY AGENCIES:**

If laws, rules, ordinances, regulations, or orders of any public authority having jurisdiction require testing and/or inspection other than that outlined herein, Contractor shall arrange for such testing and/or inspection and give Brookshire's timely notice so he may observe such testing and/or inspection.

Laboratory shall perform tests in accordance with Building Codes, Local Code Authorities, State Regulations and the Specifications of the American Society for Testing and Materials (ASTM), Texas Department of Highways and Public Transportation Standard Specifications and Bulletins (TSDHPT), and other respective technical societies as referenced in Specifications.

**REFERENCE STANDARDS:**

ASTM E 329-72 - Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as used in Construction.

## CERTIFICATES OF INSPECTION AND TESTING:

Laboratory shall mail one copy of each inspection/test report to:

- Brookshire's Facility Services Office
- Structural Engineer of Record
- General Contractor
- Building Official, Contractor(s), Materials Supplier(s), etc. when designated by Brookshire's

## RESPONSIBILITY OF TESTING LABORATORY:

Testing Laboratory and/or Field Representative, as applicable, shall adhere to the following minimum procedures/requirements:

### *Field Operations –*

- Notify the General Construction Project Superintendent (GCPS) upon arrival at Job Site and discuss what Testing is to be performed during each visit.
- Appropriately document in Field Report pertinent details of each inspection such as date, time, approximate temperature and general weather conditions, location of tested materials, and testing method employed to determine satisfactory compliance with requirements of Contract Documents.
- Upon discovery of any unsatisfactory conditions or failure to comply with requirements of Contract Documents, immediately inform GCPS, and Foreman of Trade which is conducting the specific work when applicable, of such deficiency. Record names of individuals and companies being informed.
- If correction of deficiency is achievable without compromising the quality of the work, then perform retests and so note.  
Examples = Recomposition and/or Moisture Adjustment of Soil Materials, Caving of Excavations, Casing of Drilled Piers, Improperly Placed Reinforcement Steel, and Concrete below Minimum Slump.
- If correction is not achievable without compromising the quality of the work, call Brookshire's Architect within 24 hours of discovery and report said deficiency, and so note. Accurately record location, limits, and approximate quantities of failed work to be accurately located when remediation methods have been determined.  
Examples = Soil Materials contaminated, or not meeting PI or LL requirements; Concrete or Masonry operations occurring when Temperature is below allowable; Concrete be Re-Tempered or above Maximum Slump; and Construction operations continuing over tested areas that do not meet specifications.

### *Laboratory and Office Procedures –*

- Printed Reports shall be processed and mailed to Brookshire's in a timely manner.
- Appropriately document in certificate pertinent details from field notes of each inspection such as date, time, approximate temperature and general weather conditions, location of tested materials, and testing method employed to determine satisfactory compliance with requirements of Contract Documents. Include any comments, at the job site or via phone complete with first and last names of individuals and companies involved. Attach copy of field notes whenever necessary for clarification.
- Tests and inspections indicating non-conformance to the Contract Documents shall be stamped with a red stamp indicating "Non-Conformance" and distributed to the Brookshire's Architect within 24 hours of discovery.
- In addition to above written reporting method, Laboratory Representative shall immediately call the Brookshire's Architect should Concrete or Mortar compaction samples not breaking at a minimum of 70% design strength at 7 days, or full design strength at 28 days.
- When a non-conformance is noted in reports, comment on probable cause and provide recommendation for corrective action as an attachment to the 24 hour written notice to the Brookshire's Architect.

## RESPONSIBILITY OF CONTRACTOR:

Advise Laboratory sufficiently in advance of construction operations to allow personnel to observe testing and inspection. In no case will Contractor notify Laboratory less than one full working day prior to need for testing to be performed.

Furnish such nominal labor as is required to assist Laboratory personnel in obtaining and handling samples at the site.

Provide adequate facilities for safe storage and proper curing of concrete test samples on project site for subsequent field curing as required by referenced Specification Standards.

#### INSPECTION AND TESTING:

##### *Select Fill -*

Refer to EXCAVATION, BACKFILLING AND COMPACTION Specification Section.

##### *Subgrade Hydrated Lime Stabilization -*

Refer to LIME STABILIZATION section of the specifications.

##### *Flexible Base & Asphaltic Concrete Paving -*

Refer to ASPHALT PAVING Specification Section.

- One Confirmatory Laboratory Density and Stability Test on each type of asphaltic concrete for each proposed design mix.
- Field Density Test, on each type of asphaltic concrete for each day's operation at the rate of one test for each 10,000 sf (3 minimum).
- One extracting and gradation test, on each type of asphaltic concrete for each day's operation.

##### *Concrete -*

- Design concrete mixes for each type concrete specified in CAST-IN-PLACE CONCRETE and POURED CONCRETE GROUT.
- For each concrete mix type required, make two trial mixes using aggregate proposed. If admixture is required, 2 trial mixes shall be prepared using the specified admixture. Test four cylinders in accordance with ASTM C-39 (2 at 7 days and 2 at 28 days). Do not place concrete on project until laboratory reports and breaks of confirmation cylinders have developed required strengths and reports have been approved by Brookshire's.
- During progress of mixing and placing concrete on job, take specimens and provide molds as specified. Transport, cure, and store cylinders in accordance with ASTM C 31. 5 cylinders shall be taken for each increment of testing. Perform compression tests of 1 cylinder at 7 days, 3 cylinders at 28 days in accordance with ASTM C 39. The 5th cylinder is for use at Brookshire's discretion. 7 day strength will be required to have developed 65 percent of required 28 day strength.
- Test cylinders shall be made and tested for each different mix placed each day. For every concrete placement, test cylinders shall be made from first truck and at minimum intervals of each 5 trucks thereafter, approximate 40 cubic yard intervals, by the Testing Lab.
- Make slump tests at same intervals as test cylinders in accordance with ASTM C 143. Make slump test on every truck in every instance of additional water having been introduced at the site. Turn drum of truck a minimum of 25 revolutions after the induction of water has been completed and before performing slump test. Lab representative shall record amount of water and final slump.
- When strength of test cylinders falls below design strength and Brookshire's has approved alternative testing by drilling concrete core specimen, tests shall be performed in accordance with ASTM C 42.
- Testing system called "Pad Cap" shall not be used.

##### *Mortar -*

- For each Mortar Mix Type required, Lab shall observe "Trial Batching" by the Mason and take appropriate Strength Samples, prior to placement of any Masonry Units. If admixture is required, 2 trial mixes shall be prepared using the specified admixture. Any Masonry placed on the project prior to Laboratory's confirmation of 28 day Design Strength has been satisfied shall be at Masonry Contractor's risk.
- During progress of Masonry placement, take representative Mortar & Concrete Grout specimens at 2 day intervals. Additional Testing may be called for by Brookshire's at any time.

*Structural -*

- Inspect concrete foundations for compliance with Drawings and Specifications. Report on the following:
  - a. Concrete footing size and depth.
  - b. Footing bar size, spacing and placement (cover).
  - c. Placement and vibration of concrete.
  - d. Dowel bar size, orientation, embedment and spacing.
  - e. Anchor bolt size, orientation, embedment and spacing.
- Inspect slabs-on-grade for compliance with Drawings and Specifications. Report on the following:
  - a. Preparation and compaction of subgrade.
  - b. Slab thickness.
  - c. Size, spacing, placement (cover) and lap of reinforcement.
  - d. Size, spacing and placement of joint dowels.
  - e. Placement and finishing of concrete.
  - f. Time of saw cuts after placement of concrete.
- Inspect masonry wall for compliance with Drawings and Specifications. Report on the following:
  - a. Placement of concrete masonry units (joint space, level, plumb).
  - b. Horizontal reinforcing, spacing and lap.
  - c. Vertical bar size, spacing and placement at walls and control joints.
  - d. Vertical bar laps.
  - e. Lift heights, placement and vibration of grout.
- Inspect bond beams for compliance with Drawings and Specifications. Report on the following:
  - a. Location.
  - b. Size, placement and lap of reinforcing bars.
  - c. Placement and vibration of grout.
- Inspect masonry openings for compliance with Drawings and Specifications. Report on the following:
  - a. Types of concrete masonry units used to form lintels.
  - b. Reinforcing bar size and placement at lintel.
  - c. Stirrup size and spacing at lintel.
  - d. Vertical reinforcing size and placement at door jambs.
  - e. Placement and vibration of grout in lintels and jambs.
- Inspect concrete pilasters for compliance with Drawings and Specifications. Report on the following:
  - a. Vertical reinforcing size and placement.
  - b. Tie size and placement.
  - c. Placement and vibration of grout.
- Inspection of columns, beams, joists and joist girders for compliance with Drawings and Specifications shall be by a professional licensed engineer in the state where the project is located. Report on the following:
  - a. Size of members.
  - b. Straightness.
  - c. Erection tolerances and bearing length:
    - 1) Minimum 2-1/2 inch bearing length for joists.
    - 2) Minimum 5 inch bearing length for joist girders.
  - d. Imperfections or damage.
- Inspection of bolted connections for placement and tightness shall be by a professional licensed engineer in the state where the project is located. When designated on the Drawings as "Slip Critical", high strength bolts complying with ASTM A 325 or ASTM A 490 shall be tested to ensure they have been torqued to the minimum values as shown in the AISC specification for structural connections. All other bolt locations shall be visually inspected to verify bolt placement. 10 percent of all bolted connections shall be tested to verify that nuts are snug tight. All base plate anchor bolts shall be visually inspected for out-of-plumb and extension of threads beyond the nut.
- Inspect welded connections for compliance with Drawings and Specifications. Welding inspection shall be by a Welding Inspector certified by AWS in accordance with AWS QC1-

Standard and Guide for Qualification and Certification of Welding Inspectors, and meeting the qualification requirements of AWS D1.1. Report on the following:

- a. Verify that all welding is performed by welders certified for the type of welding indicated.
  - b. A minimum of 10 percent of joist to joist girder welds selected at random and visually inspected for length and size of weld.
  - c. A minimum of 25 percent of continuous roof perimeter angle to embedded plate and joist welds selected at random and visually inspected for length, spacing and size of weld.
  - d. If more than 10 percent of the welds inspected are not acceptable, an additional 25 percent of all welds shall be inspected. If additional welds are not acceptable, 100 percent of all welds shall be inspected.
  - e. If approved by the Brookshire's Architect, the testing engineer shall verify the adequacy of all the welds in question by means of ultrasonic inspection.
  - f. A minimum of 25 percent of all deck to joist fasteners, visually inspected for type, size, spacing and penetration.
- Inspect steel roof deck for compliance with Drawings and Specifications. Report on the following:
- a. Select 6 random sheets for each type of deck used. Inspect deck for thickness, type and material.
  - b. Inspect 10 percent of side and end lap fasteners over entire roof area for type, size, spacing and penetration.

*- END OF SECTION 01400 -*

## SECTION 01421

### ROOF DEFINITIONS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES:

- A. Definitions for construction terminology not otherwise defined in Contract Documents.
- B. Definitions for special terminology used for this Project.

##### 1.02 RELATED SECTIONS:

- A. Conditions of the Contract (Definitions contained therein).
- B. Alterations project procedures - Section 01351.
- C. Materials and equipment - Section 01600.

##### 1.03 EXISTING - (PRESENTLY THERE):

- A. Also may be noted "original". Present conditions and assumed locations, if known, as of the Date of Contract Documents.

##### 1.04 ABANDONED - (NO LONGER NECESSARY OR IN USE):

- A. "Remove" items so noted, or later defined, as an all-inclusive responsibility within this contract. Pay for all work in connection with removal of these items, including municipal, disposal, utility and service charges. Dispose of all "Excess".

##### 1.05 ABANDON - (TO BECOME ABANDONED):

- A. Protect and allow to remain as "existing" until such other work makes them "abandoned", such as relocation or discontinuation of service. Upon determination of abandonment, work shall proceed in accordance with "Abandoned".

##### 1.06 SALVAGE - (TO BE REMOVED AS IS):

- A. "Remove", protect, "preserve" in complete material condition as found "existing". Also to "Save". Determine suitability for incorporation in this Contract. Store at a location mutually agreed upon. Dispose of all "Excess".

##### 1.07 UNKNOWN - (NOT SHOWN ON DRAWINGS):

- A. Products beneath surfaces indicated by drawings and encountered during the Work. Immediately support, shore and protect. Immediately notify the Architect and authority having jurisdiction. Allow free access for inspection. "Preserve" in proper condition until the Architect determines definition and interpretation of Work. Take such measures as required for protection, reinforcement or adjustment.

##### 1.08 NEW - (TO BE INCORPORATED) NOT EXISTING:

- A. Refer to various specification sections for requirements of Work to be incorporated.

##### 1.09 ADDITION - (TO ADD TO AND BE INCORPORATED) ALSO TO "ADD":

- A. Work supplementary to that indicated to accomplish that which is required by the Contract Documents. To bring to a new condition; to extend, fasten, patch and match to that which is existing.

##### 1.10 REMAIN - (TO LEAVE WHERE IT IS EXISTING):

- A. The final location of an item in its "existing" position, however, this shall not mandate the fact that this item will not move during this contract, specifically in order to "Preserve" or "Rework".



**1.11 RENOVATE - (TO REPAIR AND MAKE NEW):**

- A. The process required to bring an item to a present new standard of condition required by the Contract Documents; e.g., to "rework" "existing" "suitable" "salvage" "products" and perform "new" work and "additions" required. (Syn. rehabilitate, recondition, repair.)

**1.12 REMOVE - (TO TAKE FROM EXISTING LOCATION):**

- A. Work required to extract a portion or whole by one or a combination of methods and moved to a new location.
  - 1. "Abandoned": Remove items by dismantling or extraction and may be by demolition, if acceptable.
  - 2. Salvage: Remove by disassembly. "Relocate".
  - 3. Products: Where a specific portion of component of an assembly or whole is to be removed, take all precautions to prevent damage, defacement and displacement to the "existing" to remain i.e., mortar, bricks, and finishes.

**1.13 REINSTALL - (TO INCORPORATE AS WAS ONCE DONE):**

- A. "Remove" and "salvage" existing from its location, if it does exist.
  - 1. "Restore", "Renovate" or "Remodel" and "Reinstall" in its existing location. Reincorporate and "re-work" the original work to the extent required by the Contract Documents.
- B. If the "Existing" item, so indicated, is missing, defective, or unsuitable as "Existing", then "Reconstruct" only that portion with "New" products and incorporate as was original. Syn. Replace.

**1.14 REPLACE - (TO TAKE THE PLACE OF):**

- A. "Remove" "existing" unserviceable product and provide "new" product in place of unserviceable product.

**1.15 RELOCATE - ("REINSTALL" IN A NEW LOCATION):**

- A. "Reinstall" in a new location as indicated on Drawings.

**1.16 REUSE - (TO USE AS ONCE WAS):**

- A. The use of "suitable" "salvage" for incorporation or reincorporation in the Work. "Remove", "Relocate" and "Reinstall" as required for "Reuse".

**1.17 DEFECTIVE - (NOT ACCEPTABLE):**

- A. Refer to Conditions of the Contract, that which does not conform to the Contract Documents. As it applies to "Salvage", in addition to the above, shall mean "Unsuitable".

**1.18 EXCESS - (NOT REQUIRED):**

- A. More quantity than required to conform to the Contract Documents and not desired by the Owner. Debris shall be considered "Excess" and not be buried on this site. Remove "Excess" from the site and legally dispose. "Excess" "Suitable" "Salvage" shall be property of Contractor unless otherwise specified.

**PART 2 – NOT APPLICABLE**

**PART 3 – NOT APPLICABLE**

**END OF SECTION 01421**

**SECTION 01450**

**ROOF QUALITY CONTROL**

**PART 1 - GENERAL**

**1.01 REQUIREMENTS INCLUDED:**

- A. General Quality Control.
- B. Manufacturers' Field Services.

**1.02 RELATED REQUIREMENTS:**

- A. Conditions of the Contract: Inspection and testing required by governing authorities.

**1.03 QUALITY CONTROL, GENERAL:**

- A. Maintain quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce work of specified quality.

**1.04 MANUFACTURERS' FIELD SERVICES:**

- A. When specified in respective Specification section, require manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, and to make appropriate recommendations.
- B. Notify manufacturer's technical representative a minimum of 2 weeks prior to date of Final Inspection. The manufacturer's technical representative shall conduct an inspection of the completed roof before the Final Inspection or shall attend the Final Inspection.
- C. Representative shall submit written report to Architect listing observations and recommendations.

**PART 2 - NOT APPLICABLE**

**PART 3 - NOT APPLICABLE**

**END OF SECTION 01450**

**SECTION 01500**  
**TEMPORARY FACILITIES**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide temporary facilities, temporary utilities and temporary controls as required for the completion of the Work. All temporary utility services will be setup in the name of the General Contractor, with all billings to be delivered to their mailing address. Transfer of any accounts for permanent service will be performed after issuance of Substantial Completion.

**DEFINITIONS:**

Temporary Facilities – Temporary buildings, all-weather access roads, parking, progress cleaning and staging areas.

Temporary Utilities – Electricity, lighting, heat, ventilation, telephone service, water and sanitary facilities.

Temporary Controls – Barriers, enclosures and fencing, water control and protection of the Work.

**FIELD OFFICE:**

Project Office may be provided at Contractor's option. If used, install in Location as approved by Brookshire's.

Provide water-tight office with the minimum of the following: electrical power, lighting, heating and cooling for human comfort; conference table and chairs for at least 8 persons; 3' x 5' plan table, one plan rack, full set of drawings, specifications and addenda, and readily accessible storage for field copies of shop drawings, change orders and submittals.

Field office shall not be used as living accommodations.

**STORAGE:**

Provide storage facilities as necessary to protect materials.

**ACCESS ROADS AND PARKING:**

Construct and maintain temporary all-weather roads accessing public thoroughfares to serve building pad and construction staging area.

Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.

Provide and maintain access to fire hydrants, free of obstructions.

Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

Provide 100' x 100' all-weather material staging area exclusive of building pad.

**TEMPORARY ELECTRICITY:**

Temporary electrical service shall be coordinated with local utility for providing primary service and permanent site electrical transformer.

Provide and pay for power service required for construction.

Provide adequate distribution equipment, wiring and outlets to provide single phase branch circuits for power and lighting. Provide temporary feeders to limit voltage loss to 5% overall from local utility power lines to provide electric requirements for project during construction. Provide main service disconnect and overcurrent protection at convenient location. Provide necessary transformers, meters, cables, protective devices, switches, etc., as required.

**TEMPORARY LIGHTING:**

Provide and maintain lighting for construction operations.

Permanent building lighting may be utilized during construction.

**TEMPORARY HEAT:**

Provide and pay for heat devices and heat as required to maintain specified conditions for construction operations.

Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

**TELEPHONE SERVICE:**

Provide, maintain and pay for telephone service to field office at time of project mobilization.

**TEMPORARY WATER SERVICE:**

Provide, maintain and pay for suitable quality water service required for construction operations.

Extend branch piping with outlet located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

**TOILET FACILITIES:**

Provide and maintain required chemical toilet facilities.

**FENCES AND BARRICADES:**

Provide fences and barricades as necessary to protect the public and those involved in the work.

Provide barriers to prevent unauthorized entry to construction areas to allow for Brookshire's use of site, and to protect existing facilities and adjacent properties from damage from construction operations.

**EXTERIOR ENCLOSURES:**

Provide temporary weather tight closure of exterior openings to provide acceptable working conditions and protection for Work, to allow for temporary heating or cooling and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons.

**WATER CONTROL:**

Refer to STORM WATER POLLUTION PREVENTION PROGRAM Specification Section.

**PROTECTION OF INSTALLED WORK:**

Protect installed Work. Provide special protection where specified in individual specification sections.

Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.

Provide protective coverings at walls, projections, jambs, sills and soffits of openings.

Protect finished floors, stairs and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

Minimize traffic and storage on roofed surfaces. If traffic or storage is necessary, obtain recommendations for protection from roofing material manufacturer.

Do not operate cranes or other heavy equipment on concrete floor slabs if damage could result from such operations.

Prohibit traffic from landscaped areas.

**CONSTRUCTION AIDS:**

Provide construction aids required to facilitate execution of Work, including stairs, ladders, ramps, staging, platforms, railings, cranes, scaffolds, hoists, chutes, runways or other required facilities and equipment.

Coordinate crane service required for erection of structural steel, installation of HVAC Rooftop Units and other crane services as required.

Maintain benchmarks, monuments and other reference point. If disturbed or destroyed, replace as directed.

Protect existing adjacent streets, sidewalks, curbs, buildings and property, including trees, lawns and plants.

**SECURITY:**

Employment of watchman is optional.

**FIRE EXTINGUISHERS:**

Provide types, sizes, number and locations as would be reasonably effective in extinguishing fires during construction.

**FIRST AID FACILITIES:**

Provide First Aid Supplies and Facilities as may be reasonably required during construction.

**PROJECT SIGN:**

One only Project Sign, with maximum 32 S.F., will be allowed for General Contractor. Exact location shall be as designated by Brookshire's. Maintain sign in condition acceptable to Brookshire's until directed to remove. General Contractor shall insure that no other signs are placed on the site unless specifically directed by Brookshire's.

**REMOVAL OF FACILITIES, UTILITIES AND CONTROLS:**

Remove temporary above grade or buried utilities, equipment, facilities and materials prior to acceptance of job from Brookshire's.

Clean and repair damage caused by installation or use of temporary work to satisfaction of Brookshire's.

*- END OF SECTION 01500 -*

## SECTION 01505

### ROOF TEMPORARY FACILITIES AND CONTROLS

#### PART 1 - GENERAL

##### 1.01 RELATED REQUIREMENTS:

- A. Use of site - Section 01100.
- B. Maintenance of existing services - Section 01100.
- C. Demolition, cutting, dust control - Section 01351.

##### 1.02 SANITARY FACILITIES:

- A. Provide adequate temporary chemical toilets at each site at time Work is commenced.
- B. Maintain facilities in compliance with applicable health laws and regulations. Keep clean and unobtrusive.
- C. Upon completion of Work, remove these facilities and all traces thereof.

##### 1.03 STORAGE OF MATERIALS:

- A. If temporary storage sheds are used, locate storage sheds where directed, maintain in good condition, and remove storage sheds when so directed.
- B. Store materials on site unless otherwise approved by Owner.
- C. Cover and protect materials subject to damage by weather, including during transit.
- D. Do not use building as storage facility.
- E. Provide additional storage at no cost to Owner in the event that additional storage area is required beyond that provided by project site.
- F. Stored materials shall be available for inspection by Owner at all times.
- G. Store flammable and volatile liquids in sealed containers located a minimum of 30 ft. from existing buildings.
- H. Flammable or volatile liquids shall be transported in and used from U.L. listed safety cans.

##### 1.04 TEMPORARY WATER:

- A. Roofing Contractor shall make arrangements with General Contractor for water required for construction.
- B. Owner will pay for costs of water.
- C. Roofing Contractor shall provide hoses for conveyance.

##### 1.05 TEMPORARY ELECTRICAL ENERGY:

- A. Roofing Contractor shall provide generators to supply temporary electrical service for completion of the Work.

##### 1.06 TEMPORARY LADDERS, SCAFFOLDS, HOISTS:

- A. Furnish and maintain temporary ramps, scaffolds, hoists or chutes as required for proper execution of Work.
- B. Such apparatus, equipment and construction shall be of noncombustible construction and meet requirements of applicable Federal, State and Local Safety and Labor Laws.

### **1.07 GUARDRAILS, BARRICADES AND TEMPORARY COVERINGS:**

- A. Provide barricades as required to protect natural resources, site improvements, existing property, adjacent property and passers-by.
- B. Where pedestrian traffic is adjacent to work areas, provide necessary guardrails and barricades to protect pedestrians and to prevent pedestrian access to Work areas.
- C. At completion of construction, remove guardrails and barricades.

### **1.08 PROTECTION:**

- A. Protect existing adjacent streets, sidewalks, curbs, buildings and property, including trees, lawns and plants.
- B. Special Protection Requirements:
  - 1. Where roof penetrating items are replaced, provide temporary weather protection until replacement items have been installed and properly flashed.
  - 2. In addition to the above, maintain dust and water control during coring and cutting to prevent dust or water intrusion into facility.

### **1.09 TEMPORARY FIRE PROTECTION:**

- A. During construction, Roofing Contractor and his subcontractors and sub-subcontractors and their agents and employees shall comply with fire safety practices as outlined in NFPA Pamphlet 241 and local fire protection codes and as follows:
  - 1. During entire construction period, provide one U.L. listed 2A:20BC dry chemical fire extinguisher, or one standard U.L. listed 1-1/2 ga. water (E-10) and one U.L. listed 10BC carbon dioxide fire extinguisher mounted together, in each of following areas:
    - a. Each 3000 sq. ft. of roof work area or fraction thereof.
    - b. Each temporary storage shed.
    - c. Do not use 2A:20BC dry chemical type fire extinguisher in confines of telephone equipment areas for purposes of suppression.
  - 2. Roofing Contractor's superintendent, or other assistant superintendents, shall be appointed as project fire warden for entire construction period.
  - 3. Train workmen in proper use of each type fire extinguisher.
  - 4. Post telephone number of fire department, specific information on location of on-site firefighting equipment and procedures to be followed in event of fire.
  - 5. Maintain free access at all times to fire extinguisher equipment, street fire hydrants and outside connections for standpipe hose systems.
  - 6. Maintain all exit facilities and access thereto, free of material and other obstructions.

### **1.10 CLEANING DURING CONSTRUCTION:**

- A. Oversee cleaning and ensure that building and grounds are maintained free from accumulations of waste materials and rubbish.
- B. At not less than every day during progress of work, cleanup work areas and access, and dispose of waste materials, rubbish and debris.
- C. At General Contractor's option, on-site dump containers may be used for collection of waste materials, rubbish and debris. Locate containers a minimum of 30 ft. away from building entrances at a location acceptable to the Owner. If used, remove containers when filled.
- D. Do not allow waste materials, rubbish and debris to accumulate and become an unsightly or hazardous condition.
- E. Remove waste materials, rubbish and debris from site, and legally dispose of at public or private dumping areas off Owner's property.
- F. Keep streets and access to site free of rubbish and debris.

- G. Lower waste materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.

**1.11 EMPLOYEE CONTROL:**

- A. Do not allow construction employees to enter Owner occupied areas or except as allowed for access to roof and as required to perform work.

**1.12 PARKING FACILITIES:**

- A. Park construction personnel vehicles on grounds or parking lots of existing building site, at locations approved by Owner.
- B. Contractor shall be responsible for parking of construction personnel vehicles off-site and in accordance with City regulations.

**1.13 LEAK (WATER) DAMAGE CONTROL:**

- A. In the event of rain during reroofing construction operations, immediately inspect interior of building for leaks. This shall occur on a 24 hour basis.
- B. Coordinate with Owner for access to building.
- C. Continue to inspect building on a regular basis until rain ceases.
- D. If leaks are discovered during rains, immediately cover and protect telephone equipment with fire retardant sheeting in the area of the leak. Immediately notify Owner of leak condition.
- E. Perform emergency repairs on roofing to stop leaks.

**PART 2 - NOT APPLICABLE**

**PART 3 - NOT APPLICABLE**

**END OF SECTION 01505**



## SECTION 01510 UTILITIES

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### REQUIREMENTS OF REGULATORY AGENCIES:

Contractor shall be responsible for the installation, protection and maintenance of all temporary and permanent utilities in such a manner so as to meet requirements of local ordinances, building codes or other recognized agencies.

### PERMANENT DEPOSITS & FEES:

*Brookshire's shall pay*

- Permanent Utilities Security Deposits
- Pro-Rata and Impact Fees
- Platting, Plan Submittal and Review Fees

*Contractor shall pay*

- Metering Devices, Taps, and Extension of Services required for Temporary and/or Permanent Services
- Temporary Utilities Security Deposits required by the Contractor as further provided within this Specification

### TEMPORARY UTILITIES:

Contractor shall furnish electricity, lighting, heating, cooling, ventilation, telephone, water, sanitary utilities and toilets, natural gas, and any other utilities necessary for the proper execution of the work. Contractor shall maintain his own telephone service separate from temporary or permanent telephones installed by Brookshire's.

Contractor shall furnish and pay all installation costs, security deposits, and all bills for temporary utilities. All temporary utility services will be setup in the name of the Contractor, with all billings to be delivered to their mailing address. Transfer of any accounts for permanent service will be performed after issuance of Substantial Completion.

Contractor may make connection to existing building electrical and domestic water services for temporary construction services. All connections and devices shall be per applicable codes and OSHA requirements, shall be independent/separate from existing building devices, and shall not impede the use of services.

Contractor shall not be required to reimburse Brookshire's for utilities consumed by connection to existing building metering systems.

### PERMANENT UTILITIES:

Contractor shall provide permanent building utilities for Fire Sprinkler Water, Domestic Water, Sanitary Sewer, Storm Drainage, Electricity, and Natural Gas services required by the Construction Documents; and all meters, connections, extensions and usage fees for temporary and permanent services. Contractor shall provide telephone conduit(s) to service point with pull rope and wiring, receptacles, conduits, j-boxes, etc. as indicated on the Drawings and as specified for installation of permanent telephone service by Brookshire's.

Permanent Utilities Security Deposits and Impact Fees, when required, shall be paid by Brookshire's. Permanent utilities bills shall be assumed by Brookshire's upon acceptance at Substantial Completion.

Contractor shall pay security deposit(s) and for consumption during construction.

- END OF SECTION 01510 -

## SECTION 01600

### ROOF PRODUCT REQUIREMENTS

#### PART 1 - GENERAL

##### 1.01 GENERAL:

- A. Material and equipment incorporated into Work:
  - 1. Conform to applicable specifications and standards.
  - 2. Comply with size, make, type and quality specified, or as specifically approved in writing by Architect.
  - 3. Manufactured and fabricated products:
    - a. Design, fabricate and assemble in accord with recognized industry standards.
    - b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
    - c. Two or more items of same kind shall be identical, by same manufacturer.
    - d. Products suitable for service conditions.
    - e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
- B. Do not use material or equipment for purposes other than that for which it is designed or is specified.

##### 1.02 RELATED REQUIREMENTS:

- A. Summary of Work - Section 01100.
- B. Alterations Project Procedures - Section 01351.
- C. Shop Drawings, Product Data and Samples - Section 01330.
- D. Storage of Materials - Section 01505.

##### 1.03 REUSE OF EXISTING MATERIAL:

- A. Except as specifically indicated on Drawings, or as specified in Section 01351, materials and equipment removed from existing structure shall not be used in completed Work.
- B. For material and equipment specifically indicated or specified to be reused in Work:
  - 1. Use special care in removal, handling, storage and reinstallation, to assure proper function in completed Work.
  - 2. Arrange for transportation, storage and handling of products which require off-site storage, restoration or renovation. Pay costs for such work.

##### 1.04 MANUFACTURER'S INSTRUCTIONS:

- A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in installation, including copies to Architect.
  - 1. Maintain one set of complete instructions at jobsite during installation and until completion.
- B. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
  - 1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect for further instructions.
  - 2. Do not proceed with work without clear instructions.
- C. Perform work in accord with manufacturer's instructions. Do not omit preparatory steps or installation procedures unless specifically modified or exempted by Contract Documents.

**1.05 TRANSPORTATION AND HANDLING:**

- A. Arrange deliveries of products in accord with construction schedules, coordinate to avoid conflict with work and conditions at site.
  - 1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
  - 2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and reviewed submittals, and that products are properly protected and undamaged.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

**1.06 SUBSTITUTIONS AND PRODUCT OPTIONS:**

- A. Roofing Contractor's Options:
  - 1. For products specified only by reference standard, select any product meeting that standard, by any manufacturer.
  - 2. For products specified by naming several products or manufacturers, select any product and manufacturer named.
  - 3. Products specified by naming only one product and manufacturer: No substitutions allowed.
  - 4. Products specified by naming one manufacturer as the basis of design but allowing other equivalent products, select any equivalent product.

**PART 2 - NOT APPLICABLE**

**PART 3 - NOT APPLICABLE**

**END OF SECTION 01600**

## SECTION 01700

### ROOF CONTRACT CLOSEOUT

#### PART 1 - GENERAL

##### 1.01 REQUIREMENTS INCLUDED:

- A. Closeout Procedures and Submittals.
- B. Final Cleaning.
- C. Project Record Documents.
- D. Operation and Maintenance Data.
- E. Instruction of Owner's Personnel.
- F. Warranties.

##### 1.02 RELATED REQUIREMENTS:

- A. Time of Final Payment: The Agreement.
- B. Completion; Waiver of Claims: General Conditions.
- C. Cleaning during construction - Section 01505.
- D. Roof system closeout submittals - Section 07520.

##### 1.03 CLOSEOUT PROCEDURES:

- A. Comply with requirements stated in Conditions of the Contract and in Specifications for administrative procedures in closing out the Work.
- B. When General Contractor considers Work for a building has reached final completion, submit written certification that:
  - 1. Contract Documents have been reviewed.
  - 2. Project has been inspected for compliance with Contract Documents.
  - 3. Work has been completed in accordance with Contract Documents.
  - 4. Project is completed, and ready for final inspection.
- C. Architect will make final inspection within 7 days after receipt of certification.
- D. Should Architect consider Work finally complete in accordance with requirements of Contract Documents, he will request General Contractor to make Contract Closeout submittals.
- E. Should Architect consider Work not finally complete:
  - 1. He will notify General Contractor, in writing, stating reasons.
  - 2. General Contractor shall take immediate steps to remedy the stated deficiencies and send second written notice to Architect certifying that Work is complete.
  - 3. Architect will re-inspect Work.

##### 1.04 FINAL CLEANING:

- A. Execute prior to final inspection.
- B. Clean roofs, gutters, downspouts and drainage systems free of foreign matter and debris.
- C. Remove grease, mastics, adhesives, bitumen and other foreign materials from sight-exposed exterior surfaces.
- D. Repair, patch and touch up marred surfaces to match adjacent finishes.
- E. Remove waste and surplus materials, rubbish, and construction facilities from the Project and from the site.

- F. Prior to final completion conduct an inspection of sight-exposed exterior surfaces in work areas, to verify that entire Work is clean.

**1.05 CLOSEOUT SUBMITTALS:**

- A. Evidence of compliance with requirements of governing authorities.
- B. Manufacturer's Field Reports; Roof System Closeout Submittals to requirements of Section 07520.
- C. Project Record Documents: To requirements of this Section.
- D. Operating and Maintenance Data, Instructions to Owner's Personnel: To requirements of this Section.
- E. Warranties: To requirements of this Section. Provide a separate warranty for each building.
- F. Evidence of Payment and Release of Liens: To requirements of Contract and General Conditions.
- G. Final Adjustment of Accounts: To requirements of this Section.

**1.06 WARRANTIES AND BONDS:**

- A. Provide duplicate, notarized copies of warranty for each building. Execute Roofing Contractor's submittals and assemble documents executed by subcontractors, suppliers, and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.
- B. Submit material prior to final request for payment for each building.

**1.07 PROJECT RECORD DOCUMENTS:**

- A. Store documents apart from other documents used for construction.
- B. Label each document, "PROJECT RECORD" in two-inch-high printed letters.
- C. Keep Record Documents current with construction progress.
- D. Do not permanently conceal any work until required information is recorded.
- E. Contract Drawings: Legibly mark Drawings of each building to record actual construction:
  - 1. Field changes of dimension and details.
  - 2. Changes made by Change Order or Field Order.
  - 3. Details not on original Contract Drawings.
- F. Specifications and Addenda: Legibly mark each section to record:
  - 1. Manufacturer, trade name, catalog number of each product and item of equipment actually installed, if different than that specified.
  - 2. Changes made by Change Order or Field Order.
- G. At Contract closeout, submit documents with transmittal letter containing date, Project title, Roofing Contractor's name and address, list of documents, and signature of Roofing Contractor.

**1.08 OPERATING AND MAINTENANCE DATA:**

- A. Provide data for maintenance of roofing system for each type of system and for each building.
- B. Submit 2 copies, before final inspection, in three-ring 8-1/2 x 11 in. binders with durable plastic covers.
- C. Provide a separate index tab section in manual for each system, with a table of contents for each system.
- D. Supplier Directory: Suppliers and principal subcontractors, with name, address and telephone number of each.

**1.09 INSTRUCTION OF OWNER'S PERSONNEL:**

- A. Fully instruct Owner's designated operating and maintenance personnel at each building in proper maintenance of systems.
- B. Schedule instructions at times agreed upon by Owner.
- C. Use operating and maintenance manual as basis of instruction.
- D. Review contents of manual with Owner's personnel in full detail to explain all aspects of maintenance.

**1.10 EVIDENCE OF PAYMENTS, AND RELEASE OF LIENS:**

- A. Contractor's Affidavit of Release of Liens from General Contractor.
- B. Submittals shall be duly executed before delivery to Owner.

**1.11 FINAL ADJUSTMENT OF ACCOUNTS:**

- A. Submit final statement of accounting to General Contractor per their requirements.
- B. Statement shall reflect all adjustments.
  - 1. Original Contract Sum.
  - 2. Additions and Deductions resulting from:
    - a. Previous Change Orders.
    - b. Deductions for uncorrected Work.
    - c. Deductions for Re-Inspection Payments.
  - 3. Total Contract Sum, as adjusted.
  - 4. Previous payments.
  - 5. Sum remaining due.
- C. General Contractor will prepare final Change Order, reflecting approved adjustments to Contract Sum not previously made by Change Orders.

**1.12 FINAL APPLICATION FOR PAYMENT:**

- A. Submit final application in accordance with requirements of General Contractor.

**PART 2 - NOT APPLICABLE**

**PART 3 - NOT APPLICABLE**

**END OF SECTION 01700**

SECTION 02210  
**STORM WATER POLLUTION PREVENTION PROGRAM**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Perform all Erosion Control as indicated on the Drawings and as specified herein. Erosion Control requirements within this specification section are required for all denuded site areas within the scope of this project.

A copy of all documentation, including drawings, reports and maintenance records, shall be provided to Brookshire's at final acceptance.

**SITE DESCRIPTION:**

Project Name and Description:

**BROOKSHIRE'S #006**  
BUILDING EXPANSION, FUEL KIOSK REPLACEMENT AND PAVEMENT  
IMPROVEMENTS  
212 E. COKE STREET  
WINNSBORO, TEXAS 75494

Owner Name and Address:

**Brookshire Grocery Company**  
P.O. Box 1411  
Tyler, TX 75710  
Phone - 903/579-0500

This project will consist of a building expansion, removal and replacement of existing fuel station kiosk, and pavement re-construction and overlay, and associated improvements.

The limits of construction consist of approximately 2.41 total acres which will be involved and disturbed by construction activities.

The site generally consists of existing concrete/asphalt paving with underlying brown to brownish-red sandy clay to clayey sand and light gray to brownish-red silty and sandy clay.

The site will generally drain via overland flow and on-site storm sewer west and south to the City of Winnsboro MS4, south to Indian Creek, south to Big Sandy Creek, southeast to the Sabine River.

**INTRODUCTION:**

Construction phase pollutant sources anticipated at the site are disturbed soil, vehicle fuels and lubricants, chemicals associated with building construction and building materials. Without adequate control there is the potential for each type of pollutant to be transported by storm water.

Soil disturbing activities will include: demolition and removal of existing pavement and buildings; installation of perimeter and other erosion and sediment controls; building pad construction; site grading and pavement construction and; preparation of subgrade and base for roads; and preparation for final seeding.

Texas Commission on Environmental Quality prohibits most non-storm water discharges during the construction phase. Allowable non-storm water discharges that could occur during construction on this project, are listed in the General Permit.

## SUMMARY:

The Construction Contractor and all subcontractors involved with a construction activity that disturbs site soil or who implement a pollutant control measure identified in the Storm Water Pollution Prevention Plan (SWPPP) must comply with requirements of the Texas Pollutant Discharge Elimination Systems (TPEDS) General Permit and any local governing agency having jurisdiction concerning erosion and sedimentation control.

- A copy of the Notice of Intent (NOI) and a copy of the Construction Site Notice must be posted in a prominent place for public viewing at the construction site.
- Complete copy of TCEQ General Permit TXR150000 shall be retained at the project site for the duration of the project.
- Complete copy of SWPPP, including copies of all inspection reports, plan revisions, etc. must be retained at the project site at all times and kept in the permanent project records for at least three years following submission of the Notice of Termination (NOT).
- The Construction Contractor must provide names and addresses of all subcontractors working on this project who will be involved with the major construction activities that disturb site soil. That information must be kept with this SWPPP.
- Regular inspections must be made to determine effectiveness of the SWPPP. It should be modified as needed to prevent pollutants from discharging from the site. The inspector must be a person familiar with the site, the nature of the major construction activities and qualified to evaluate both overall system performance and individual component performance. Additionally, the inspector must either be someone empowered to implement modifications to this SWPPP and the pollutant control devices, if needed, in order to increase effectiveness to an acceptable level, or someone with the authority to cause such things to happen.
- This SWPPP must be updated each time there are significant modifications to the pollutant prevention system or a change of subcontractors working on the project who disturbs site soil. The construction contractor must notify the governing agency as soon as these modifications are implemented.
- Discharge of oil or other hazardous substances into the storm water is subject to reporting and cleanup requirements.
- This SWPPP must be amended as necessary during the course of construction in order to keep it current with the pollutant control measures utilized at the site. Amending the SWPPP does not mean that it has to be reprinted. It is acceptable to add addenda, sketches, new sections and/or revised drawings.
- A log with a record of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated must be maintained until the NOT is filed.
- Once the site reaches final stabilization, the construction contractor must complete and submit a Notice of Termination (NOT). Coordinate submittal with Brookshire.
- Construction Contractor will need to submit all SWPPP forms for approval by Brookshire's prior to disturbing of any site soil.

## PROJECT DESCRIPTION:

Described below are the major construction activities that are the subject of this SWPPP. They are presented in the order they are expected to begin, but each activity will not necessarily be completed before the next begins. Also, these activities could occur in a different order if necessary to maintain adequate erosion and sedimentation control.

- Install sediment barriers down slope from construction activities that disturb site soil.
- Demolition and remove existing improvements. Sediment barriers shall already be in place down slope.
- Install sediment barriers down slope from all soil stockpiles.



- Install silt fencing down slope around area for concrete wash out area.
- Final grading shall have sediment barriers maintained down slope during this operation.
- Completion of on-site stabilization.

#### STORM WATER POLLUTION AND PREVENTION MEASURES AND CONTROLS:

Topsoil Stockpiles - Topsoil in proposed disturbed areas shall be salvaged to a depth of six-inches and stockpiled. The salvaged topsoil shall be replaced to a depth of four-inches on all landscaped areas, parkways, practice areas, drainage swales, berms, dikes, and right-of ways.

Temporary Stabilization -Top soil stock piles and disturbed portions of the site where construction activity temporarily ceases for at least 21 days will be stabilized with temporary seed and mulch no later than 14 days from the last construction activity in that area. The temporary seed shall be 50% Rye and 50% Bermuda (hulled) applied at the rate of 1.5 pounds per 1000 square feet. Prior to seeding, 15 pounds of 15-5-10 fertilizer shall be applied to each 1000 square feet to be stabilized. Areas of the site which are to be paved will be temporarily stabilized by applying base until bituminous pavement can be applied.

Permanent Stabilization - Disturbed portions of the site where construction activities permanently ceases shall be stabilized with permanent seed no later than 14 days after the last construction activity. The permanent seed mix shall be 50% Rye and 50% Bermuda (hulled) applied at the rate of 1.5 pounds per 1000 square feet. Prior to seeding, 15 pounds of 15-5-10 fertilizer shall be applied to each 1000 square feet to be stabilized.

Off-site Vehicle Tracking - Construction traffic must enter and exit the site at the stabilized construction entrance. The paved street adjacent to the site entrance will be swept daily, if needed, to remove any excess mud, dirt or rock tracked from the site. Dump trucks hauling material from the construction site will be covered with a tarpaulin.

Dust Control – Water trucks will be used as needed during construction to reduce dust generated on the site. Dust control must be provided by the Construction Contractor to a degree that is in compliance with local and state dust control regulations.

Solid Waste Disposal – No solid materials, including building materials, are allowed to be discharged from the site with storm water. All solid waste, including disposable materials incidental to the major construction activities, must be collected and placed in containers. The container will be emptied periodically by a contract trash disposal service and hauled away from the site. No construction waste materials will be buried onsite.

Sanitary Facilities – All personnel involved with construction activities must comply with state and local sanitary or septic system regulations. Temporary sanitary facilities will be provided at the site throughout the construction phase. They must be utilized by all construction personnel and shall be serviced by a commercial operator.

Water Source – Non-storm water components of site discharge must be clean water. Water used for construction, which discharges from the site, must originate from a public water supply approved by the State Health Department.

#### SPILL PREVENTION:

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff.

##### *Good Housekeeping –*

The following good housekeeping practices will be followed onsite during the construction

project.

- An effort will be made to store only enough product required to do the job.
- All materials stored onsite will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposing of the container.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The site superintendent will inspect daily to ensure proper use and disposal of materials onsite.

#### *Hazardous Products -*

These practices are used to reduce the risks associated with hazardous materials.

- Products will be kept in original containers unless they are not resealable.
- Original labels and material safety data will be retained; they contain important product information.
- If surplus product must be disposed of, manufacturer's or local and State recommended methods for proper disposal will be followed.

#### *Petroleum Products -*

All onsite vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations.

#### *Fertilizers -*

Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

#### *Paints -*

All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system but will be properly disposed of according to manufacturer's instructions or State and local regulations.

#### *Concrete Trucks -*

Concrete Trucks will not be allowed to wash out or discharge surplus concrete or drum wash water on the site, unless a specific area has been designated by the contractor. The specified area will be surrounded by a 24-inch high berm that diverts drainage away from the concrete wash, and also contains the concrete wash from leaving the specified area.

#### **SPILL CONTROL PRACTICES:**

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area onsite. Equipment and materials will include but not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.

- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate clothing.
- The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
- The General Contractor's Site Superintendent responsible for the day to day operations as designated in Part 10, will be the spill prevention and cleanup coordinator. He may designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and onsite.

#### INSPECTIONS AND SYSTEM MAINTAINANCE:

These are the inspection and maintenance practices that will be used to maintain erosion and sediment controls.

- All control measures will be inspected once each week on the same day.
- All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours of report.
- Built up sediment will be removed from silt fence when it has reached one-third the height of the fence.
- Silt fence will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.
- The sediment trap/basin and ponds will be inspected for depth of sediment, and built up sediment will be removed when it reaches 10 percent of the design capacity or at the end of the job.
- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and healthy growth.
- A maintenance inspection report will be made after each inspection.
- The Construction Contractor's Site Superintendent responsible for the day to day operations will be responsible for inspection, maintenance and repair activities, and filling out the inspection and maintenance report.
- Any other personnel selected for inspection and maintenance responsibilities will received training form the Construction Contractor's Site Superintendent responsible for the day to day operations. They will be trained in all inspection and maintenance practices necessary for keeping the erosion and sediment controls used onsite in good working order.

*- END OF SECTION 02210 -*

SECTION 02220  
**EXCAVATING, BACKFILLING AND COMPACTING**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Perform all Clearing, Excavating, Backfilling, Grading and Compacting as indicated on the Drawings and as specified herein. Compaction requirements within this specification section are required for all fill/backfill operations within the scope of this project, except for Top Soil.

**CONDITIONS AT SITE:**

Visit the site. Examine and note all conditions as to the character and extent of the Work involved.

**TESTS, INSPECTIONS, LAY-OUT, AND SUPERVISION:**

Refer to TESTING LABORATORY CONTROL for Testing Laboratory to perform tests and inspections required by this Section.

Brookshire's shall locate and clearly mark all property corners, and establish a singular permanent bench mark for the project at location acceptable to Contractor. Contractor shall maintain references, or replace at his expense, until completion of the project, and indicate exact location of bench mark on record drawings at project and on all As-Built drawings.

Contractor shall lay out all lines and levels for work within his contract.

If any discrepancies are found by the Contractor between the Drawings and actual conditions at the site, Brookshire's shall be notified prior to execution of any work in area(s) of discrepancy.

**REFERENCE STANDARDS:**

Meet all requirements and recommendations of applicable portions of latest edition of the American Society for Testing and Materials (ASTM), all applicable Building Codes, Local and State Ordinances, and other standards referenced in the specifications.

All Contractors, Subcontractors, and any others associated with manipulation of Soils Materials and/or Storm Drainage related activities throughout the duration of this project shall comply with Specifications Section 02210 – STORM WATER POLLUTION PREVENTION PROGRAM.

**SHOP DRAWINGS:**

Per SUBMITTALS, obtain approval by Brookshire's of testing laboratory report certifying that controlled fill material meets requirements of this section prior to any fill/backfill placement on the site.

**EXISTING UTILITIES OR UNKNOWN SITE FEATURES:**

Where existing utilities, piping, cables, conduits, etc. are not shown on the Drawings are encountered; or an unknown obstacle such as an abandoned well, sub-surface stream is encountered; or "cave-in" should result from unforeseen subterranean fault occur; support, shore up, barricade and otherwise protect same from workers and public, and immediately notify Brookshire's. Allow entrance, opportunity and ample time for measures necessary for resolution/correction. Contractor shall be compensated on a UNIT COST basis for unforeseeable site features and/or changes in soil quantities from those included in the Construction Documents. UNIT COST amounts will be established prior to any work being performed.

Corrective measures will be accomplished by the Contractor and/or Brookshire's as provided in GENERAL CONDITIONS for changes in the work. If such unknown condition is encountered and work is continued without approval of Brookshire's, any damages will be the responsibility of the Contractor as provided in GENERAL CONDITIONS and the Contractor will waive consideration for extra work.

#### PROTECTION & SAFETY:

Per CONTRACT AND GENERAL CONDITIONS and all applicable laws, ordinances, regulations, guidelines and customary Construction Procedures including, but not limited to, those of the Occupational Safety and Hazards Administration (OSHA).

- All Sides of Excavations less than 20 feet in depth shall be Sloped and/or Benched per OSHA 29 CFR part 1926 as Soil Classification Type C with maximum allowable slopes of 1½ horizontal to 1 vertical (34° from horizontal).
- Unprotected Excavations of Depths less than 5 feet are allowable when accomplished in full compliance with OSHA 29 CFR part 1926.652 (a)(1)(ii).
- For Excavations of 20 feet or greater, or any variation from the aforementioned Sloping/Benching method, the Contractor shall submit a design of the proposed system certified by a Professional Engineer (mutually acceptable to Contractor and Brookshire's and having a current license in the State where the project is located), and Geotechnical Laboratory Certification of Soil Classification to Brookshire's per SUBMITTALS Section. Contractor must receive written notification that Brookshire's has no objection to the proposed method(s) a minimum of 24 hours prior to any Excavation employing said method(s). Acknowledgment of Alternative Excavation System(s) by Brookshire's does not relieve or abridge Contractor's responsibilities per CONTRACT AND GENERAL CONDITIONS.

Contractor shall be responsible for protection of Brookshire's property and adjacent property(ies) outside of construction lines.

Contractor shall bear responsibility to properly install and maintain "Erosion Control" measures to prohibit migration of Soils related materials to migrate improperly within the site, or off of the site. This includes, but is not limited to, soils being moved by stormwater run-off, tracking by vehicle tires, and airborne particulate due to lack of moisture or other appropriate measures of restraint.

Contractor shall erect and maintain sufficient barricades to protect adjacent property from damage by construction vehicles and operations. Barricades shall be erected where required to prevent injury to workers and the public.

Contractor shall erect and maintain sufficient barricades to protect from damage all trees that are designated to remain after construction. Contractor shall replace damaged trees that cannot be restored to full growth, as acceptable to Brookshire's.

#### FILL MATERIAL:

SELECT FILL shall be homogeneous, uniformly blended soils of a non-expansive nature, shall be clean and free from organic materials, rubbish, and rocks larger than 2" diameter, and as follows:

- Atterberg Plasticity Index - 4 minimum to 15 maximum
- Liquid Limit – 30% or less.

Laboratory technician shall obtain each material to be used from the Contractor's source location for testing 2 weeks in advance of the time for material to be delivered to Site. Testing of more than one source for each type of material will be at Contractor's expense.

#### PREPARATION:

The limits of work required within this contract, unless specifically indicated otherwise on the Drawings, SCOPE OF WORK, etc., is the area within property lines or limits indicated on Drawings and area(s) on public right-of-ways from said lines/limits to nearest edge of paving or back of curb. Contractor shall obtain permits/approvals from appropriate authority for work within right-of-ways.

Remove all rubbish, trash, trees, stumps and all vegetation, except grasses suitable for mowing, unless specifically noted as to remain on the Drawings, and accomplish demolition of structures not to remain prior to grading operations. Strip all grass or other vegetation from surfaces which

receive earth fill, slabs, paving, walks, other permanent construction elements. Remove all stumps, roots greater than 1/2" diameter, etc. from removed vegetation and otherwise encountered.

Establish adequate site drainage during stripping operations and maintain positive drainage of the entire site at all times during the work to prevent ponding of water on or adjacent to construction operations.

Contractor shall insure that the exit of surface drainage from the site is not redirected or otherwise altered from original and/or finished drainage path(s), as appropriate for present phase of construction.

Keep all areas including excavations, pits, trenches, footings, etc., entirely free from water by bleeder ditches where gradient allows and/or by mechanical pumps.

All subgrade which will be located below the proposed new concrete slab shall be excavated to Elevation 487.12' before beginning to scarify and recompact.

#### SCARIFY AND RECOMPACTION:

Contractor shall provide within Base Bid for subgrade that is exposed after clearing operations which will be below the proposed new concrete slab to be scarified to a depth of 6" by mechanical means such as disking to produce a consistently loose layer of material. Adjust the moisture content should range from +1% to +4% above optimum; and recompact to between 95% and 100% of the maximum density defined by ASTM D 698.

#### OVEREXCAVATION:

Contractor shall submit "overexcavated" option as an Alternate Bid as described by **item 3** under general procedures for excavation and recompaction in the Geotechnical Investigation. Contractor shall excavate to Elevation 482.00', scarify the exposed subgrade, adjust the moisture content for range to be from +1% to +4% above optimum; and recompact to between 95% and 100% of the maximum density defined by ASTM D 698.

Contractor may assume for purpose of bidding that material removed from the "overexcavated" area noted in the Geotechnical Investigation may be used as fill for re-use at all areas within the building pad area to within 12" of top of finished subgrade.

#### EXCAVATION:

Excavate to depths noted on Drawings, as required for proper completion of all footings and other subgrade Work. Cut to exact depth and dimension for "earth formed" footings, grade beams, etc. with level bottoms and sharp corners. Areas to receive forms shall be of sufficient size to provide ample room for construction of forms, shoring, and bulkheading as required.

Areas which have been mistakenly or excessively excavated, "caved-in", eroded by adverse weather, have become excessively wet, or are otherwise unsuitable shall be corrected, tested, and approved by Brookshire's prior to placement of concrete, additional fill, base materials, etc. Remove wet material from deficient area and stockpile for reprocessing or remove from site. Replace material per all fill requirements.

Excessively excavated areas for concrete elements may be filled with concrete at Contractor's option and expense when acceptable to Brookshire's and provided enlarged element will not conflict with placement or location of other elements.

Shore and brace excavations where necessary to prevent cave-ins, and in accordance with good construction practices, all safety laws and applicable codes.

Excavation and Backfilling by every trade including storm drainage, utilities, underground piping and sleeves, electrical conduits, etc. shall be done in conformance with this specification.

#### FILL AND BACKFILL:

Place subsequent lifts of select fill in thin layers not exceeding eight inches in loose thickness to the desired bottom of "Surface Seal". Compact by machine or device appropriate for application each lift to within 95% to 100% of the density defined by ASTM D 698, Standard Proctor. The moisture content should range from +1% to +4% above theoretical optimum.

Conduct in-place density tests at the rate of one test per 3,000 square feet for each lift or at intervals of 75 feet for trenches, ditches, etc., minimum 1 test for all lifts, trenches, ditches, etc. Confirm suitability of fill by Atterberg limit testing at the rate of one test per 600 cubic yards of placement, when visual observation of material indicates change, or when source of material is changed.

Fill against grade beams and walls shall be placed only after concrete has gained sufficient strength to withstand the pressure of the dirt or a minimum of 70% of design strength. Backfill retainers shall be installed per manufacturer's instructions prior to backfill operations when carton void forms are used below grade beams. Fill on both sides of grade beams at same time or brace walls. Finish elevation of fill shall allow of a layer of cushion granular fill, thickness as shown, immediately beneath concrete slab which meets compaction requirements.

Contractor shall exercise caution during compaction operations to avoid prolonged repetitive loading. Excessively worked areas which are observed to "pump" are unsuitable and will be replaced.

Where completed areas are disturbed by construction operations, adverse weather, etc., scarify surface, fill if required, reshape, and compact to required density.

#### SHORING:

Provide all shoring, bracing, etc., which is necessary to support adjoining soil, building walls, etc. All shoring to be designed by the Contractor so that it will resist all pressures and movement of earth or building walls, etc. The Contractor shall replace, repair, or rebuild improper, damaged or displaced shoring. Bracing of concrete walls and piers shall be maintained until adequate permanent support is provided by new construction.

Safety precautions, barricades, etc., shall be the responsibility of the Contractor.

Remove all formwork, stakes, shoring, walkboards, etc. prior to backfilling.

Contractor shall exercise great care to see that soil and debris is kept out of trenches and other areas which receive concrete. Excavation in areas which require forming shall be made wide enough for forming, inspection and other work.

#### SURFACE SEAL:

Surface seal to be "Select Fill" a minimum thickness of 12" to be installed over any subgrade located below the proposed new concrete slab. Top of cap shall be at Elevation 488.12'.

Upon completion of excavation and recompaction, the select fill should be placed with in approximately seven working days to limit the moisture loss.

#### SAND CUSHION:

Indication of Sand Cushion on the Drawings is as an aid to achieve required concrete tolerances, and is at Contractor's option. Sand cushion material shall be clean sand having no plasticity, have free draining characteristics, be clean of all organic matter and chlorides, and allow 100% passage #80 Sieve with no more than 10% passing the #200 Sieve. Compact to between 92% and 100% of maximum density Standard Proctor ASTM D 698 at 3% below to 3% above theoretical optimum including moisture introduced by broadcasting of waterborne solutions.

Obtain final confirmatory densities immediately prior to placement of vapor barrier or concrete as applicable.

#### SOIL POISONING:

Before application of any chemical the Contractor shall provide license certificate of applicator and obtain approval of working solutions. Ensure that soil is clean of all wood chips, roots, and debris.

All soils or fill under buildings, covered walks, docks, vestibules, motor rooms, etc., shall be treated with a 1% solution of Dursban TC, by Dow Chemical; or Demon TC, by Zeneca Professional Products, applied as follows:

- Horizontal Surfaces: 1 gallon per 10 square feet.
- Footings, grade beams and plumbing penetrations: 4 gallons per 10 linear feet.

Soil poison may be applied to sand cushion or to subgrade directly below sand cushion at Contractor's option.

Retreat all areas which have been regraded, replaced, or otherwise manipulated after initial application.

Provide Brookshire's with a written guarantee that the building will be free from termite infestation for a period of five (5) years from date of treatment.

#### TOPSOIL:

Topsoil shall be furnished and installed by General Contractor.

Contractor shall prepare all areas disturbed by any work within this Contract which will leave exposed soils, and designated on the drawings to receive Planting, Seeding, Sod, Landscaping, etc. Areas shall be smoothed by Box-Scraper or Bladeing with a minimum of tire/track impressions, and be free of trash, roots, rocks larger than 3/4" diameter, rubble, construction debris, etc. Finished Subgrade shall be at 4" less than Finished Final Grade for areas to receive Top Soil.

Topsoil is defined as fertile sandy loam of native surface soil. Satisfactory topsoil is reasonable free of subsoil, clay lumps, stones, and other objects over 1/2" in diameter, and without weeds, roots and other objectionable material.

Contractor may at his option import fertile "Sandy Loam" or reuse existing on-site topsoil provided roots, rocks, and debris are removed and it is properly tilled and to produce a smooth and consistent finish grade surface material. It is the responsibility of Contractor to determine depth of useable on-site material.

#### SUBGRADE PREPARATION FOR AREAS TO RECEIVE PAVING SYSTEMS:

Contractor shall provide within Base Bid Amount for cut/fill operations as required to achieve subgrade elevations for paving option selected.

#### Concrete:

After stripping operations have been completed and prior to commencing filling operations:

- Scarify a minimum 6" depth and recompact to a minimum of 95% standard proctor per ASTM D 698 at or above optimum moisture content.
- Proof-roll with loaded dump truck, or other suitable rolling weight, under the observation of Testing Laboratory Representative to insure acceptability.
- For Subgrade Failure and "Pumping" areas, Overexcavate all material identified by Testing Laboratory as unsuitable and replace with Select Fill per previous requirements of this section.

#### Asphalt:

After stripping operations have been completed and prior to commencing filling operations:

- 6" lime-stabilized subgrade, 6% hydrated lime (27 pounds per square yard), compacted to a minimum of 95% Modified Proctor per ASTM D1557 at or above optimum moisture content.
- Proof-roll with loaded dump truck, or other suitable rolling weight, under the observation of Testing Laboratory Representative to insure acceptability.



- For Subgrade Failure and "Pumping" areas, Overexcavate all material identified by Testing Laboratory as unsuitable and replace with Select Fill per previous requirements of this section.

Scarifying, Recompacting, and Proof-rolling operation shall be included in Base Bid. Overexcavation and Backfilling shall be at Brookshire's expense and Contractor shall be compensated on a UNIT COST basis. UNIT COST amounts will be established prior to any work being performed.

**SUBGRADE CONFIRMATION/REPAIR OF PAVEMENT AREAS:**

Contractor shall provide within Base Bid Amount for cut/fill operations as required to achieve subgrade elevations for paving option selected.

Prior to placement of any Asphalt Paving or Exterior Concrete Paving, Walks, Ramps, Curbs, etc. all cut/fill areas that have been previously determined as acceptable by the Testing Laboratory and exposed to weathering for a period greater than 14 days, have received Precipitation greater than 0.5", or are native materials remaining at natural grade. Contractor shall repeat the requirements listed above under SUBGRADE PREPARATION FOR AREAS TO RECEIVE PAVING SYSTEMS.

Scarifying, Recompacting, and Proof-rolling operation shall be included in Base Bid. In this case, Overexcavation and Backfilling shall be at Contractor's expense.

**CLEANUP:**

Per GENERAL CONDITIONS, conduct Work in an orderly manner and so as not to create nuisance. Dirt shall not be permitted to accumulate on streets or sidewalks nor to be washed into sewers.

Remove from the site and legally dispose of all debris and excess material not required for backfill. No rubbish, debris, trash, vegetation, rubble, spoil materials, etc. shall be buried, or otherwise disposed of, on the site.

*- END OF SECTION 02220 -*

**SECTION 02222**  
**LIME STABILIZATION**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all subgrade hydrated lime stabilization under all building and paving areas as indicated on the drawings and as specified. Minimum compacted thickness shall be no less than 6", unless specifically noted otherwise on the Drawings.

**REFERENCES:**

Texas State Department of Highways and Public Transportation (TSDHPT) standard Specifications Items 260 and 264.

**MATERIALS:**

Hydrated Lime - conforming to TXDOT Item 264.

Unless noted otherwise, use 30 pounds of hydrated lime per square yard (will yield approx. 5 to 7 percent) for 6 inch thickness.

Brookshire's will pay the actual invoice cost of additional lime material only, FOB job site. No Change Order Fee or other "mark-up". No credit will be due to Brookshire's for lesser lime content. Contractor shall furnish labor, equipment, handling, etc. for processing regardless of lime quantity. Contractor's base bid shall also include proof-rolling, reprocessing, etc. of sample area as required to establish Laboratory criteria.

When final subgrade is achieved and Lime Stabilization is ready to begin, prepare a sample area per above requirements of 500 sq. ft. minimum. Notify Laboratory to obtain samples to perform lime series tests, using shear strengths and Atterberg limits, to determine the proper quantity of lime required for soil to be brought within "Select Fill" plasticity requirements.

**EXCAVATION AND/OR FILL:**

Refer to Section EXCAVATION, BACKFILLING AND COMPACTING.

Finish Subgrade to elevations indicated. Provide Lime Stabilization as a surface seal under the building expansion as required in the Geotechnical Report.

**APPLICATION:**

Hydrated Lime shall be applied only in the area where mixing operation can be completed during the same working day. Hydrated lime shall be placed only by "Slurry Method".

Hydrated lime shall be mixed with water in trucks or tanks and applied as a thin water suspension or slurry. The distributor source shall be equipped with an agitator which keeps the lime and water in a uniform mixture.

Soil and hydrated lime slurry shall be thoroughly mixed by a rotary mixer or other device to obtain a homogeneous, friable mixture of soil and lime, free from all clods or lumps and shall be kept moist for a minimum curing period of 72 hours.

Provide adequate surface and subgrade drainage during construction.

**FINAL MIXING:**

After curing material shall be uniformly mixed with a rotary mixer capable of reducing the size of the particles so that when all non-slaking aggregates (including asphalt particles for paving reprocessing) retained on the No. 4 sieve are removed, the remainder of the material shall meet the following requirements when tested dry by laboratory sieves.

- Minimum passing 1-3/4" sieve - 100%
- Minimum passing No. 4 sieve - 60%

During the interval of time between application and mixing, hydrated lime slurry shall not be exposed to the open air for a period of over 6 hours.

**COMPACTION:**

Compaction of the mixture shall begin as soon as possible after final mixing, but in no case in excess of 2 calendar days.

Compaction shall begin at the bottom and progress upward in loose lifts no greater than 8" loose measure to achieve required compacted depth and gradient of uniformly compacted material to:

-For Building Foundation - 95% minimum of Standard Proctor Density - ASTM D698 (at or above optimum moisture)

-For Pavement - 95% minimum of Modified Proctor Density - ASTM D1557 (at or above optimum moisture)

All irregularities, depressions, or weak spots shall be corrected by scarifying deficient area(s) and repeating APPLICATION process, or removing and replacing with acceptable material.

All surfaces shall be brought to and maintained in a smooth condition by rolling with pneumatic tire or other suitable device which produces smooth surface without cracking. Maintain all compacted surfaces free from undulations and ruts.

Moist cure all compacted areas for a minimum of 3 days.

After compaction is achieved material shall be watered or sprinkled to maintain optimum moisture plus or minus 1% until covered by permanent improvement.

**TESTING:**

Refer to TESTING LABORATORY CONTROL section of the specifications.

One field-in-place density test shall be performed for each 4000 square feet of area per lift.

*- END OF SECTION 02222 -*

**SECTION 02510**  
**ASPHALT PAVING**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Complete all Paving Work as shown on the Drawings and as specified herein.

**REFERENCE STANDARDS:**

In the event of conflict between Referenced Standards and/or specification requirements, the most stringent shall apply.

All materials and placement shall conform to the 1993 edition of Texas State Department of Highways and Public Transportation (TSDHPT) standard Specifications as called for and as amended by the Drawings and Specifications.

- Item 247 - Flexible Base Materials as applicable
- Item 260 – Lime Stabilization as applicable
- Item 300 - Asphalts, Oils and Emulsions
- Item 340 - Hot Mix Asphaltic Concrete Pavement and of the American Association of State Highway & Transportation Officials (AASHTO).

**SHOP DRAWINGS:**

Per SUBMITTALS.

The contractor shall submit reports by an independent testing laboratory certifying base and paving materials for conformance with standards of this specification, furnish location of source of base material, and identify batch plant for asphalt material for approval by Brookshire's prior to the commencement of any work.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**COORDINATION:**

Coordinate Work and cooperate with any other Trades whose Work relates to paving in any way.

Brookshire's reserves the right to install site related accessories and materials during the progress of this work.

Make careful inspection of surface on which paving is to be placed and check grades of area to receive paving prior to starting Work under this Section.

**PERSONNEL:**

All Work shall be accomplished by trained and experienced applicators, thoroughly adept at the procedures and equipment required by this Section.

At least one supervisory person who is thoroughly trained and experienced in the skills required shall be present at all times and shall direct all work performed.

**WORKMANSHIP:**

Apply paving in true planes to eliminate depressions or "fat" spots. Carefully warp changes in slope. Carefully hand compact and roll with proper heat around building projections so that compaction and texture matches machine compaction. Mask building and ramps or sidewalks before placing concrete primer to prevent staining exposed building surfaces, and prevent staining curbs. Permit no traffic on paving until it has reached atmospheric temperature.

#### DAMAGE:

Barricade or otherwise protect from any damage to finished pavement surfaces that may result from subsequent construction until final acceptance by Brookshire's. Should damage occur, repair to a smooth, true and uniform surface, at no extra cost to Brookshire's.

#### WEATHER LIMITATIONS:

Do not install pavement of base course when the surface or subgrade are frozen or show any evidence of excess moisture, nor when moisture on the surface to be paved would prevent proper bond.

Do not produce pavement mixture when the air temperature is less than 40 degrees Fahrenheit nor when temperature of the surface on which mixture is to be placed is below 40 degrees Fahrenheit.

#### PROTECTION:

Accomplish work in such manner to protect the safety of the public by flagmen, barricades, signs, etc. and so as not to damage improvements, property, landscaping, etc. Any damage caused by this work will be repaired or replaced at the expense of the Contractor by methods acceptable to Brookshire's. Should Contractor not perform correction within a reasonable time or unacceptably, Brookshire's shall have the right to perform said correction and deduct the appropriate amount from the contract.

Notify Brookshire's upon completion of each phase and obtain approval prior to beginning the next phase of the work. Notify Brookshire's 48 hours prior to the placement of Surface Course Asphalt.

Deficient materials shall be removed from the site and replaced with suitable materials. Deficient performance of suitable materials may be reprocessed until satisfactory, except unsuitable surface materials shall be removed and properly replaced.

#### TESTING AND QUALITY CONTROL:

Refer to TESTING LABORATORY CONTROL for Testing Laboratory to perform tests and inspections required by this Section.

#### BASE COURSE ASPHALT:

All paving shall be mixed at a central mixing plant and be Type "B" Item 340 Hot Mix Asphaltic Concrete Pavement, with exceptions as follows:

- "Spreading and Finishing" shall be by approved self-propelled spreading and finishing machine only.
- Compaction/surfacing by power driven smooth surface steel drum-type roller only.

#### SURFACE COURSE ASPHALT:

All paving shall be mixed at a central mixing plant and be Type "D" Item 340 Hot Mix Asphaltic Concrete Pavement, with exceptions as follows:

- "Spreading and Finishing" shall be by approved self-propelled spreading and finishing machine only.
- Compaction/surfacing by power driven smooth surface steel drum-type roller only.

Pavement surface after final compaction shall be smooth and true to established line, grade, cross section, and with a uniform surface appearance. Excessive surface graveling is unacceptable. The minimum allowable slope for all paving shall be 1/16" per foot. Any area on which water stands in excess of 10 minutes shall be rejected. Deviations in excess of 1/4" in 10'-0" shall be rejected. Saw-cut a minimum of 5'-0" in every dimension around the rejected area and at right angles to building lines (rectangular only), remove and replace all paving within the saw-cut. Any deficient paving slope, thickness or finish shall be removed and replaced by a method acceptable to Brookshire's.

#### ADJOINING WORK, REPAIR, & REPLACEMENT:

Where new asphalt in this contract meets or connects to existing asphalt to remain, Contractor shall provide vertical saw-cut, full thickness, of existing surface course, straight and true to lines indicated on the Drawings. Protect and maintain cut edge as necessary to produce clean straight alignment of new to existing asphalt. Any sawn edge which is broken, caved, gouged, etc. or new paving surface which is not aligned with sawn edge or varies greater than 1/8" in elevation with existing paving, shall be rejected and replaced as outlined in "SURFACE COURSE ASPHALT".

#### SUBGRADE:

Contractor shall include within Base Bid the appropriate cost for cut/fill operations as required to achieve subgrade elevations for the respective paving option.

Subgrade preparation shall be in accordance with the Geotechnical Report.

#### LIME STABILIZED SUBGRADE:

Stability, moisture content, and density are required for full depth of material and until time of application of asphalt course. Rate of application to be 6% (27 pounds per square yard) installed per TxDOT Item 260. Compact to a minimum of 95% Modified Proctor density per ASTM D 1557 at or above optimum moisture. Proof rolling may be required by Brookshire's at any time. Removal and replacement shall be same as previously discussed in SUBGRADE paragraph.

#### PRIMER AND TACK COAT (Item 300):

- Apply Prime Coat of MC-30 OR SS-1 at a rate of 0.25 gal./sy. to flexible base after proper compaction has been achieved.
- Apply Tack Coat of AC-20 at a rate of 0.05 gal./sy. over Primer; directly to base material when Primer is not required; or to existing paving surface to be overlaid. All contact surfaces of curbs, structures, cut edges of patches, etc. shall be painted with a thin uniform layer of Tack Coat.

#### WEED KILLER:

Apply Ciba Gaya Primamitol 25E at a rate of 1/2 gal. per 3500 sq.ft. or 6 gal. per acre to base material in water emulsion 5:100 mix (5 gal. Primatol to 100 gal. water) for dry conditions to 5:35 mix for wet conditions, after compaction and prior to application of Primer.

#### BITUMINOUS SURFACE AND BASE COURSE DENSITY:

Item 340 Type "B" and Item 340 Type "D" --

Materials shall be placed at a minimum of 95% for molded laboratory density as determined by Method TEX-206-F. Measurement of in-place density will be made in accordance with Method TEX-207-E Part II. Cores may be secured from the completed asphaltic concrete base for verification of density as determined by Method TEX-207-E. Place material at a temperature no less than 200 degrees F.

#### PAVING SYSTEMS:

Use thickness as indicated unless specifically noted otherwise on the Drawings.

FLEXIBLE PAVEMENT-FULL DEPTH ASPHALT OVER LIME STABILIZED SUBGRADE; Type "D" (Item 340) Surface Course Asphalt over Type "B", (Item 340) Base Course Asphalt. Weed Killer, Primer and Tack Coat required.

-Standard Duty – 1.5" Surface over 2.5" Base over 6" Lime Stabilized Subgrade (Item 260, 6% cement (27 pounds per square yard) compacted to a minimum of 95% Modified Proctor Density, ASTM D1557 at or above optimum moisture).

-Heavy Duty – 1.5" Surface over 3.5" Base over 6" Lime Stabilized Subgrade (Item 260, 6% cement (27 pounds per square yard) compacted to a minimum of 95% Modified Proctor Density, ASTM D1557 at or above optimum moisture).

Thickness of all materials indicated are minimum after proper compaction.

Compaction of base material shall be achieved by power driven roller or acceptable mechanical compacting device suitable for the application when restraints are such that roller cannot be used.

**CLEAN-UP:**

On completion of Work, remove all excess materials, equipment and debris from the site. Leave all Work in clean condition per GENERAL CONDITIONS.

*- END OF SECTION 02510 -*

SECTION 02520  
**CONCRETE PAVING, WALKS, CURB & GUTTER**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Concrete Site work as shown on Drawings and as specified herein. Refer to CAST-IN-PLACE CONCRETE Specification Section for Design, Mixing, Handling, etc.

**SHOP DRAWINGS:**

Per SUBMITTALS section. Paving Contractor shall provide Brookshire's with a paving layout plan for approval prior to commencement of any paving operations. 30' wide maximum paving strips are encouraged to allow for brooming to be performed across the full width of the strip from one side with no laps.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper dimension, elevation and alignment of all concrete and accessories is required.

**COORDINATION:**

Coordinate with all other trades whose Work relates to Site work, utilities, accessories and the like to insure proper locations.

**WEATHER:**

For Cold Weather Applications comply with American Concrete Institute standard ACI-306 to protect all concrete work from physical damage and reduced strength caused by frost, freezing actions or low temperatures. Place no concrete against frozen earth. Do not place Concrete when Ambient Temperature or Wind Chill Factor is below 32 degrees F, or when Ambient Temperature or Wind Chill Factor is predicted by the National Weather Service to be below 32 degrees F within 24 hours, except as provided for in *Cold Weather Provisions* within this Specification.

**CONCRETE:**

All concrete shall conform to 1989 ACI Standards unless specifically noted otherwise within this Specification.

Contractor shall notify Brookshire's a minimum of 48 hours or two full working days prior to placement of all concrete to allow for inspection of steel, vapor barrier, forms and the like. No concrete shall be placed without acceptance by Brookshire's of the aforementioned items.

All concrete not conforming to the requirements of the Drawings and Specifications shall be removed and replaced by the Contractor in a manner acceptable to Brookshire's.

**MINIMUM COMPRESSIVE STRENGTH:**

- Paving - 3000 PSI at 28 days (5 sack mix).

**FINISHES:**

Paving - Heavy Broom Finish acceptable to Brookshire's. Coordinate with Brookshire's to observe application of first pour finish and to establish acceptable finish.

**SLUMP:**

Minimum 3", Maximum 5" (except curb & gutter).



#### FORMS:

Forms shall be built true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement or sagging between supports. Adequately brace all beams, walls, etc. to restrain backfill, construction loads, wind loads, etc. until adjoining structural elements have been placed and permanently attached or curing time has elapsed. Responsibility for their adequacy shall rest with the contractor.

#### CONCRETE REINFORCING STEEL:

Bars shall be ASTM Grade 60, New deformed bars except #3 bars shall be Grade 40, and shall be free of scale, dirt, rust, oil, grease, etc. Corner bars shall be equal in size and shall lap adjacent reinforcement 1'-6" (minimum).

Use adequate tie wire to insure that reinforcing acts as a "mat" and is not displaced during placement of concrete.

Provide non-corrosive supports to insure reinforcement remains in center of slab and as called for on the Drawings with minimum coverage of 2" within form (3" within earth forms). Steel dowels may not be used as supports.

#### ACCESSORIES:

Concrete Expansion Joint (E.J.) - Carey Elastic, Celotex Flexcell or approved equal, use 1/2" unless noted otherwise.

#### SUBGRADE PREPARATION, CONFIRMATION/REPAIR:

Per requirements of EXCAVATION, BACKFILLING AND COMPACTION section.

#### TESTING AND QUALITY CONTROL:

Contractor shall have a slump cone at the job site at all times during concrete pours. The Contractor or his representative will perform slump tests on the first truck and alternating trucks thereafter. Brookshire's may call for additional slump tests at any time. Brookshire's may require laboratory representatives to perform slump tests. No water may be added to the concrete once the slump test has been approved except as authorized by Brookshire's. Concrete with excessive slump shall be removed from the job site.

Brookshire's will employ and pay for the services of the testing laboratory for the testing of concrete as follows. During the progress of the work and for each different mix of concrete, a set of 4 standard 6" cylinders shall be made and tested, where from 1 to 25 cubic yards are placed during each days operation. Additional sets of cylinders shall be made for each additional 40 cubic yards.

NO RETEMPERING of concrete will be allowed.

NO ADDITIVES may be mixed with or applied to concrete unless specifically authorized by Brookshire's.

Air Entrainment of 4% to 6% - per ASTM C 260 for all Exterior Concrete which will remain exposed to the elements in the finished construction, including walks and drives under canopies and overhangs.

Fly Ash is allowed for mix design(s) containing fly ash substitute in portland cement to 20% maximum of portland cement dry weight (75.2 lbs. portland + 18.8 lbs. fly ash = 94 lb. sack) subject to the following requirements:

The mixing plant shall be certified by testing laboratory to have acceptable automated control of quantity and method of blending fly ash with portland cement to achieve uniform introduction to and consistency within the concrete mix, or shall use Texas Industries, or approved equal, Type IP manufactured pre-mix.

#### CONCRETE PLACEMENT:

Place concrete in compliance with practices and recommendations of ACI 304, and as specified herein.

#### *Cold Weather Provisions -*

For convenience of the Contractor, an approved non-chloride accelerant, may be used when Ambient Temperature or Wind Chill Factor is between 32 degrees F and 25 degrees F, or when Ambient Temperature or Wind Chill Factor is predicted by the National Weather Service to be between 32 degrees F and 25 degrees F within 24 hours, at no additional cost to Brookshire's. Accelerant shall be used only with written approval of Brookshire's and shall conform to ASTM C 494 for type C admixtures, except that 90% water content maximum of control shall be used. Reduce water batching volume proportionate to accelerant volume addition. Product shall be added in the batching process during the approved initial mortar mixing process. Product volume amount added in batching shall be clearly designated on each delivery ticket.

W.R. Meadows SEALTIGHT HYDRASET-FREE is used to establish quality, other manufacturers will be considered for substitution, at the rate of 1 1/2 quarts per bag of Cement. No Concrete operations will be allowed when Ambient Temperature or Wind Chill Factor is below 25 degrees F, or predicted to be below 25 degrees F within 24 hours.

#### *Hot Weather Provisions -*

For Hot Weather Applications prepare aggregates, mix water and other ingredients, and place, cure and protect concrete in accordance with the requirements of ACI-305.

#### HORIZONTAL SURFACE FINISHES AND TOLERANCES:

Finished surface shall be to within 1/4" maximum above or below indicated elevation and 1/4" maximum variation above or below across an 8'-0" straight edge placed at any location and in any direction on the finished surface, and subject to same ponding requirements as Asphalt Paving.

All areas which do not meet the specified finishes and tolerances will be removed and properly replaced. Saw cut around the entire area designated by Brookshire's making all cuts square with the exterior walls of the building and in no case having a dimension less than 3'. Remove and discard the entire thickness of the concrete area and all related reinforcement except 1' around the perimeter of the removed area. Install new reinforcement steel and attach to the remaining perimeter steel, and properly replace concrete.

NO FILL/LEVELING materials or fill techniques of any type will be allowed to attempt to alter placed concrete to achieve tolerances.

#### SAWING:

Saw-Cutting of Concrete Control Joints shall be accomplished as soon as concrete will support foot traffic and after finish has been applied, but in no event longer than 8 hours, unless noted otherwise on the Drawings, after commencement of Concrete Pour for the specific placement section.

All Saw-Joints, and Cutting for replacement, removal, adjoining of work, etc. shall be accomplished by Power Driven - Water Assisted Equipment specifically manufactured for the application, and operated by experienced personnel. All cuts shall be uniform in depth to within  $\pm 1/8"$ , straight and true to line with variance of no greater than  $\pm 1/8"$  along a 8' straight edge and no more than  $\pm 3/8"$  overall. Saw cuts should be spaced in feet 2.5 to 3 times the pavement thickness in inches.

#### CURING:

Cure all exterior concrete including, but not limited to, Paving, Walks, Curb & Gutter, Steps, Ramps, Landings, and Drainage Structures with application of Transparent (clear, non-pigmented, non-milking) liquid curing compound as concrete will support foot traffic and after finish has been applied, but in no event longer than 4 hours after finishing. Use Sonneborne Sonosil, Kure-N-Seal, Sonocure or approved equal per manufacturer's printed recommendations for application and coverage.

When temperature is predicted by the National Weather Service to be 85° F or higher, or temperature is predicted to be 80° F or higher with sustained wind speed in excess of 10 mph, within 24 hours of beginning of Concrete Placement, "Hot Weather" methods shall be employed as follows. In addition to application of Liquid Curing Compound, and immediately after Sawing of Joints, cover all horizontal and near-horizontal Concrete Surfaces with "Heavy Burlap" and saturate with water, or flood surface and cover with 4 mil Clear Polyethylene Film. Maintain Concrete Surface in a "Continually Wet" condition for a minimum of 5 days.

#### CONTROL/COLD JOINT FILLING:

Material: Self-Leveling Traffic Grade Sealant, Color as selected from Manufacturer's Standard. Others will be considered for substitution.

- Metzger/McGuire, MM-80
- Pemco Urexpan NR-2000
- Sonneborn, Sonolastic SL1 - Limestone
- Mameco International, Vulkem 45 - Limestone

Fill all exterior concrete saw-cut control joints; formed cold joints, both in concrete flatwork and where concrete paving and walks abut curbs and gutters; and where concrete paving, curbs, walks, landings, steps, etc. abut building elements. Products by one manufacturer only shall be used throughout the entire job.

Do not fill joints in walks, ramps, etc. which have been formed by tooling only.

Provide back-up material at joints which are 3/8" or larger after concrete has cured for a minimum of 28 days. Use expanded foam tube or rod stock recommended by manufacturer for this application and acceptable to Brookshire's. Diameter of back-up material shall allow for 25% to 50% compression when in place. Install leaving a minimum of 3/4" depth to receive sealant. Install back-up material without stretching, twisting or braiding.

Scrape or otherwise remove fibrous expansion joint material, at joints indicated to receive Sealant, to a minimum of 3/4" below finished surface.

#### INSTALLATION:

Clean surface to receive Sealant of all dirt, saw residue, loose fibrous material, scale, rust, moisture, mildew, or any other foreign matter by use of wire brush; scraper; sand, air, or water blasting; or chemical recommended by sealant manufacturer's printed information.

Allow a minimum of 24 hours drying time after moisture is no longer visible in joints.

Apply under pressure with hand or power-actuated gun or other appropriate means. Guns shall have nozzle of proper size and provide sufficient pressure to completely fill joints as designed.

Thoroughly and completely mask all joints where the appearance of sealant on adjacent surfaces would be objectionable.

Install in strict accordance with manufacturer's recommendations as approved by Brookshire's, thoroughly filling all joints to the recommended depth.

Apply material at rate that produces cured surface with sealant at level of finish to 1/8" below surface. Should sealant flow above or on concrete surface, allow material to "set" and trim flush with surface at joint and remove remainder from concrete surface. Protect joint from foot or vehicular traffic for 48 hours, and contact with water for 24 hours after application.

**PAVING SYSTEMS:**

Use thickness as indicated unless specifically noted otherwise on the Drawings.

**CONCRETE PAVEMENT:** 3,000 psi concrete with #3 bars spaced at 24 inches on-center.

-Standard Duty - 5" concrete over 6" scarified and recompactd subgrade. Subgrade should be compacted to a minimum of 95% Standard Proctor Density with the moisture content at optimum or above.

-Heavy Duty - 6" concrete over 6" scarified and recompactd subgrade. Subgrade should be compacted to a minimum of 95% Standard Proctor Density with the moisture content at optimum or above.

**DELIVERY AND STORAGE:**

Deliver and store materials per manufacturer's printed instructions.

**CLEAN-UP:** Per GENERAL CONDITIONS.

*- END OF SECTION 02520 -*

SECTION 02530  
**SITework & PAVEMENT MARKING**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Marking and Stripes for the Work as shown on Drawings and as specified herein.

**SHOP DRAWINGS:**

Per SUBMITTALS.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; unless noted otherwise, stripe dimensions are to center line.

**COORDINATION:**

Coordinate with all other trades whose Work could damage or interfere with placement of pavement markings and stripes.

**DELIVERY AND STORAGE:**

Deliver, store, and protect materials per manufacturer's printed instructions. Do not store paints, solvents, etc. or their application accessories in enclosed areas, near open flame, or expose to extreme heat.

**PRECAUTIONS:**

Coating Systems products shall be handled by personnel skilled in their application and fully aware of potential hazards and risks involved. Contractor is hereby made aware that materials specified herein may contain lead, are highly flammable, and have the potential of causing explosion.

**PREPARATIONS:**

*Power Washing –*

Surfaces shall be thoroughly cleaned with Potable Water from a Mechanical Washing device capable of delivering at a continuous rate from 2000 to 2500 pounds per square inch (psi) in sufficient volume, ranging from 4 to 14 gallons per minute (gpm), to remove surface adherents and blemishes which would interfere with the proper bond of coatings to be applied; including, but not limited to, Oil, Grease, Dirt, Loose Rust, Loose Mill Scale, and Loose Paint/Primer. Contractor shall take care in adjusting pressure, volume, duration of time, and number of passes to assure material being cleaned is not damaged during the cleaning process. Protect all adjacent workers, work, and materials as necessary to prevent damage from this process or its by products.

*Acid Etching –*

Liberally coat the surface with a solution of 2 parts water to 1 part Muratic Acid assuring the solution is applied evenly to the surface. Do not brush or broom; allow to remain undisturbed for 15 to 20 minutes. Contractor shall provide appropriate barriers to assure that this material does not migrate beyond the coating application area. Allow the surface to dry completely, but in no case less than 24 hours, prior to application of coating.

**MATERIALS:**

*Traffic Paint -*

Stripes and Markings shall be Aexcel Chlorinated Rubber Traffic Marking Paints, no substitutes. All Stripes and markings shall be White, unless specifically noted otherwise on the Drawings.

Yellow = 12Y-D112

White = 12W-D110

Red = 12R-D032

Handicap parking background shall be Aexcel Regular-Dry Alkyd Zone Marking Paint, no substitutes.

Blue = 12L-D004

*Reflective Pavement Markers –*

SA-SO 44X020T Amber Color Both Directions attached to pavement with 44X16 Series Epoxy Adhesive. Clean paving surface thoroughly and apply per manufacturer's printed instructions.

*Concrete Stain -*

For Coloration of "Grooved Concrete" where indicated on the Drawings, apply Sherwin Williams H&C Concrete Stain #1071521; or Tuf-Top Concrete Floor and Driveway Stain; Silicone Acrylic, manufacturer's standard color as selected by Brookshire's.

**INSTALLATION:**

Prior to application of Coating Systems, insure that surface is clean of dust, dirt, grease, moisture, debris and the like which could inhibit proper adhesion of this material. Verify that paving surface is sufficiently cured in accordance with manufacturer's printed recommendations.

New concrete or asphalt paving should be aged for a minimum of 30 days prior to painting.

**Traffic Paints:**

- Apply at rate to achieve a minimum dry thickness of 7.5 mils (15 mils –wet) per coat.
- Stripes, Curbs, and other Pavement Markings require one coat and shall be applied by use of Power Actuated "Airless" Spraying device, only, capable of continuous operation at a minimum pressure of 2400 psi.
- Concrete Light Pole Bases shall be painted by use of Brush and/or Roller.

**Concrete Stain Application:**

- Should grease or oil spots exist, scrub with strong detergent and rinse thoroughly, repeat if necessary, to completely remove contaminants.
- Should mildew, algae, etc. be present, apply household bleach liberally and rinse thoroughly.
- Pressure Wash the surface thoroughly to remove all loose materials and embedded dirt.
- Acid Etch the concrete surface.
- Reduce the first coat to 3 parts Stain to 1 part Thinner and apply liberally. Allow this coat to dry completely, but in no case less than 24 hours, prior to application of next coat.
- Apply finish coat liberally at full strength. Allow this coat to dry completely, but in no case less than 72 hours, prior to allowing any foot or vehicular traffic.
- Application of Stain products shall be by Brush and/or Roller only, and in strict accordance with manufacturer's printed instructions.

Lay-out all lines to dimensions and configurations indicated on the Drawings by use of chalk markings, stencils or templates. Notify Brookshire's immediately if there is a conflict in dimensions or should additional dimensions be required. Scaling of drawings by Contractor is not acceptable.

Application of Traffic Marking Paint without the use of lay-out chalk markings, stencils or templates "Free-Handed" is prohibited.

Apply Coating Systems to achieve uniform finished appearance in color, texture and thickness. Markings and Stripes shall be uniform to plus or minus 1/4" of required width, with crisp edges varying not more than 1/4" in 8' when checked with straight edge.

Do not apply Coating Systems during windy conditions which could cause spray to travel to elements not to receive the material or to other property. Do not use nails, screws, stakes, tabs, etc. which attach to or blemish paving or building elements unless specifically authorized by Brookshire's.

Items which have been misplaced or do not meet tolerance for width or straightness shall be removed by carefully sandblasting so as not to blemish the paving surface, and properly reinstalled. Items being deficient in thickness, color, and/or texture will be removed or recoated at the discretion of Brookshire's. "Blacking-out" is not acceptable.

Apply Traffic Marking Paint only when weather is clear and temperature is a minimum of 50 degrees and rising, or when relative humidity is less than 85 percent. Protect work from foot or vehicular traffic for a minimum of 48 hours after placement.

**CLEAN-UP:**

Per GENERAL CONDITIONS.

Contractor shall repair or replace to Brookshire's satisfaction any construction elements or property damaged by this operation. Remove and properly dispose of all containers, surplus materials, masking, stencils, etc. from the site.

*- END OF SECTION 02530 -*

**SECTION 02600**  
**SITE UTILITIES**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Site Related Improvements, Accessories, and Amenities as shown on Drawings and as specified herein.

**CODES:**

All labor, equipment and materials shall be in strict accordance with applicable laws, codes, regulations, rules, practices, and recommendations of all Governmental/Regulatory Agencies having lawful jurisdiction over the work, including but not limited to:

- National Board of Fire Underwriters
- City/Municipality, County/Parish, and State
- All work shall be accomplished in full compliance with the Occupation Safety and Health Act (OSHA) latest edition

Each Contractor shall secure all necessary permits, licenses, and inspections required by law for the work, the cost of which shall be paid for by the Contractor. Contractor shall secure such pay for all certificates of approval that may be required and deliver them to Brookshire's before final acceptance of the work.

**GENERAL PROTECTION:**

Contractor will be responsible for properly storing and protecting his materials, supplies, tools and equipment on the site. After materials are installed, he is responsible for properly protecting his installation until the work is completed and accepted. Any damage from whatever cause will be made good by the Contractor whose work is damaged, without cost to Brookshire's, whether the repair is made with his own materials and by his own workman, or by others under his direction.

**DRAWINGS AND SPECIFICATIONS:**

Drawings accompanying these specifications show the extent of the work to be done. The evident intent of these documents shall be carried out in every particular.

Dimensions shall be followed without regard to scale. Scaling of the plans is specifically prohibited. Any omissions, conflicts, errors, etc. shall be reported to Brookshire's Facility Services Office immediately for clarification, interpretation, or resolution.

**SHOP DRAWINGS:**

Per SUBMITTALS.

**RECORD DRAWINGS:**

Contractor shall maintain two complete sets of drawings upon which all deviations and changes shall be legibly recorded and actual installed position of all items shown in accordance with requirements of General Provisions. Drawings shall include water mains, water valves, water meters, fire hydrants, blow-off valves, tees and wyes for future connections, sanitary sewer mains, manholes, cleanouts, storm sewer, etc. and shall be accurately located by dimensions.

Two sets of record drawings shall be delivered to Brookshire in good condition upon completion and acceptance of the work and before final payment is made.

**GUARANTEE:**

Per GENERAL CONDITIONS.



#### EXAMINATION OF PREMISES:

Contractor shall visit this site to become fully acquainted with the immediate and surrounding premises and the conditions under which the work will be executed. Submission of a bid will be taken as evidence that this inspection has been made.

#### UTILITIES:

Location and sizes of sewer, water and gas lines are shown in accordance with data secured from available sources, such as Utility Providers. Data shown is offered as an estimating guide without guarantee of accuracy; each bidder shall make complete investigations of the site and shall check and verify all data given. Each Contractor will be responsible for coordinating Locator Services and physically verifying the exact location of all utility services related to his work.

#### INTERPRETATION OF REQUIREMENTS:

Any questions as to interpretation of Drawings and Specifications or any questions arising after examination of premises must be referred to Brookshire's website in the form of a Request For Information (RFI). No interpretation nor instructions given verbally by any person or persons will be considered valid.

#### SUBCONTRACT AND LABOR:

Per CONTRACT AND GENERAL CONDITIONS, all provisions of this section shall apply to all Contractors and suppliers to the extent that they are applicable.

#### MATERIALS AND WORKMANSHIP:

All components of the work shall be new and unused unless specifically noted otherwise in the Construction Documents. It is the intention of these specifications to indicate a standard of quality for all materials incorporated in this work.

All materials of a type for which the Underwriter's Laboratories have established a standard shall be listed by the agency and shall bear their label. Manufacturer's names and catalog numbers are used to designate the item of equipment or material as a means of establishing grade and quality. Where several manufacturers are named, only these named manufacturer's products will be considered and the Contractor's bid shall be based on their products.

All work shall be performed by competent workers, skilled in their trade, and shall be executed in a thorough, substantial and workmanlike manner.

Refer to SUBMITTALS for substitutions.

Should requirements for substituted equipment differ from the Construction Documents and/or the named manufacturer, it shall be the responsibility of the Substituting Contractor to provide the proper services, whether greater or lesser, at no additional expense to Brookshire's.

#### CUTTING AND PATCHING:

Contractor shall be responsible for all cutting and patching required for the proper installation of his own work. Contractor shall obtain permits and/or permission from any governing authority prior to any work within any right-of-way and affecting any highway, street or paved surface. The affected roadway shall be repaired by the Contractor as indicated on the Drawings.

#### CONSTRUCTION REQUIREMENTS:

Refer to EXCAVATING, BACKFILLING AND COMPACTING and all other related Specification Sections for Below Grade Work.

#### MEASUREMENTS:

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

#### COORDINATION:

Coordinate with all other trades whose Work relates to work within this Section for placing of all required sleeves, anchorage, attachments, etc., to insure proper locations. Coordinate timing of placement of these elements to avoid damage to this work and adjoining trades.

#### DELIVERY AND STORAGE:

Deliver and store materials in dry, protected areas. Keep free of corrosion or other damage. Replace any damaged parts at no cost to Brookshire's.

#### DRAINAGE PIPE and ACCESSORIES:

##### *Storm Drainage Pipe -*

Reinforced Concrete Pipe (RCP), Class 3 per Texas Department of Transportation (TxDOT) Item 464 specifications and installation standards. No substitutes in right-of-ways.

Reinforced Concrete Box Culverts (RCB), per Texas Department of Transportation (TxDOT) Item 462 specifications and installation standards. No substitutes in right-of-ways.

##### *French Drain Pipe -*

Advanced Drainage Systems, Inc. (ADS) corrugated exterior with smooth interior polyethylene pipe per ASTM F-405, or approved equal. Use ADS N-12 perforated for french drains and solid for where indicated as "solid" on the Drawings.

##### *Filter Fabric -*

Advanced Drainage Systems, Inc. (ADS) ADS-600 or approved equal. Lap 18" minimum at connections to adjacent fabric, ends, structural elements and top of drainage beds that are independent from structures. Keep clean, dry and protected from damage prior to installation. Repair any damaged area by removing and replacing with 18" minimum lap all around.

#### SANITARY SEWER PIPE and ACCESSORIES:

##### *Sanitary Sewer Pipe -*

All sanitary sewer lines shall be DR 35 PVC pipe.

##### *Sanitary Sewer Manholes -*

Manholes shall be furnished and constructed as indicated on the Drawings.

##### *Cleanout -*

All sanitary sewer cleanouts shall be Wade W-6030-Z-12-75 Series, unless noted otherwise on the Drawings. Cleanout shall be provided at each change in direction of the waste lines, at the end of each continuous waste line, and at 100'-0" maximum intervals in lines on the Brookshire's site. All locations not specifically indicated on the Drawings shall be acceptable to Brookshire's. Inside diameters of cleanout openings shall be equal to or larger than the size of waste lines in which they are placed, except 5" to 8" diameter may be served with 4" diameter cleanouts.

All exterior cleanouts, not located within pavement area shall be encased in 18" x 18" x 6" concrete pad, or as detailed on the Drawings.

#### WATER PIPE and ACCESSORIES:

##### *Water Main Pipe -*

All water mains shall be AWWA C-900 or C-905 PVC, Class 200 pipe. Provide all materials, labor, equipment, etc. and obtain taps, connections, etc. as required to provide water service as indicated on the Drawings. All valves, fittings, and devices which come in contact with Domestic Water shall be certified as such by applicable Standard, such as: ASSE, IAPMO, AWWA, CSA, USC/FCCC & HR.

Provide domestic water service of the size shown on the Drawings, including main shut off valve in underground concrete box with cast iron locking cover, labeled "WATER". Furnish and install all other required valve boxes where indicated on the Drawings and as required by the City. Boxes and cover shall be cast iron and the cover shall have the word "WATER" in raised letters

on casting. Valve box shall be sufficient size for installation and maintenance valves. Top of boxes shall be installed flush with final finished grade.

*Domestic Pipe -*

All exterior Domestic water service lines from meter to the building shall be Schedule 40 PVC, unless superior grade is required by governing authority, to be installed as indicated on the Drawings.

*Underground Fire Sprinkler Pipe -*

All underground fire sprinkler pipe shall be AWWA C-900 or C-905 PVC, Class 200 pipe. Underground piping shall be braced and clamped in an approved manner acceptable to the Rating Bureau. Provide concrete thrust blocks at each change in direction and at all tees, plugs, caps and bends in strict accordance with NFPA 24, Section 8-6.2 and Appendix B.

*Fire Hydrants -*

Fire hydrants shall be furnished and installed as indicated on the Drawings.

**TRENCHING AND BACKFILL:**

Refer to EXCAVATING, BACKFILLING AND COMPACTING, TESTING LABORATORY CONTROL and all other related Specification Sections for Below Grade Work.

**INSTALLATION:**

Install all Site Improvements, Accessories and Amenities per manufacturer's printed instructions.

Install in a sturdy, substantial manner, straight, and true to alignment/elevations indicated on the Drawings.

All drainage piping shall be installed with a constant slope from flow line elevations indicated, unless specifically noted otherwise.

Verify location and depth at each end of work and determine that proper flow elevations are available before commencing any work.

Sanitary Sewer lines shall not be closer horizontally than 10'-0" to a potable water line, except that where the bottom of the water line will be at least 1'-0" above the top of the sewer line, the horizontal spacing may be minimum of 6'-0".

Where sanitary sewer lines cross above water lines, the sewer pipe for a distance of 10'-0" each side of the crossing, shall be cast iron and without any joint closer horizontally than 3'-0" to the crossing or shall be fully encased in a minimum 4" thick concrete envelope.

All sanitary sewer and water lines shall have a minimum of 48" cover to finished grade.

All piping shall have reducing fittings used for reducers or increasers where any change in the pipe sizes occur. No bushings of any nature shall be allowed in piping.

**CLEAN-UP:**

Per GENERAL CONDITIONS. Each Contractor must be responsible for all equipment, unused material, rubbish and debris of any kind which is generated during the execution of his portion of the work. Keep premises clean and free from unnecessary impediments and debris at all times.

- END OF SECTION 02600 -

SECTION 02610  
**SITE UTILITIES – TESTING AND CLEANING**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Contractor shall during the progress of the work or upon its completion, make such tests of his work as are herein specified in accordance with all law governing authorities, or as are required by Brookshire's or by state or municipal bureaus having jurisdiction and under their supervision.

Contractor shall provide all apparatus, temporary piping connections or any other requirement necessary for such tests, and shall take all due precautions to prevent any damage.

Any leaks, defects or deficiencies discovered as a result of the tests shall be immediately repaired or made good and tests shall be repeated until the test requirements are fully complied with.

NO CAULKING of pipe joints to remedy leaks will be permitted.

No work of any nature shall be covered, enclosed or otherwise concealed until properly inspected, tested and approved. Any leaks which develop during any of the tests shall be corrected with new material and made good as required; said tests shall be repeated until the work is satisfactory to Brookshire's.

**TESTING AND ADJUSTING:**

*Water Piping and Underground Fire Sprinkler -*

Shall be properly tested to a hydrostatic pressure of 150 psi (pounds per square inch) gauge for a period of not less than eight hours. During this test period, all leaks in pipe, fittings and accessories, in the particular piping system which is being tested, shall be stopped and the hydrostatic test shall again be applied.

This procedure shall be repeated for an entire eight hour period and no leaks can be found while the system being tested is subject to the pressure mentioned above.

*Sanitary Sewer -*

Pipe shall have all outlets temporarily plugged. The pipes shall be filled with water testing the system in sections such that no section shall be tested with less than ten (10) foot head of water. If, after 24 hours, the level of the water has been lowered by leakage, the leaks must be found and stopped by this Contractor, and the water level shall again be raised and the test repeated until after 24 hour retention period there shall be no perceptible lowering of the water level of the system being tested.

**DOMESTIC WATER PIPING SYSTEM STERILIZATION:**

Sterilization process shall be conducted under the direction of the local health department and upon completion of the process, health department shall test and verify the cleanliness of the water piping system.

On the house side of the water meter assembly, provide a 3/4" connection through which chlorine shall be introduced into the house water piping systems to sterilize those systems thoroughly. This sterilization procedure is inclusive of any and all underground mains whether dedicated only to Domestic service, or common to Fire Protection and Domestic service. Sterilization is not required after Fire Protection piping becomes segregated from Domestic service.

After completion of the testing, entire domestic water piping systems shall be thoroughly sterilized with a solution containing not less than 50 parts per million of available chlorine, conforming to U.S. Army Specification No. 4-1, or calcium hypochlorite or chlorinated lime conforming to the requirements of Federal Specifications 0-C-114, and shall be pumped into the

system throughout the connection described above. Sterilizing solution shall be allowed to remain in the system for a period of 24 hours, during which time all valves and faucets shall be opened and closed several times. After sterilization, the solution shall be flushed from the system with clean water until the residual chlorine content is not greater than 0.2 parts per million.

**SANITARY SEWER CLEANING:**

After completion of testing and prior to city acceptance, the Contractor shall clean each section of waste line in the presence of the Owner's representative. This shall be done by rodding each main and individual branch runouts.

Notify Brookshire's in writing 48 hours in advance of cleaning schedule.

**CERTIFICATE OF APPROVAL:**

Upon the satisfactory completion and final test of the site utilities, the Contractor shall obtain from the proper authority having jurisdiction and shall deliver to Brookshire's an appropriate certificate of approval.

*- END OF SECTION 02610 -*

**SECTION 02800**  
**SITE IMPROVEMENTS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Site Related Improvements, Accessories, and Amenities as shown on Drawings and as specified herein.

**SHOP DRAWINGS:**

Per SUBMITTALS.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

**COORDINATION:**

Coordinate with all other trades whose Work relates to work within this Section for placing of all required sleeves, anchorage, attachments, etc., to insure proper locations. Coordinate timing of placement of these elements to avoid damage to this work and adjoining trades.

**DELIVERY AND STORAGE:**

Deliver and store materials in dry, protected areas. Keep free of corrosion or other damage. Replace any damaged parts at no cost to Brookshire's.

**EXTERIOR IDENTIFICATION SIGNAGE & MARKINGS:**

Sargent-Sowell Co., "SA-SO", Grand Prairie, TX, is used to establish quality. Other manufacturers will be considered for substitution. .080 Aluminum with Reflective Baked Enamel Painted finish unless noted otherwise:

Disabled Parking -	09345	12" x 18"
Van Accessible -	09146	12" x 18"
\$50-200 Fine -	09264	12" x 6"
No Parking Fire Lane -	09602	12" x 18"
No Parking Bet. Signs -	09682	12" x 18"
No Truck Parking -	01575	12" x 18"
Stop -	09398	30" x 30"
Keep Out -	04K240K	20" x 14"
Reflective Posts	47K149	62" Ht.

**CHAIN LINK FENCING:**

Anchor Fence, Inc. is used to establish quality. Other manufacturers will be considered for substitution. All items shall be Hot Dipped Galvanized per ASTM A-641, unless noted otherwise.

- Fabric = Steel core wire 11 gauge x 1 3/4" to 2 1/4" diamond mesh x 4' height, unless noted otherwise.
- End, Corner & Pull Posts = 2.375" O.D., Type I, 3.65 lb/ft.
- Intermediate Posts = 1.9" O.D., Type I, 2.72 lb/ft.
- Rail = 1.6" O.D., Type I, 2.2 lb/ft., with 6" minimum lap integral crimp/sleeve joining system or 3" minimum overlap each side external coupling device.

Install all fencing indicated on the Drawings with the following minimum requirements. Furnish end, corner and pull posts at all terminations, change of direction, break point in elevation which create a visible "angle", steps, and to limit continuous lengths to a maximum of 200 ft.

Furnish 1, 2, 3 or 4 way cap and top rail receiver where appropriate, or cap-only and bolted top rail receiver as necessary for angles, steps, offsets, etc.

Fabric shall be installed per manufacturer's printed instructions, stretched "taut" to remove slack but not to deform diamonds. Intermediate posts shall be installed to limit top rail spans to 10' maximum and be equally spaced between end/corner posts, each with combination top rail support and cap. Terminate fabric with 3/16" x 3/4" x fence height less 2" flat steel tension bars clamped to end/corner/pull posts with bolted strap clamps at 15" maximum spacing, 3 each minimum.

All mechanical connectors, bands, etc. shall be bolted with 5/16" x 1 1/2" galvanized carriage bolts, minimum. Furnish 9 gauge, minimum, galvanized wire continuous at bottom attached to fabric at 2' minimum with galvanized hog ring clamps. Secure fabric to top rail at 30" o.c. maximum and to intermediate posts at top, bottom, and 15" o.c. maximum with 13 gauge galvanized steel wire, double wrapped. Fold twist/cut ends of the wire under top rail and against side of intermediate posts so as to prevent injury.

Embed all posts in 2500 psi (4 1/2 sack) concrete, "sackrete" is not acceptable. Size holes to allow for 4" minimum coverage between pipe and earth, including bottom. End/corner/pull posts shall be embedded 24" minimum, Intermediate - 18", unless noted otherwise on the Drawings. Concrete shall be smooth and flush with finish grade.

**DRAINAGE PIPE and ACCESSORIES:**  
Refer Civil Drawings for all site utilities.

*Reinforced Concrete Pipe (RCP) -*  
Class 3 per Texas State Highway Department specifications and installation standards. No substitutes in right-of-ways.

*PVC Drainage Pipe -*  
J-M pipe, Ring Tite PVC or approved equal per

ASTM D3034-SDR26 for 4" through 15" diameter,  
ASTM D3034-SDR35 for 4" through 15" diameter,  
and ASTM F679 for 18" through 27" diameter pipe with GPK Products, Inc.

Gasketed Sewer Fittings or approved equal. Install in strict accordance with manufacturer's printed instructions. Use only solvents, lubricants, etc. recommended by the manufacturer for the specific task. Use only factory molded or fabricated fittings of same manufacturer as pipe, or certified as compatible by piping manufacturer. Field modification or fabrication of fitting is not acceptable. Schedule 40 PVC and solvent fittings may be substituted at Contractor's option for 8" diameter and smaller.

*Subsurface Composite Drainage Panel System -*  
Miradrain 6000 by Mirafi®, or approved equal, single sided filter fabric glued to a three dimensional, high impact polystyrene core of a configuration to allow gravity fed water to flow freely to the related discharge system. Provide 4' minimum sheet width, unless specifically noted otherwise on the Drawings. Panel shall be adhered to substrate by mechanical fasteners and/or adhesive, and properly protected during backfilling operations to prevent movement and damage.

*Area Drain & French Drain Pipe -*  
Hancor co-extruded smooth wall polyethylene pipe per ASTM F810, or approved equal. Use perforated for french drains and solid for area drains, irrigation sleeves, and where indicated as "solid" on the Drawings.

*4" PVC Sleeve -*  
Schedule 40 PVC for irrigation installation under paved areas. Glue all connections as required.

*Turf Box -*  
Wilkins AP219/AP969, nominal 12" square x 12" deep, or approved equal.  
*Corrugated Polyethylene Vertical Panel Drainage System -*

As manufactured by Advance Drainage Systems (ADS), Contech/Tenstar, Hancor, or approved equal. ADS AdvanEDGE is used to establish quality. Furnish in continuous full lengths, or 500 lf minimum, as required for the installation. Provide in 12" or 18" height as indicated on the Drawings complete with high modulus geotextile Typar wrap for the entire installation. Install with manufactured end caps, end outlets, couplings, connectors, tees, etc. as required for complete installation. Trenches shall be excavated by mechanical trencher to produce a clean and straight ditch no greater than 3" wider than Drainage Panel width. Install and cover Drainage devices as soon as possible after excavation. In no case shall ditches be left open overnight.

*Filter Fabric -*

Amoco 4545 or 4551 or approved equal. Lap 12" minimum at connections to adjacent fabric, ends, structural elements and top of drainage beds that are independent from structures. Keep clean, dry and protected from damage prior to installation. Repair any damaged area by removing and replacing with 12" minimum lap all around.

*Erosion Control Fabric -*

Phillips 66 Supac 5 NP (UV) or Mirafi 100X or approved equal.

**INSTALLATION:**

Install all Site Improvements, Accessories and Amenities per manufacturer's printed instructions.

Install in a sturdy, substantial manner, straight, and true to alignment/elevations indicated on the Drawings.

All drainage piping shall be installed with a constant slope from flow line elevations indicated, unless specifically noted otherwise.

**CLEAN-UP:**

Per GENERAL CONDITIONS.

- END OF SECTION 02800 -



## SECTION 02910 LANDSCAPING

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### SCOPE:

Complete all Landscaping Work as shown on the Drawings and as Specified herein. Locate all areas requiring planting materials and accessories and stake out for approval prior to planting. Inspect areas to receive Topsoil, Landscaping, and Accessories prior to beginning this work.

### GUARANTEE:

Per GENERAL CONDITIONS.

### GENERAL REQUIREMENTS:

All plants furnished by Contractor shall be true to name. Conform to "Standardized Plant Names" by American Joint Committee on Horticulture Nomenclature. All work shall conform to applicable requirements of American Assoc. of Nurserymen, Inc. Standards.

All shipments of nursery stock and other plant materials shall be subject to inspection by Brookshire's before being removed from nursery. Each shipment shall be declared free of disease and insects of any kind, and all necessary inspection certificates shall accompany each shipment as required by all applicable authorities.

Provide plants of normal growth and uniform height, according to species, with straight trunks and well-developed leaders, roots and tops. Heeled-in stock or stock from cold storage are not acceptable. Plants cut back from larger sizes to meet specifications are not acceptable.

Provide plants of sizes specified or listed on Drawings. Size stated in each case shall be interpreted to mean dimensions of plant as it stands in its natural position in nursery without straightening of any branches or leaders. Height shall be that of plant above soil line at main stem or trunk.

Legible labels shall be placed and remain attached to all plants, specimens, bundles, boxes, bales or other containers, indicating botanical genus, species and size of each until time of planting.

### DEFINITIONS:

*"Caliper"* - diameter of the trunk measured 12 inches above the ground or above the root-ball, whichever is more stringent. For multi-trunk varieties, the diameter of the largest trunk plus one-half the diameter of other trunks at location indicated above.

*"Planting Area(s)"* - all planters, beds, islands, pits, etc. for individual or multiple trees, shrubs, groundcovers, vines, etc.; lawn areas shown on Drawings or specified herein.

### GRADES:

Grade of all finished lawn and planting areas shall be 3 inches lower than top of curbs, paving edges, sidewalks, etc. prior to installation of sod, and 1 1/2 inches below for areas to be seeded and to receive landscaping. When proper grade has been achieved, surplus soil material from excavations for planting shall be removed and properly disposed of or distributed in area(s) designated by Brookshire's.

Provide for positive drainage of all areas by maintaining a minimum slope of 1 inch in 10 feet. Crown and/or swale, in a manner acceptable to Brookshire's, all areas in which grade change is deficient to achieve drainage by a constant slope, or where improvements such as buildings, sidewalks, curbs, paving, etc. prohibit positive drainage.

#### TOPSOIL:

Topsoil shall be furnished and installed by this contractor. Refer to EXCAVATION, BACKFILLING AND COMPACTING Sections for Subgrade Preparation.

Topsoil is defined as fertile sandy loam or surface soil native to the geographic area of this project commonly accepted as having the ability to support the growth of vegetation. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 1/2" in diameter, and without weeds, roots, and other objectionable material.

Contractor shall ensure suitability of areas indicated to receive planting prior to placement of Topsoil. Areas which have been compacted; exposed to vehicular traffic, stockpiling/holding of materials or equipment; or previously covered by buildings, sidewalks, paving, etc. shall be loosened by hand excavation, mechanical discing, tilling, or other means appropriate for the size area and acceptable to Brookshire's, to approximate a natural consistency. Sort materials as necessary and backfill excavations for planting materials, irrigation system, and accessories by methods to prevent intermingling with underlying subsoil or other objectionable material.

After placement of building, walks, curbs, etc. and no further excavation by Contractor will occur, place topsoil in a depth of not less than 4" as required to cover all exposed earth area affected by this construction on-site and to paving, walks, curbs, etc. on public right-of-way areas. Finish grading shall be of uniform slope between grades noted. Surfaces shall be hand raked to a smooth even surface free from lumps, rocks, and debris. Leave finish topsoil grade 1" minimum to 2" maximum below top of curb, walk or adjacent paving edge; and 3" minimum below finish floor elevation, unless waterproofing condition at building wall is indicated on the drawings.

#### HANDLING OF PLANT MATERIALS:

Exercise extreme care in digging, transporting, handling and packing of all plants.

Handle plants so roots are protected at all times. Properly cover when delivery is in open vehicles so as to protect from drying and wind damage to foliage without causing excessive heating within covered area.

No plant will be accepted when ball of earth surrounding roots has been cracked or broken preparatory to or during process of planting or when burlap, staves, ropes or platform have been removed. Protect balls from sun and wind by covering with soil or other suitable material if not planted immediately on delivery. Keep all materials properly moist at all times.

#### PRUNING:

After all planted material is completely installed, final pruning/shaping shall be performed by skilled workmen under direction of landscape contractor to achieve uniformity of appearance.

#### MAINTENANCE:

Installing contractor shall be responsible for proper care and maintenance of planted areas until Final Acceptance by Brookshire's. Maintenance includes watering, weeding, mowing, repairing and protection.

##### *Watering -*

After planting, keep ground continuously moist until healthy growth is established. Thereafter thoroughly water at appropriate intervals to keep ground moist. Water in manner to prevent erosion due to application of excessive quantities of water. Should Irrigation System not be available, use watering equipment of type that will prevent damage to finished surface.

##### *Weeding -*

Uproot and remove weeds completely and in no case allow to grow and germinate more seeds. Fill in large holes caused by weeding with screened topsoil and rake level.

*Repairing and replanting -*

When any portion of surface becomes eroded or otherwise damaged and planting has failed to grow, repair with screened topsoil and replant.

*Protection -*

Protect planted areas against traffic by erecting barricades and warning signs. Planted areas damaged by traffic shall be replanted.

**HYDROMULCH:**

Prior to application, insure that Irrigation System is in place and properly tested; all areas to receive Hydromulch have been "fine-graded" and are sufficiently moist (8" min. depth) to allow for germination of seeding.

Properly cover, mask, or otherwise protect all buildings, walks, curbs, paving, fences, etc. from receiving over-spray of the Hydromulch materials. Contractor shall immediately clean-up any materials which extend beyond the areas of application.

Apply Hydromulch at a sufficient rate to achieve 1/4" minimum thickness coverage of all exposed soils of areas indicated to receive Grass Seeding.

Hydromulch mixture shall be of consistency to distribute grass seeding, as scheduled on the drawings, at a minimum rate of 1 lb. seed (minimum for each type) per 1,000 sf soil area. All seed shall be introduced to mixture on site, and bags must remain on-site to allow for verification of quantities by Brookshire's. Mixture may be applied in multiple layers at Contractor's option. Seed mixture shall be appropriate for season in which it is applied.

**REPLACEMENT:**

For a period of 180 days for *Trees* and 90 days for all other types of Landscaping, this Contractor shall be responsible for timely removal of any plants not in a satisfactory and healthy condition from the site, and replacement with materials of like kind and size and in a manner specified for original planting at no additional cost to Brookshire's.

**CLEANUP:**

Cleanup shall be accomplished as the work progresses to prevent accumulation of trash, debris, etc. from accumulating on site or from migration off-site to the satisfaction of Brookshire's. All trash, debris, containers, surplus materials, trimmings, etc. shall be removed from the site and properly disposed of.

- END OF SECTION 02910 -

## SECTION 03100 FORMWORK

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### SCOPE:

Supply and install all Formwork, Ties, Coatings, and Accessories necessary and incidental to all cast-in-place concrete as shown on the Drawings and as specified herein.

Furnish all necessary supports and anchorage for elements to be incorporated within Concrete work such as:

- Built-in anchors, inserts, and bolts for connection of other materials.
- Built-in sleeves, thimbles, dovetails slots, and water stop devices.

### CODES AND STANDARDS:

Meet all requirements and recommendations of applicable portions of latest edition of standards listed. Should conflict with referenced standards and specifications arise, the most stringent will govern.

- American Society for Testing and Materials (ASTM) -  
As indicated for specific items.
- American Concrete Institute's ACI-347 -  
ACI 318 - Building Code Requirements for Reinforced Concrete  
ACI 301 - Specifications for Structural Concrete Buildings  
ACI 347 - Recommended Practice for Concrete Formwork
- Design criteria for formwork - ACI 347, Chapter 2 -  
The design and engineering of all formwork and shoring, as well as its construction and removal, shall be the responsibility of Contractor.
- American Plywood Association (APA)  
Form V 345, and printed applicable performance and construction standards.

### SUBMITTALS:

Per SUBMITTALS section.

Submit manufacturer's data and installation instructions for all accessory items such as ties, form coatings, and manufactured form systems, if used.

### SURFACE CONDITIONS:

Check all surfaces and conditions under which the Work is to be done. Correct any conditions which would prevent the timely completion of the Work, before proceeding.

### DELIVERY AND STORAGE:

Deliver and store materials in dry protected areas. Remove any damaged items from site and replace at no cost to Brookshire's.

### COORDINATION:

Secure all pipe sleeves, anchors and bolts, including those for angle frames, inserts, supports, ties and other materials in connection with concrete construction, in position before concrete is placed.

Obtain ALL related shop drawings, such as Anchor Bolt Placement Plan(s) and instructions from other trades and suppliers in ample time to schedule and coordinate the installation of items to be embedded in concrete so provisions for their Work can be made without delaying the project.

### MATERIALS:

#### *Forms* -

Construct formwork for all exposed concrete surfaces with smooth faced undamaged plywood or other panel type material acceptable to Brookshires, to provide continuous, straight, and smooth surfaces. Furnish in largest practicable sizes to minimize number of joints.

*Lumber -*

Softwood framing lumber, kiln dried, PS 20, No. 2 common grade. Grade marked by grading rules agency approved by American Lumber Standards Committee.

*Plywood -*

Exterior type softwood plywood, PSI, panel veneer grades BB. Each panel stamped or branded indicating veneer grades, species, type and identification. Mill-oiled sides and mill-sealed edges of panels.

*Metal Forms -*

Clean, unpainted and in good condition. Forms shall at all times be straight to provide members of the widths and depths required. Severely damaged or indented forms shall not be acceptable.

*Form Ties -*

Provide factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and prevent spalling concrete surfaces on removal. Provide form ties which will not leave a hole larger than 1" diameter in concrete surface.

Bolts, rods, or patented devices shall have a minimum tensile strength of 3,000 pounds when fully assembled. Ties shall be adjustable in length and free of lugs, cones, washers or other features which would leave a hole or depression larger than 7/8" in diameter back of the exposed surface of the concrete.

*Form Coatings -*

Provide commercial formulation form-coating such as Nonstaining Mineral Oil or other acceptable compounds that will not bond with, stain nor adversely affect concrete surfaces requiring bond or adhesion, nor impede wetting of surfaces to be cured with water or curing compounds.

*Carton Void Forms -*

SureVoid to establish quality. Other manufacturers will be considered for substitution. Forms to be size, shape and dimensions as shown on Drawings.

*Backfill Retainer -*

SureVoid to establish quality. Other manufacturers will be considered for substitution. Forms shall be 1/2" thickness minimum and installed per manufacturer's instructions.

*Sonotube -*

Forms to be size, shape and dimensions as shown on Drawings.

*Moisture/Vapor Barrier -*

Provide moisture barrier cover over prepared base material where indicated. Use only materials which are resistant to decay when tested in accordance with ASTM E 154.

Polyethylene thickness shall be installed per the Drawings, but not less than 6 mils thick.

Use maximum widths of vapor barrier material applied directly over sand fill. Install with widths of sheets parallel with direction of pour, joints lapped 6" and sealed per manufacturer's instructions. Duct tape is not an acceptable joint sealer.

**FORM CONSTRUCTION REQUIREMENTS:**

Construct forms per ACI-347 to precise sizes, shapes, lines and dimensions shown.

Design, erect, support, brace and maintain formwork so it will safely support vertical and lateral loads, until such loads can be supported by the concrete structure. Carry vertical and lateral loads to ground by formwork system and in-place construction that has attained adequate strength for that purpose.

Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.

Design forms and falsework to include assumed values of live load, dead load, weight of moving equipment operated on formwork, concrete mix, height of concrete drop, vibrator frequency, ambient temperature, foundation pressure, stresses, lateral stability and other factors pertinent to safety of structure during construction.

Provide shores and struts with positive means of adjustment capable of taking up formwork settlement during concrete placing operations, using wedges or jacks.

Provide complete forms of such strength and construction as to prevent any spread, shifting, or settling when concrete is deposited, and tight enough to avoid any leakage or washing out of cement mortar.

Contractor shall insure that construction of forms and supports will provide sufficient rigidity to prevent deflection in excess of 1/8" between supports after concrete has been placed and to assure a smooth and even appearance of surfaces.

Use bolts, rods and other approved devices for internal ties and spreaders; of such construction that when forms are removed, no supporting device is within 1" of any concrete surface whether exterior or interior.

Take special care that forms are true to required lines, grades and surfaces so as to give a uniform neat and workmanlike finish to all concrete surfaces and to make form supports of sufficient strength, well braced and on adequate foundations so there is no settling or distortion when construction activities and weight of concrete are added.

Remove all dirt, chips, sawdust, rubbish, water, etc., from forms by water hosing and air pressure before any concrete is deposited. Leave no wooden ties or blocking in concrete except where indicated for attachment of other work. Leave lowest board of forms along walls loose or provide cleanout pockets. At any columns and pilasters, provide holes in forms at bottom for cleaning purposes. Leave openings and holes open until just before concrete is poured. Provide openings for the introduction of vibrators wherever necessary.

Contractor shall insure that forms, bracing, shoring, etc. are left in tack for time required for concrete to obtain the design strength and on construction loads that will be placed on concrete. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where the slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses and the like to prevent swelling and assure ease of removal.

#### *Corner Treatment -*

Unless shown otherwise, form chamfers with 1/2" x 1/2" strips, accurately formed and surfaced to produce uniformly straight lines and tight edge joints on exposed concrete. Extend terminal edges to required limit and miter chamfer strips at changes in direction.

#### *Control Joints -*

Locate as indicated.

#### *Provision for Other Trades -*

Provide openings in concrete formwork to accommodate Work of other trades. Verify size and location of openings, recesses and chases with the trade requiring such items. Accurately place and securely support items to be built into forms.

#### **FORM COATINGS:**

Coat form contact surfaces with form-coating compound before reinforcement is placed. Do not allow excess form coating material to accumulate in forms or to come into contact with surfaces which will be bonded to fresh concrete. Apply in compliance with manufacturer's instructions.

#### EARTH FORMS:

Concrete may be placed directly within excavations or properly compacted dirt fill or undisturbed original earth at sides and bottoms of footings, bottoms of grade beams only, and where specifically indicated on the Drawings, or when requested by Contractor and accepted by Brookshire's. When omission of forms is accepted, provide additional concrete 1" on each side of the minimum design profiles and dimensions shown. Should walls/sides of earth excavations become excessively wet or otherwise be designated by Brookshire's as not suitable to restrain concrete placement, Contractor shall provide formwork per this specification.

#### REMOVAL OF FORMS:

Contractor shall insure that form removal is accomplished in a manner to insure complete safety of personnel, concrete work and work in place.

Formwork not supporting weight of concrete, such as sides of beams, walls, columns and similar parts of the Work, may be removed after cumulatively curing at not less than 50 degrees F for 24 hours after completion of concrete placement, provided concrete is sufficiently hard to not be damaged by form removal and that proper curing and protection are maintained.

Formwork supporting weight of concrete, such as beam soffits, joists slabs and other structural elements may not be removed in less than 14 days, and not until Testing Laboratory Certification is obtained indicating that concrete has attained design minimum 28 day compressive strength. Confirmation of compressive strength of in-place concrete shall be by testing of field-cured specimens representative of the concrete location or members, and per TESTING LABORATORY CONTROL specification section.

#### RE-USE OF FORMS:

Clean and repair surfaces of forms to be re-used in the Work. Split, frayed, delaminated or otherwise damaged form-facing material will not be acceptable. Apply new form coating compound material to concrete contact surfaces as specified for new formwork. When forms are reused for successive concrete placement, thoroughly clean surfaces, remove fins and latency, and tighten forms to close all joints. Align and secure joints to avoid offsets.

"Patched" forms are not acceptable for concrete surfaces exposed to view.

#### CLEANUP:

Per GENERAL CONDITIONS.

- END OF SECTION 03100 -

## SECTION 03200 REINFORCING STEEL

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### SCOPE:

Supply and install all Reinforcement Steel, supports, wire and accessories as required for concrete systems and placement as shown on the Drawings and as specified herein.

### CODES AND STANDARDS:

Meet all requirements and recommendations of applicable portions of latest edition of standards listed. Should conflict with referenced standards and specifications arise, the most stringent will govern.

- American Society for Testing and Materials (ASTM)
- Concrete Reinforcing Steel Institute (CRSI)
- Manual of Standard Practice
- American Concrete Institute's (ACI)
  - ACI 318 Building Code Requirements for Reinforced Concrete
  - ACI 301 Specifications for Structural Steel Concrete for Buildings
- American Welding Society (AWS)
  - AWS D12.1 Recommendations for Welding Reinforcing Steel

### SUBMITTALS:

Per GENERAL CONDITIONS and ACI 315, submit Shop Drawings showing bending, placing, bar schedules, stirrup spacing and arrangement and assemblies of all reinforcing. All bars, including straight bars and stock lengths, shall bear placing mark, and the drawings shall show location of each bar required.

Bar Lists alone are not acceptable as Shop Drawings.

At specific request by Brookshire's, furnish mill analysis certificates, tensile and bend tests to confirm proper grades of reinforcement.

### COORDINATION:

Coordinate Work with Other Trades so as not to interfere. Bring interference between Trades to Brookshire's attention and resolve before any concrete is poured. No cutting of reinforcement or displacement of bars shall be done by any trade without the consent of Brookshire's, then only with adequate reinforcement being provided to insure original design requirements are satisfied.

### TESTING AND INSPECTION:

When specifically required by Brookshire's, testing procedure shall be as follows. Take samples from bundles as delivered from the mill. Where bundles are identified by heat number and a mill analysis accompanies the report, take one tensile and one bending test specimen from each ten (10) tons or fraction thereof, of each size of reinforcing steel. Where positive identification of heat numbers cannot be made, or when random samples are taken, make one series of tests from each five (5) tons or fraction thereof, of each size and kind of reinforcing steel.

### MATERIAL HANDLING:

Deliver reinforcing steel to the site bundled, tagged and marked, with metal tags indicating bar sizes, lengths and other information corresponding with markings shown on placement diagrams.

Store reinforcement off the ground and so as to prevent damage, excessive rust, dirt and the like.

### MATERIALS:

*Reinforcing Steel -*

Meeting the requirements of ASTM A615, Grade 60, including stirrups and ties. Reinforcing steel shall be new, clean, and free of heavy rust and scale. Mill Certification markings are required.



Non-Domestic made steel is acceptable only for Deformed Bars for #3, #4, and #5 Bar Sizes from Mills having Certification acceptable to Brookshire's for production of ASTM A615, Grade 60 Steel; all physical properties shall be determined in accordance with ASTM A-370 (latest revision).

*Welded Wire Fabric -*

Meet requirements of ASTM A185 and A82. Fabric shall be Galvanized where indicated.

*Tie Wires -*

Black, annealed, 14 gauge minimum.

*Reinforcement Support -*

Chairs, spacers, and other devices for supporting, spacing and fastening reinforcement shall be of proper size to safely carry the construction loads as recommended by CRSI. Supports and spacers occurring in exposed concrete surfaces shall be zinc or plastic coated. Spacing of supports and spacers shall conform to requirements of CRSI and as specified herein.

*Supports for Footings, Beams and Slabs-on-Grade -*

Use pre-cast concrete blocks 3"x 3" x thickness required for proper clearance of bottom of layer of steel. Irregular or broken pieces not permitted. Concrete for blocks to be of same density as concrete in which it is placed. Space supports in footings and beams 4'-0" o.c. maximum and in slabs-on-grade 4'-0" o.c. maximum each direction.

**FABRICATION:**

Fabricate reinforcing bars to conform to required shapes and dimensions, with fabrication tolerances complying with CRSI Manual and ACI as applicable.

Bend bars cold and at proper pressure and rate to prevent cracks, splits, or kinks.

In case of fabricating errors, do not rebend or restraighten reinforcement.

Reinforcement with any of the following defects will not be permitted in the Work:

- Bar lengths, depths, and bends exceeding specified fabrication tolerances.
- Bend or kinks not indicated on Drawings or final Shop Drawings.
- Bars with reduced cross-section due to excessive rusting or other cause.
- Bars which have been heated for bending or cut by use of torch.

**INSTALLATION:**

Reinforcing steel of the sizes, shapes, lengths, spacing, and other dimensions shown shall be placed where shown on the Drawings. Details of reinforcing shall conform to ACI Building Code Requirements for Reinforced Concrete (ACI 318-89).

At time concrete is placed, metal reinforcement shall be free from mud, oil, or other nonmetallic coatings that adversely affect bonding capacity.

Reinforcement shall be accurately placed and securely saddle tied at every other intersection, and shall be rigidly held in place during the placing of the concrete by means of metal chairs or spacers.

Bars in beams and slabs shall be held to exact location during placing of concrete by spacers, chairs, or other necessary supports.

All splicing of bars shall be 30 diameters unless specifically noted otherwise on plans.

Concrete Protection for reinforcing steel shall not be less in any direction than the following:

- Reinforcing in slabs-on-grade in center of slab.
- Grade beams exposed to weather or in contact with the ground = 1-1/2".

Support and wire bars together to prevent displacement beyond the following tolerances:

- Concrete cover to formed surfaces = 3/8"
- Minimum spacing between bars = 1/4"

Top bars in slabs and beams

- Members 12" deep or less = 3/8"
- Members more than 12" deep = 1/2"

In length or width of members, space evenly within 2 inches.

Move bars as necessary to avoid interference with other reinforcing steel, conduits, or embedded items. If bars are moved to exceed above tolerances, resulting arrangements of bars must be approved by Brookshire's.

Place reinforcement to obtain minimum coverage for concrete protection. Arrange, space and securely tie bars and bar supports together with 14 gage wire to hold reinforcement accurately in position during concrete operations. Set wire ties so twisted ends are directed away from exposed concrete surfaces.

Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least 2 full meshes, but not less than 8".

Provide sufficient numbers of supports and of strength to carry reinforcement. Do not place reinforcing bars more than 2" beyond the last leg of any continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

Provide standard reinforcement splices by lapping ends, placing bars in contact, and tightly wire tying.

**INSPECTION:**

Brookshire's shall be given 24 hours notice to inspect placement of reinforcing steel before concrete is placed.

- END OF SECTION 03200 -

SECTION 03310  
**CAST-IN-PLACE CONCRETE**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Scope of work shall include careful examination of the Drawings to determine quantities, locations, sizes types and details of Cast-In-Place Concrete and related work described in this section including but not limited to the following:

- Slabs on grade inside and outside the building.
- Concrete reinforcement and accessories including reinforcing steel, welded wire fabric, chairs, spacers, supports, tie wire.
- Placement of anchor bolts, inserts, sleeves, blocking, other items to be embedded as required by this and other trades as furnished under other sections.
- Equipment bases, pads for mechanical and electrical trades.
- Vapor barrier.
- Concrete curing, joints, saw cuts, and finishes for floors.
- Insulation for foundation walls and slab.
- Concrete fills for steel pipe guards, bases.
- Slab depressions, pits.

**REFERENCE STANDARDS:**

Comply with all applicable Federal, State and local codes, safety regulations, and all other references herein. In any conflict between referenced standards and this specification, the more stringent requirements shall govern.

- Portland Cement Association (PCA)
- Follow finishing guidelines per American Concrete Institute standards (ACI) 302
- ACI 304, 305R, 306R, 309, & 311 shall also apply.
- ACI 318 "Building Code Requirements for Structural Concrete"

**SUBMITTALS:**

Per SUBMITTALS section.

*Shop Drawings -*

Show details of construction, connections, gages, thicknesses and sizes of all reinforcing members in accordance with the "ACI, Code of Standard Practice". No detail or shop drawings will be checked for approval unless accompanied by general erection drawings, showing the locations of all pieces detailed. In addition, the erection plan shall show the location of all masonry dowels protruding from the foundation. Detailer shall refer to the Drawings for detailing requirements at corners, control joints, and at jambs of openings. No Architectural or Structural Drawing in any form may be used as reinforcing steel detailer's shop drawing or erection drawing. Design of connections for any portions of the reinforcing steel not indicated on the design drawings shall be completed by the fabricator. Any fabrication of reinforcing members before receipt of the approved shop drawings shall be at this Subcontractor's risk.

*Samples -*

Submit samples of materials specified herein as may be requested by Brookshire's.

*Joint Locations -*

Submit location of construction joints, contraction joints and isolation joints to Brookshire's for approval.

*Concrete Design Mix -*

Submit concrete design mix, air, dry weight and durability factor for approval. Concrete design mix to be as specified – no substitutions.

**SUBSTITUTIONS:**

Substitutions for materials or products identified herein shall be in accordance with specification section SUBMITTALS.

**DELIVERY, STORAGE AND HANDLING:**

The Concrete Contractor is responsible for the safe handling, unloading, receipt and protection of all material delivered to the jobsite. Cement and aggregates to be stored at the site in such manner to prevent deterioration, or intrusion of foreign matter. Store reinforcement steel on wood skids to protect it from weather, oil, earth and damage from trucking or other construction operations. All forms shall be stored in a neat manner and orderly fashion, protected from the weather and abuse. All materials shall be stored to prevent damage from the elements or other causes. Materials judged not acceptable for this project shall not be stored on the site, but shall be immediately removed from the site.

**QUALITY ASSURANCE:**

Concrete work will be subject to detailed inspections and tests at site and at mixing plant. These inspections and tests will be made by an inspection agency representing and paid for by Brookshire's. All concrete work shall meet requirements of this specification. All areas designated by Brookshire's as not meeting the Drawings and Specifications will be removed and properly replaced. No patching or repair will be allowed unless approved in writing or specifically outlined within this Specification. Contractor is responsible for notification and facilitation of the work in cooperation with the agency inspectors at all times. Retaining of inspection agency by Brookshire's will in no way relieve this Contractor of his responsibility for proper design mixing, placing, curing and finishing of concrete.

**SEQUENCING/SCHEDULING:**

Order materials so that they will be delivered to the jobsite in increments conforming to the construction sequence. Obtain information and instructions from other Trades and suppliers in ample time to schedule and coordinate the installation of items furnished by them to be embedded in concrete so provision for their Work can be made without delaying the project. Do any cutting and patching made necessary by failure or delay in complying with these requirements, at no cost to Brookshire's. Cooperate and coordinate with trades performing work under other sections affected by concrete work herein.

**TESTS AND CERTIFICATIONS:**

Before starting any Work under this section, make all required arrangements with testing agency per specification section TESTING LABORATORY CONTROL. Testing laboratory shall test and furnish certified reports on proposed cements, aggregates, mixing water, admixtures, etc. as required.

Lab shall prepare design mixes for each type of concrete required per methods as specified in ACI 301.

**CEMENT MATERIALS:**

*Portland Cement -*

Only one approved brand or manufacturer shall be used on this project for each type of cement. Portland Cement shall conform to ASTM C150 Type I. Minimum content per cubic yard shall be as follows (PSI is Compressive Strength at 28 days, Sacks is minimum number of sacks per cubic yard regardless of mix test strength):

2500 psi = 4½ sack	3500 psi = 5½ sack
3000 psi = 5 sack	4000 psi = 6 sack

Use 4000 psi minimum when not clearly noted otherwise.

#### *Water -*

Clean potable, not detrimental to concrete conforming to requirements stated under ASTM C94. Do not exceed 6 gallons of water per sack of cement. Surface water contained in the aggregate must be included as part of the mixing water.

#### *Concrete Aggregates -*

Concrete aggregates shall be natural conforming to ASTM C33. Where aggregates conforming to these specifications are not obtainable, aggregate that has shown by test or actual service to produce concrete of the required strength, durability, water tightness and wearing qualities may be used. Maximum size of aggregate shall be not larger than one-fifth (1/5) of the narrowest dimension between sides of the forms of the member for which concrete is to be used, nor larger than three-fourths (3/4) of the minimum clear spacing between reinforcing bars. For slab-on-grade maximum size, 1/3 the slab thickness but not less than 3/4". Should the aggregates normally available in project locality possess unusual characteristics, additional restrictions may be imposed at the option of Brookshire's. Maximum size limit may be raised at the option of Brookshire's wherever design permits good workmanship with a coarser aggregate.

Aggregate sizing requirements are as follows.

Fine Aggregates shall conform to ASTM C 33, and shall consist of clean, hard, durable washed and graded sand, free from lumps, soft or flaky particles, organic matter, or other deleterious substances, and within the following limits:

- Passing No. 4 sieve not less than 95%
- Passing No. 8 sieve not less than 90%
- Passing No. 16 sieve not less than 50% nor more than 85%
- Passing No. 50 sieve not less than 12% nor more than 30%
- Passing No. 100 sieve not less than 2% nor more than 6%
- Volume removed by sedimentation not more than 3%

Coarse Aggregates shall be clean crushed stone or gravel free of deleterious matter or coatings and conforming with ASTM C 33, and within the following limits:

- Size No. 467 for footings only
- Size No. 57 for slabs, foundation walls and all other concrete

#### **ADMIXTURES:**

Consideration of admixtures is for the convenience of Contractor and will be used at no additional cost to Brookshire's. Admixtures may only be used with written approval from Brookshire's. Pozzolans, such as clays, fly ash, pumicite, etc., shall not be used as a cement substitute for concrete mixes under these specifications.

#### *Water Reducing Admixtures -*

Water-reducing admixtures shall conform to the requirements of ASTM C494, Types A, D, E and F shall be provided from W.R. Meadows, Master Builders or Sonneborn only, as approved by Brookshire's. Type G shall not be used. W.R. Grace - WRDA with HYCOL per ASTM C494, Type A (AASHTO M194, Type A) may be used at Contractor's Option. Use of this product is encouraged to increase workability during placement while maintaining Slump Requirements.

Calcium chloride will not be permitted within the concrete or for surface application.

Reduce water batching volume proportionate to accelerant volume addition.

Product shall be added at the plant only during the batching process. Product name and volume per sack of Cement shall be clearly designated on each delivery ticket.

All procedures shall be per manufacturer's printed instructions unless specifically noted otherwise in this specification, or approved in writing by Brookshire's.

#### *Accelerating Admixtures -*

Accelerating admixtures may be used when the following conditions affect the placement.

When the Ambient Temperature or Wind Chill Factor is **above 32 degrees F and below 55 degrees F**, or when the Ambient Temperature or the Wind Chill Factor is predicted by the National Weather Service to be above 32 degrees F and below 55 degrees F within 24 hours. The

contractor is allowed to use W.R. Meadows SEALTIGHT HYDRASET-FREE at the rate of up to 1 quart per sack of Cement, Master Builders Pozzutec 20 at a rate up to 1 gallon per sack of Cement, or Master Builders Pozzoloth NC 534 at a rate up to 3 quarts per sack of Cement.

#### REINFORCEMENT STEEL:

Per REINFORCING STEEL section.

#### MISCELLANEOUS ITEMS:

##### *Metal Chairs and Spacers –*

Shall be in accordance with CRSI recommendations and be either zinc-coated or plastic type. Provide concrete pedestals for chairs at blotter layer to prevent embedment.

##### *Grout –*

Premixed, non-shrink, 5000 psi minimum at 28 days, Master Builders "Embeco" or Gifford Hill "Supreme", no alternates allowed.

##### *Premolded Joint Material –*

ASTM D994, preformed types, as approved.

##### *Vapor Barrier –*

Polyethylene film 6 mil thickness with a water vapor permeability not more than 1.11 perms when tested by ASTM D 96.

#### WATER STOPS:

##### *Non-Working Water Stop Joints –*

PVC water stop based on Flat-Ribbed #646/#679 as applicable, manufactured by Greenstreak, St. Louis, Missouri, or equal as approved by Brookshire's. Include all factory fabricated intersecting, corner and transition fittings for conditions.

##### *Working Water Stop Joints –*

PVC water stop based on Split-Ribbed Centerbulk #727/#723 as applicable, manufactured by Greenstreak, St. Louis, Missouri, or equal as approved by Brookshire's. Include all factory fabricated intersecting, corner and transition fittings for conditions.

##### *Butt Non-Working Joints –*

3/4" x 1" mastic bonded strips based on "Swellstop #594" and "Lockstop #595" as applicable, manufactured by Greenstreak, St. Louis, Missouri, or equal as approved by Brookshire's.

#### FOUNDATION WALL INSULATION:

##### *Extruded-Polystyrene Board Insulation –*

Rigid, cellular, polystyrene thermal insulation with closed cells and integral high-density skin; formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C578, Type IV. Square edge on all four sides. Minimum compressive strength of 25 psi, with an "R" value of 5 per inch. See Drawings for locations and limits.

- Styrofoam Brand "Square Edge" as manufactured by Dow Chemical.
- Foamular "250" as manufactured by Owens Corning.
- Amofam "CM" as manufactured by Pactiv Building Products.
- Expanded polystyrene board will not be accepted.

##### *Adhesive –*

Type recommended by insulation board manufacturer for application indicated. PL-300 as manufactured by Contech or other approved compatible extruded polystyrene foam board adhesive. "R" value required for foundation walls and slab-on-grade shall conform to local building and energy code.

MINIMUM COMPRESSIVE STRENGTH: (Unless specifically noted otherwise on the Drawings) *Slabs, Footings, Grades Beams, Drilled Piers, Retaining Walls, Concrete Paving and Light Pole Bases* –

- 3000 PSI at 28 days (5 sack mix)

*Steps, Walks, Ramps, Curb & Gutter* –

- 2500 PSI at 28 days (4-1/2 sack mix)

CONCRETE DESIGN MIXES:

*Strengths, Slump and Cement Factors* -

Concrete shall be proportioned and mixed for a 28 days compressive strength as noted on the Drawings when tested in accordance with ASTM C39, and shall conform to ASTM C94 as follows. Refer to Drawings for location of specific psi types required.

Type of Concrete	Location	Max. Water-Cement Ratio, lb. of Water per lb. of Cement	Maximum Slump Prior to Addition of Any Admixtures
3000 psi Natural Aggregate	All areas unless otherwise noted.	0.53	4"
2500 psi Natural Aggregate	Steps, Walks, Ramps & Curb	0.616	4-1/2"

*Fly Ash* -

Fly ash as a cementitious substitute is allowed, unless otherwise noted. The maximum allowance of fly ash substitute is 20%, provided that the mixing plant is certified by Testing Laboratory to have acceptable automated control of quantity and method of blending fly ash with Portland cement to achieve a uniform introduction to and consistency within the concrete mix.

*Slump* -

Slump shall be determined by ASTM C 143 and as follows:

- Slab, Footings, Grade Beams, Foundation Walls, and Curbs - 2" minimum, 4" maximum.
- Walks, Drives, Paving, and Pipe Guards – 3" minimum, 5" maximum.
- Building slabs should be +/- 4" at the point of placement. Allowances of up to 2" will be allowed for pumped mixes as long as the slump at the point of placement coincides with the limitations above.
- All concrete containing high-range water-reducing admixtures (super-plasticizer) –
- 6" maximum unless otherwise approved by Brookshire's.
- Concrete shall arrive at job site at a slump of 2" to 3", (3" to 4" for lightweight concrete), be verified by testing lab field tech, then the high-range water-reducing admixture shall be added to increase slump to approved level. All other concrete shall have a maximum slump as indicated above.

*Reduction of Cement Factor* –

If, during the course of construction it appears that cement factors may be reduced and still achieve the specified strengths, a revised mix design shall be submitted for approval. Contractor shall state a unit price at which this reduction in cement will be credited to Brookshire's. Water-reducing admixtures may be used once. There will be no retempering of the mix with additional water-reducing admixture.

#### *Entrained Air -*

Minimum of 4% to maximum of 6% per ASTM C 260 is required for all Exterior Concrete which will remain exposed to the elements in the finished construction, including walks and drives under canopies and overhangs. Air may be used at Contractor's Option for Sub-Surface elements such as Grade Beams and Spread Footings, unless specifically noted otherwise on the Drawings.

Air Entrainment admixtures are not allowed in Building Floor Slabs or Drilled Piers. Maximum entrapped air in these mixes should be less than 3%.

#### EXAMINATION:

Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely and will not cause hardship in placing concrete. Verify requirements for concrete cover over reinforcement in accordance with ACI-318.

#### PREPARATION:

Examine all areas and conditions under which the Work of this Section will be performed. Correct any conditions detrimental to the approval of completed Work. Do not proceed until all such conditions are corrected.

Do not pour concrete in any area where any standing water is present. Remove water from the space, do not displace water with concrete, and verify that earth formed areas are properly compacted and shaped.

Before concrete placing is begun, the place of deposit shall be fully prepared. Be responsible for seeing that all work that will be embedded is complete. Pour stops or bulkheads shall be in place; all reinforcement, including dowels, shall be secured in proper location prior to concrete placement. Forms shall be cleaned and thoroughly wetted. Reinforcing steel and previously placed concrete at pour stops shall be wetted. In freezing weather, all surfaces shall be heated above the freezing point and kept free of frost, snow and ice. Reinforcement shall be free from loose mill scale, rust, form oil, concrete splatter and other extraneous coatings at the time it is embedded in the concrete.

#### MEASURING, MIXING AND PLACING CONCRETE:

Use only ready mixed concrete from a mixing plant with a batch mixer of an approved type having a positive water control device and so designated that all materials for each batch can be accurately measured.

Concrete shall be measured, mixed, and placed in accordance with ACI-304R, and as specifically mentioned hereinafter for slabs on compacted fill and for slabs on metal decks. Ready mixed concrete shall conform to ASTM C94.

Mixing operation shall begin within thirty minutes after the cement has been intermingled with the aggregates.

After the introduction of the cement to the aggregate, the entire load of concrete shall be completely discharged at the job within 90 minutes when the ambient temperature is below 90 degrees F and 60 minutes when above 90 degrees F.

Concrete shall be of such consistency and composition that it can be worked readily into the corners and angles of the forms and around the reinforcement without permitting the materials to segregate or free water to collect on the surface.

Water shall be introduced at the plant. Water added at the site shall be at the risk of the contractor. Should water be added, the mixer must complete a minimum of ten revolutions after all water has been introduced and prior to discharge of the mix. Concrete in excess of the maximum allowable



slump will be removed from the site. Retempering of concrete which has partially hardened, that is mixing with or without additional cement, aggregate or water, will not be permitted.

A copy of each truck delivery ticket shall be made available by the driver to Brookshire representative or the Testing Laboratory representative at the site. Minimum information on the ticket shall be:

- Ticket number
- Mix proportions, including admixtures
- Time and date of batching
- Number of cubic yards of concrete on truck
- Truck and driver identification
- Project name
- Amount of additional water

Placing operations shall be organized to proceed without delay when once started. Methods and equipment as recommended in ACI-304R shall be employed.

Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has already hardened sufficiently to form seams or planes of weakness within the section.

Equipment for conveying and depositing concrete shall be selected to handle mixes stiff enough to satisfy the requirements of this specification. Rate of placing shall be such that concrete is plastic at all times.

Provide runways for wheeled conveying equipment from delivery point to location of final deposit so as to prevent deformation of subgrade, form work, control joints, reinforcement, or any other elements of construction.

Concrete that has lost more than half its original slump shall not be used.

No retempering by addition of water will be permitted.

Cold joints shall be avoided by frequent relocation of chutes and hoppers so that concrete is brought up in numerous shallow lifts with nearly horizontal surfaces, each lift being vibrated or worked into union with previous lifts.

Concrete shall be deposited from chutes, hoppers or buggy as close as possible to its final position to reduce segregation by rehandling or flowing. Schedule operations to avoid bugging over concrete less than 28 days old.

Keep interior surfaces of conveying equipment, including chutes and tremies, free from hardened concrete, debris, water, or other deleterious materials.

Should drop in excess of 6' be required use chutes or tremies.

Deposit concrete in forms in horizontal layers not deeper than 2'. Where placement consists of several layers, place each layer while preceding layer is still plastic. Remove temporary spreaders in forms when concrete placing has reached the elevation of such spreaders.

Deposit and consolidate concrete slabs in a continuous operation, within the limits of any construction joints, until the placing of a panel or section is completed.

If a pump is to be used for placing concrete, equipment must be of such capacity with a large diameter line so that slump at the hose end is no greater than that specified herein before. Varying the mix in which a greater slump occurs will not be acceptable. Responsibility for concrete quality relevant to strength and durability shall be maintained by this Contractor. For normal weight concrete pumped, slump must be as previously specified in concrete design mixes.

Placement of concrete slabs shall be at a rate not faster than concrete can be properly leveled and compacted; and at point of final repose, directly ahead of the screed bar, vibrating mass just ahead of the screed. Screed twice, the first to strike a full, rough level and move the concrete mass ahead. Follow this with necessary filling of low areas and another screeding to final level. Remove any puddles of "soup", pull screeds and screed supports, fill all depressions, and tamp with flat surface or mesh; tamp only enough to embed coarse aggregate to permit finishing, a maximum 1/8", allowing as much time between tamping's as weather conditions will allow.

Alternate placement in areas not to exceed 10,000 square feet per pour for building slab and 20,000 square feet for paving to allow for shrinkage. Alternate pours allowing a minimum of 7 days curing time prior to placing adjacent panels. Prepare a placement sequence schedule for Brookshire's approval and indicate locations for construction and control joints.

Consolidation of concrete shall be done in accordance with ACI-309. Consolidation shall be accomplished with the aid of heavy-duty mechanical vibrators operated by mechanics especially trained in their use. Internal vibrators shall not be used to transport concrete in forms or to spread concrete deposited in piles for slabs. Vibrators shall be operated only after surface of concrete has been brought sufficiently level so that horizontal flowing does not result from their operation.

Rate and method of placing concrete and arrangement of construction joint bulkheads shall be such that concrete between construction joints shall be placed in one continuous operation.

Reinforcing shall continue through all construction joints in walls. No horizontal construction joints will be permitted in concrete walls. See Drawings for wall construction details. When new concrete is to be jointed to existing concrete or concrete which has set, the bond surfaces of the set concrete shall be suitably roughened and then thoroughly cleaned of all loose materials, drenched with water and coated with neat cement mortar or an approved bonding agent.

#### COLD WEATHER PROVISIONS:

For Cold Weather Applications prepare aggregates, mix water and other ingredients, and place, cure and protect concrete in accordance with the requirements of ACI-306R, and as follows. When Ambient Temperature or Wind Chill Factor is **between 32 degrees F and 25 degrees F**, or when Ambient Temperature or Wind Chill Factor is predicted by the National Weather Service to be between 32 degrees F and 25 degrees F within 24 hours, use W.R. Meadows SEALTIGHT HYDRASET-FREE at the rate of 1 1/2 quarts per sack of Cement, or Master Builders Pozzutec 20 at a rate of 1 gallon per sack of Cement. Brookshire's shall be notified by Contractor of his intent to exercise this option, a minimum of 3 working days prior to each application. No Concrete operations will be allowed when Ambient Temperature or Wind Chill Factor is below 25 degrees F, or predicted to be below 25 degrees F within 24 hours.

Provide equipment and methods adequate to protect concrete in place from low temperatures. Equipment shall be such as to maintain temperature within the concrete above 50° F for 7 days. Methods of protection may consist of insulation, enclosures with temporary heat, depending on the temperature and subject to Brookshire's approval. Equipment for cold weather shall be on the job ready for use whenever two consecutive day temperatures fall below 40° F.

Contractor shall maintain and submit weekly reports on temperature as follows:

- Outside air temperature at the job in the morning, at noon, and at the end of each workday.
- Air temperature, at 4-hour intervals, inside enclosures whenever temporary heat is applied.
- When insulation alone is used for protection of concrete, concrete temperature shall be measured by thermometers inserted into wells in the concrete twice a day.

Temporary heat devices shall be operated with special care, to protect against concentrations of heat or the direct contact with combustion gases. Salamanders radiating heat are preferred to blowers. All surfaces within the enclosure shall be kept soaking wet for curing and fire protection.

No calcium chloride shall be used.

#### HOT WEATHER PROVISIONS:

Follow the recommendations of ACI-305R and these specification requirements. Special care shall be taken to avoid rapid evaporation of moisture from concrete during placing operations in warm weather. Operations shall be shaded from the direct sunlight or scheduled to avoid the hottest part of the day. On windy days, drying shall be retarded by windbreaks. Curing of concrete slabs shall be accomplished by preventing loss of moisture, rapid temperature change, and mechanical injury from rain or flowing water. Curing shall be started as soon after the placing and finishing as free water has disappeared from the surface of the concrete. Forms shall be kept continually wet and if removed before the end of the curing period, curing shall be continued as originally started. Concrete, after forms are removed, shall be kept continuously wet for at least 14 days after pouring.

#### FINISHING OPERATIONS:

- Bring slab surfaces to correct level with a straight edge, and then strike off.
- Use jitterbug across concrete surface to allow concrete paste to float to surface.
- Use bullfloats or darbies to smooth the surface, leaving it free from bumps and hollows.
- After bleed water has naturally evaporated, verify surface of slab to be within horizontal tolerances by use of 8' minimum bump-cutter across entire poured area prior to pan machine operation. Level bumps and hollows in concrete slab as required.
- Begin pan machine operations across concrete slab moving generally in one direction. Each subsequent pass to be at perpendicular direction from previous.
- Alternate bump-cutter use and pan machine operation with each pass.

Do not sprinkle water on the surface, introduce additional materials, or otherwise disturb the slab surfaces prior to start of finishing operations.

#### REPAIRING DEFECTIVE WORK:

Any concrete, which is not formed as shown on Drawings or for any reason is out of alignment, or level, or shows a defective surface, shall be considered as not conforming with the intent of these Specifications, shall be a subject for rejections, and shall be removed by this Contractor at his expense unless otherwise approved by Brookshire's. Immediately after removing forms, when permissible, all concrete surfaces shall be inspected and any pour joints, voids, stone pockets or other defective areas shall be patched before concrete is thoroughly dry; tie holes shall be patched before concrete is dry. Any voids or irregularities found on exposed concrete, either inside or outside of the building are to be pointed with mixture of 1 part cement and 2 parts of sand very soon after removing forms; honey-combing is to be picked out wherever same is loose or easily removed and repaired by specified pointing procedure.

#### LEVELING, FLOATING AND TOLERANCES:

Wood or metal screeds shall be installed in areas to receive concrete at intervals not over 10'-0" on centers to properly level poured concrete. All screeds shall have a straightedge top, shall be installed prior to placing of concrete and shall be firmly anchored. Install screeds to the exact plane of the area to receive concrete for level floors, and pitched as required for floors where drains occur and at ramped areas.

Screeds shall be removed 1 hour maximum after concrete has been leveled and the voided spaces filled with concrete; any irregularities in the joint line shall be leveled with a wood float and all laitance removed. Level using only wood or resin impregnated canvas composites or magnesium surfaced leveling floats; plastic float blades shall not be used. Use only magnesium floats on concrete. Allow to stand until water sheen disappears from surface. Power float surface to even surface, producing levels or slopes indicated on Drawings. Follow with troweling or other finishes as specified.

Combination trowels can be used at the contractor's discretion. Unless otherwise noted, all concrete slabs, after having set sufficiently so that floating and leveling operations do not bring water or excess fine materials to the surface, are to be troweled no more than 2 times using a steel trowel. Do not trowel slabs that have not been floated. Do not use trowel blades for floating. As an option, the wet screed method may be used, but only in these areas not specified or required to be installed with a high degree of flatness and level in slab surface. Do not use floating or trowelling machines with water attachments or devices for wetting slab surface during finishing process. Edge finishing is an integral part of the process. It is Brookshire's intent to provide a polished concrete finish. All pour edges should be smooth and level with the adjacent slabs. A walk behind trowel should be used along the perimeter of all pours with 2 passes, completed in a counter clockwise direction. The trowel blades should lap over onto forms or adjacent slab pours to insure that all concrete is consolidated and mechanically troweled.

#### SAW CUT JOINTS:

##### *Exterior Slabs -*

Saw cut control joints within 8 hours after concrete finishing. Start cutting as soon as concrete has hardened sufficiently to prevent aggregates being dislodged by saw. Complete cutting before shrinkage stresses become sufficient to produce cracking.

All new Saw-Joints, and Cutting for replacement, removal, adjoining of work, etc. shall be accomplished by Power Driven - Water Assisted Equipment specifically manufactured for the application, and operated by experienced personnel. All cuts shall be uniform in depth to within  $\pm 1/8$ ", straight and true to line with variance of no greater than  $\pm 1/8$ " along an 8' straight edge and no more than  $\pm 3/8$ " overall. Saw cuts should be spaced in feet 2.5 to 3 times the pavement thickness in inches.

Flush saw cut joint with water after cutting to remove excess sludge and debris.

After a minimum of 28 days after joints are saw cut, install backer rod and sealant in joints per CAULKING AND SEALANTS section of the specifications.

##### *Building Slabs -*

Saw-Cutting of Concrete Control Joints shall be accomplished as soon as concrete will support foot traffic and after finish has been applied, but in no event longer than 8 hours, unless noted otherwise on the Drawings, after commencement of Concrete Pour for the specific placement section.

All new Saw-Joints, and Cutting for replacement, removal, adjoining of work, etc. shall be accomplished by Power Driven Dry-Cut Equipment specifically manufactured for the application followed by a vacuum to remove concrete debris caused by saw, and operated by experienced personnel. All cuts shall be uniform in depth to within  $\pm 1/8$ ", straight and true to line with variance of no greater than  $\pm 1/8$ " along an 8' straight edge and no more than  $\pm 3/8$ " overall. Saw cuts should be located as indicated on the Drawings.

All saw cuts in the retail floor slab must be straight with clean edges and minimal corrective double cuts. If, during the cutting process, it becomes evident that the joint edges are spalling or pulling out

rock, the contractor should stop work and give the concrete sufficient time to harden so that the edges are clean after cutting.

After a minimum of 28 days after joints are saw cut, install backer rod and sealant in joints per CAULKING AND SEALANTS section of the specifications. All caulking at concrete pour joints shall be removed and replaced after Substantial Completion and prior to Final Acceptance. Coordinate exact replacement schedule with Brookshire's.

#### HORIZONTAL SURFACE FINISHES AND TOLERANCES:

##### *Slab Finishes -*

All floor slab finishes shall be monolithic (finished at the time of placing) smooth trowel finish. Surface shall be hard, true and smooth without blemishes caused by exposed aggregates, mechanical trowel marks, blistering, or crazing.

Slab finishes shall be level to within 1/4" maximum above any adjoining slab area to 1/4" maximum below any adjoining slab area across a 16'-0" horizontal straight edge placed at any location and in any direction on the finished slab surface, and shall be level to within 1/2" maximum above reference finish elevation to 1/2" maximum below reference finish elevation at any point on the entire finish surface.

Grinding will be allowed as a method of correction for surfaces up to 1/4" above the maximum allowable elevation. All other areas, which do not meet the specified finishes and tolerances, will be removed and properly replaced. Saw cut around the entire area designated by Brookshire's making all cuts square with the exterior walls of the building and in no case having a dimension less than 3'. Remove and discard the entire thickness of the slab and all related reinforcement except 1' around the perimeter of the removed area. Replace vapor barrier, install new reinforcement steel and attach to the remaining perimeter steel, and properly replace concrete.

NO FLOOR FILL materials or filling techniques of any type will be allowed to attempt to achieve tolerances.

##### *Exterior Concrete Finishes -*

All walks, steps, drives, paving, curb and gutter shall be monolithic "Heavy Broom" finish. All Ramp and Landing Surfaces shall be "Heavy Broom" finish, including the walking surfaces of those areas that are "grooved" or otherwise patterned for the purpose of "Detectable Warning". Coordinate with Brookshire to observe application of first pour to establish type of brooms, weight, and manner of application to achieve finish acceptable to Brookshire. Exterior concrete shall be to within 3/8" maximum above to 3/8" maximum below referenced grade for the specific area. Any area, which does not meet this requirement, as well as, any area which "ponds" water will be removed and properly replaced the same as required for slabs, except no grinding will be allowed. After a minimum of 28 days curing, install sealant in all control joints and cold joints per CAULKING AND SEALANTS section of the specifications.

##### *Vertical Surface Finishes -*

After forms are removed, remove projecting fins, bolts, form ties, nails, etc. not necessary for the work or cut back one inch from the surface. Where surface defects such as honeycomb occur, repair the blemished areas as directed by Brookshire's.

Repair defects in concrete Work as per ACI 301, Chapter 9 and as directed by Brookshire's. Chip voids and stone pockets to a depth of one inch or more as required to remove all loose material. Voids, surface irregularities, chipped areas, etc., shall be filled by gunite or immediately saturating with water and repairing with mortar of the same composition as used in the mix, rubbing the entire exposed surface with carborundum stone to produce a smooth finish. Repaired surfaces shall duplicate appearance of unpatched work and acceptable to Brookshire's.

All vertical concrete surfaces shall be to within 1/4" maximum outside to 1/4" maximum inside referenced dimension for the specific area. Any area, which does not meet this requirement, as well as any area, which is designated as not acceptable by previous inspection, will be removed and properly replaced.

#### CURING:

Protect adequately from injurious action by sun, rain, flowing water, and mechanical injury for a period of at least 14 days after placing. Curing operations shall commence after concrete has attained its initial set by not later than 10 hours after placing.

Curing to be by one of the following methods using those which are compatible with required final finishes as specified hereinafter. Wherever unusual temperature or other conditions occur, at the direction of Brookshire's, modify or augment the methods described, or adopt additional protective measures as directed.

#### *Water Curing by Saturated Coating Method –*

Concrete surfaces shall be kept continuously wet by covering with water, by continuous spraying, or by covering with burlap, cotton mats, or other approved material thoroughly saturated with water and kept wet by intermittent hosing.

#### *Curing Compound –*

A dissipating wax or resin based curing compound may be used if approved by Brookshire's. If a curing compound is used the contractor must have a minimum of 4 sprayers on hand to ensure that clogged tips do not become a hindrance to even placement per manufacturers written recommendations. Patterns left due to improper placement of the curing compound will require additional grinding will be at the cost of the finishing contractor. No curing compound with a sealer component shall be used on retail concrete slab surfaces.

#### APPLICATION OF CONCRETE FLOOR HARDENER:

All concrete floors left exposed in the finish work that are not scheduled to receive resilient tile, carpet, epoxy/acrylic flooring, ceramic tile or other scheduled finishes shall be hardened and sealed with 3 coats of hardener specified herein. Each coat shall be applied in accordance with the manufacturer's specifications. Before installing any hardener, any spalling, cracks, loose material, or crevices in slabs shall be repaired. All cracks to be cut to 1/4" cleaned and filled. Cracks cut to 1/4" width by 3/8" to 1/2" deep, filled with non-shrinking grout. All surfaces to be hardened to be dry, clean and free of all loose particles, dust, dirt, oil, and wax.

Ashford Formula, Cure Hard by Seal Tight, Lapidolith or Sonosil by Sonneborn, or approved equal. Product must be transparent in color.

#### CUTTING AND PATCHING OF WORK:

Do all cutting, fitting or patching of concrete work that may be required to make its several parts come together properly and fit it to receive or be received by work of other Subcontractors shown upon, necessary, or reasonably implied by, Drawings and Specifications for completed structure, and he shall make good after them as Brookshire's may direct. Any cost caused by defective or ill-timed work shall be borne by the party responsible therefore. Do not endanger any work by cutting, or otherwise altering the work, nor cut or alter the work of any other Subcontractor save with consent of Brookshire's.

#### CLEAN-UP:

Per GENERAL CONDITIONS.

Clean exposed concrete surfaces and adjoining work stained or otherwise blemished by concrete work to approval of Brookshire's.

- END OF SECTION 03310 -

SECTION 03600  
**POURED CONCRETE GROUT**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all Concrete Grout and related work as shown on the Drawings and as specified herein.

**CODED AND STANDARDS:**

Meet all requirements and recommendations of applicable portions of latest edition, unless otherwise indicated, of standards listed. Should conflict with referenced standards and specifications arise, the most stringent will govern.

American Society for Testing and Materials (ASTM)

- ASTM C39-72 Method of Test for Compressive Strength of Cylindrical Concrete Specimens.
- ASTM C476-71 Specification for Mortar and Grout for Reinforced Masonry.
- ASTM C329-72 Recommended Practice for Inspection and testing Agencies for Concrete, Steel, and Bituminous Materials as used in Construction.

Portland Cement Association (PCA)

American Concrete Institute's ACI-347

- ACI 318-89 Building Code Requirements for Reinforced Concrete.
- ACI 211.1-70 Recommended Practice for Selecting Proportions for Normal Weight Concrete.
- ACI 214-77 Recommended Practice for Evaluation of Compressive Test Results of Field Concrete.
- ACI 531.1-76 Specifications for Concrete Masonry Construction.

**DELIVERY AND STORAGE:**

Deliver and store materials in dry protected areas. Whenever possible, Concrete Grout shall be produced, transported, and conveyed by "ready-mix" method per CAST-IN-PLACE CONCRETE specification section.

**QUALITY OF THE WORK:**

All concrete work shall meet all requirements of this specification. All areas designated by Brookshire's as not meeting the drawings and specifications will be removed and properly replaced.

**COORDINATION:**

Obtain information and instructions from other Trades and suppliers in ample time to schedule and coordinate the installation of items furnished by them to be embedded in concrete grout so provision for their Work can be made without delaying the project.

**WEATHER:**

Do not lay Masonry or place Concrete Grout when Ambient Temperature or Wind Chill Factor is below 32 degrees F, or when Ambient Temperature or Wind Chill Factor is predicted by the National Weather Service to be below 32 degrees F within 24 hours, except as provided for in *Cold Weather Provisions* within this Specification for MORTAR and POURED CONCRETE GROUT.

**TESTS AND CERTIFICATIONS:**

Before starting any Work under this Section, make all required arrangements with testing agency per specification section TESTING LABORATORY CONTROL. Testing laboratory shall test and furnish certified reports on proposed cements, aggregates, mixing water, admixtures, etc. as required.

Lab shall prepare design mixes for each type of concrete grout required per methods as specified in ACI 301.

**MATERIALS:**

*Portland Cement* - ASTM C150, Type I, 94 pound sack, minimum 5 sack content per cubic yard to produce 2000 PSI minimum Compressive Strength at 28 days.

Grout shall conform to ASTM C 476. Mix grout with sufficient water to give a fluid pouring consistency without segregation of materials.

*Water* - clean, potable, free of oil, acid, vegetable matter, alkalis, salts, and substances harmful to concrete. Do not exceed 6 gallons of water per sack of cement. Surface water contained in the aggregate must be included as part of the mixing water.

*Fine Aggregates* - Shall conform to ASTM C 33, and shall consist of clean, hard, durable washed and graded sand, free from lumps, soft or flaky particles, organic matter, or other deleterious substances.

*Fill Stop Fabric* - Dur-O-Wal is used to establish quality, others will be considered for substitution. Unless noted otherwise on the drawings, use Dur-O-Stop monofilament screen, or Fil-Stop Fiber Glass Mesh.

*Chemical Admixtures* - Shall be used only with written approval of Brookshire's and shall conform to ASTM C 494 for types A, D, and E except that 90% water content maximum of control shall be used. Product shall be added at the plant only, during the batching and clearly designated on each delivery ticket. All procedures shall be per manufacturer's printed instructions. W.R. Meadows, Master Builders, and Sonneborn are approved manufacturers; others will be considered per SUBMITTALS.

Calcium chloride will not be permitted within any concrete or for surface application.

Consideration of admixtures is for the convenience of the Contractor and will be used at no additional cost to Brookshire's.

*Cold Weather Provisions* - For convenience of the Contractor, an approved non-chloride accelerant, may be used when Ambient Temperature or Wind Chill Factor is between 32 degrees F and 25 degrees F, or when Ambient Temperature or Wind Chill Factor is predicted by the National Weather Service to be between 32 degrees F and 25 degrees F within 24 hours, at no additional cost to Brookshire's. Accelerant shall be used only with written approval of Brookshire's and shall conform to ASTM C 494 for type C admixtures, except that 90% water content maximum of control shall be used. Reduce water batching volume proportionate to accelerant volume addition. Product shall be added in the batching process during the approved initial mortar mixing process. Product volume amount added in batching shall be clearly designated on each delivery ticket for Ready-mix materials; or documented by Brookshire's Representative and/or Testing Laboratory for Job-mix.

W.R. Meadows SEALTIGHT HYDRASET-FREE is used to establish quality, other manufacturers will be considered for substitution, at the rate of 1 1/2 quarts per bag of Cement. No Masonry Laying or Concrete Grouting operations will be allowed when Ambient Temperature or Wind Chill Factor is below 25 degrees F, or predicted to be below 25 degrees F within 24 hours.

**CONCRETE GROUT METHODS & PLACEMENT:**

Place grout in compliance with practices and recommendations of ACI 304, and as specified herein.

Contractor shall verify that all prior work has been accomplished properly. Beginning of work indicates the Contractor has accepted the area or surface as ready to receive this work.



Proportion grout to a fluid consistency but not to the point of segregation to produce a concrete grout mix of approximately 10-inch slump.

Erect vertical reinforcing in single lengths, unless specifically detailed otherwise on the Drawings, from foundation to top of wall. Secure in place while laying masonry units with permanent Bar Positioning Devices and wire horizontal reinforcing to verticals, as necessary to assure reinforcement will remain in position during Grout Pouring operations, as work progresses. Lap splice 30 diameters minimum, unless noted otherwise on the Drawings or Specified otherwise in REINFORCING STEEL Specification Section, and wire together. Fully embed reinforcement in grout, not in mortar or mortar joints. Provide all required accessories for accurate alignment of steel during grout filling operations.

Freshly mix grout and place in lifts not over 4 feet high while fluid and before initial set has taken place. Puddle grout into place with steel rod. Do not vibrate grout.

Grout beams over openings in one continuous operation.

Stop grout pours 1-1/2 inch below a mortar joint, except at top of wall. Where bond beams are used, stop grout pour 1/2 inch below top.

Use Fill Stop Fabric, Metal Lath, Mortar, or Special Units, approved by Brookshire's, to confine grout to area required. Do not use materials which may inhibit bond or are combustible.

In multiple wythe masonry, tie wythes together with horizontal joint reinforcement spaced at 16" o.c. vertically, unless noted otherwise on the Drawings.

Provide cleanout openings of 12 sq. in. minimum area opposite each vertical bar at bottom course or in foundation wall when wall is erected in more than 4' lifts. Clean cores and collar joints of mortar droppings and foreign material, position reinforcement, and close cleanout openings before grouting starts.

Place vertical barriers consisting of masonry units and mortar in bound beam type hollow units and in collar joints to be grouted at 30 ft. maximum to limit horizontal flow of grout.

Do not use high-lift grouting method until masonry units have been in place 3 days minimum.

Do not permit water or foreign material to fall in grout space while grout is being placed and cured.

CLEAN-UP:  
Per GENERAL CONDITIONS.

Clean all excess Concrete materials, Mortar, and related materials from Masonry surfaces and adjoining work, regardless of whether to be exposed to view in the finished work, to approval of Brookshire's.

- END OF SECTION 03600 -

**SECTION 04200**  
**UNIT MASONRY**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Unit Masonry, Mortar, and Masonry Insulation Work as shown on the Drawings and as specified herein.

**RELATED SECTION(S):**

03600 - Poured Concrete Grout

**GUARANTEE:**

Per GENERAL CONDITIONS.

**REFERENCE STANDARDS:**

Along with all applicable codes and regulations, conform with installation and manufacturing standards of:

State Concrete Masonry Association

National Concrete Masonry Association

American Concrete Institute (ACI)

American Society for Testing and Materials (ASTM)

For *Concrete Masonry Units*: ASTM C-55, C-90, C-91, C-129, C-139, C-140, C-144, C-145, C-150, C-207, C-270, C-387, C-426, C-476, C-595, C-744, C-780, C-979, C-1093, C-1157, C-1314, C-1329, C-1586, C-1714, and E-447 as applicable.

For *Face Brick*: ASTM C-62 and C-216 as applicable.

Portland Cement Association

State Insurance Board

American Insurance Association (AIA)

Underwriter's Laboratory (UL)

**TESTING:**

Per TESTING LABORATORY CONTROL, testing of Masonry Units, Mortar, or Accessories may be called for at the discretion of Brookshire's.

**COORDINATION:**

Coordinate with all other Trades whose Work relates to masonry installation for placing of all required blocking, subframing, backing, furring, HVAC, electrical, plumbing, etc.

**SAMPLES:**

Before any masonry is delivered to the site, and per SUBMITTALS, submit to Brookshire's for approval one sample of each specified type masonry unit and appropriate manufacturer's information for mortar material, reinforcement, and accessories.

After individual masonry units sample(s) have been approved, lay 48" width by 32" height sample panel of Unit(s) to be used on the project at location established by Brookshire's. Lay on 4" deep x 16" wide x 60" length, 2500 psi concrete footing.

**WEATHER:**

Do not lay masonry when Ambient Temperature or Wind Chill Factor is below 32 degrees F, or when Ambient Temperature or Wind Chill Factor is predicted by the National Weather Service to be below 32 degrees F within 24 hours, except as provided for in *Cold Weather Provisions* within this Specification for MORTAR and Poured Concrete Grout.

**DELIVERY, STORAGE AND PROTECTION:**

Deliver and store materials in dry, protected areas. Store all masonry units and mortar materials in a manner to be kept off the ground and protected from rain. Keep free of stain or other damage before, during and after installation. Any damage is cause for rejection of the work.

#### CONCRETE MASONRY UNITS (CMU):

Hollow load-bearing units as per ASTM C-90. Non load-bearing units as per ASTM C-129. Shrinkage shall not exceed the amount recommended in ASTM C-426. Water Content at the time of delivery to job site shall have a value, in weight of contained water, of not more than 35% of the fully saturated content for the unit tested. Calcium Chloride content shall not exceed 10% of Portland Cement volume by weight. Ship all units from factory, and store at job site, with all necessary protection to prevent increase of water content from rain and other sources. Grade, Type, Compressive Strength, etc. indicated within this Specification shall establish the minimum performance requirements of Masonry Units. Indications which vary on the Drawings shall govern when requiring Units of Superior Performance.

#### *Standard CMU Units -*

Grade N - Type I, with 1500 PSI minimum compressive strength on the average gross area, 80 PCF approximate density. All units natural cement gray color.

#### *Custom CMU Units -*

Premium Grade as Produced by manufacturer acceptable to Brookshire's. Straight surfaces shall conform to requirements of Standard CMU. Decorative irregular faces shall be free of damage and surface defects, and uniform in appearance. Color as selected by Brookshire's from Manufacturer's standards.

#### *Size -*

4x8x16, 12x8x16, 12x12x16 and any other sizes and shapes as required to complete the Work indicated on Drawings.

#### *Pattern -*

Running Bond, except where specifically noted otherwise on the Drawings.

#### FACE BRICK:

*Standard Modular Face Brick* – Belden Brick Company. No Substitutes.

3 5/8" x 2 1/4" x 7 5/8" (TxHxL)

C216 "Berwick Red Range"

Type FBS

Grade SW

#### MORTAR:

All mortar materials and mixing for Masonry shall conform to ASTM C-270 the same as if repeated verbatim herein.

#### *Type -*

"S" (1800 psi) at CMU Wall Systems, Multiple Wythe, and Load-Bearing; and "N" (750 psi) at Single Wythe, Non-Bearing Masonry Veneer, unless specifically noted otherwise on the Drawings. Job mixed is used as standard. Texas Lehigh Cement Co., (of Type specified only) Masonry Premix or approved equal is acceptable when used in accordance with manufacturer's printed instructions and not in conflict with the provisions of this specification.

#### *Joint Type -*

3/8" thickness, concave, hard tooled, full head and bed, unless specifically noted otherwise on the Drawings.

Color: Natural Portland

Cement: Portland Cement Type I or II, ASTM C-150

Masonry Cement: ASTM C-91

Hydrated Lime: ASTM C-207, Type S.

Water: Potable.

#### *Cold Weather Provisions -*

For convenience of the Contractor, an approved non-chloride accelerant, may be used when Ambient Temperature or Wind Chill Factor is between 32 degrees F and 25 degrees F, or when

Ambient Temperature or Wind Chill Factor is predicted by the National Weather Service to be between 32 degrees F and 25 degrees F within 24 hours, at no additional cost to Brookshire's. Accelerant shall be used only with written approval of Brookshire's and shall conform to ASTM C 494 for type C admixtures, except that 90% water content maximum of control shall be used. Reduce water batching volume proportionate to accelerant volume addition. Product shall be added in the batching process during the approved initial mortar mixing process. Product volume amount added in batching shall be clearly designated on each delivery ticket for Ready-mix materials; or documented by Brookshire's Representative and/or Testing Laboratory for Job-mix.

W.R. Meadows SEALTIGHT HYDRASET-FREE is used to establish quality, other manufacturers will be considered for substitution, at the rate of 2 quarts per bag of Cement. No Masonry Laying operations will be allowed when Ambient Temperature or Wind Chill Factor is below 25 degrees F, or predicted to be below 25 degrees F within 24 hours.

#### MORTAR DROPPING COLLECTION:

Mortar Trap™ by Hohmann & Barnard, Inc. is used to establish quality, other manufacturers will be considered for substitution. Mortar dropping collection material shall fill bottom portion of air cavity between back of masonry unit and exterior sheathing material and shall be installed per manufacturer's instructions.

#### MASONRY INSULATION:

Foamed-In-Place Insulation shall be installed in masonry wall cavities and at junctions of dissimilar wall and roof materials.

Foamed-In-Place Insulation manufacturer used to establish quality shall be BASF Corporation WALLTITE US Series Closed Cell. Icynene-Lapolla and Johns Manville are acceptable as equal manufacturers. Other manufacturers will be considered for substitution.

Foamed-In-Place Insulation shall be medium density, rigid or semi-rigid closed cell polyurethane foam that is installed on site using blowing agent of water or non-ozone-depleting gas. Closed cell content shall be at least 90% and shall have the following characteristics.

1. Thermal Resistance: R-Value of 5.0 minimum per 1 inch thickness at 75 degrees F mean temperature when tested in accordance with ASTM C518.
2. Water Vapor Permeance: Vapor retarder shall be 2 perms maximum when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
3. Water Absorption: Less than 2% by volume maximum when tested in accordance with ASTM D2842.
4. Air Permeance: 0.04 cfm per SF maximum when tested at intended thickness in accordance with ASTM E2178 or ASTM E283 at 1.57 psf.
5. Surface Burning Characteristics: Flame spread/Smoke developed index of 24/450 maximum when tested in accordance with ASTM E84.

Verify work within construction spaces of crevices is complete prior to insulation application. Verify that surfaces are clean, dry and free of matter that may inhibit insulation or overcoat adhesion.

Mask and protect adjacent surfaces from over spray or dusting. Apply primer as required by manufacturer and in accordance with manufacturer's instructions.

Apply foamed-in-place insulation in accordance with manufacturer's instructions. Do not permit subsequent construction work to disturb applied foamed-in-place insulation.

#### GENERAL:

Install foamed-in-place insulation from interior, of as specified, prior to installation of interior finish work and after all masonry and structural concrete work is in place; comply with manufacturer's instructions.

#### MASONRY CLEANING COMPOUND:

An acid compound which is 100% soluble in water and is not injurious to the hands, such as Sure-Klean. Commercial muriatic acid shall not be used. All handling, mixing, usage and disposal shall be in strict accordance with manufacturer's printed directions.

#### MASONRY ACCESSORIES:

Hohmann & Barnard is used to establish quality. Other manufacturers will be considered for substitution unless specifically noted otherwise. Use the following, unless specifically noted otherwise on the Drawings.

*Control & Expansion Joint -*  
RS Series – Rubber Control Joint

*Veneer & Soaps -*  
NS – Closed Cell Neoprene Sponge

*Bar Positioners -*  
RB – Rebar Positioner

#### *CMU Wall Reinforcement -*

Ladder type Standard duty (9 ga. Side and Cross Rods), Regular Mill Galvanized per ASTM A641, size and design type as appropriate for single wythe, composite or cavity walls and per ASTM A-82. Place in first horizontal joint and every second horizontal joint (16" o.c.) in all walls. Place in first and second joints above openings. Lap 6" minimum. Use prefabricated corners and tees of same material. All reinforcement shall be clean and free from rust, scale, oils, etc. Install per manufacturer's instructions. Reinforcement shall be continuous through control joints, and shall not be continuous through expansion joints.

#### *Masonry Veneer Reinforcement -*

Foundation Supported Condition - Hot dip galvanized DW-10HS 14 ga. Veneer Anchors at 16" o.c. horizontal and 16" o.c. vertical, and within 6" of ends, out-corners, change of direction, etc. To structural steel with SX fasteners and to metal studs through sheathing with #10 Polymer-Coated, Self-Drilling, Self-Tapping screws per DRYWALL. Embed 2 1/2" minimum to 3" maximum in mortar joint, unless specifically detailed otherwise on the Drawings.

#### MASONRY FLASHING:

Hohmann & Barnard Textroflash™ Flashing 40 mil thick, non-asphalt composite membrane with a clear adhesive. Membrane shall be installed as shown on the Drawings.

#### MORTAR MIXING:

Provide accurate measuring devices and proportions mixes exactly and consistently.

Mix in a mechanical batch mixer for a period of at least 3 minutes after all materials are added. Prevent segregation of materials. Empty mixer completely before loading succeeding batch materials.

Do not use mortar more than 1-1/2 hours after water was first added to mix. Do not retemper, or otherwise remix mortar that has started to set.

Proportion grout to a fluid consistency but not to the point of segregation to produce a slump of approximately 10-inches.

#### INSTALLATION:

Lay up all walls plumb, level and true to lines and dimensions shown on the Drawings. Use no chipped, cracked, spalled, off-color or otherwise defective masonry units; any such units are cause for rejection of the work.

*Tolerances -*

- Joint thickness = +/- 1/8" in 2'-0"
- Variation from level = +/- 1/4" in 12'-0"
- Variation from plumb = +/- 3/8" maximum from ref. elev.
- Variation from dimension = +/- 1/8" in 2'-0"
- Variation from dimension = +/- 3/8" maximum in 20'-0"
- Variation from dimension = +/- 3/8" in 20'-0"
- Variation from dimension = +/- 3/4" maximum

Do not wet units before laying. Only when sufficiently hot and dry weather causes units to be warm to the touch may surface be lightly fog-sprayed.

Place all units in mortar with full bed and head joints. Align all vertical cells which receive insulation to maintain a clear, unobstructed system of flues. Hold racking to an absolute minimum. Limit grout pours to maximum of four feet in height.

Tool ALL joints to a dense, smooth surface, regardless of whether exposed or concealed.

Saw-cut all partial units and miters, no broken masonry units will be accepted.

Control Joints in masonry walls shall be as indicated on the Drawings, but in no instance spaced more than 20'-0" o.c. maximum, and at all intersections, corners, and within 8" of angle points. All joint locations not specifically indicated on the Drawings shall be approved by Brookshire's. Submit Control Joint lay-out for approval when exact locations and spacing of joints are not clearly indicated on the Drawings.

Masonry Unit voids shall not be exposed to view on finished work. Use manufactured end units or miter as required. Masonry insulation shall be installed as per National Concrete Masonry Association guidelines for insulation in concrete masonry walls. Masonry Insulation shall be poured into the concrete block cavities directly or through the use of a hopper device placed immediately on top of the wall section. The insulation shall be poured at any convenient interval so as to insure that all areas are filled. All holes and openings in the wall through which the insulation can escape shall be permanently sealed or caulked prior to installation; glass fiber, rope, galvanized steel, or copper screens shall be used at weep holes to prevent leakage. Wall sections under doors and windows shall be filled before sills are placed. Completely fill all voids in "Fire Rated CMU Walls" and all other areas specifically noted on the Drawings.

**CLEANING:**

Per GENERAL CONDITIONS.

Clean all exposed block thoroughly and as the Work progresses. Dry brush or sack rub masonry at the end of each day and after final pointing. Remove mortar and mortar stains using cleaning compound and rinse thoroughly with water. All finished surfaces of finished Work shall be unmarked and unmarred.

Clean all excess Concrete materials, Mortar, and related materials from Masonry surfaces and adjoining work, regardless of whether to be exposed to view in the finished work, to approval of Brookshire's.

Protect all materials in place and stored, people, property, etc. during all operations related to masonry work.

- END OF SECTION 04200 -

## SECTION 05120 STRUCTURAL STEEL

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### SCOPE:

Furnish, fabricate, mark for erection identification, pack, crate, or otherwise properly prepare for shipment, ship to the site, handle, store, and erect all structural steel indicated on the Drawings, described in these specifications, or otherwise required for proper completion of the work.

Structural steel shall include cold rolled "CEE" sections and other cold rolled shapes used as wall girts, roof purlins and opening framing.

### CODES AND STANDARDS:

Meet all requirements and recommendations for applicable portions of latest edition, unless noted otherwise, of standards listed. Should conflict occur between referenced standards and the specifications, the most stringent shall govern.

American Society for Testing and Materials (ASTM)

- Wide Flange Shapes and WT's: ASTM A992 with minimum yield of strength of 50 ksi.
- Steel Plates, Channels, Angles, Bars, Miscellaneous connection material: ASTM A 36 unless noted otherwise on the drawings.
- Cold-Formed Steel Tubing: ASTM A 500, Grade B
- Steel Pipe: ASTM A 53, Type E or S, Grade B
- Structural Cold-Rolled Steel Sheets: ASTM A 570
- Galvanized Structural Steel Sheets: ASTM A 446, Coating Designation G 90
- Concrete Inserts: Malleable Iron (ASTM A 47) or cast steel (ASTM A 27) inserts, with steel bolts, washers, and shims; hot dip galvanized.
- Grade 50: ASTM A992

American Institute of Steel Construction (AISC)

- Specifications for Steel Buildings.
- Specification for Structural Joints Using ASTM A325 or A490 Bolts.
- Specification for the Design of Cold-Formed Steel Structural Members using AISI SG02-1.

American Welding Society (AWS)

- Structural Welding Code

American National Standards Institute (ANSI) as referenced.

### SHOP DRAWINGS:

Per GENERAL CONDITIONS, submit Shop Drawings of all Work herein showing shop and erection details, layouts, sizes, methods of construction and installation, including sizes and type of all fastening devices. Furnish anchor bolts and fasteners as required. Furnish templates for bolt installation.

Members and connections for any portion of the structure not shown on the contract Drawings shall be detailed by the fabricator and indicated on the Shop Drawings. All welds shall be indicated by standard welding symbols of the AWS.

Contractor shall be responsible for all errors of detailing, fabrication, and for the correct dimensions, elevations, etc. of all members, and for fabrication/erection tolerances to insure proper fit of the structural members.

### TESTING AND CERTIFICATION:

Certification that each welder is qualified in accordance with AWS Code D1.1 shall be provided. Any welder shall be retested and recertified as designated by Brookshire's when the work of the

welder creates a reasonable doubt as to his proficiency. Such subsequent tests shall be conducted per TESTING LABORATORY CONTROL specification section.

Contractor shall provide Mill Certifications, Ultrasonic Testing of Shop and/or Field Welding, etc. for conditions and at rates as called for on the drawings per TESTING LABORATORY CONTROL specification section.

**GUARANTEE:**  
Per GENERAL CONDITIONS.

**MEASUREMENTS:**  
Verify all dimensions by taking field measurements; proper fit and attachment of all items is required.

**COORDINATION:**  
Coordinate with other Trades for prompt delivery of all materials needed for erection or installation. Identify all bolts or other loose materials.

**DELIVERY AND STORAGE:**  
Material shall be stored out of contact with the ground in such manner and location as will minimize contamination and deterioration.

In the event of damage Contractor shall make all repairs and replacements necessary to the approval of Brookshire's and at no additional cost per the following requirements.

Brookshire's shall make determination if damage/misfabrication is to be repaired or replaced. Remove any items designated as unacceptable by Brookshire's from site and replace with new material.

Contractor shall furnish Shop Drawings per SUBMITTALS procedure, Certified by Registered Professional Engineer, for proposed repair of Structural elements designated by Brookshire's as "Critical".

Structural steel fabricator shall provide 5 gallons of primer used in steel fabrication for delivery to job for touch-up by Paint Contractor.

**MATERIALS STANDARDS:**

Shall meet the following criteria/standards unless specifically noted otherwise on the Drawings.

- Structural Steel -  
ASTM A992  
Steel Plates, Angles, Channels, and Bars
- ASTM A36  
Structural Tubing -  
ASTM A500, Grade B
- Steel Pipe -  
ASTM A53, Type E or Type S as indicated on the Drawings, Grade B.
- High-strength bolts, including nuts and washers -  
ASTM A325 or A490. High-strength load indicator threaded fasteners, where shown on the Plans shall be Le Jeune bolts, nuts and washers, complying with ASTM A325 Specification.
- Bolts and nuts, other than high-strength -  
ASTM A307, Grade A.  
Plain washers, other than those in contact with high-strength bolt heads and nuts -  
ANSI Standard B18.22.1, Type B.
- Steel Castings -



Comply with ASTM A27, Grade 65-35, medium-strength carbon steel.

Anchor Bolts/ Rods-

Comply with ASTM F1554 grade 36, nonheaded type with heavy hexagonal nuts, unless otherwise indicated.

Unfinished threaded fasteners -

Comply with ASTM A307, Grade A, regular low-carbon steel bolts and nuts. Provide either hexagonal or square heads and nuts; except use only hexagonal units for exposed connections.

Electrodes for Welding -

Comply with AWS Code, using ASTM A233 E-70 series electrodes.

Non-shrink grout -

Per CAST-IN-PLACE CONCRETE specification section.

Galvanizing -

ASTM A386 for assembled products, ASTM A153 for iron and steel hardware.

#### SHOP PRIMING:

Shop coat and touch-up any ungalvanized ferrous metal with overall application of brush or spray coat of light gray primer per Federal Specification TT-P-636 equal to Pratt & Lambert 466771, Gillespie Coatings #99 LFD, or approved equal.

All metal to be primed shall be clean and free of scale, dirt and dust by sanding, wire brushes or sandblasting as appropriate for proper application of finish. Remove oil and grease with petroleum naphtha. Thoroughly work paint into all joints by brushing or spraying process.

All job fabrications shall receive one field coat of primer on all exposed surfaces.

#### FABRICATION:

Structural steelwork material shall be in accordance with the applicable provisions of the AISC Specification. Fabrication and assembly shall be done in the shop to the greatest extent possible. Structural steelwork, except surfaces of steel to be encased in concrete and surfaces to be field welded, shall be prepared for painting in accordance with the AISC Specification and primed with specified paint materials.

Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work. Furnish templates and other devices necessary for presetting bolts and other anchors to accurate locations.

Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A325 or A490 Bolts", using A325-N bolts, unless noted otherwise. The use of Load Indicator Washers or Direct Tension Indicator bolts is acceptable.

Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welded work.

Execute all Work using skilled workers only. Use only certified welders. Do only such Work at the site as cannot reasonably be performed in the shop. Make cuts, bends, punching and drilling accurate, neat and properly located. Grind and file smooth all parts exposed to view; leave exposed surfaces free of fabrication marks. Make members true to length to allow assembly without fillers.

Assemble and weld built-up sections by methods which will produce true alignment of axes without warp.

Provide holes required for securing other work to Structural Steel framing, and for the passage of other work through steel framing members, as shown on the final Shop Drawings. Provide threaded nuts welded to framing, and other specialty items as shown to receive other work.

Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

Bases and bearing plates shall be shop-welded to columns and members attached to concrete and masonry. Slotting or otherwise oversizing of bolt-holes shall be cause for rejection. Install slide bearing plates and protect against damage in accordance with manufacturer's written directions.

Splice members only where indicated on Shop Drawings. Submit structural calculations Certified by a Registered Professional Engineer where fabricator is proposing splices not called for on the Drawings.

Shop paint all structural steel work not specifically noted as having finish of other type, including those members or portions of members to be embedded in concrete, mortar, roofing materials, etc. unless specifically noted otherwise on the Drawings.

Apply "Galvaweld" or equal to any surfaces welded after galvanizing.

DO NOT use gas-cutting torches at job site for correcting fabrication errors in the structural framing. Cutting will be permitted only on secondary members as acceptable to Brookshire's. Only Shop-performed finish gas-cut sections equal to a sheared appearance will be permitted.

#### DIMENSIONAL TOLERANCES:

##### Straightness -

Structural members of a single rolled shape or built-up structural member fabricated by bolting or welding shall be straight within the tolerances allowed for wide flanged shapes by ASTM A6. Compression members shall not deviate from straightness by more than 1/1000 of the axial length between points of lateral support.

##### Length -

With both ends finished for contact bearing, maximum variation of overall length equals 1/32 of an inch. For members without ends finished for contact bearing, maximum length variation equals 1/16" for lengths up to 30 feet and 1/8" for members over 30 feet in length.

#### ERECTION:

Contractor shall examine the areas and conditions under which work of this Section will be performed. Correct the conditions detrimental to proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

High-strength bolting - All ASTM A325 bolts in structural connections shall be tightened using the "turn-of-the-nut method", or by using direct tension indicators as required.

Slip joint bolts shall be tightened to a "snug fit" only and bolt threads burred or tack-welded to prevent loosening.

Clean the bottom surface of base and bearing plates. Set loose and attached base plates for structural members with wedges or other adjusting devices. Tighten anchor bolts with spud wrench after the supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with the edge of the base or bearing plate prior to packing with grout. Pack grout solidly between bearing surfaces and bases or plates to ensure

that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure in strict compliance with the manufacturer's instructions as approved by Brookshire's.

Correct deficiencies in structural steel work which inspections and test reports have indicated to be not in compliance with the specified requirements. Perform all additional tests required to reconfirm non-compliance of the original work and to show compliance of corrected work.

Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Provide temporary guy lines to achieve proper alignment of the structures as erection proceeds.

Remove temporary connections and members when permanent members are in place and final connections are made.

Provide adequate temporary planking and working platforms, per OSHA standards, as needed for effective completion of the work of this Section.

Set structural frames accurately to the lines and elevations indicated. Align and adjust the various members forming a part of a complete frame or structure before fastening permanently. Clean the bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments for discrepancies in elevations and alignment. Level and plumb individual members of the structure within specified AISC tolerances.

Erection tolerance for Exposed Structure and Custom Fabricated Decorative elements such as steel angle fascia frames shall be + 1/4" vertically and horizontally. Erection tolerance Concealed Structure and for Custom Fabricated Long-Span or extremely heavily loaded structures such as deep steel trusses spanning distances greater than 75' shall be +/- 1/2" vertically and +/- 1/4" horizontally.

Establish required leveling and plumbing measurements on the mean operating temperature of the structure. Make allowances for the difference between temperature at time of erection and the mean temperature at which the structure is completed and in service.

Weld corners and seams continuously; grind exposed welds smooth and flush whether shop or field fabricated. Form exposed connections with hairline, flush joints; use concealed fasteners where possible.

#### CLEAN-UP:

Per GENERAL CONDITIONS. At completion of Work, remove all excess material, equipment, debris and cuttings from site and properly dispose.

All dirt, mud, debris, etc. shall be cleaned from all structural and Decorative Steel, regardless of whether to remain exposed or concealed by other work, prior to acceptance by Brookshire's.

- END OF SECTION 05120 -

**SECTION 05210**  
**STEEL JOISTS & JOIST GIRDERS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Open-Web Steel Joists, Joist-Girders, x-bracing, bridging, ceiling extensions, anchors, extended ends, bearing plates and accessories as shown on the Drawings and as specified herein.

**CODES AND STANDARDS:**

Meet all requirements and recommendations of applicable portions of latest edition of standards listed. Should conflict with referenced standards and specifications arise, the most stringent will govern.

- Steel Joist Institute (SJI) Standard Specification for Open Web Steel Joists, Series as called for on the Drawings. ex: H-s Series or K-Series
- Standard Specification for Longspan Steel Joists LH-Series, and Deep Longspan Steel Joists DLH-Series
- Manufacturer shall furnish Certificate stating that all joists, girders, etc. are manufactured and conform to requirements of applicable Steel Joist Institute Standards, as modified by Drawings and Specifications.
- American Society for Testing and Materials (ASTM) as referenced.
- American Welding Society (AWS) as applicable.

**TESTING AND CERTIFICATION:**

Contractor shall provide Mill Certifications, Ultrasonic Testing of Shop and/or Field Welding, etc. for conditions and at rates as called for on the Drawings per TESTING LABORATORY CONTROL specification section.

All Drawings, Specifications, Bar Joist Lists, etc. provided by Joist Manufacturer for this Project shall be prepared and executed under the direction of a Registered Professional Engineer holding a current License in the State in which this Project is to be constructed.

**SHOP DRAWINGS:**

Per SUBMITTALS.

Furnish detailed Shop Drawings and lists showing mark, number, type, location, and spacings of joists. Show bridging type, mark, method of attachment to joists, and anchorage at ends. Show type of paint, accessories, and details as required for proper installation of joists.

When specifically requested by Brookshire's, provide Certification of chemical composition and physical properties of steel in each specific shipment in the form of certified copies of mill test, prior to erection.

**DELIVERY AND STORAGE:**

Deliver and store materials in areas convenient as possible to erection location so as to minimize handling and to protect from damage from other construction operations.

Protect joists and accessories from harmful elements when stored at job site. Store above ground on platforms, pallets, or other supports. Keep joists free of dirt and other foreign matter.

Remove any damaged joists or girders from site and replace at no cost to Brookshire's.

**MATERIALS & FABRICATION:**

Fabricator shall be a member of Steel Joist Institute or American Institute of Steel Construction and publish a brochure of his products, including load tables.

Materials shall conform to Standard Specifications and the following requirements:

Joists - Each shall be identified with its mark.

Shop Paint & Touch-up per STRUCTURAL STEEL specification section. Joist fabricator shall provide 5 gallons of primer used in steel fabrication for delivery to job for touch-up by Paint Contractor.

Bridging - Member sizes, spacing, and end anchorage in accordance with Standard Specifications unless shown otherwise on Drawings.

Ceiling Extensions - Provide where contact or suspended ceilings occur below joists.

Extended Ends - Load-carrying capacity equal to loads shown on drawings. If no loads are shown on Drawings, capacity (PLF) shall be equal to capacity of joist.

Splices at bottom chords shall not be visible from below.

#### COORDINATION:

Coordinate with all adjoining Trades and provide all required bridging, headers, extension of chords, anchors and clips to complete the Work.

#### INSTALLATION:

All handling and erection procedures shall comply with Steel Joist Institute's "Code of Standard Practice", unless otherwise indicated or specified.

Erect joists parallel, plumb, and straight.

Joist spacing tolerance shall be held to maximum +/- 1" throughout full length of joist.

Vertical plane of joists shall not be out of plumb more than 1/4" per foot.

Tolerance for placing bridging and x-bracing is same as indicated for joist.

Lap all bridging 4 to 6 inches. All laps to occur at a joist or joist girder.

Bearing - Extend joists 1" minimum past centerline of supporting member where possible. On masonry walls 12" or more in thickness, minimum bearing shall be 6", unless indicated otherwise on the Drawings.

Anchorage - Joists bearing on steel shall be welded to the supports with two welds, one on each side of the joist heel. Equal to two 1/8" fillet welds 1" long, or with two 3/4" bolts, unless specifically noted otherwise on the Drawings.

Align web members of adjacent joists of the same depth to permit passage of ducts. Install all joists and girders, of same and similar types, in same direction/orientation to insure best possible alignment or webs, tails, braces, etc. Do not remove identification tags without permission of Brookshire's.

Reinforce joists, by method acceptable to Brookshire's, for all concentrated or "point" loads in excess of 100 pounds occurring between panel points.

#### REPAIR AND REPLACEMENT:

Should damage occur to joists, girders, bridging materials, etc. whether in shipping and handling or to work in place, Brookshire's shall determine whether material is to be repaired or replaced.

Any repair method to joists or girders shall be submitted as Shop Drawing with original manufacturer's certification that said is equal or superior to original design. No repair shall be performed without written approval of Brookshire's.

**CLEAN-UP:**

Per GENERAL CONDITIONS.

After erection, clean all surfaces of dirt, mud, debris, etc. regardless of whether to be exposed to view or concealed in the finished work. Remove from the site and properly dispose of unused and unacceptable materials, tools, scaffolding and debris.

- *END OF SECTION 05210* -

**SECTION 05310**  
**METAL ROOF DECK**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Roof Deck Work as shown on Drawings and as specified herein.

**SHOP DRAWINGS:**

Per SUBMITTALS.

Shop Drawings shall show complete erection layouts, details, steel deck dimensions, complete computations of deck section properties, and installation instructions. Details and layouts shall allow framing, locations, lengths, and markings of deck to correspond with sequence and procedure to be followed in installing and fastening steel deck. Show method of fastening deck and installing accessories. Show locations, types, and sequence of welded connections for deck units. Indicate welds by standard welding symbols adopted by the American Welding Society. Show size and number of holes to be cut in the roof deck.

**CODES AND STANDARDS:**

Meet all requirements and recommendations of applicable portions of latest edition of standards listed. Should conflict with referenced standards and specifications arise, the most stringent will govern.

- American Iron and Steel Institute (AISI) "Specification for the Design of Cold-Formed Steel Structural Members."
- American Welding Society (AWS) "Structural Welding Code."
- Steel Deck Institute (SDI) "Design Manual for Floor Decks and Roof Decks."

**QUALITY CONTROL:**

Roof Deck is the finish ceiling material in this Project. Deck which is not uniform in appearance, such as lack of uniformity of ribs or irregular flat surfaces ("oil-canning"), will not be acceptable.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

**COORDINATION:**

Coordinate with all other trades whose Work relates to Roof Deck for placing of all required backing, attachments, furring, etc., to insure proper locations.

**DELIVERY AND STORAGE:**

Deliver, store, handle, and install steel deck and accessories so as not to damage or deform them. Failure to wire brush and paint rusted areas immediately upon detection shall be cause for rejection. Stack deck stored at site before erection on platforms or pallets and cover with tarpaulins or other suitable covering to provide weathertight enclosure, while affording proper air circulation. Do not use deck for storage or as a working platform until sheets have been securely fastened in position and do not damage or overload during entire construction period. Any deck damage in shipping, unloading, or erection is cause for rejection. Discard any sheets not properly cushioned from banding. Replace any damaged parts at no cost to Brookshire's.

## MATERIALS:

Wheeling and Consolidated are acceptable manufacturers for Metal Decking. Other manufacturers will be considered for substitution.

Roof Deck shall be 1-1/2", 22 gauge minimum, Type B, Factory Mutual approved, factory painted gray, unless specifically noted otherwise on the Drawings.

Self-Drilling Screws shall be galvanized Tek fasteners for metal deck, as manufactured by Buildex, Division of Illinois Tool Works, Inc., or an approved equal. Minimum size, unless specifically noted otherwise on the Drawings:

- 12-24 x 7/8" Tek/4 for structural supports of 1/4" thickness or less
- 12-24 x 1-1/4" Tek/5 for structural supports with thickness greater than 1/4" to 1/2" thickness.
- 12-14 x 3/4" HWH Tek/1 for side lap fastening.

## INSTALLATION:

Install Roof Deck per manufacturer's directions. Install in a sturdy, substantial manner, straight, true and plumb.

Contractor shall verify that all prior work has been accomplished properly. Beginning of work indicates the Contractor has accepted the area or surface as ready to receive this work.

Do not undertake laying of deck units until supporting members are completely in place. Lay and align units so as to maintain required number of units shown on Shop Drawings and to prevent stretching or contracting of side-laps. Fasten deck units to structural supports. End laps shall be a minimum to two (2) inches and shall occur over supports. Lay decking such that all end and side laps occur in same direction and uniformly. Overlap shingle style for decking which runs with slope.

Deck shall be fastened to the supporting steel using #12 Tek self-drilling screws, through lowest portion of decking ribs only, minimum fastener spacing shall not exceed:

- End laps and side supports = 6" o.c.
- Intermediate Supports (Joists) = 12" o.c.
- Side laps = 18" o.c.

Use chalk/string line or otherwise establish location of supports. Fasteners not attached to supports or "miss" holes are cause for rejection of deck. Fastening sequence and procedure shall be coordinated with the placing of units, and shall be shown on the Shop Drawings for approval prior to proceeding with the work. Fully attach as decking is being installed to prevent deformation of decking by construction traffic.

Field Painting: After erection, scarred areas on both sides of the deck, bruises, and rust spots, shall be wire brushed and touch-up painted. Touch up deck with same type of paint as used for shop coat. Improperly painted deck is cause for rejection.

Cut deck by saw, punch, snips, or other appropriate means and fit deck tightly and uniformly around supports, corners, angles, penetrations, curbs, etc.

Cutting torch is not acceptable for use on metal decking. Welding of metal roof decking is not acceptable.

Deck shall be properly supported and attached at all edges, penetrations, curbs, supports, corners, angles, etc. regardless of whether or not detailed.



CLEAN-UP:

Per GENERAL CONDITIONS.

Remove all excess screws, clips, decking cuts, metal filings, dirt, debris, etc. from deck surface and ribs. Deck shall be swept broom clean prior to and during application of roofing.

Underside of deck shall be clean and free of dust, dirt, grease, or other foreign materials. Remove rust by wire brush or sanding and spot prime.

- END OF SECTION 05310 -

SECTION 05425  
**PRE-ENGINEERED LIGHT GAUGE STEEL TRUSSES**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install pre-engineered, pre-fabricated light gauge steel trusses, supplemental and permanent bracing, bridging, strapping, splices, and accessories as shown on the Drawings, described in these specifications, or otherwise required for proper completion of the work.

**CODES AND STANDARDS:**

Meet all requirements and recommendations for applicable portions of latest edition, unless noted otherwise, of standards listed. Should conflict occur between referenced standards and the specifications, the most stringent shall govern.

American Society for Testing and Materials (ASTM)

- Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated by the Hot-Dip Process: ASTM A 653/A 653M
- Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings: ASTM A780
- Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes: ASTM A 500

American Iron and Steel Institute (AISI)

- Specification for the Design of Cold-Formed Steel Structural Members
- Design Guide for Cold-Formed Steel Trusses

American Welding Society (AWS)

- Structural Welding Code

LGSEA (Light Gauge Steel Engineers Association)

- Field Installation Guide for Cold-Formed Steel Roof Trusses

American National Standards Institute (ANSI) as referenced.

**SHOP DRAWINGS:**

Per GENERAL CONDITIONS, submit shop drawings of all Work herein showing member, type, location, spacing, size and gauge of members, method of attachment to supporting members, and all required erection details. Detail supplemental and permanent strapping, bracing, splices, bridging, accessories, method of attachment to trusses and details required for proper installation.

Members and connections for any portion of the structure not shown on the contract Drawings shall be detailed by the fabricator and indicated on the shop drawings. All welds shall be indicated by standard welding symbols of the AWS.

Contractor shall be responsible for all errors of detailing, fabrication, and for the correct dimensions, elevations, etc. of all members, and for fabrication/erection tolerances to insure proper fit of the structural members.

**TESTING AND CERTIFICATION:**

Shop drawings shall be signed and sealed by a qualified licensed Professional Engineer, verifying the ability to meet local code and design requirements. Description of design criteria, engineering analysis depicting member stresses and truss deflection, all truss member sizes, gauges and connections at truss joints, truss support reactions, and supplemental and permanent bracing, bridging, strapping, splices, accessories and details required for proper installation shall be included.

Certification that each welder is qualified in accordance with AWS Code D1.1 shall be provided. Any welder shall be retested and recertified as designated by Brookshire's when the work of the

welder creates a reasonable doubt as to his proficiency. Such subsequent tests shall be conducted per TESTING LABORATORY CONTROL specification section.

Where metal framing is a part of a fire-resistance-rated assembly, provide framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction. Fire-Resistance ratings shall be indicated by GA File Numbers in GA-600, "Fire Resistance Design Manual", or by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions by taking field measurements; proper fit and attachment of all items is required.

**COORDINATION:**

Coordinate with other Trades for prompt delivery of all materials needed for erection or installation. Identify all loose materials.

**DELIVERY AND STORAGE:**

Protect cold-formed metal trusses from corrosion, deformation and other damage. Protect with a waterproof covering and ventilate to avoid condensation. Deliver cold-formed metal trusses in Manufacturer's unopened containers or bundles. Store trusses off the ground, adequately supported, either vertically or horizontally in order to avoid damage. Trusses stored vertically shall be gently sloped in order to prevent accumulation of water on the interior of the truss chord members.

In the event of damage Contractor shall make all repairs and replacements necessary to the approval of Brookshire's and at no additional cost per the following requirements.

Brookshire's shall make determination if damage/misfabrication is to be repaired or replaced. Remove any items designated as unacceptable by Brookshire's from site and replace with new material.

Contractor shall furnish shop drawings per SUBMITTALS procedure, Certified by Registered Professional Engineer, for proposed repair of Structural elements designated by Brookshire's as "Critical".

**MANUFACTURERS:**

The following are acceptable suppliers of pre-engineered light gauge steel trusses, subject to compliance with requirements. Other manufacturers will be considered for substitution.

- Steel Source, Inc., Tyler, Texas 903-581-8107
- Southern Components, Inc., Shreveport, Louisiana 800-256-2144
- Frametek, Ltd., Round Rock, Texas 512-255-9831
- Steelway International, Canutillo, Texas 915-877-2755

**MATERIALS STANDARDS:**

Shall meet the following criteria/standards unless specifically noted otherwise on the Drawings.

Pre-engineered light gauge steel truss

- ASTM A 653, minimum G60 coating

Chord Members

- ASTM A500, 22ga, 20ga, and 18ga – minimum yield strength 33,000 KSI
- ASTM A500, 16ga – minimum yield strength 50,000 KSI

#### Web Members

- ASTM A500, 20ga C-shaped web – minimum yield strength 33,000 KSI
- ASTM A500, 20ga, 18ga and 16ga 1 1/2" square tube – minimum yield strength 45,000 KSI
- ASTM A500, 18ga and 16ga 1 1/2" x 3 1/2" rectangular tube – minimum yield strength 45,000 KSI

#### Steel Shapes and Clips

- ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123.

#### Power-Actuated Anchors

- ASTM E 1190, Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing conducted by a qualified independent testing agency.

#### Mechanical Fasteners

- Corrosion-resistant coated, self-drilling, self-threading drill screws with low profile head.

#### SHOP PRIMING:

Touch-up any galvanized metal with application of brush or spray coat of SSPC-Paint 20, DOD-P-21035M A 780, or approved equal.

All metal to be primed shall be clean and free of scale, dirt and dust by sanding, wire brushes or sandblasting as appropriate for proper application of finish. Remove oil and grease with petroleum naphtha. Thoroughly work paint into all joints by brushing or spraying process.

All job fabrications shall receive one field coat of primer on all exposed surfaces.

#### FABRICATION:

Shop fabricate from cold-formed steel members in accordance with shop drawings, using templates to ensure consistent member placement and alignment of members, and to maintain specified tolerances.

Field fabrication of trusses is strictly forbidden unless performed by an authorized Truss Fabricator using the fabricator's shop assemblers and portable fabrication tables and templates.

Members to form components shall be joined together by means of self-drilling screws as per certified truss component drawing. Self-drilling screws shall be of sufficient size and number to ensure the strength of the connection. Screws shall penetrate joined members not less than three exposed screw threads.

Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welded work.

Execute all Work using skilled workers only. Use only certified welders. Do only such Work at the site as cannot reasonably be performed in the shop. Grind and file smooth all parts exposed to view; leave exposed surfaces free of fabrication marks. Make members true to length to allow assembly without fillers.

Splice members only where indicated on shop drawings. Submit structural calculations Certified by a Registered Professional Engineer where fabricator is proposing splices not called for on the Drawings.

#### DIMENSIONAL TOLERANCES:

Material tolerances of steel for cold-formed members shall be as follows:

- Nominal 22ga chord members: minimum bare metal thickness 0.0269 inch. Maximum design thickness 0.0283 inch.

- Nominal 20ga chord members: minimum bare metal thickness 0.0329 inch. Maximum design thickness 0.0346 inch.
- Nominal 18ga chord members: minimum bare metal thickness 0.0428 inch. Maximum design thickness 0.0451 inch.
- Nominal 16ga chord members: minimum bare metal thickness 0.0538 inch. Maximum design thickness 0.0566 inch.

Truss manufacturing dimensions which vary from the truss design shall not exceed fabrication tolerances as follows:

- Maximum 1/2" in length for trusses up to 30 feet long.
- Maximum 3/4" in length for trusses over 30 feet long.
- Maximum 1/4" in height for trusses up to 5 feet high.
- Maximum 1/2" in height for trusses over 5 feet high.

#### ERECTION:

Contractor shall examine the areas and conditions under which work of this Section will be performed. Correct the conditions detrimental to proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

Provide proper lifting equipment suited to sizes and types of trusses required, applied at lift points consistent with recommendations outlined in LGSEA "Field Installation Guide for Cold-Formed Steel Roof Trusses". Exercise care to avoid damage to trusses during installation and to keep horizontal bending of the trusses to a minimum.

Place components at spacing indicated on shop drawings, with indicated bracing and bridging. Install trusses with plane of truss webs vertical and parallel to each other. Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Provide temporary guy lines to achieve proper alignment of the trusses as erection proceeds.

Provide framing anchors as indicated by the truss manufacturer's drawings. Anchor trusses securely at bearing points. Locate and install mechanical fasteners with screws penetrating joined members by not less than three exposed threads.

Field weld in accordance with AWS D1.3 all fillet, flat, plug, butt or seam connections. Minimum steel thickness for welded connections shall be 18 gauge.

Install permanent bracing and bridging as indicated by the Drawings. All truss bracing and bridging shall be installed before the application of any loads. All sub-contractors shall employ proper construction procedures to ensure adequate distribution of temporary construction loads so that the carrying capacity of any single truss or group of trusses is not exceeded.

Remove temporary connections and members when permanent members are in place and final connections are made.

Provide adequate temporary planking and working platforms, per OSHA standards, as needed for effective completion of the work of this Section.

The field removal, cutting or alteration of any truss chord, web or bracing member is not allowed without prior written approval of the Truss Designer. Damaged chords, webs and complete trusses shall be repaired or replaced as directed and approved by Brookshire's prior to installation or application of the repair or replacement.

Erection tolerance for variation from level or specified plane shall be a maximum of 1/8" in 10 feet, and variation from specified position shall be a maximum of 1/4".

Establish required leveling and plumbing measurements on the mean operating temperature of the structure. Make allowances for the difference between temperature at time of erection and the mean temperature at which the structure is completed and in service.

**CLEAN-UP:**

Per GENERAL CONDITIONS. At completion of Work, remove all excess material, equipment, debris and cuttings from site and properly dispose.

All dirt, mud, debris, etc. shall be cleaned from all trusses, regardless of whether to remain exposed or concealed by other work, prior to acceptance by Brookshire's.

*- END OF SECTION 05425 -*

SECTION 05500  
**MISCELLANEOUS METAL**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Miscellaneous Metal Work as shown on the Drawings and as specified herein including all anchorage devices and required appurtenances.

**CODES AND STANDARDS:**

Meet all requirements and recommendations for applicable portions of latest edition of standards listed.

- American Society for Testing and Materials (ASTM)
- American Institute of Steel Construction (AISC)
- "Specifications for the Design, Fabrication, and Erection of Steel for Buildings."
- American Welding Society (AWS) "Structural Welding Code."
- Structural Steel Shapes: ASTM A 992
- Steel Plates, Shapes, Bars: ASTM A 36
- Cold-Formed Steel Tubing: ASTM A 500, Grade B
- Steel Pipe: ASTM A 53, Type E or S, Grade B
- Structural Cold-Rolled Steel Sheets: ASTM A 570
- Galvanized Structural Steel Sheets: ASTM A 446, Coating Designation G 90
- Concrete Inserts: Malleable Iron (ASTM A 47) or cast steel (ASTM A 27) inserts, with steel bolts, washers, and shims; hot dip galvanized.

**SHOP DRAWINGS:**

Per GENERAL CONDITIONS, submit Shop Drawings of all Work herein showing layouts, sizes, methods of construction and installation, including sizes and type of all fastening devices.

Furnish anchor bolts and fasteners as required. Furnish templates for bolt installation.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions by taking field measurements; proper fit and attachment of all items is required.

**COORDINATION:**

Coordinate with other Trades for prompt delivery of all materials needed for erection or installation. Identify all bolts or other loose materials.

**DELIVERY AND STORAGE:**

Deliver and store materials in dry protected areas. Protect from rusting and other damage. Remove any damaged items from site and replace at no cost to Brookshire's.

**FABRICATION:**

Standard commercial products, conforming to requirements of Drawings and Specifications may be used subject to approval of Brookshire's. Nuts shall be drawn tight and end threads upset.

Build anchors and other connecting members required to concrete into concrete as Work progresses to avoid unnecessary cutting and drilling.

Execute all Work using skilled workers only. Use only certified welders. Do only such Work at the site as cannot reasonably be performed in the shop. Make cuts, bends, punching and drilling accurate, neat and properly located. Grind and file smooth all parts exposed to view; leave exposed surfaces free of fabrication marks. Make members true to length to allow assembly without fillers.

Do all welding per AWS Specifications. Apply "Galvaweld" or equal to any surfaces welded after galvanizing.

Make fabrication of all structural steel shapes conform to AISC standards.

Furnish all necessary templates and patterns required by other Trades. Supervise and be responsible for proper location and installation of built-in items. Deliver any items of this Section required to be embedded in concrete, or built into partitions and other locations to respective Contractors. Provide holes and connections for Work of other Trades and make necessary connections.

When possible, fit and shop assemble, ready for erection, with shop and field connections riveted, welded or attached with screws, countersunk and finished flush where exposed.

Grind smooth all welds exposed to view, whether shop or field fabricated.

Galvanizing: ASTM a 386 for assembled products, A 153 for iron and steel hardware.

#### SHOP PRIMING:

Shop coat and touch-up any ungalvanized ferrous metal with overall application of brush or spray coat of gray primer per Federal Specification TT-P-636 equal to Pratt & Lambert 466771, Gillespie Coatings #99 LFD, or approved equal.

Clean all metal to be primed of scale, dirt and dust by sanding, wire brushes or sandblasting as appropriate for finish to be applied. Remove oil and grease with petroleum naphtha. Thoroughly work paint into all joints by brush.

All job fabrications shall receive one field coat of primer on all exposed surfaces.

#### FABRICATION:

Use materials of size and thickness shown or, if not shown, or required size, grade, and thickness to produce strength and durability in finished product.

Weld corners and seams continuously; grind exposed welds smooth and flush. Form exposed connections with hairline, flush joints; use concealed fasteners where possible.

NO use of CUTTING TORCH WILL BE ALLOWED.

#### MATERIALS:

##### *Bar-Grating -*

McNichols Co. GW series welded steel grating, or approved equal. Primed at interior and galvanized at exterior applications. Use GW-100 (1"x 3/16") unless noted otherwise on Drawings.

##### *Manufactured Bar-Grating Tread -*

McNichols Co. same as "Bar-Grating" with factory Type B - Standard Checkered Plate Nosing.

- 1"x 3/16" up to 3'-0" span
- 1 1/4" x 3/16" to 4'-0" span
- 1 1/2" x 3/16" to 5'-3" span

##### *Loose Bearing Plates -*

Provide for steel items bearing on masonry or concrete, as shown. Drill plates to receive anchor bolts, if required.

##### *Loose Steel Lintels -*

Fabricate to sizes shown.



*Miscellaneous Framing and Supports -*

Provide as required to complete work not included with structural steel framework. Fabricate or 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 24" o.c.

*Miscellaneous Steel Trim -*

Fabricate to shapes and sizes as required for profiles shown, continuous welded joints and smooth, ground exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings, and anchorage; coordinate assembly and installation with other work.

**CLEAN-UP:**

Per GENERAL CONDITIONS at completion of Work, remove all excess material, equipment, debris and cuttings from site and properly dispose.

- END OF SECTION 05500 -

## SECTION 06100 CARPENTRY

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### SCOPE:

Provide all Carpentry Work, complete and in place, as shown on the Drawings and as specified herein.

### MEASUREMENTS:

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required. Before starting Work, check all lines and levels indicated and such other Work as has been completed. Should there be any discrepancies, immediately report in writing to Brookshire's. In the event of failure to do so, Contractor is responsible for correction of any errors.

### COORDINATION:

Coordinate Work with all other trades (Elec., Mech., Plumbing, etc.) and do all cutting and patching required to accommodate their Work. Protect all adjacent Work.

### DELIVERY AND STORAGE:

As per GENERAL CONDITIONS, deliver and store lumber on sills and cover for protection. Ensure ventilation and drainage; protect against weather and damage. Keep all materials clearly identified, with all grade marks legible. Keep all damaged material clearly identified and separated. Store so as to prevent inadvertent use. Protect all installed Work and materials of all other trades.

### GENERAL REQUIREMENTS:

All lumber used structurally shall be graded and marked with grade and trade mark of a lumber grading organization, except that a certificate of grade from such a grading organization may be accepted in lieu of grade and trade marks when approved by Brookshire's. Trade mark of manufacturer shall also appear on each piece.

Each piece of plywood used structurally or non-combustible applications shall carry the American Plywood Association trade mark.

#### *Grading Rules -*

Conform with all applicable requirements of American Lumber Standards "Simplified Practice Recommendation R-16" and to grading rules of manufacturer's association under whose rules the lumber is produced.

#### *Reference Standards -*

Conform with all requirements of U.S. Dept. of Commerce Product Standards, and the American Wood Preservers Association Standards, as they apply.

### WOOD BACKINGS:

Provide all wood backing, furring, stripping or blocking indicated or required for installation and attachment of Work of all other trades. Cut and frame all openings required by other trades. Structural members shall not be cut, notched or drilled, except as may be shown or noted on Drawings.

### CONNECTIONS:

#### *Nails -*

Bright common wire nails, galvanized for exterior Work. Subdrill where necessary to avoid splitting.

*Bolts -*

Drill bolt holes 1/32 inch larger than bolt diameter. Use square plate or malleable iron washers under heads and nut where they bear against wood. Re-tighten bolts immediately prior to concealing with finish Work. Re-tighten exposed bolts immediately prior to final inspection.

*Lag Screws and Screws -*

Subdrill, use square plate or malleable iron washer under lag screw heads when they bear on wood.

**MATERIALS:**

*Wolmanized -*

Pressure treated equal to Hickson Corp. Wolman CCA Type C in accordance with AWWA Standard P5. Use for exterior wood, and wood in contact with roofing materials/systems, sheet metal, metal roofing, structural steel or masonry.

*Non-Comb -*

Dricon fire retardant treated equal to Hickson Corp. Chemicals must be registered for use as a wood preservative with the US Environmental Protection Agency, and shall maintain a flamespread rating of less than 25 in accordance with LA ASTM E-84, NFPA 255, or UL 723. Use where indicated on the Drawings and for all wood in attic spaces or other non-sprinklered spaces not totally enveloped by Fire Code Gypsum Board.

*Waferboard -*

Martco is used to establish quality. Temple Industries, Louisiana Pacific, and Georgia Pacific are acceptable as equal. Others will be considered for substitution.

- Tuff-Strand OSB Structural Panels of 48" x 96" x 7/16" thickness as certified by TECO Products and Testing Corporation and Stamped confirming compliance with PRP 133.

**INSTALLATION:**

Install work to details shown plumb; level; properly aligned; cut and fitted in a workman like manner; securely anchored; and acceptable to Brookshire's.

All penetrations shall be accomplished by drilling, coring, sawing or other method of neatly cutting to minimum size and appropriate shape for item being placed.

**TERMITE CONTROL AND DECAY PREVENTION:**

Remove all wood, including form lumber, scrap lumber, shavings and sawdust in contact with ground. Leave no wood buried in any fill or backfill.

**CLEAN-UP:**

Per GENERAL CONDITIONS.

- END OF SECTION 06100 -

**SECTION 06200**  
**FINISH CARPENTRY**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install complete Finish Carpentry Work as shown on the Drawings and as specified herein.

**SHOP DRAWINGS:**

Per GENERAL CONDITIONS, submit Shop Drawings of millwork at full size or large scale showing sizes, materials, grain run, methods of construction, connection to adjacent members and installation. Indicate all backing members for installation and all hardware.

**SAMPLES:**

Submit per SUBMITTALS, before fabrication, two (2) completely finished samples of all exposed Work specified herein. Wherever possible, samples shall be 6 inches x 6 inches in size.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

**COORDINATION:**

Coordinate Work with all other Trades as required to complete Work to satisfaction of Brookshire's.

**DELIVERY AND STORAGE:**

Deliver all materials under protective cover and store within dry enclosed area.

**GENERAL REQUIREMENTS:**

Following standards apply to Work of this Section except where more stringent requirements are specified herein:

Architectural Woodwork Institute "Quality Standards".

Western Wood Products Association Manual.

American Wood Preservers Association Specifications.

**FINISH CARPENTRY INSTALLATION:**

Use only hot-dip galvanized or aluminum finish or casing nails. Set nails for putty stopping in surfaced members. Hammer marks not acceptable on any exposed finished surface and may be cause for rejection of Work by Brookshire's.

Make all end splices exposed in finished members bevel splices and not square butted. Install members in as long lengths as possible.

Install Work to details shown, plumb, level and to line and securely anchored. Make scribes where required accurate. Miter corners of trim.

Provide and install other miscellaneous millwork items and related Work required to complete

Work of this Section.

Prepare all woodwork installed hereunder by cleaning and sanding as required to receive finishes specified in Section PAINTING AND WALL COVERING.

**MATERIALS:**

Cabinetry --

Stained Plywood - grade N-N for stained both sides and N-A for stain one side only, Natural Birch.

Painted Plywood - grade A-B or better Natural Birch or Douglas Fir.

Plastic laminate covered countertops - countertop grade particle board or grade A-B plywood.

Solid Stock - premium grade Birch.

Internal cabinet framing - No. 1 Douglas Fir.

**CABINET HARDWARE:**

Drawer Guides --

K & V #1300 for standard drawers.

Cabinet & Drawer Locks --

K & V #986 (10B) Dark Bronze Finish.

Adjustable Shelves --

K & V #255/256 for shelving within cabinets.

Magnetic Catch --

K & V #915 at each Door.

Recessed Pulls --

Lifetime Cabinet Hardware 370-BK "Black" recessed pulls at all doors and drawers.

Hinges --

Stanley #331 and #332 Pivot Hinges (10B).

**CLEAN-UP:**

Per GENERAL CONDITIONS.

*- END OF SECTION 06200 -*

## SECTION 06415 COUNTERTOPS

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### SCOPE:

Provide all Countertops, complete in place, as shown on the Drawings and as specified herein.

### GUARANTEE:

Per GENERAL CONDITIONS.

### CODED AND STANDARDS:

- ANSI A161.2 – Performance Standards for Fabricated High Pressure Decorative Laminate Countertops; 1998.
- ANSI Z124.3 – American National Standard for Plastic Lavatories; 1995.
- ASTM A 666 – Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2003.
- ASTM D 635 – Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2003.
- ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials; 2004.
- AWI/AWMAC (QSI) – Quality Standard Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2003.
- ISSFA-2 – Classification and Standards for Solid Surfacing Material; International Solid Surface Fabricators Association; 2001 (2002).
- NEMA LD 3 – High-Pressure Decorative Laminates; 2000.
- ASTM E 662 – Test Method for Specific Density of Smoke Generated by Solid Materials; 1997.

### GENERAL REQUIREMENTS:

Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

### SUBMITTALS:

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Shop Drawings shall indicate dimensions, component sizes, installation details, attachment provisions and coordination requirements with adjacent work.

Submit a 6" square for each finish product specified representing actual product, color and patterns. Samples shall be used to verify standard of work.

Complete materials list of items proposed for the Work of this Section.

Manufacturer's specifications and other data as necessary to demonstrate compliance with the specified requirements.

Manufacturer's recommended installation procedures.

Submit manufacturer's care and maintenance recommendations, including recommended repair and cleaning instructions for each product.

Provide manufacturer's warranty.

**MATERIALS HANDLING:**

No components shall be delivered to project site until ready for installation. Store products indoors in manufacturer's unopened packaging until ready for installation.

Use all means necessary to protect materials before, during, and after installation and to protect installed Work and materials of all other trades.

Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

In the event of damage, immediately make all repairs and replacements necessary to approval of and at no additional cost to Brookshires.

**MATERIALS:**

*Plastic Laminate Countertops –*

High pressure decorative laminate sheet, with 0.039 inch nominal thickness and NEMA LD 3 Grade HGP, bonded to substrate with manufacturer's recommended adhesive.

Surface burning characteristics shall be: Flame Spread 25, maximum; Smoke Developed 450, maximum; when tested in accordance with ASTM E 84.

Product shall comply with NEMA LD 3 High Wear Grade requirements for wear resistance.

Winsonart International, Inc. is used to establish quality. Formica Corporation, Nevamar Company, and Panolam Industries are acceptable as equal manufacturer's. Substitutions shall be as per SUBMITTALS.

Exposed edge treatment and splashes shall be covered with matching laminate per the Drawings.

*Solid Surfacing Countertops –*

DuPont™ Corian® is used to establish quality. No others will be considered for substitution.

Countertop shall be 1/2" thick homogenous sheet material composed of acrylic resins, fire-retardant filler materials and color agents.

Skirt, back and end splashes shall be 1/2" thick material like countertop made separate for field installation. Color to be the same as countertop. Install using attachment per manufacturer's instructions.

Components shall be fabricated to greatest extent practical to size and shape as indicated on the Drawings.

Form joints between components using manufacture's standard joint adhesive. Joints shall be inconspicuous in appearance and without voids. Attach 4" wide reinforcing strip under joints per manufacturer's fabrication requirements.

Provide holes and cutouts as indicated on the Drawings. Rout and finish component edges to a smooth, uniform finish. Repair any defective or inaccurate work.

Surfaces shall have a uniform finish.

*Stainless Steel Countertops –*

ASTM A 666 Type 304 stainless steel sheet, 16 gauge, 0.06 inch nominal thickness with 4B satin brushed finish.

Exposed edge shape shall be bullnose with 5/8" radius, returned to the face of the cabinet and reinforced with hardwood or steel where indicated on the Drawings.

Splash dimensions shall be 4" high by 1" thick, unless noted otherwise.

**FABRICATION:**

Fabricate in accordance with standards governing fabrication quality.

Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush. Join lengths of tops using best method recommended by manufacturer.

Fabricate stainless steel tops up to 144 inches long in one piece including nosings and back and end splashes, accurately fitted mechanical field joints in lengths over that dimension are permitted. Weld joints, grind smooth and polish to match. Apply water resistant, fire resistant sound deadening mastic to entire bottom surface.

Fabricate to overhang fronts and ends as indicated on the Drawings.

Prepare all cutouts accurately to size. Replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

Provide back and/or end splash wherever counter edge abuts vertical surface unless noted otherwise.

Provide skirts, aprons, brackets, and braces as indicated on the Drawings on all wall mounted counters with finishes to match.

**INSTALLATION:**

Do not begin installation until substrates have been properly prepared. If substrate is the responsibility of another installer, notify Brookshire's of unsatisfactory preparation before proceeding. Starting Work under this section implies acceptance of surfaces.

Clean surfaces thoroughly prior to installation. Prepare surfaces using methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

Attach plastic laminate countertops using compatible adhesive.

Attach solid surfacing countertop using manufacturer's recommended attachment.

Attach stainless steel countertops using stainless steel fasteners and clips.

Seal joints between back/end splashes and vertical surfaces with approved sealant.



**CLEANING AND PROTECTION:**

Clean countertop surfaces thoroughly.

Protect installed products until completion of project.

Touch-up, repair or replace damaged products before Substantial Completion.

Fabricator/Installer to review maintenance procedures and warranty for each countertop material with Brookshire's upon completion of the project.

*- END OF SECTION 06415 -*

## SECTION 07100 WATERPROOFING

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### SCOPE:

Supply and install all Membrane Waterproofing Work as shown on Drawings and as specified herein.

### SHOP DRAWINGS:

Per SUBMITTALS, furnish approximate 6" x 6" sample of membrane material and manufacturer published specification data sheets, installation instructions, and certification of compatibility for all membrane, adhesives, primers, and protection board products from sheet membrane manufacturer.

### GUARANTEE:

Per GENERAL CONDITIONS and 5 year written warranty on sheet membrane materials by manufacturer.

### QUALIFICATION:

Manufacturer shall furnish proof of 10 years minimum experience in the production of self-adhesive sheet membrane waterproofing, and include a list of projects of similar design and complexity completed within the past five years.

Installer shall have had at least 5 years experience in work of the type required by this section and be acceptable to Brookshire's.

### COORDINATION:

Coordinate with all other trades whose Work relates to Membrane Waterproofing for placing of all required backing, attachments, furring, etc., to insure proper locations.

Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer's printed installation instructions.

Proceed with installation only when substrate construction and preparation work is complete and in condition to receive sheet membrane waterproofing.

### DELIVERY AND STORAGE:

Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer's instructions, recommendations, and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.

Do not double stack pallets of membrane on the job site. Provide cover on top and all sides, allowing for adequate ventilation.

Protect primer, mastic and adhesive from moisture and potential sources of ignition.

Store protection board flat and off the ground. Provide cover on top and all sides. Whenever possible, sequence deliveries to avoid delays, but minimize on-site storage.

Replace any damage at no cost to Brookshire's.

**MATERIALS:**

*Concrete and Masonry Application --*

Grace Construction Products is used to establish quality. Other manufacturers will be considered for substitution.

*Sheet Membrane --*

Bituthene 3000, self-adhesive, cold-applied composite sheet, thickness 56 mil rubberized asphalt, 4 mil cross-laminated polyethylene film, rubberized asphalt membrane covered with release paper to be removed during installation. No special adhesive or heat shall be required to form laps.

*Protection Board --*

1" thickness, R-4, expanded polystyrene adhered to membrane with protection board adhesive.

*Primer and Adhesives --*

Per manufacturer's printed installation requirements.

*Building Application --*

Tamlyn is used to establish quality. Other manufacturers will be considered for substitution.

*Tape Membrane --*

XtremeFlashing™ self-adhesive, self-sealing waterproofing tape coated with an aggressive Broad Temperature Spectrum (BTS™) asphalt adhesive covered with a release liner to be removed during installation. Width of tape shall meet minimum flashing requirements shown on the Drawings.

**INSTALLATION:**

Install Membrane Waterproofing per manufacturer's directions. Install in a sturdy, substantial manner, straight, true and plumb.

Surfaces to receive membrane shall be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil, and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods which are acceptable to Brookshire's.

*Cast-in-place Concrete Substrates --*

Do not proceed with installation until concrete has properly cured and dried, minimum 7 days for normal structural concrete and minimum 14 days for lightweight structural concrete. Fill form tie rod holes with concrete and finish flush with surrounding surface. Repair voids over 1/2" in length and 1/4" deep and finish flush with surrounding surface. Remove scaling to sound, unaffected concrete and repair exposed area. Grind irregular construction joints to suitable flush surface.

*Masonry Substrates --*

Apply waterproofing over concrete block and brick with smooth trowel-cut mortar joints or purge coat. Apply surface conditioner or primer at rate recommended by manufacturer. Recoat areas not waterproofed if contaminated by dust. Mask and protect adjoining exposed finish surfaces. Delay application of membrane until surface conditioner and primer are completely dry. Dry time will vary with weather conditions. Seal daily terminations with troweled bead of mastic.

Building Substrates --

Apply self-adhesive, self-sealing, waterproof flexible flashing membrane tape to surface per manufacturer's instructions. Install in a shingle fashion at the lowest portion of the location and move vertically. Seam overlap will be 6" on all vertical and horizontal installation and 12" at corners.

CLEAN-UP:

Per GENERAL CONDITIONS.

- END OF SECTION 07100 -

SECTION 07210  
**BUILDING INSULATION**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Building Insulation Work as shown on Drawings and as specified herein. Roof Insulation and loose fill Masonry Insulation are specified elsewhere.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**SUPPLIER:**

Materials designated for each specific application shall be the products of one manufacturer.

**COORDINATION:**

Check Work of other Trades which abuts, adjoins or is affected by Work under this Section. Consult Drawings and other Sections and expedite and coordinate Work to avoid omissions and delays.

**INSPECTION:**

Examine all subsurfaces to receive Work of this Section. Report in writing to Contractor, with a copy to Brookshire's, any conditions detrimental to Work of this Section.

**DELIVERY AND STORAGE:**

Deliver materials to job in manufacturer's original unopened packaging. Adequately protect against damage while stored at the site. Deliver so that stocks of materials on the site will permit uninterrupted progress of the Work.

**PROTECTION:**

Take precautions to protect all insulation, both during and after installation, from damage of any kind until covered.

**MATERIALS:**

Owens Corning, CertainTeed and Celotex are acceptable as equal manufacturers for batts. Dow only, no substitutes, for styrofoam.

***Batts -***

Foil faced or unfaced insulation batts or blankets (Kraft or Paper Faced not acceptable).

- Walls: R-11 for 3-5/8" and 4" studs.  
R-19 for 6" and larger studs.  
R-4 per in. thickness for less than 3-5/8" studs.
- Ceilings: R-19 where specifically noted on Drawings.

***Styrofoam -***

*High Load 100* (formerly HI-115 or HD-1623) for horizontal below grade applications, such as under slabs.

*Perimate* for below grade vertical applications, such as foundation and retaining walls.

*Square Edge, Cavitymate, or Tongue & Groove* as appropriate at above grade walls.

***Thermax Sheathing -***

As manufactured by Dow Building Products; others will be consider for substitution.

Polyisocyanurate foam core rigid board with glass fiber reinforcement, Aluminum foil faced, both sides; R=7.2 per inch of thickness; use 3/4" thickness, unless noted otherwise on the Drawings.

**INSTALLATION:**

Installation of batts/blankets shall be in accordance with Fiberglass Building Insulation - Specification and Application Data 5-BI-9089. Materials shall be of size and shape to fit tight in wall/ceiling cavities and cut neatly around all fixtures, penetrations, etc. so as to provide a complete thermal envelope.

Store, handle and install styrofoam products per manufacturer's printed instructions. Material shall be kept clean, dry, and to avoid prolonged exposure to sunlight. Fit tight to penetrations, adjacent insulation, fixtures, building elements, etc. Repair broken, gouged, or otherwise damaged portions by cutting out defect and fitting replacement area of not less than 12" in any dimension, or replace entire sheet.

**CLEAN-UP:**

Per GENERAL CONDITIONS.

*- END OF SECTION 07210 -*

## SECTION 07220

### ROOF INSULATION

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES:

- A. Installation of new rigid insulation over new metal deck on building addition.

##### 1.02 RELATED SECTIONS:

- A. Section 07520 - Modified Bituminous Membrane Roofing.
- B. Section 07565 - Minor Roof Renovation Work.
- C. Section 07625 - Sheet Metal Work.

##### 1.03 REFERENCES:

- A. ASTM C177 - Test for Thermal Conductivity of Materials.
- B. ASTM C1278 - Standard Specification for Fiber-Reinforced Gypsum Panel.
- C. ASTM C1289 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- D. ASTM D312 - Asphalt for Use in Constructing Built-up Roof Coverings.
- E. ASTM E84 - Surface Burning Characteristics of Building Materials.
- F. FM 4450 - Class I Insulated Steel Roof Decks; 1989.
- G. FM DS 1-28 - Design Wind Loads, Factory Mutual Research Corporation, 2005.
- H. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components, Factory Mutual Research Corporation, 2005.
- I. PIMA 101 - Technical Bulletin No.101, Roof Insulation Specimen Conditioning Procedure; Polyisocyanurate Insulation Manufacturers Association; updated for LTTR - Long Term Thermal Resistance.

##### 1.04 SUBMITTALS:

- A. Procedures for Submittals: Section 01330.
- B. Shop Drawings:
  - 1. Indicate complete installation details of tapered insulation, including identification of each insulation block, sequence of installation, layout, roof slopes, thicknesses, crickets and saddles.
  - 2. Indicate fastener placement patterns for insulation boards at corners, along perimeter and within field of roof.
- C. Product Data: Manufacturer's product data sheets for each product.
- D. Quality Control Submittals (For Information Only):
  - 1. Certifications:
    - a. Submit roof manufacturer's certification that insulation furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.
    - b. Submit roof manufacturer's certification indicating that insulation fasteners furnished are acceptable to roof manufacturer.

##### 1.05 QUALITY ASSURANCE:

- A. Regulatory Requirements: Listed by Underwriter's Laboratories, Inc. for use under Class A or B roof covering.

## **1.06 DELIVERY, STORAGE AND HANDLING:**

- A. Deliver materials in manufacturer's original, unopened packages with labels intact and legible.
- B. Store products off ground and under cover.
- C. Provide continuous protection of materials against wetting and absorption; remove wet materials from project site.

## **PART 2 - PRODUCTS**

### **2.01 RIGID FOAM ROOF INSULATION:**

- A. Qualities: Rigid closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers. Glass-reinforced recycled paper facers are not acceptable.
  - 1. Thickness: As indicated on Drawings.
  - 2. Size: 48 in. x 48 in. maximum.
  - 3. R-value: As indicated on Drawings, LTTR Method.
  - 4. UL Rating: Class A.
  - 5. Complies with Factory Mutual 4450 or U. L. 1256 for use directly over metal roof deck (without separate thermal barrier).
- B. Standards:
  - 1. Overall Product: ASTM C1289, Class 1, Type II.
  - 2. Fire Hazard: ASTM E84.
  - 3. Thermal Conductance: ASTM C177.
- C. Source: SOPRA-ISO by Soprema or other manufacturer's product as approved by roofing manufacturer in writing.

### **2.02 TAPERED RIGID FOAM ROOF INSULATION:**

- A. Qualities: Factory tapered rigid closed cell polyisocyanurate foam core bonded to heavy duty 100% glass fiber mat facers. Glass-reinforced recycled paper facers are not acceptable.
  - 1. Thickness: As scheduled, tapered at 1/2 inch per foot as scheduled.
  - 2. Size: 48 in. x 48 in. maximum.
  - 3. R Value: As indicated, LTTR Method.
  - 4. UL Rating: Class A.
- B. Standards:
  - 1. Overall Product: ASTM C1289, Class 1, Type II.
  - 2. Fire Hazard: ASTM E84.
  - 3. Thermal Conductance: ASTM C177.
- C. Source: SOPRA-ISO by Soprema or other manufacturer's product as approved by roofing manufacturer in writing.

### **2.03 GYPSUM ROOF BOARD OVERLAYMENT:**

- A. Qualities: Fiber-reinforced gypsum panel designed for use as a roof board, free of facings.
  - 1. Thickness: 1/2 inch.
  - 2. Size: Nominal 4 x 8 ft.
  - 3. Fire Resistance: Noncombustible, ASTM E136.
- B. Standard: ASTM C1278.
- C. Source: DensDeck Prime by Georgia Pacific.

### **2.04 RELATED MATERIALS:**

- A. Polyurethane Foam Adhesive: Insta-Stik by Dow Chemical or other adhesive approved by roofing manufacturer.

## **PART 3 - EXECUTION**



### **3.01 EXAMINATION AND PREPARATION:**

- A. Verify that other work which penetrates roof deck has been completed.
- B. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture and unevenness.
- C. Do not proceed until defects are corrected.
- D. Do not apply insulation until roof deck is sufficiently dry.
- E. Perform final cleaning of surfaces to receive insulation prior to application of insulation.

### **3.02 APPLICATION – AT NEW METAL DECK:**

- A. Mechanically attach the base layer of rigid foam insulation to metal deck with fastener patterns as required for the field, perimeter and corners as defined by FM 1-60 standards.
- B. Adhere subsequent layers of rigid foam insulation and tapered rigid foam insulation with joints in each subsequent layer staggered from the layer below using adhesive patterns as required for the field, perimeter and corners as defined by FM 1-60 standards.
- C. Neatly cut and fit insulation around penetrations and at roof perimeters.
- D. Gypsum Roof Board:
  - 1. Completely cover final layer of rigid or tapered foam insulations with gypsum roof board. Install board with foam adhesive in accordance with FM 1-60 requirements at the field, perimeter and corners.
  - 2. Stagger joints from insulation joints, stagger end joints 2 ft.
  - 3. Tightly butt joints between adjoining boards with no gaps greater than 1/4 inch. Field cut and fit board at edges.
- E. Install temporary water cut-offs at completion of each day's work and remove upon resumption of work.
- F. Install no more roof insulation and coverboard at one time than can be roofed on the same day.

### **3.03 CLEANING:**

- A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

**END OF SECTION 07220**

SECTION 07240  
**EXTERIOR INSULATION AND FINISH SYSTEM**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all materials and components as shown on Drawings, specified herein, and as otherwise necessary, to produce a complete field applied Synthetic Plaster Exterior Insulation and Finish Fascia and Soffit System. Use of the word "DRYVIT" and "EIFS" on the Drawings and within this Specification are generic in nature and apply to the aforementioned complete Synthetic Plaster System.

**MANUFACTURERS:**

Dryvit Systems, Inc. and Teifs are the only acceptable Manufacturers. No others will be considered for substitution.

**SHOP DRAWINGS:**

Per SUBMITTALS, submit color chart, certification of compatibility of insulation board, and technical information to describe materials and installation procedures used in this work.

After color/texture selection, submit 12"x 12" confirmatory panel for approval by Brookshire's of each color to be used.

**GUARANTEE:**

All metal stud, resilient channel, and like framing and attachments for storefront Fascia and Soffit shall be by the approved Manufacturer's system installer or direct subcontractor to achieve warranty of complete system by the approved Manufacturer's System Contractor.

In addition to GENERAL CONDITIONS requirements, deliver to Brookshire's, prior to final payment for the Work, a written guarantee, signed by the installing Contractor including manufacturer's material warranty, agreeing to replace any defective materials or workmanship, including surface finishes and discoloration in The approved Manufacturer's system for 3 years from Substantial Completion at no additional cost to Brookshire's.

Observation of this Work by Materials Manufacturers' Representative(s) is permissible unless Brookshire's has notified Contractor otherwise. Such representatives have no authority to make written or verbal interpretations or modifications of this specification or manufacturers' printed information which has been accepted for the Work per SUBMITTALS, or to accept or reject any portion of the Work.

**INSTALLER'S QUALIFICATION:**

Installer shall submit a current certificate of training by The approved Manufacturer for application of products; have a minimum of five years continuous operation experience; capacity to furnish the quality, sizes and quantity of EIFS required without delaying the progress of the Work.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

**COORDINATION:**

In all Work under this Section, coordinate with all other trades whose work connects with, is affected or concealed by EIFS. Before proceeding, make certain all required inspections have been made. EIFS installer shall do all cutting and patching required to accommodate Work of other trades.

**INSPECTION:**

Inspect surfaces to receive EIFS before starting Work and do not start until surfaces are acceptable. Starting Work under this Section implies acceptance of surfaces.

**DELIVERY AND STORAGE:**

Deliver all manufactured materials in original packages bearing manufacturer's name and brand. Store materials in dry area, protected from sunlight and excessive heat, and in temperature greater than 40 degrees F. Neatly stack insulation and sheathing flat to prevent deformation and handle to prevent damage to edges, ends or surfaces.

**REFERENCE STANDARDS:**

System shall be Factory Mutual Class I and have Underwriter Laboratory flamespread of 25 or less.

**PROTECTION:**

This Contractor shall be responsible for protection of any work which may be damaged or blemished by any operation related to EIFS Work. The cost to repair or replace will be withheld from payment to this contractor.

**MATERIALS:**

EIFS fascia and soffit systems shall be manufactured by Dryvit System, Inc., or Teifs no substitutes.

Finish and color shall be as noted on the Drawings.

**INSTALLATION:**

Install EIFS per manufacturer's latest published information, including but not limited to "Outsulation System Specifications" and per the requirements of this specification Section. In the event of conflict between manufacturer's information and this Specification, the most stringent shall apply.

Foam Insulation Board shall be adhered to WR gypsum board sheathing with Primus/Adhesive Mixture and to plywood sheathing with ADEPS adhesive.

Base Coat shall be applied to all surfaces to receive EIFS Finish with a continuous layer of Standard Reinforcing Mesh embedded in Primus/Adhesive Mixture. Install an additional layer of Panzer Mesh to all areas within 6'-0" of finish floor elevation.

Finish Coat shall be applied continuously and in one operation to the entire wall surface. A wet edge shall be maintained. Finish shall not be allowed to set up in a distinct area. Sufficient manpower, scaffolding and equipment shall be employed to ensure a continuous operation and a uniform appearance. Any visual appearance of joining of sections of work or inconsistency of color or texture of finish shall be cause for rejection.

All adhesives, mastics, base coat, and finish materials shall be trowel applied. Spraying is not acceptable for any portion of EIFS.

Any EIFS surface that has been modified for any reason or has graphics, letters, signage, etc. removed, shall receive a new skim coat to cover any existing holes, damages or blemishes. Limits of new skim coat to cover entire face of affected panel or surface unless directed otherwise by Brookshire's. Finish coat texture shall match existing or be installed as noted on the Drawings.

**DIMENSIONAL TOLERANCES:**

Finished system shall be within 1/8", plus or minus, in 8' to a maximum variation of 1/4" plus or minus from the established working plane.

**WEATHER:**

Conduct no EIFS operations when water in any form is present, or when greater than 30 percent chance of precipitation is predicted by the National Weather Service within 24 hours, or when temperature is below 40 degrees F or predicted by the National Weather Service to be below 40 degrees F within 24 hours.

**REPLACEMENT:**

Any rejected area shall be completely removed for the entire panel area and replaced as acceptable to Brookshire's at no additional cost.

**CLEAN-UP:**

Per GENERAL CONDITIONS. Remove all excess materials from work in place, molds, reglets, etc. and clean. Leave scaffolding in place for sufficient time to allow for inspections to be performed by Brookshire's.

*- END OF SECTION 07240 -*

**SECTION 07270**  
**AIR BARRIER MEMBRANE**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all fluid applied waterproof Air Barrier Membrane Work as shown on Drawings and as specified herein.

**CODES AND STANDARDS:**

Meet all requirements and recommendations for applicable portions of latest edition of standards listed.

- ICC Acceptance Criteria for Water-Resistive Coatings used as Water-Resistive Barriers over Exterior Sheathing (ICC)
- 2009 IBC, International Building Code
- 2009 IECC, International Energy Conservation Code
- American Society for Testing and Materials (ASTM)
- American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
- National Fire Protection Association (NFPA)

**SHOP DRAWINGS:**

Per SUBMITTALS, furnish manufacturer published specification data sheets, installation instructions, warranty information and certification of compliance with the IBC and IECC as an air barrier and water-resistive barrier. Furnish shop drawings showing application at substrate joints, cracks, flashing transitions, penetrations, corners, terminations, and tie-ins with adjoining construction, interfaces with separate materials that form part of the air barrier assembly.

**GUARANTEE:**

Per GENERAL CONDITIONS and 15 year written warranty on fluid applied waterproof air barrier membrane materials by manufacturer.

**QUALIFICATION:**

Manufacturer shall furnish proof of 10 years minimum experience in the production of fluid applied waterproof air barrier membrane, and include a list of projects of similar design and complexity completed within the past five years.

Installer shall have had at least 5 years experience in work of the type required by this section and be acceptable to Brookshire's.

**COORDINATION:**

Coordinate with all other trades whose Work relates to fluid applied waterproof Air Barrier Membrane for foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuous air barrier.

Install cladding within 180 days of fluid waterproof air barrier installation.

Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer's printed installation instructions.

Proceed with installation only when substrate construction and preparation work is complete and in condition to receive fluid applied waterproof air barrier membrane.

#### DELIVERY AND STORAGE:

Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product. Store and handle in strict compliance with manufacturer's instructions, recommendations, and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.

Protect product from moisture and potential sources of ignition.

Whenever possible, sequence deliveries to avoid delays, but minimize on-site storage. Do not retain on job site any material which has exceeded shelf life recommended by manufacturer.

Materials designated for a specific application shall be the products of a single manufacturer.

Replace any damage at no cost to Brookshire's.

#### MATERIALS:

Sto Corp. is used to establish quality. Other manufacturers will be considered for substitution.

Air Barrier Membrane --

StoGuard with Sto Gold Coat: ready-mixed flexible spray or roller applied waterproof air barrier membrane material.

Joint Treatment --

Sto Gold Coat with StoGuard Fabric: flexible waterproof air barrier membrane material.

Joint Reinforcement --

StoGuard Fabric: non-woven integrally reinforced cloth reinforcement.

Transition Membrane --

Sto VaporSeal with StoGuard Fabric: flexible waterproof air barrier membrane material with non-woven integrally reinforced cloth.

Patching and Leveling Material for Concrete and Concrete Masonry --

- Sto Leveler: polymer modified cementitious patch and leveling material for prepared concrete and masonry surfaces up to 3/8 inch.
- Sto BTS Xtra: polymer modified lightweight cementitious patch and leveling material for prepared and cement and masonry surfaces up to 1/8 inch.

Auxiliary Materials --

- Wet Sealant: Dow Corning 790, 791 and 795 sealants.
- Pre-Cured Sealant Tape: Dow 123.
- Spray Adhesive: 3M Super 77 Spray Adhesive.
- Spray Foam: Dow Great Stuff for Gaps and Cracks.

#### INSPECTION:

Examine all subsurfaces to receive Work and report in writing to General Contractor, with a copy to Brookshire's, any conditions detrimental. Failure to observe this injunction constitutes a waiver to any subsequent claims. Commencement of Work will be construed as acceptance of all subsurfaces.

#### SURFACE PREPARATION:

Provide protection of surrounding areas and adjacent surfaces from application of materials.

#### Sheathing --

Remove and replace any damaged sheathing. Spot all fasteners with knife grade joint treatment material. Repair surface defects such as over-driven fasteners, knot holes or other voids in the sheathing with knife grade joint treatment material.

#### Concrete and Concrete Masonry --

Remove surface contamination and weak surface conditions. Use chemical cleaners such as TSP (trisodium phosphate) detergent to remove oil and grease, and rinse with potable water. Use chemical cleaners to remove efflorescence or other surface contamination in accordance with manufacturer's instructions. Use mechanical methods such as waterblasting, sandblasting, and wire brushing to remove weak surface conditions.

Repair cracks up to 1/8 inch wide by raking with a sharp tool to remove loose, friable material and blow clean with oil-free compressed air. Apply joint treatment material over crack, embed reinforcement (where applicable), and smooth joint treatment material with a trowel, drywall or putty knife to cover the reinforcement.

Remove projecting fins, ridges and mortar by mechanical means. Remove excess mortar from masonry ties, lintels and shelf angles.

Fill honeycombs, aggregate pockets, holes and other voids with patching material.

#### INSTALLATION:

Coordinate the Work with other trades to ensure air barrier continuity with connections at foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line.

Install joint treatment material with applicable reinforcement over sheathing joints and transition membrane into and around openings per manufacturer's instructions.

Install air barrier accessory materials, with reinforcement where applicable, or auxiliary material at transition areas such as foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line.

#### Glass Mat Faced Gypsum, Plywood and OSB Sheathing --

Install 1 coat of Sto Gold Coat by spray or roller in a uniform, continuous film of 10 wet mils to the prepared substrate to achieve a void and pinhole free surface. Do not install over working or moving joint sealants.

#### Concrete --

Install 1 coat of Sto Gold Coat by spray or roller in a uniform, continuous film of 10 wet mils to the prepared concrete substrate to achieve a void and pinhole free surface. Do not install over working or moving joint sealants.

#### Concrete Masonry --

Install 1 liberal coat of Sto Gold Coat by spray or roller in a uniform, continuous film to the prepared concrete masonry substrate. Backroll spray applications. Allow to dry. Install a second liberal coat in a uniform, continuous film, and backroll spray applications, to achieve a void and pinhole free surface. Depending on the condition of the surface, a minimum of 10 wet mils up to a maximum of 30 wet mils per coat is required. Apply additional coats if needed to

achieve a void and pinhole free surface. Do not install over working or moving joint sealants.

The number of coats and thickness is highly dependent on CMU composition, unit weight, porosity, joint profile and other variables that may exist. For "rough" CMU wall surfaces, skim coat the entire wall surface with the leveling material to fill and level the surface prior to applying the fluid waterproof air barrier membrane and transition materials per manufacturer's instructions.

Repair non-conforming air barrier material installations to conform with manufacturer's instructions at no cost to Brookshire's.

CLEAN-UP:  
Per GENERAL CONDITIONS.

Protect air barrier materials from damage during construction caused by wind, rain, freezing, continuous high humidity or prolonged exposure to sunlight. Protect air barrier materials from damage from trades, vandals and water infiltration during construction.

Repair damaged materials to meet project specification requirements.

Clean spills, stains, soiling from finishes or other construction materials that will be exposed in the completed work with compatible cleaners.

Remove all masking material after the Work is completed.

- *END OF SECTION 07270* -



SECTION 07410  
**PREFINISHED ROOFING SYSTEMS AND WALL PANELS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Prefinished Roof and Wall Panel Work as shown on Drawings and as specified herein.

**GUARANTEE:** Per GENERAL CONDITIONS.

**SUBMITTALS:** Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

**COORDINATION:**

Check Work of other Trades which abutts, adjoins or is affected by Work under this Section. Consult Drawings and other Sections and expedite and coordinate Work to avoid omissions and delays.

**INSPECTION:**

Examine all subsurfaces to receive Work of this Section. Report in writing to Contractor, with a copy to Brookshire's, any conditions detrimental to Work of this Section.

**DELIVERY AND PROTECTION:**

Deliver finish surface materials to job in a timely manner such that prolonged storage of materials on site will not occur. Take precautions to protect all materials, both during and after installation, from damage of any kind.

**MATERIALS:**

Pac-Clad and MBCI is used to establish quality for metal components. Others will be considered for substitution unless noted otherwise.

*Metal Soffit Panels -*

Pac-Clad .032" prefinished aluminum PAC-850, Kynar 500 color as indicated on the Drawings. 12" wide panel with 7/8" depth, "VEE" groove, concealed fastener, panel interlock system.

*Metal Roofing/Closure Panels -*

MBCI 26 minimum gauge (unless noted otherwise on the Drawings) profile "M" or "R", color as selected by Brookshire's from manufacturer's standard finishes for roofing and when exposed to view. Dexstar 100 polar white or Galvalume at Contractor's option at back side of fascia.

*Standing Seam Panels -*

Pac-Clad 24 gauge Snap-On Standing Seam, Kynar 500 color as indicated on the Drawings. 12" wide with 1" seam height, concealed stainless steel clips with full length joint engagement.

**INSTALLATION:**

All prefinished panels shall be installed plumb, straight and true to adjacent work. Battens/Seams shall be equidistant from corners, hips, mullions, etc. as shown on the drawings. Spacing, if any, to be checked after each panel is engaged with a spacing tool supplied by the roof system manufacturer. All exposed trims shall be same color and texture as panels.

Install panels in full lengths - no butt joints allowed. Any scratched, marred, discolored, or otherwise blemished panels shall be removed and replaced as directed by Brookshire's. No patching or repair will be allowed.

CLEAN-UP: Per GENERAL CONDITIONS.

- END OF SECTION 07410 -

## SECTION 07520

### ROOF MODIFIED BITUMUNIOUS MEMBRANE ROOFING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES:

- A. Removal of existing roof membrane as required to tie in new roof membrane.
- B. New modified bitumen sheet roofing.

##### 1.02 RELATED SECTIONS:

- A. Section 01351 - Alteration Project Procedures
- B. Section 07220 - Roof Insulation
- C. Section 07565 - Minor Roof Renovation Work
- D. Section 07625 - Sheet Metal Work
- E. Section 07720 - Roof Accessories.

##### 1.03 REFERENCES:

- A. ASTM D41 - Asphalt Primer.
- B. ASTM D312 - Asphalt for Use in Constructing Built-up Roof Coverings.
- C. ASTM D4586 - Fibrated Asphalt Roof Cement.

##### 1.04 SUBMITTALS:

- A. Procedures for Submittals: Section 01330.
- B. Shop Drawings:
  - 1. Indicate complete installation details of roofing and flashing, including flashing details, penetration details and accessories.
  - 2. Include complete flashing detail for each flashing condition.
- C. Product Data: Manufacturer's roofing and base flashing specifications, including list of materials proposed for use, and manufacturer's data sheets for other products.
- D. Progress Schedule/Phasing Plan:
  - 1. Submit a complete progress schedule and phasing plan indicating complete sequence of roofing work.
  - 2. Include roof plan with layout of phasing, indicating amount of roof area included in each day's work.
  - 3. Indicate dates for beginning and completing each activity.
  - 4. Identify other related work affecting roof replacement and phasing.
- E. Samples: Submit 8 x 11 in. sample of roof membrane cap sheet.
- F. Warranty: Submit specimen copy of manufacturer's roofing warranty with Product Data submittal, including evidence of application for warranty.
- G. Manufacturer's Reports: Submit manufacturer's field quality reports of field inspections, including 2 copies of manufacturer's final inspection punch list.
- H. Maintenance Data: Compile and submit maintenance instructions in accordance with Section 01700. Include complete manufacturer's instructions for periodic inspection and maintenance of roofing system, including precautions and warnings to prevent damage and deterioration to roofing system.

### **1.05 QUALITY ASSURANCE:**

- A. Applicator:
  - 1. Approved in writing by manufacturer of accepted roofing system.
  - 2. A single applicator with a minimum of 3 years previous successful experience in installations of similar systems.
- B. Regulatory Requirements: Underwriter's Laboratories, Inc.: Class A fire hazard classification.
- C. Pre-Installation Conference:
  - 1. Prior to installation of roofing system, conduct a pre-installation conference at each project site.
  - 2. Attendance: Owner, Architect, General Contractor, project superintendent, Roofing Contractor, and roof manufacturer's technical representative.
  - 3. Agenda:
    - a. Methods of removing existing roofing and debris and controls required to prevent damage to building.
    - b. Maintaining water tightness of building during reroofing, including night seal procedures.
    - c. Roofing details and procedures.
    - d. Critical work sequencing and review of phasing plan.
    - e. Maintaining Owner access to and usage of existing facilities.

### **1.06 DELIVERY, STORAGE AND HANDLING:**

- A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible, including required fire resistance classification labels.
- B. Store rolled goods on end on clean raised platforms with weather protective covering when stored outdoors.
- C. Provide continuous protection of materials against wetting and absorption; remove wet materials from project site.
- D. Materials stored on roof levels for immediate use shall be:
  - 1. Distributed to prevent concentrated loads that would impose excessive strain on deck or structural members.
  - 2. Positively secured to prevent displacement by excessive wind forces.

### **1.07 PROJECT CONDITIONS:**

- A. Existing Conditions: Examine existing buildings and existing roofing to determine existing physical conditions that affect removal of existing roofing and installation of new roofing.
- B. Environmental Requirements:
  - 1. Apply roofing in dry weather.
  - 2. Do not remove existing roofing and flashing in inclement weather or when rain is predicted (30% or more possibility).
  - 3. Do not apply roofing when ambient temperature is below 40 degrees F.
  - 4. Ensure roof deck is structurally sound and sufficiently rigid to support the live and dead load requirements of the construction traffic.
- C. Protection:
  - 1. Provide special protection or avoid heavy traffic on completed work when ambient temperature is above 80 degrees F.
  - 2. Restore to original condition or replace work or materials damaged during handling of roofing materials.
- D. Emergency Equipment: Maintain on-site equipment necessary to apply emergency temporary edge seal in the event of sudden storms or inclement weather.
- E. Leak Damage Control: Comply with requirements of Section 01505.

- F. Restrictions:
  - 1. Comply with requirements of Section 01100 on use of site.
  - 2. Smoking is prohibited on roof areas or in existing building.
- G. Continuation of Services: Comply with requirements of Section 01100.

**1.08 SEQUENCING/SCHEDULING:**

- A. Do not remove more existing roofing in one day than can be replaced with new roof membrane or temporary roof in the same day.
- B. For each day's work, install complete roof system including flashings, penetrations and other materials required for a complete, watertight installation.

**1.09 WARRANTY:**

- A. Applicator: Furnish a 5 year warranty against leaks and defects in materials and workmanship.
  - 1. Include repairs required to maintain roof and base flashing in a watertight condition.
  - 2. Make repairs at no expense to Owner.
- B. Roof Manufacturer: Furnish a minimum 15 year "No Dollar Limit" (NDL) warranty against leaks and defects in materials and workmanship.
  - 1. Include agreement to maintain roof and base flashing in a watertight condition for period of warranty.
  - 2. Make repairs at no expense to Owner.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURER:**

- A. Systems specified for roofing are SBS modified bitumen sheet roof systems manufactured by Soprema.
- B. Component products listed for roofing systems are product names of Soprema, unless otherwise specified.
- C. Comply with roofing system manufacturer's recommendations for component roofing system materials not listed in this specification.

**2.02 ROOF SYSTEM – TORCH APPLIED TWO PLY MODIFIED BITUMEN ROOF SYSTEM:**

- A. Qualities: Granular surfaced torch applied modified bitumen cap sheet installed over a semi-adhered modified bitumen base ply torch applied over the primed surface of the existing modified bitumen cap sheet that has been prepared in accordance with the manufacturer's requirements.
- B. System Components by Soprema:
  - 1. Cap Sheet: ELASTOPHENE LS FR GR.
  - 2. Semi-Adhered Base Ply: COLVENT Flam TG.
  - 3. Primer: ELASTOCOL 500 Primer.
  - 4. Resin Penetration Flashing: Polymethacrylate (PMMA) liquid resin, liquid-applied (Alsan RS 230 Flash), layered application of resin encapsulating a layer of polyester fleece (Alsan RS Fleece) by Soprema.
- C. System Components by Soprema at Addition:
  - 1. Cap Sheet: ELASTOPHENE LS FR GR.
  - 2. Base Ply: ELASTOPHENE Flam.
  - 3. Resin Penetration Flashing: Polymethacrylate (PMMA) liquid resin, liquid-applied (Alsan RS 230 Flash), layered application of resin encapsulating a layer of polyester fleece (Alsan RS Fleece) by Soprema.
- D. Base Flashing Components: Same as System Components above.

### **2.03 RELATED MATERIALS:**

- A. Flashing Primer: ASTM D41, Elastocol 500 by Soprema.
- B. Cold Adhesive (Flashing Cement): ASTM D4586, COLPLY by Soprema.
- C. Cants and Tapered Edge Strips: As approved by manufacturer.
- D. Metal Termination Bar: 1/8 x one inch aluminum bar pre-drilled or punched for fasteners at 6 in. o.c.
- E. Caulking: Sopramastic 200 by Soprema.
- F. Unsurfaced Torch Applied Base Ply (For installation over gypsum roof board at locations where infill insulation is being installed where wet roofing materials have been removed and for installation over semi-adhered base ply where necessary to eliminate ponding): Sopralene Flam 180 by Soprema.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION:**

- A. Verify that work which penetrates roof deck has been completed.
- B. Verify that insulation systems have been satisfactorily completed.
- C. Verify that all roofing materials containing moisture have been removed.
- D. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture and unevenness.
- E. Do not proceed until defects are corrected.

#### **3.02 PREPARATION:**

- A. Remove roof system base flashings and other flashings in accordance with the manufacturer's requirements at all existing modified bitumen roof areas.
- B. Preparation of Existing Roofing to Remain: Prepare existing roof membrane which is to remain and be tied into for extension at the front of the building or to be tied into with an expansion joint. Existing roof is under warranty. Follow original manufacturer's written instructions to preserve existing warranty.
- C. Priming: Prime metal and masonry surfaces with asphalt primer as necessary.

#### **3.03 APPLICATION:**

- A. General:
  - 1. Membrane application: Apply roofing in accordance with roofing manufacturer's instructions and as detailed and specified herein.
  - 2. Aesthetic considerations: An aesthetically pleasing overall appearance of the finished roof system will be required prior to the work being accepted. Numerous patches and other repairs that will be sight exposed after the installation of the roof system has been completed will not be acceptable.
- B. Roofing Membrane – Heat Welded Application:
  - 1. Install in accordance with roofing manufacturer's specification, and as specified below.
  - 2. Phased construction of roofing membrane is strictly prohibited, unless specifically approved by roofing manufacturer.
  - 3. Lay sheets at right angles to slope of deck.
  - 4. Beginning at low point of roof, heat weld semi-adhered base ply to substrate, lapping sides a minimum of 3 inches and ends a minimum of 6 inches. Seal laps by running a hot trowel along edge of the seam. Note: Install leading edges of semi-adhered base ply in cold adhesive at roof drains, roof edges and base flashings.

5. Heat weld cap sheet over semi adhered base ply membrane, lapping sides a minimum of 3 inches and ends a minimum of 6 inches. Stagger laps between plies a minimum of 12 inches. Heat weld in accordance with manufacturer's recommendations. Avoid asphalt seepage greater than 1/2 inch at seams. Check lap seams using edge of a hot trowel. Correct defects.
  6. Granule Embedment: Broadcast approved granules into asphalt seepage during installation of cap sheet while bitumen is still hot.
  7. Complete application of roofing system without pockets, blisters, wrinkles or fishmouths.
  8. Complete installation of roofing system up to line of termination of day's work. Install temporary water cut-offs of asphalt or plastic cement and fiberglass felts at end of each day's work. Remove upon resumption of work.
- C. Base Flashing:
1. Install 2 ply system consisting of unsurfaced ply sheet and mineral surfaced flashing sheet in accordance with requirements of roofing system manufacturer, with each ply sheet extending full height of flashing.
  2. Adhere sheets with torch application and mechanically attach leading edge at 9 in. o.c.
  3. Install where roofing system abuts vertical surfaces and at curbs.
- D. Liquid Applied Penetration Flashing:
1. Install penetration flashings at scheduled penetrations as detailed in accordance with manufacturer's directions.
  2. Prepare metal surfaces by sandblasting to bare metal or as otherwise required by roofing manufacturer. Prime all metal surfaces with manufacturer's recommended primers.
  3. Install liquid flashing in a layered application with scrim cloth reinforcing.
- E. Roof Walkways: Adhere an additional ply of modified bitumen cap sheet over the surface of the finished modified bitumen cap sheet in accordance with the manufacturer's requirements. Install walkways around discharge side of all roof hatches, below doors providing access to roof areas, on each side of roof access ladders installed to provide access from one roof area to another and around all rooftop equipment requiring periodic maintenance. Provide one inch gaps between walkways at a maximum of 6 ft. on center or as otherwise approved.
- F. Unsurfaced Torch Applied Base Ply: Install over the top of gypsum roof board where infill insulation and gypsum roof board are installed where wet roofing materials are removed. Install additional plies at locations where minor ponding of water is present as necessary to eliminate ponding water that will not evaporate within 48 hours of the last occurrence of rainfall with such being included in the Base Bid.

### **3.04 FIELD QUALITY CONTROL:**

- A. Manufacturer's Field Service:
1. During installation, provide for 3 on-site inspections of roof application by qualified technical representatives of roofing manufacturer with individual inspections being made for all base ply installations prior to the installation of the cap sheet.
  2. Upon completion of installation, provide a final inspection at site by a technical representative of roofing manufacturer to confirm that roofing system has been installed in accordance with manufacturer's requirements.

### **3.05 CLEANING AND PATCHING:**

- A. Clean up debris, excess materials and equipment and remove from site.
- B. Remove drippage or spills of coatings, sealant, mastic or primers from finish surfaces.
- C. Patch misaligned or inadequately lapped seams, inadequately adhered areas, punctures or other damage to membrane with a patch of membrane sheet that extends at least 6 inches in each direction from deficiency.

**3.06 PROTECTION:**

- A. Provide special protection and avoid heavy traffic on completed work when ambient temperature is above 80 degrees F.
- B. Restore to original condition or replace work or materials damaged during handling of roofing materials.

**END OF SECTION 07520**



## SECTION 07565

### ROOF MINOR ROOF RENOVATION WORK

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES:

- A. Required minor work associated with roof maintenance work.

##### 1.02 RELATED SECTIONS:

- A. Section 01100 – Summary
- B. Section 01351 - Alteration Project Procedures
- C. Section 07520 – Modified Bituminous Membrane Roofing
- D. Section 07720 - Roof Accessories
- E. Section 07925 - Joint Sealants

##### 1.03 SUBMITTALS:

- A. Product Data: Submit manufacturer's product data sheets for each product in accordance with Section 01330.

##### 1.04 PROTECTIONS:

- A. Prior to starting minor demolition operations, provide necessary protections as specified in Section 01505

##### 1.05 COORDINATION:

- A. Sequence minor demolition and renovation with work sequence of reroofing work.
- B. Coordinate with reroofing work so that no more existing items are removed in one day than can be replaced along with new roofing work in same day.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS:

- A. Wood Nailers and Blocking:
  - 1. No. 2 or better Southern Yellow Pine.
  - 2. Fire-retardant treated with Osmose Flame Proof LHC, bearing UL Label FR-S.
  - 3. Dimensions to match existing 2x4's, 2x6's, 2x8's and 2x10's.
- B. Fasteners:
  - 1. Screws: Hot-dip galvanized wood screws.
  - 2. Nails: Non-ferrous, cement-coated, or hot-dip galvanized nails.
- C. Metal Paint:
  - 1. Galvanized Metal Primer: PPG Galvanized Steel Primer, No. 6-209.
  - 2. Ferrous Metal Primer: PPG Speedhide Inhibitive Red Primer, No. 6-208.
  - 3. Exterior Metal Paint: PPG Alkyd Gloss Enamel, Interior-Exterior, 6 Series. Color as selected by Owner.
  - 4. Rust-Inhibitive Paint: 1500 System Speedy-Dry 1573 Rust-Inhibitive Primer as manufactured by Rust-Oleum or similar approved product.

#### PART 3 - EXECUTION

##### 3.01 PREPARATION:

- A. Verify that required barricades and other protective measures are in place.

### **3.02 MINOR DEMOLITION OPERATIONS:**

- A. General:
  - 1. Comply with precautions and procedures specified in Section 01351.
  - 2. Cut and remove materials as designated on Drawings.
  - 3. Execute demolition in a careful and orderly manner with least possible disturbance or damage to adjoining surfaces and structure.
  - 4. Avoid excessive vibrations in demolition procedures that would be transmitted through existing structure and finish materials.

### **3.03 DISPOSAL:**

- A. Materials, equipment and debris resulting from roof demolition operations shall become property of Roofing Contractor. Remove demolition debris in accordance with applicable City, State and Federal Laws, and in accordance with requirements of Section 01351 and 01505.
- B. Legally dispose of demolition debris.

### **3.04 MINOR RENOVATION WORK:**

- A. Replacement of Wood Nailers:
  - 1. Replace deteriorated wood blocking where present with new blocking anchored or fastened to substrate in a similar manner to existing. Base Bid shall include the replacement of the following with the actual price being established on the basis of Unit Pricing:
    - a. 400 l.f. of 2x4 wood nailer including all fastening
    - b. 400 l.f. of 2x6 wood nailer including all fastening
    - c. 400 l.f. of 2x8 wood nailer including all fastening
    - d. 400 l.f. of 2x10 wood nailer including all fastening
- B. Metal Painting – Existing Metal Fascia, Conductor Heads, Downspouts, Downspout Wall Brackets and New Expansion Joints. New expansion joints shall be primed and painted where they extend over and down existing fascial and to a point 6 inches from the roof edge.
  - 1. Prepare substrates in accordance with paint manufacturer's recommendations.
  - 2. Prime substrates with appropriate primer.
  - 3. Apply 2 coats of exterior metal paint, 4.0 miles (wet film) per coat.
  - 4. Spray application not permitted.

### **3.05 METAL ROOF DECK RENOVATION:**

- A. Examine metal roof decking for rust and deterioration at locations where existing roofing is being removed down to metal decking.
  - 1. Coat areas of metal roof decking that have surface rust with a rust-inhibitive paint coating.
  - 2. Remove areas of metal roof decking that are severely rusted, damaged or deteriorated beyond use.
- B. Replace removed areas with new metal deck to match existing.
  - 1. Place metal deck units on supporting steel and adjust to final position, with ends bearing minimum 3 inch.
  - 2. Place metal deck units end-to-end before permanently fastening.
  - 3. Align cells over entire length of run. Do not stretch or contract side lap interlocks.
  - 4. Secure metal deck units to supports with minimum No. 12 TEK screws in 36/3 fastener pattern.
  - 5. Lock side laps between adjacent units at maximum intervals of 2'-0" o.c. between supports using No. 10 TEK screw fasteners (minimum 2 fasteners between each support).
- C. Patch minor voids and damages in existing metal deck from removal of existing penetrations with such work being completed as a part of the Base Bid.

**END OF SECTION 07565**

**SECTION 07620**  
**SHEET METAL**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all Sheet Metal Work and flashing as shown on Drawings, specified herein and as required to make the outer building watertight.

**GUARANTEE:**

Per GENERAL CONDITIONS, furnish written guarantee, countersigned by Contractor and installing subcontractor, that all sheet metal Work is unconditionally guaranteed to be watertight and free of defects and faulty workmanship for a period of two years from date of completion of the Work.

**SUBMITTALS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Shop Drawings of all proposed custom fabricated Work.

Manufacturer's data for stock manufactured items as required to demonstrate compliance with the specified requirements.

Manufacturer's recommended installation procedures.

**REFERENCE STANDARDS:**

In addition to complying with all pertinent codes and regulations, comply with all applicable recommendations of the "Architectural Sheet Metal Manual" of Sheet Metal and Air Conditioning Contractors National Association (Fourth Edition used for number references).

**COORDINATION:**

Coordinate and cooperate with any other trades whose Work relates in any way to sheet metal, especially roofing work; make sheet metal and roofing a weathertight and watertight assembly.

**MATERIALS:**

Fabricate sheet metal from galvanized domestic sheet steel having a protective coating of zinc conforming to ASTM A525. Thickness: 24 gauge minimum, unless noted otherwise.

Finish --

Above Roof Surface and not exposed to view, Concealed Sheetmetal (both interior and exterior), or noted specifically on the Drawings as "G.I.", "No Finish", "Not-Painted", etc., Curbs, Caps, and Counterflashings =

Standard Galvanized

Exposed to View and noted specifically on the Drawings as "Painted" =

"Paint Grip" Surface treatment for painting by phosphatizing

Exposed to View and noted as "Pre-Finished", or Exposed to View and not having specific notation to be Painted or to remain unfinished =

Embossed Finish, Dexstar 850 Prefinished Factory Baked Enamel System, 20 year guarantee, Premium Custom Color to match Paint sample furnished by Brookshire's, and in conformance with Specification Section, PREFINISHED ROOF AND WALL PANELS.

#### INSPECTION:

Examine all subsurfaces to receive Work. Report in writing to General Contractor, with a copy to Brookshire's, any conditions detrimental to Work. Failure to observe this injunction constitutes a waiver to any subsequent claims to the contrary and holds Contractor responsible for any corrections Brookshire's may require. Starting Work will be construed as acceptance of all subsurfaces.

#### MATERIALS HANDLING:

Use all means necessary to protect materials of this Section before, during, and after installation.

In the event of damage, immediately make all repairs and replacements necessary to approval of and at no additional cost to Brookshire's.

#### WORKMANSHIP:

Form all sheet metal accurately and to dimensions and shapes required, finishing all molded and broken surfaces with true, sharp, straight lines and angles. Where intercepting other members, cope to an accurate fit, soldering securely.

Unless otherwise specifically permitted by Brookshire's turn all exposed edges back 1/2". Form bends to 1/16" inside radius.

Verify all Drawing dimensions by taking field measurements and assume responsibility for such measurements.

Counterflashing is required at all roof curbs regardless of configuration of item it is to receive.

Shield all sheet metal against galvanic action with two coats of asphalt base paint or sealer tape. Embed all roofing metal in a solid bed of sealant per CAULKING & SEALANTS Section.

Fabricate, form and install all sheet metal so as to adequately provide for expansion and contraction in the finished Work. Finish watertight and weathertight.

Make all lock seams flat and true to line, sweating full of solder. Make all lock and lap seams, when soldered, at least 1/2-inch wide. Where lap seams are not soldered, lap according to pitch but in no case less than 3 inches. Make all flat and lap seams in direction of flow.

Joint parts with rivets or sheet metal screws where necessary for strength or stiffness. Provide watertight expansion joints for all runs of more than 40 feet, except where closer spacing is indicated on Drawings or required for correct installation.

Secure metal by means of clips, screws or cleats without nailing. In general, space all required rivets and screws not more than 8" apart and, where exposed to weather, use lead or neoprene washers. For securing to wood use US Gypsum 1-1/4" type S pancake head cadmium plated screws. Drill or cleanly punch metal prior to riveting, or screwing other than by self-taping screws.

#### SOLDERING:

For all joints in Standard Galvanized and Paint Grip Metals. Use sealant and mechanical fasteners for Prefinished Sheetmetal fabrications.

Thoroughly clean and tin all joint materials before soldering.

Perform all soldering slowly with well heated copper to heat seams thoroughly and completely fill with solder. Perform all soldering with heavy soldering copper of blunt design, properly tinned for use.

Make all exposed soldering on finished surfaces neat, full flowing, smooth. After soldering, thoroughly wash acid flux with a soda solution.

**TEST:**

Should Brookshire's request, demonstrate by hose or standing water that all sheet metal and flashing is completely watertight.

**CLEAN-UP:**

Clean all metal surfaces, whether exposed or concealed, after installation. Carefully remove grease and oil with solvent and wipe clean.

Clean-up per GENERAL CONDITIONS.

*- END OF SECTION 07620 -*

## **SECTION 07625**

### **ROOF SHEET METAL WORK**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Shop or field-formed sheet metal work for moisture protection
- B. Accessories.

##### **1.02 RELATED SECTIONS**

- A. Section 07520 – Modified Bituminous Membrane Roofing.
- B. Section 07925 - Joint Sealants.

##### **1.03 REFERENCES**

- A. ASTM B 32 - Standard Specification for Solder Metal; 2000.
- B. ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2012.
- C. FS FF-S-325 - Shield Expansion; Nail, Expansion; and Nail, Drive-Screw.
- D. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

##### **1.04 SUBMITTALS**

- A. Procedures for Submittals: Section 01330.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Samples: Submit two samples 6 x 6 inch in size illustrating metal finish color.

##### **1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.
- C. Pre-Installation Conference:
  - 1. Attend roofing pre-installation conference at the project site.
  - 2. Attendance: Owner, General Contractor, Roofing Contractor, project superintendent, sheet metal fabricator and applicator.
  - 3. Agenda: As specified in Section 01314.

##### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials which may cause discoloration or staining.

##### **1.07 WARRANTY:**

- A. Provide Owner a written warranty which shall warrant sheet metal work to be free of leaks and defects in materials and workmanship for 5 years after date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 SHEET MATERIALS**

- A. Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; thicknesses as indicated.
- B. Pre-Finished Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; thicknesses as indicated, shop pre-coated with PVDF coating, color as selected.
  - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as selected from manufacturer's standard color.

### **2.02 ACCESSORIES**

- A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.
  - 1. Nails: Flathead, wire, barbed, slating type.
  - 2. Screws: Self-tapping sheet metal type with rubber washer made of EPDM.
  - 3. Rivets: Type and size as recommended by sheet metal manufacturer.
  - 4. Concrete Fasteners: Round-head stainless steel screw and neoprene washer with lead expansion anchor, FS FF-S-325, Group IV, Type 2. Powers Rawl Screw Type Nailins.
- B. Sealant: Type silicone sealant specified in Section 07925.
- C. Solder: ASTM B 32; Sn50 (50/50) type.
- D. Non-Shrink Grout: CG-86 by W.R. Meadows or similar approved product.
- E. Pourable Sealer: Firestone Building Products Co. SL-1 Part A and Part B.

### **2.03 FABRICATION**

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of same material as sheet, minimum 3 inches wide, interlocking with sheet.
- C. Form pieces in longest possible lengths.
- D. Make angle bends and folds for interlocking metal with full regard for expansion and contraction to avoid buckling or fullness in metal after installation.
- E. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- F. Form material with scheduled or specified seams. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- G. Solder shop formed metal joints in galvanized steel. After soldering, remove flux. Wipe and wash solder joints clean, weather seal joints.
- H. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- I. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- J. Fabricate sight-exposed items on building exterior using pre-finished galvanized sheet steel; fabricate items visible only on roof areas using plain galvanized sheet steel.

### **2.04 FABRICATED ITEMS:**

- A. Counter Flashings:
  - 1. One piece system as detailed.
- B. Cleats or Clips:
  - 1. One system as detailed.
- C. Metal Edging/Fascia:
  - 1. Fabricate as shown with type and gauge of metal as indicated.

- 2. Provide joint system similar to SMACNA Figure 2 - 5C.
- D. Copings:
  - 1. Sheet metal types as indicated formed in minimum 10 ft. lengths and detailed as shown.
  - 2. Provide joint system in accordance with SMCNA Table 3-1 - J2 Butt + Backup Plate.
- E. Gutters (to include gutter brackets and gutter wall brackets):
  - 1. Fabricate from sheet metal as indicated to match existing in type and profile.
  - 2. Rivet and seal joints.
  - 3. Install butt type expansion joint where shown and as detailed, similar to SMACNA Figure 1-7.
- F. Downspouts:
  - 1. Fabricate from sheet metal as indicated to match existing in type and profile similar to SMACNA Figure 1-32B.
  - 2. Rivet and seal joints.
  - 3. Provide downspout thimbles similar to SMACNA Figure 1-33, Detail 1.
- G. Multiple Pipe Penetration Flashing:
  - 1. Sheet metal as indicated similar to SMACNA Figure 8-9A.
  - 2. Solder all joints.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify roof openings, curbs, pipes, sleeves and vents through roof are solidly set and nailers are set in place.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.
- C. Verify that substrates are smooth and clean to extent needed for sheet metal work.
- D. Do not start sheet metal work until conditions are satisfactory.

### **3.02 INSTALLATION - GENERAL**

- A. Install work watertight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.
- B. Install fabricated sheet metal items in accordance with SMACNA Architectural Sheet Metal Manual, except as otherwise detailed.
- C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Seal prefinished metal joints watertight using specified sealant.
- E. Solder metal joints where indicated. After soldering, wash metal clean with neutralizing solution and rinse with water.

### **3.03 INSTALLATION - FABRICATED ITEMS:**

- A. Counter Flashings:
  - 1. Install where shown with fasteners installed as indicated. Fabricated as shown similar to SMACNA Figure 4-4D.
  - 2. Overlap counter flashing 4 inches over base flashing, lap ends of sheets 3 inches.
  - 3. Solder joints in galvanized sheet metal counter flashings.
- B. Cleats or Clips:
  - 1. Install where shown with fasteners installed at 12 inches o.c.
- C. Metal Edging and Fascia:
  - 1. Set horizontal flanges in plastic cement and nail to wood blocking at 3 in. o.c. staggered.



2. Fasten bottom drip edge of face to cleat.
  3. Install backup plates at joints.
- D. Copings:
1. Install over tops of parapet walls as indicated.
  2. Secure leading, or exterior exposed edge, onto cleat.
  3. Install back up plates.
  4. Fasten on back side as indicated.
- E. Gutters:
1. Install with fasteners spaced in accordance with the gutters that are being removed.
  2. Install downspout thimbles at locations were downspouts are to be installed, sealing and riveting flanges.
- F. Downspouts:
1. Install where shown.
  2. Telescope upper sections into lower sections.
  3. Install wall brackets in locations were existing brackets were remove.
- G. Multiple Pipe Penetration Flashing:
1. Install over base ply of modified bitumen roof membrane securing to wood nailers with fasteners installed at 4 inches o.c.
  2. Install around conduits and refrigerant piping.
  3. Solder all joints.
  4. Seal openings in metal decking with non-combustible material prior to installing non-shrink grout.
  5. Install non-shrink grout in bottom of penetration dam.
  6. Install pourable sealer over non-shrink grout after the non-shrink grout has fully cured.
  7. Install flashing hood, securing such in place with sheet metal fasteners.

#### **3.04 CLEANING:**

- A. Remove flux and residual acid immediately by neutralizing with baking soda and washing with clean water. Leave work clean and free of stains, scrap, and debris.

**END OF SECTION 07625**

SECTION 07700  
**BUILDING ROOFING ACCESSORIES**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Roofing Accessories Work as shown on Drawings and as specified herein.

**SHOP DRAWINGS:**

Per SUBMITTALS.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required. Roof curbs shall be sized for specific item it is to receive.

**COORDINATION:**

Coordinate with all other trades whose Work relates to Roofing Accessories for placing of all required backing, attachments, furring, etc., to insure proper locations.

**DELIVERY AND STORAGE:**

Deliver and store materials in dry, protected areas. Keep free of corrosion or other damage. Replace any damaged parts at no cost to Brookshire's.

**MATERIALS:** ThyCurb, Bar-Brook, Bilco and Vent Products are used to establish quality. Other manufacturers will be considered for substitution, except for Roof Hatch.

Standard Curb -

ThyCurb Model TC-5 of height sufficient to achieve 4" minimum vertical surface above cant. Use at all openings greater than 24" in any dimension unless specifically noted otherwise.

Mini Curb -

ThyCurb Model TC-3, 18 ga. galvanized shell, with 1 1/2" thick, 3 pound density factory installed rigid insulation. Contractor's option for use at openings with every dimension 24" or less.

- 12" or less, use 18 ga. galvanized base plate, no burglar bars required.

- over 12" but less than 24", use 14 ga. galvanized base plate with welded 1/2" diameter burglars at 9" o.c. both ways.

Ventilated Curb Extension -

Use at all Exhaust Fans from Cooking Hoods. Same as MINI CURB or STANDARD CURB as applicable for size, omit insulation, with 1 1/2" x 14" x 18 ga. galvanized extension as manufactured by ThyCurb. Provide with 6" stamped ventilation slots and 1 1/2" x 2" x 14 ga. galvanized base angle.

Vibration Isolation Curb -

ThyCurb Vibro-Curb II of height sufficient to achieve 4" minimum vertical surface above cant.

**INSTALLATION:**

Install Roofing Accessories per manufacturer's directions.

Install in a sturdy, substantial manner, straight, true and plumb.

Outside dimension of all roof curbs shall be 3/4" less than opening size of device to be placed on curb.

All Standard Roof Curbs and Vibration Isolation Curbs shall bear on structural steel framing and be attached by same fasteners and spacing as roof decking unless indicated otherwise on the Drawings. Mini Curbs may be placed directly on metal decking and be attached at each high rib of deck with #12 Tek screws (6" o.c. max. spacing). Steel support frame is not required for Mini Curbs unless specifically noted otherwise on the Drawings.

All wood nailers shall be wolmanized or penta treated, S4S, 1-1/2" minimum thickness and height, No. 2 or better Southern Yellow Pine, White Pine, or redwood; continuous around entire perimeter of curb with joints, splices, etc. fit tight and neatly; being uniform thickness and height; and securely fastened to the curb. Any deficiencies or damage to curb, nailers, insulation, etc. shall be removed and properly replaced.

CLEAN-UP:  
Per GENERAL CONDITIONS.

- END OF SECTION 07700 -

## SECTION 07720

### ROOF ACCESSORIES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES:

- A. Pipe supports.
- B. Precast concrete splash blocks.

##### 1.02 RELATED SECTIONS:

- A. Section 07520 - Modified Bituminous Membrane Roofing.
- B. Section 07625 - Sheet Metal Work: Sheet Metal Flashing.

##### 1.03 REFERENCES:

- A. ASTM D4586 - Fibrated Asphalt Roof Cement.
- B. FS FF-S-325 - Shield Expansion; Nail, Expansion; and Nail, Drive-Screw.
- C. FS TT-C-494A - Coating Compound, Bituminous, Solvent Type, Acid Resistant.

##### 1.04 SUBMITTALS:

- A. Procedures for Submittals: Section 01330.
- B. Product Data: Manufacturer's product data sheets, including installation instructions.

#### PART 2 - PRODUCTS

##### 2.01 PIPE SUPPORTS:

- A. Type 1:
  - 1. Mifab No. C10C, No Substitutions.
- B. Type 2:
  - 1. Cooper B-Line Dura-Block DBR4-6 fixed height roof pipe support, No Substitutions.
- C. Type 3:
  - 1. 6-DS, 8-DS or 10-DS by Miro Industries.
- D. Type 4:
  - 1. Cooper B-Line Dura-Block DBM Series adjustable height rooftop pipe support, No Substitutions.

##### 2.02 RELATED MATERIALS:

- A. Fasteners: Size and type suitable for application or as indicated.

#### PART 3 - EXECUTION

##### 3.01 EXAMINATION:

- A. Verify that substrates are smooth and clean to extent needed for roof accessories work.
- B. Do not start work until all conditions are satisfactory.

##### 3.02 INSTALLATION:

- A. General:
  - 1. Install work watertight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.

2. Coat contact surfaces of dissimilar metals with asphalt coating compound.
- B. Pipe Supports:
1. Install Type 1 pipe supports under small conduits over an additional ply of the modified bitumen cap sheet adhered to the underlying modified bitumen cap sheet. Install Type 1 pipe supports at 8 ft. o.c. and within 2 ft. of each change of direction. Secure pipe and conduit loosely in pipe support using metal strap fastened with approved fasteners.
  2. Install Type 2 pipe supports under piping that is 4 inches in diameter or smaller over an additional ply of the modified bitumen cap sheet adhered to the underlying modified bitumen cap sheet. Install Type 2 pipe supports at 8 ft. o.c. and within 2 ft. of each change of direction. Secure pipe and conduit loosely in pipe support using metal strap fastened with approved fasteners.
  3. Install Type 4 pipe supports under Rooftop unit condensate piping. Provide pipe supports sized and spaced per manufacturer's requirements.

**3.03 CLEANING:**

- A. Leave work clean and free of stains, scrap, and debris.

**END OF SECTION 07720**

SECTION 07920  
**CAULKING & SEALANTS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Throughout the Work, caulk and seal all joints shown on Drawings, and elsewhere as required to provide a positive barrier against passage of air and moisture, all as specified herein.

**REFERENCE STANDARDS:**

- ASTM C661 – Standard Test Method for Indentation of Elastomeric Type Sealants by Means of a Durometer.
- ASTM C794 – Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
- ASTM C834 – Specification for Latex Sealants
- ASTM C920 – Specification for Elastomeric Joint Sealants
- ASTM C1193 – Guide for Use of Joint Sealants
- ASTM C1248 – Test Method for Staining of Porous Substrate by Joint Sealants
- ASTM C1311 – Specification for Solvent Release Sealants
- ASTM C1330 – Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants
- ASTM D412 – Test Methods for Vulcanized Rubber and Thermoplastic Elastomer-Tension
- ASTM D624 – Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
- ASTM D2240 – Test Method for Rubber Property – Durometer Hardness
- ASTM E283 – Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- ASTM E331 – Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

**DEFINITIONS:**

**Caulking -**

A latex, acrylic, and/or butyl composition filler material primarily used where paint or other finish material is to be applied and filler is not normally exposed to the elements (interior).

**Sealant -**

A silicone or epoxy composition filler primarily used as a finish material, normally exposed to the elements (exterior, but may be called for on interior surfaces also), which remains elastic, adherent and weather tight throughout its life expectancy.

**GUARANTEE:**

Per GENERAL CONDITIONS. Furnish a written guarantee signed by the applying contractor or firm, agreeing to make any repairs or replacements required because of faulty materials or workmanship, at no additional cost to Brookshire's, for a period of 2 years from date of completion of the Work.

All silicone sealants shall be under the same conditions for a period of 20 years. Applying contractor shall provide all preconstruction testing requirements by manufacturer to validate warranty.

Exterior Work that does not remain weathertight and all Work which does not retain all properties inherent in the product will be considered faulty.

#### SUBMITTALS:

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

- Samples of each sealant, each backing material, each primer and each bond breaker proposed.
- Samples of sealant colors from manufacturer's standard selection.
- A complete materials list of all items proposed for the Work.
- Sufficient data to demonstrate that all proposed materials meet or exceed the specified requirements.
- Preconstruction compatibility and adhesion test reports.
- Preconstruction field-adhesion test reports.

Specifications, installation instructions and general recommendations of manufacturers indicating installation procedures.

#### QUALITY ASSURANCE:

Installer shall be experienced, equipped and trained for application of joint sealants required for this Project with record of successful completion of projects of similar scope.

Provide exterior joint sealants by a single manufacturer responsible for testing of Project substrates to verify compatibility and adhesion of joint sealants.

Submit samples of each material that will be in contact with or affect joint sealant for Preconstruction Manufacturer Laboratory Compatibility, Staining, and Adhesion Testing. Consult with manufacturer's representative for recommendations on the extent of preconstruction testing and number of samples required for this Project. Test sealants with substrate materials using ASTM C794 or manufacturer's standard test methods to determine requirements for joint preparation, including cleaning and priming. Test sealants with related materials to verify compatibility.

Prior to installing joint sealants, field test adhesion to joint substrates using ASTM C1193 Method A or method recommended by manufacturer. Verify adhesion is adequate. Modify joint preparation recommendations for failed joints and re-test. Submit written report to Brookshire's.

Provide joint sealant application within mockups required by Brookshire's identical to specified joint sealants and installation methods.

#### MATERIALS HANDLING:

Deliver all materials to job site in original unopened containers with all labels intact and legible at time of use. Store only under conditions recommended by manufacturers. Do not retain on job site any material which has exceeded shelf life recommended by manufacturer.

Use all means necessary to protect materials before, during, and after installation and to protect the Work and materials of all other trades.

In the event of damage, immediately make all repairs and replacements necessary to approval of Brookshire's and at no additional cost to Brookshire's.

#### RELATED PRODUCTS:

Related items such as cleaners, primers, back-up materials and sealants shall be certified by the sealant manufacturer and the surface(s) manufacturer as compatible.

#### COLORS:

Color for each caulk and sealant installation will be selected by Brookshire's from standard colors normally available from the specified manufacturers except for silicone sealant. Should any such standard color(s) not be available from the approved manufacturer except at additional charge,

provide any such color(s) at no additional cost to Brookshire's. Should color(s) of the substitute manufacturer not be compatible, in the opinion of Brookshire's, with the selection made from the specified manufacturer's color(s), the specified manufacturer shall be used at no additional cost to Brookshire's.

Color for silicone sealants may be selected from standard colors or may be required to be tinted by manufacturer to match adjacent materials as directed by Brookshire's and shall be at no additional cost to Brookshire's.

#### PRIMING:

Use only primer recommended by manufacturer of sealant and approved by Brookshire's for the particular installation. Apply primer in strict accordance with manufacturer's printed instructions.

#### BACK-UP MATERIAL INSTALLATION:

Where back-up material is required, use only material recommended by manufacturer of sealant and approved by Brookshire's for the particular installation, compressing backup material 25% to 50% for a positive and secure fit. When using backup of tube or rod stock, avoid lengthwise stretching of material. Do not twist or braid hose or rod backup stock.

#### MATERIALS:

Manufacturer and Series Numbers are used to establish quality standards. Dow Corning®, Pecora, Bostik, Tremco, 3M, Sonneborn, GE and Dap are acceptable as equal manufacturers. No others will be considered.

Glass to Glass or Glass to Frame Sealant --

Applied in conjunction with specification section GLAZING. Dow Corning® 795 Silicone Building Sealant and color shall be translucent.

All other Exterior Sealant except EIFS and Concrete Control Joints --  
Color as selected.

- Dow Corning® 795 Silicone Building Sealant

EIFS and Exterior Concrete Control Joints --  
Color as selected.

- Dow Corning® 790 Silicone Building Sealant

Interior Caulking and Interior Masonry Control Joints --  
Color as selected.

- Sonneborn Sonolastic NP1

Exterior Concrete Control/Cold/Construction Joints (C.J.) and Waterstops --  
Refer to CONCRETE PAVING, WALKS, CURB & GUTTER Specification Section.

Backer Rod --

Size as recommended by manufacturer's selection chart.

- Sonneborn Sonofoam Soft Backer Rod

#### INSTALLATION:

Clean and prepare surfaces to which sealant is to be applied, per manufacturer's recommendations. Scrape and wire brush any concrete, tile or similar surface as required. Blast, scrape or wire brush any steel surfaces. Clean any aluminum surfaces of protective coating, dirt, oil, grease. Use only cleaning solvents recommended by surface manufacturer's printed information.

Thoroughly and completely mask all joints to prevent staining or damage by contact with sealant or primer.



Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.

Select joint backing materials recommended by sealant manufacturer to be compatible with sealant material. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.

Apply under pressure with hand or power-actuated gun or other appropriate means. Guns shall have nozzle of proper size and provide sufficient pressure to completely fill joints as designed.

Install in strict accordance with manufacturer's recommendations as approved by Brookshire's, thoroughly filling all joints to the recommended depth. Tool all joints to profile shown on Details in the Drawings. Should detail not be indicated, Brookshire's shall be called to field to observe and approve such.

Exterior concrete joints shall be thoroughly cleaned of all dirt, trash, debris, etc. flushed with water and allowed to thoroughly dry. Joints may be filled full depth or foam/fibrous backer may be used to control depth to a minimum of 3/4" below surface of concrete. Leave top of sealant at level of finish to 1/4" below surface. Should sealant flow above or on concrete surface, allow material to "set" and trim flush with surface at joint and remove remainder from concrete surface. Protect joint from contact with water for 48 hours after application.

CLEAN-UP:

Per GENERAL CONDITIONS.

Remove masking tape immediately after joints have been tooled without disturbing seal.

Clean adjacent surfaces free from sealant as the installation progresses.

- END OF SECTION 07920 -

## SECTION 07925

### ROOF JOINT SEALANTS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES:

- A. Remove and replace existing joint sealant in all existing sealant joints of exterior walls.
- B. Roofing related sheet metal.

##### 1.02 RELATED SECTIONS:

- A. Alteration procedures - Section 01351.
- B. Minor renovation work - Section 07565.
- C. Sheet metal work - Section 07625.

##### 1.03 REFERENCES:

- A. ASTM C920 - Elastomeric Joint Sealants.
- B. ASTM D2240 - Rubber Property - Durometer Hardness.
- C. ASTM D412 - Rubber Properties in Tension.
- D. ASTM D903 - Peel or Stripping Strength of Adhesive Bonds.

##### 1.04 SUBMITTALS:

- A. Procedures for Submittals: Section 01330.
- B. Product Data: Manufacturer's product data sheets for each product.
- C. Samples: Manufacturer's standard color samples of sealant for Architect's selection of colors.

##### 1.05 QUALITY ASSURANCE:

- A. Applicators: Qualified applicators thoroughly skilled and specially trained in application techniques of sealant products.
- B. Job Mock-up:
  - 1. Prepare a maximum of 3 sample applications of sealant, 24 in. length, in location directed by Owner.
  - 2. Mock-up will be used for final approval of color and as standard of workmanship for application.

##### 1.06 DELIVERY, STORAGE AND HANDLING:

- A. Deliver materials in unopened containers as packaged by manufacturer.
- B. Store in a manner to protect materials from weather.

##### 1.07 PROJECT CONDITIONS:

- A. Comply with requirements of Section 07565.

##### 1.08 WARRANTY:

- A. Manufacturer: Provide Owner a written warranty for a period of 10 years from date of Substantial Completion against following defects in sealant materials.
  - 1. Loss of flexibility.
  - 2. Adhesive or cohesive failure due to weathering or material failure.
  - 3. Discoloration of adjacent concrete surfaces.
  - 4. Excessive and continuous dirt accumulation due to exuded oil.

5. Hardening beyond Shore A durometer of 50.

## **PART 2 - PRODUCTS**

### **2.01 SILICONE BUILDING SEALANT:**

- A. Qualities: Single component, neutral cure, silicone rubber formulation with medium modulus, high elongation characteristics, capable of obtaining strong, durable bond strength and with  $\pm$  50% movement capability. Sealant shall be specially formulated to reduce or eliminate dirt pickup and substrate staining from plasticizer bleed.
  1. Hardness, Type A Durometer: 27, ASTM D2240.
  2. Tensile Strength: 295 psi, ASTM D412.
  3. Peel Strength, Unprimed Concrete: 39lb./100% cohesive failure, ASTM D903.
  4. Color: Manufacturer's standard color selected by Architect.
- B. Standard: ASTM C920, Type S, Class 50, Grade NS.
- C. Source: SilPruf NB, SCS9000 Silicone Sealant by GE Silicones.

### **2.02 RELATED MATERIALS:**

- A. Joint Backing: Closed-cell, non-gassing, polyethylene joint backing material recommended by sealant manufacturer. Select a size that will cause about 30% compression in joint.
- B. Bond-preventive Materials: Polyethylene tape, pressure-sensitive adhesive.
- C. Primer: As recommended by sealant manufacturer for each type of working surface.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION:**

- A. Removing Existing Sealants:
  1. Cut-out and remove existing sealants.
  2. Exercise care not to damage existing adjacent surfaces.
  3. Remove and discard existing backer rods and bond-breaker tapes.
  4. Immediately place debris in covered containers and remove from site.
  5. Do not remove more existing sealant in one day than can be replaced with new sealant in same day.
- B. Cleaning Joint Surfaces:
  1. Clean joint surfaces free of dust, dirt, oil, grease, moisture and coatings.
  2. Clean joint surfaces free of existing sealant by mechanical abrasion.
  3. Remove residual dust and other foreign substances by blowing with high-pressure air.
  4. Thoroughly wipe surfaces with a heavy solvent wash using toluene or xylene on clean, lint-free cloths.
  5. Mask areas adjacent to joints as required, protecting adjacent surfaces.
- C. Priming: Prime joint substrate surfaces as recommended by sealant manufacturer. Apply specified primers in strict accordance with sealant manufacturer's written recommendations. Use correct primer for each substrate. Exercise care to prevent staining of surfaces.

### **3.02 JOINT SIZES:**

- A. Sealant: Minimum and maximum joint sizes and depth as recommended by sealant manufacturer. In vertical joints 1/2 in. and wider, depth shall be equal to 1/2 width with minimum depth of 1/4 in.

### **3.03 APPLICATION:**

- A. Joint Backing: Install joint backing to achieve required depth of joints. Do not puncture or twist backing material while installing. Where backing is not used, install bond-preventive material in joint.

- B. Sealant:
  - 1. Apply sealant within 8 hours after primer has dried.
  - 2. Apply sealant to joints using pressure gun with nozzle cut to fit joint width. Completely fill joint uniform and continuous, free of voids or gaps.
  - 3. If recommended by sealant manufacturer, dry-tool joints smooth and wrinkle-free.
  - 4. Install sealant in roofing related sheet metal where indicated.

**3.04 CLEANING:**

- A. Remove excess sealant and caulking materials from adjacent surfaces as work progresses. Use xylol or toluol solvent to remove sealant.
- B. Remove debris from site.

**END OF SECTION 07925**

SECTION 08100  
**METAL DOORS AND FRAMES**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all Hollow Metal Doors and Frames, complete in place, as shown on the Drawings and as specified herein.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**GENERAL REQUIREMENTS:**

All doors and frames specified herein shall be provided by one manufacturer.

Coordinate all doors and frames with FINISH HARDWARE and all miscellaneous items to be incorporated within or attached to items within this Section.

**SHOP DRAWINGS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Shop Drawings showing elevations of each door and frame design type, details of construction, anchorage and installation.

Complete materials list of items proposed for the Work of this Section.

Manufacturer's specifications and other data as necessary to demonstrate compliance with the specified requirements.

Manufacturer's recommended installation procedures.

**MATERIALS HANDLING:**

Use all means necessary to protect materials before, during, and after installation and to protect installed Work and materials of all other trades.

In the event of damage, immediately make all repairs and replacements necessary to approval of and at no additional cost to Brookshire's.

**MATERIALS:**

CECO Corporation is used to establish quality. Republic, Curries, and Dittco are acceptable as equal manufacturers. Other manufacturers will be considered for substitution. Designations for materials within this section are to be used unless specifically noted otherwise on the Drawings.

Hollow Metal Doors --

Imperial doors shall be 1-3/4" thick, of composite construction, and fabricated of two 16-gauge steel sheets. The interior of the doors shall be completely filled with a rigid urethane core foamed in place and chemically bonded to all interior surfaces. Urethane foam is to be self-bonding, self-hardening and self-extinguishing. The doors shall have flush seamless face sheets with mechanically interlocked vertical edges. Use for exterior unless noted otherwise.

Regent doors shall be 1-3/4" thick, of hollow metal construction, and fabricated of two steel sheets. Use 16-gauge for Masonry and 18-gauge for drywall. A one piece resin impregnated honeycomb core with sanded edges shall be securely bonded to both face sheets. The vertical

door edges shall be mechanically interlocked. All doors shall have flush seamless face sheets. Use for interior unless noted otherwise.

Pairs of doors shall have astragals:

4441 series for labeled fire doors

4451 series with wool pile strip for non-labeled, one leaf active, one inactive

4461 series with wool pile strip for non-labeled for both leaves active and at removable mullion.

Grilles/Louvers shall be series 4631 Fixed Grid for interior, 18"x 24" unless noted otherwise, and series 4634 Fixed Slat for exterior, 20"x 16" unless noted otherwise.

Hollow Metal Frames --

Double Rabbet, size and fire rating as scheduled on the drawings. 14-gauge for masonry and all fire rated frames, and 16-gauge for drywall frames unless noted otherwise on the drawings. Use SF Series 2"x 5-3/4" depth for masonry and 3-5/8" metal studs with single layer 1/2" gyp. board each side; and CF Series for all other applications unless noted otherwise.

Use 4" head at all exterior conditions unless noted otherwise.

**FIRE RATINGS:**

All labeled fire doors and frames shall be of a type which has been investigated and tested in accordance with UL- 10(b), ASTM E-152, NFPA 252, ANSI A2.2 and, when required, UL-305.

Underwriters Laboratories labeled doors and frames shall be manufactured under the UL factory inspection program and in strict compliance to UL procedures R-3791 (doors, hollow metal construction), R-5493 (doors, composite construction), R-3821 (fire door frames), and/or UL-63 Standard for Safety (fire door frames), and shall provide the degree of fire protection, heat transmission and panic loading capability indicated by the opening class.

A physical label shall be affixed to the fire door or fire door frame at an authorized facility as evidence of compliance with procedures of the labeling agency.

Any notation on the drawings or specifications for either door or frame requiring label shall be construed as both requiring the same rating.

Anchors for all frames shall be certified by the manufacturer as to the type, location, and spacing as appropriate for the installation, shall be factory attached and as acceptable to Brookshire's.

**FACTORY FINISH:**

All hollow metal shall be chemically treated for optimum paint adherence and painted a uniform coat of rust inhibiting quality primer, oven dried.

Prime finishes on all doors and series SF frames shall meet the ASTM humidity, salt spray, impact, and film adhesion test as required by ANSI A224.1-1980.

**FABRICATION OF DOORS:**

Fabricate doors to sizes shown; provide necessary clearances and bevels (1/8" in 2" unless noted otherwise) to permit operation without binding and to accommodate thresholds where required.

Include reinforcements and mortising for all required hardware, specified under Section FINISH HARDWARE.

Interior doors shall be fabricated from roller leveled, prime quality, cold rolled steel sheets. Exterior doors and interior doors noted as galvanized shall be fabricated from roller-leveled, prime quality, hot dipped galvanized steel sheets.

The top and bottom of the doors shall be closed flush by 16- gauge steel channels. Hinge reinforcements shall be 7-gauge steel, drilled and tapped by the manufacturer.

Closer Reinforcement shall be 12 gauge x 5" x 16" minimum.

Doors prepared for lites shall have the openings framed and securely attached. Glazing beads shall be the screwless snap-in type.

#### FABRICATION OF FRAMES:

Fabricate frames, moldings, reinforcements from either cold- rolled or hot-rolled steel (at fabricator's option).

Fabricate all exterior frames from commercial quality hot dipped galvanized steel which exhibits a smooth gray matte surface and which is chemically treated to promote good paint adhesion, including anchors and hardware reinforcing.

Frames shall be welded unit construction in sections as large as practical with field joints only at approved locations. Factory joints shall be continuously welded full length including returns, faces and integral stops. Any field joints shall fit to hairline joint over internal sleeve matching section profile.

Provide jamb anchors, spaced equally (30" max.) for wall attachment, factory welded into frame. Attachment shall be concealed unless specifically detailed otherwise on Drawings. Provide the following unless specifically noted otherwise:

##### *Masonry -*

- MT for Standard Jamb
- YS for Labeled Jamb
- FFA, SFA, or SLFA Floor Anchor, 14 ga.  
to concrete with 2 - Hilti HX 5/16 x 1 1/2.

##### *Metal Studs with Wood Blocking or Wood Studs -*

- WS or WSZS Jamb Anchors  
at 6" from top and bottom and equal spaces (30" max.). No floor anchorage.

##### *Metal Studs without Wood Blocking -*

- MS or MSZ2 Jamb Anchors  
at 6" from top and bottom and equal spaces (30" max.). No floor anchorage.

Make cutouts for required hardware specified under Section FINISH HARDWARE. Reinforcement shall be 7-gauge steel at butts and 12-gauge steel at strikes, drilled, tapped and welded in place. On single door frames, provide strike stops of frames with holes for 3 rubber door silencers; on double door frames, provide for 2 silencers per door at head.

Provide angle spreader for frames during shipping, handling, and installation.

#### GLAZING PROVISIONS:

Doors and frames shall be provided where required with glazing pockets to receive glazing as indicated on the Drawings and shall include all necessary trim for door lites and beads for glazed frame designs.

#### INSTALLATION:

Install frames plumb, level and rigidly secure in place. Properly brace, until built in. Backs of frames to any masonry or concrete shall be filled solid with mortar. Wherever surface mounting is indicated, plug countersunk anchors with metallic filler, finished smooth and flush with frame

surface. Door clearance of head and jambs shall be 3/32" plus or minus 1/32". Leave doors operating freely and without rattle when closed.

Install labeled fire doors, including all operating characteristics, labeled frames, and UL listed builders' hardware, shall be in accordance with NFPA publication No. 80 and No. 101 and with the codes of local authorities having jurisdiction

**ADJUSTMENT AND CLEANING:**

Check and adjust operating finish hardware items in hollow metal doors just prior to final inspections. Leave Work in complete and operable condition. Remove and replace defective Work, such as warped, bowed or otherwise damaged doors.

Immediately after installation, sand smooth all rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

*- END OF SECTION 08100 -*



**SECTION 08210**  
**WOOD DOORS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Furnish and deliver to the site all Wood Doors indicated on the Drawings, specified herein or required for the completed installation.

**REFERENCE STANDARDS:**

All wood doors shall bear the Window & Door Manufacturers Association seal of approval and meet or exceed I.S. 1-80 Series and AWI Requirements. Any fire doors shall also bear the UL label for the designated rating.

**GUARANTEE:**

As a condition of acceptance of the specified doors at the site, deliver to Brookshire's two copies of an agreement written on the door manufacturer's standard form, signed by the door Manufacturer and the Contractor, agreeing to replace or repair doors which have warped (bow, cup or twist) or which show telegraphing of inner construction in veneer faces, as defined in WDMA Standard Door Guarantee, except the WDMA provision for refunding the price received by the door Manufacturer for any defective door shall not apply. Guarantee shall also include any refinishing and reinstalling required due to repair or replacement of defective doors. Guarantee shall be in effect for a period of five years for solid core and 2 years for hollow core from date of acceptance.

**SUBMITTALS:**

Comply with provisions of SUBMITTALS.

Within 45 calendar days of Contract award, submit:

- Complete materials list of items proposed for furnishing and delivering under this Section.
- Sufficient data to demonstrate that all such items meet or exceed the specified requirements.
- A copy of the proposed guarantee.

**MATERIALS HANDLING:**

Protect the materials of this Section during transit, storage, and handling to prevent deterioration, damage, soiling.

Package each door at the factory in a separate heavy paper-type carton. Mark each carton for location to correspond with opening number on the Drawings.

Store doors flat on a level surface in a dry, well-ventilated environment. If doors are stored at the job site for more than one week, all edges should be sealed. Handle unfinished doors with clean gloves and take appropriate care to eliminate marring or smudging. Blemishes to facings which cannot be removed by light sanding will be cause for rejection of the door.

In the event of damage, immediately make all repairs and replacements necessary to approval of Brookshire's.

**DELIVERY:**

Deliver all doors to the site in such manner as to permit orderly progress of the total Work.

**MATERIALS:**

Weyerhaeuser is used to establish quality. All doors are 1-3/4" thickness, Premium Grade, Rotary Cut, Natural Birch, unless specifically noted otherwise.

- Solid Core Unrated: DPC-1
- Solid Core 20 and 30 Minute: DFP-20/30
- Solid Core 45, 60 and 90 Minute: DFM-45, DFM-60, and DFM-90
- Hollow Core: DHC-2

**INSTALLATION:**

The utility or structural strength of the door must not be impaired in the fitting of the door, the application of hardware, or cutting and altering the door for lights, louvers, or other special details.

Allow a fitting clearance of 1/8" at each side and at the top.

Three hinges for doors 7'-0" in height or less. Allow one additional hinge for each additional 30" of door height or fraction thereof.

Interior doors should not be subjected to extremes of heat and/or humidity conditions. Relative humidity should not be less than 30 percent or more than 60 percent.

Manufacturer's Care and Handling brochure for size of pilot holes and correct hardware shall be used.

- END OF SECTION 08210 -

SECTION 08330  
**ROLLING DOORS & SHUTTERS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Sectional Doors and Accessory Work as shown on Drawings and as specified herein.

The purchase and installation of ALL Rolling Door Materials and Devices designated as "Overhead Door Corporation" within this Specification Section shall be through "Brookshire's National Accounts Program" as established with Overhead Door Co. of Tyler. Contact Ken Townsend, 903/561-3483, 2000 Anthony Dr., Tyler, TX 75703.

**SHOP DRAWINGS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Shop Drawings shall show elevations of each door design type, details of construction, anchorage and installation.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

**COORDINATION:**

Coordinate with all other trades whose Work relates to Sectional Doors and Accessory for placing of all required backing, attachments, furring, etc., to insure proper locations.

**DELIVERY AND STORAGE:**

Deliver and store materials in dry, protected areas. Keep free of corrosion or other damage. Replace any damaged parts at no cost to Brookshire's.

**MATERIALS:**

Products of "Overhead Door Corporation" and "QMI Roll Shutter Supply" only are acceptable, no others will be considered.

*Rolling Steel Slat Door (Exterior Non-Rated) --*

"Overhead Door Corporation"

Type: 620 Series Stormtite size as indicated on the Drawings.

Curtain: Flat profile type FE-265 interlocking roll-formed slats, 14 gauge Mill Finish aluminum. Wind load minimum design of 20 psf with maximum horizontal deflection of 1/120 of width. Double Angle Steel Bottom Bar with Interior bottom bar slide bolts both sides prepped for padlocking to guides.

Standard Guides: "Angle Guide" style constructed of 3 Structural Steel Angles (minimum sizes of 3" x 3" x 3/16" at wall, 2 1/2" x 2" x 3/16" center, and 4" x 3" x 1/4" at outer) continuous from floor to top of hood, factory assembled and painted. All installations shall be "Face of Wall" style, welded securely, and grind smooth, to Steel Framed Opening, unless indicated otherwise on the Drawings.

Weatherseal: Manufacturer's standard Vinyl bottom seal, exterior guide, lintel baffle and internal hood baffle.

Vision Lites: 3" x 5/8" uniformly spaced factory punched openings with internal clear plexiglas covers for 2 each Slats most near 45" AFF and 62" AFF, unless specifically noted otherwise on the Drawings.

Springs: 50,000 cycle springs.

**INSTALLATION:**

Install Sectional Doors and Accessory per manufacturer's printed instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.

Install in a sturdy, substantial manner, straight, true and plumb. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.

For all welding performed by this Contractor, grind smooth and properly prime.

CLEAN-UP: Per GENERAL CONDITIONS.

- END OF SECTION 08330 -

SECTION 08385  
**SEMI-FLEXIBLE, INSULATED DOUBLE ACTING IMPACT TRAFFIC DOORS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all double acting, self-closing, fully insulated, 1-1/2" thick, impact traffic doors, complete in place, as shown on the Drawings and as specified herein.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**GENERAL REQUIREMENTS:**

All doors specified herein shall be provided by one manufacturer.

Coordinate all doors and all miscellaneous items to be incorporated within or attached to items within this Section.

**SHOP DRAWINGS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Shop Drawings showing elevations of each door design type, details of construction, anchorage and installation.

Complete materials list of items proposed for the Work of this Section.

Manufacturer's specifications and other data as necessary to demonstrate compliance with the specified requirements.

Manufacturer's recommended installation procedures.

**MATERIALS HANDLING:**

Use all means necessary to protect materials before, during, and after installation and to protect installed Work and materials of all other trades.

Verify doors were shipped in upright position. Note specific doors shipped in other than upright position on bill of lading and contact manufacturer.

In the event of damage, immediately make all repairs and replacements necessary to approval of and at no additional cost to Brookshire's.

Store in upright position and follow manufacturer's instructions printed on carton.

**MATERIALS:**

RubbAir Door is used to establish quality. Other manufacturers will be considered for substitution. Designations for materials within this section are to be used unless specifically noted otherwise on the Drawings.

Door shall be models Brookshire's Ultra-Lite-NG and Brookshire's Ultra-Lite-G; and shall be Black in color. Brookshire's Ultra-Lite-NG shall be used where a Non-insulated door is indicated on the Drawings. Brookshire's Ultra-Lite-G shall be used where an Insulated door is indicated on the Drawings.

Door shall have high strength polymer cell core, 0.125 inch thick thermoplastic facing on both sides, and a total door thickness of 1-1/2" with heavy duty mounting screws included.

Door shall be supplied with 9" wide x 36" height window with the bottom of window at 42" above finished floor with continuous black rubber molding. Glazing shall be clear double glazed acrylic.

Door shall include 0.25 thick high impact resistant thermoplastic "Easy Spring" bumper that is 24" height and shall be black in color.

Door hardware shall be zinc coated double action "Easy Swing" hinges.

Door seals shall allow less than 5 cfm air infiltration per linear foot of seal per ASHRAE Bulletin 90-75. Door shall include full perimeter gasket, factory installed. Perimeter gasket shall only be used where an Insulated door is indicated on the Drawings.

#### FABRICATION OF DOORS:

Fabricate doors to sizes shown on Drawings and provide necessary clearances to permit operation without binding.

Fabricate door components without visible fasteners on face into 1-1/2" thick unitized assembly with facings sonic welded to frame. Secure hardware assembly to door with 3" steel screws through edge of door into internal sub blocking. Secure windows and all features to door using stainless steel and zinc coated fasteners.

Fabrication tolerances shall be within +0, -1/8" for the width and height of each leaf.

#### INSTALLATION:

Examine opening in which door will be installed. Do not install door until frame has been properly installed. Notify Brookshire's of unsatisfactory preparation before proceeding. Starting Work under this Section implies acceptance of opening conditions.

Install doors with necessary anchors, hardware and accessories. Install plumb and level. Follow manufacturer's instructions.

#### ADJUSTMENT AND CLEANING:

Clean and lubricate operating parts per manufacturer's instructions. Adjust to open and close smoothly and freely without binding. Check seals for proper fit. Leave Work in complete and operable condition.

Remove and replace defective Work, such as warped, bowed or otherwise damaged doors.

Clean all surfaces soiled by Work. Remove all surplus materials and debris from the site.

- END OF SECTION 08385 -

SECTION 08400  
**ENTRANCE DOORS & STOREFRONTS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Entrance Doors, Aluminum Storefront Framing and all Appurtenances shown on Drawings and as specified herein.

**SHOP DRAWINGS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Submit Shop Drawings of all specified Work showing sizes, methods of construction, connection to adjacent members and installation.

**SAFETY STANDARDS:**

All framing, doors, operators, electronics, and devices shall be manufactured and installed per all applicable codes and standards, including but not limited to the latest edition of:

- Americans with Disabilities Act (ADA)
- ANSI (American National Standards Institute)/BHMA A156.10
- BHMA (Builders Hardware Manufacturers Association) 1601

**GUARANTEE:**

Per GENERAL CONDITIONS.

Door Control Services Inc. and Record-USA shall be used to establish quality of automatic doors and operating devices. Others will be considered for substitution unless noted otherwise.

Warranty shall be for 100% repair or replacement of all parts and labor for the following period of time from the date store opens for business:

- 18 months for all mechanical and electronic operation devices, components, and wiring furnished within this Section.

**MEASUREMENTS:**

Verify all dimensions by taking field measurements; proper fit and attachment of all component parts is required.

**RESPONSIBILITY:**

Assume sole responsibility for final construction, erection and weathertightness of the complete framing system, including all component parts and connections.

**COORDINATION:**

Coordinate Work and scheduling of the Work of this Section with other trades for coordination of size of reveals, locations of anchorage, etc.

**INSPECTION:**

Examine all subsurfaces to receive Work and report in writing to General Contractor, with a copy to Brookshire's, any conditions detrimental to Work. Failure to observe this injunction constitutes a waiver to any subsequent claims to the contrary and will make this Contractor responsible for any corrections Brookshire's may require. Commencement of Work will be construed as acceptance of all subsurfaces.

**DELIVERY AND STORAGE:**

Deliver and store materials in dry protected areas. Remove any damaged items from site and replace at no cost to Brookshire's.

**CAULKING AND SEALANTS:**

Install as per Section CAULKING AND SEALANTS.

## GENERAL DESIGN AND FABRICATION CRITERIA:

Members shown on Drawings are diagrammatic only; perimeter dimensions of member shown on Drawings shall be maintained in final design of Work.

Extrusions shall be 6063-T5 alloy and temper (ASTM B221 alloy G.S. 10A-T5). Fasteners shall be aluminum, stainless steel or plated steel in accordance with ASTM A 164. Perimeter anchors shall be aluminum or steel, providing the steel is properly isolated from the aluminum.

Provide all flashing, drainage or drip systems as detailed and as required of same material as framing. Allow for seepage of infiltrated water and condensation from within members.

Allow for expansion and contraction due to temperature variation and building movement, taking into account the climatic conditions.

Connect to supporting structure so as to properly carry all vertical and horizontal loads. Design horizontal members so as to carry the vertical load tributary to them.

## MATERIALS:

Kawneer, Record-USA and Vistawall are used to establish quality. Other manufacturers will be considered for substitution of aluminum framing systems. Record-USA only are acceptable as manufacturers for operation devices.

### *Aluminum Storefront -*

Kawneer Trifab 450, 1-3/4" x 4-1/2" Screw Spline System as follows, unless specifically noted otherwise on the Drawings or code requires greater wind loading:

- Head/Jamb - 450-001
- Vertical Mullion - 450-005
- Horizontal Mullion - 450-002/003/004
- Sill - 450-003/004/037
- Door Head w/o Transom - 450-503
- Door Head w/ Transom - 450-001/026
- Door Jamb - 450-019
- 4x4 at Door w/o Sidelight - 60-119
- 4x4 at Door w/ Sidelight - 450-015/017
- Sidelight Base - 450-004(2)/027/037/109
- 4x4 at Corner - 450-016/017

Natural Aluminum Finish: All exposed surfaces shall receive #17 Clear caustic etch followed by anodic oxide treatment to obtain Architectural Class II clear anodic coating conforming to Aluminum Association Standard AA-M12 C22 A31.

Dark Bronze Anodized Finish: All exposed surfaces shall receive Architectural Class I #40 Permanodic Dark Bronze anodic coating conforming to Aluminum Association Standard AA-M12 C22 A42/44.

All aluminum framing shall be accurately assembled with unexposed fasteners utilizing extruded splines, clips and/or snap-in features. All glazing shall be flush, including the horizontal muntins and sills, and shall have removable stops to facilitate glazing. Glass shall be set in the center of the section. Glass shall be held in place by elastomeric glazing gaskets on both sides. No applied stops shall be permitted.

### *Automatic Entrance Sliding Doors -*

Record-USA Series 5100 Automatic Sliding Doors with overhead concealed electro-mechanical operator, BEA Wizard Motion and Presence Detector automatic sliding door system consisting of:

- Aluminum frames and doors, including top and bottom pivots and breakaway hardware.
- Sliding door operator with electronic controls.
- Operator housing, guide rollers, door carriers.



- Emergency breakaway side lights.

Doors shall be provided with one pair each door 36" height x 36" length side rails both interior and exterior with intermediate cross bar, aluminum threshold and 1" finger guards.

All exposed surfaces shall receive anodic treatment to obtain Architectural Class and Color as called for in Aluminum Flush Glazing.

All extruded members serving as structural support shall be of 6061-T5 alloy and shall be capable of spanning 15'-0" without the use of intermediate supports. The sliding door tracks shall be anodized.

Door carriers shall incorporate two roller wheels per door leaf. Carrier shall also incorporate two anti-rise wheels per leaf. Roller wheels and anti-rise wheels shall be Delrin, shall incorporate sealed, oil impregnated bearings and shall have 3/8" vertical and lateral adjustment with positive mechanical lock.

Vertical jambs shall be 1-3/4" x 4-1/2" one-piece tube. The header shall be a nominal 6" x 8" section and shall require a two-piece bolt-on cover. Extruded sections used for door leaf fabrication shall be of narrow stile configuration measuring 2-1/4" x 1-3/4". Top rails shall be 2-1/2" in width for active leaf and 3-7/16" for sidelight. All bottom rails shall be 4".

The door system shall be equipped with heavy weather pile between the doors and sidelights, between emergency breakaway hardware and door stiles. The package shall exceed ASHRAE Standard 90-75 for air leakage.

Each slide door system shall include one motion detector each side, located in a central position to the traffic pattern and provide a signal to the door operator when the zone is intruded by persons or objects. Furnish one 4 position Key Switch per unit having "off", "automatic", "exit only", and "open" features. Install switch in Jamb at 72" AFF on inside face on side directed by Brookshire's.

System shall be equipped with emergency release hardware which allows for the active leafs to swing out in the direction of egress. Emergency release hardware shall consist of top and bottom pivot and shall include an Underwriters' Laboratories listed breakaway release latch. Sidelights shall allow for active door leaf(s) to swing out 90 degrees from any position in the sliding mode. Breakaway pressure shall be in accordance with ANSI Standard 156.10 and BHMA 1601 Protection Standards.

The breakaway feature shall allow doors to swing in the direction of egress, with forces that comply with BHMA 1601 Protection Standards, in accordance with all applicable local codes and national standards.

#### INSTALLATION:

Installation, glass and glazing shall be performed by experienced technicians, according to the manufacturer's recommended procedures. All units shall be securely anchored with all joints fully caulked to insure a water tight seal.

Protect all Work from corrosion or galvanic action which may be caused by any material adjacent thereto. Any steel supporting work shall be prime coated before installation.

Provide shims and anchors as required so work is plumb, level, true, firmly fastened and fully operable at completion.

#### PROTECTION:

At completion of installation protect all members against damage by other trades. Mark glass by application of decals. Remove protection for final inspection and acceptance.

All exposed framing surfaces shall be free of scratches and other serious blemishes.

CLEAN-UP: Per GENERAL CONDITIONS.

*- END OF SECTION 08400 -*

**SECTION 08700  
FINISH HARDWARE**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide at the job site all Finish Hardware required to complete the Work as indicated on Drawings, Drawing Schedules and as specified herein. Provide all trim attachments and fasteners specified or required for complete installations.

**SUBMITTALS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Submit manufacturer's specifications, catalog cuts and any other data required to demonstrate compliance with this Section. Submittals shall reference all items by Set Number and individual hardware item codes. All boxes shall be clearly marked with codes at job.

To ensure orderly progress of the Work, deliver Templates or physical samples of approved Finish Hardware items to the appropriate manufacturers of interfacing items such as doors and frames.

**MANUFACTURER QUALIFICATION:**

Each system, material, product used in the Work shall be as regularly produced by a manufacturer with a history of supply acceptable to Brookshire's. Abbreviations and approved manufacturers are as follows:

Ada = Adams Rite	Nor = Norton
Arw = Arrow Lock	Pem = Pemko
Bst = Stanley Best Access	Pre = Precision
C/R = Corbin-Russwin	Sch = Schlage Lock
Cst = Custom Made Product	Sec = Security Door Controls
Det = Detex	SqD = Square D Electrical
Edw = Edwards	Sta = Stanley Hardware
Hag = Hagar	Tri = Trimco
Ive = Ives Manufacturing	

**MATERIALS:**

Furnish hardware sets as listed and scheduled on the plans unless specifically noted otherwise.

**DELIVERY AND HANDLING:**

Stockpile all hardware items sufficiently in advance to guarantee availability and make all deliveries so as to ensure orderly progress of the entire Work.

Individually package each unit of Finish Hardware complete with fasteners and accessories, clearly marked on the outside to indicate contents, hardware schedule identification and location in the Work.

Use any means necessary to protect materials of this Section before, during and after delivery to job site, and to protect the Work and materials of all other trades.

In the event of damage, immediately make all repairs and replacements necessary to approval of and at no additional cost to Brookshire's.

**FASTENERS:**

Where necessary, furnish fasteners with expansion shields, toggle bolts, sex bolts and other anchors approved by Brookshire's, according to the material to which hardware is to be applied and the recommendations of the hardware Manufacturer. All fasteners shall harmonize with hardware in material and finish.

**SUPPLEMENTAL ITEMS:**

Any miscellaneous items, not specifically described or scheduled but required for the complete installation of all Finish Hardware, shall be as selected by Contractor subject to approval of Brookshire's.

**INSTALLATION INSPECTION:**

On completion of installation, and as a condition of acceptance, visually inspect all Finish Hardware furnished under this Section and put in optimum working condition.

**TOOLS AND MANUALS:**

Furnish Brookshire's one complete set of adjustment tools and one set of maintenance manuals for locksets, latchsets and any scheduled cylinders, bolts, closers, panic devices and the like.

*- END OF SECTION 08700 -*

**SECTION 08800**  
**GLAZING**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all Glass and Glazing, complete in place, as shown on the Drawings and as specified herein.

**REFERENCE STANDARDS:**

Comply with all applicable standards of the Flat Glass Marketing Association's "Glazing Manual".

All glass and glazing materials and installation shall be in conformance with U.S. Consumer Product Safety Commission Standard 16CFR 1201 C I and C II.

Heat strengthened and tempered glass shall meet ANSI standard Z 97.1.

**SUBMITTALS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Complete materials list of all items proposed for the Work. Sufficient data to demonstrate that all such materials meet or exceed specified requirements.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

**DELIVERY AND STORAGE:**

Do not store glazing on site. Materials shall be transported directly from vehicle to their installation point in one continuous operation.

**MATERIALS HANDLING:**

Provide all means necessary to protect the materials of this Section before, during and after installation.

In the event of damage, immediately make all repairs and replacements necessary to approval of and at no additional cost to Brookshire's.

**MATERIALS:**

PPG Industries is used to establish quality. Guardian, LOF, DuPont, and Ford are acceptable as equal manufacturers. No others will be considered.

*Tempered Glass -*

1/4" minimum thickness per Federal Specification DD-G-451d, 89% minimum daylight transmittance. Use as noted on the Drawings; and for all doors, sidelights and glazing at locations required by CPSC Standard 16 CFR 1201 CI and CII.

*Storefront Glass and Entrance Door Glass -*

Versalux Grey 2000, 1/4", shading coefficient of 0.59, solar heat gain coefficient of 0.54.  
AFGD Grey, 1/4", shading coefficient of 0.69, solar heat gain coefficient of 0.59.

*Plexi-Glass -*

1/4" minimum thickness Lexan MR 10, mar-resistant.

**INSPECTION:**

Examine all surfaces to receive the Work and report in writing to Brookshire's through the General Contractor any detrimental conditions. Failure to observe this injunction constitutes a

waiver to any subsequent claims to the contrary and holds Contractor responsible for any corrections Brookshire's may require. Starting of Work will be construed as acceptance of subsurfaces.

**INSTALLATION:**

Prepare all glass and surrounds, unless otherwise directed, in conformance with the details and general conditions governing glazing in the FGMA Glazing Manual.

Install Glass types at locations shown on Drawings and according to glass manufacturer's recommended maximum size limitations and placement of setting blocks. Make all adjacent glass in same glazed areas consistent in type and thickness unless otherwise noted or directed.

Glazing installed in hollow metal frames shall be set in bed of sealant. This installer shall be responsible for the weather-tight integrity of glazing-to-frame.

Items to be glazed shall be shop-glazed or field-glazed with glass of the qualities and thickness specified. Use beads or stops furnished with the items to be glazed to secure glass in place. No glazing shall be less than 1/4" thickness unless specifically noted.

Keep labels indicating manufacturer, quality and thickness on glass until installation has been approved by Brookshire's.

**CLEAN-UP:**

Per GENERAL CONDITIONS, and prior to acceptance of the Work, thoroughly clean all glass and remove all labels, paint spots, putty and all defacements. Replace any scratched, defective or broken glass caused by installation at no cost to Brookshire's.

*- END OF SECTION 08800 -*

SECTION 09250  
**DRYWALL**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide, in place, all Drywall Work and accessories as shown on Drawings, as specified herein, and as required for the complete installation.

**REFERENCE STANDARD:**

Comply with all applicable requirements of Gypsum Association (GA) GA-216 "Recommended Specifications for the Application and Finishing of Gypsum Board", except where more stringent requirements are called for herein, in local codes, or by wallboard manufacturer.

**SUBMITTALS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Submit complete materials list of all items proposed for the Work of this Section and manufacturer's specifications and all other data required to demonstrate compliance.

**MATERIALS HANDLING:**

Use necessary means to protect all materials before, during and after installation and to protect installed Work of all other trades.

In event of damage, immediately make all repairs and replacements necessary to the approval of and at no cost to Brookshire's.

Deliver all materials to job site in original unopened containers with all labels intact and legible at time of use. Store in strict accordance with manufacturer's recommendations.

**PRECONDITIONS:**

All Work herein requires coordination with trades whose work connects with, is affected or concealed by, drywall. Prior to drywall installation, carefully inspect the installed Work of all other trades and verify such Work is complete and that drywall may be installed in strict accordance with all pertinent codes and regulations, and manufacturer's recommendations.

**MATERIALS:**

US Gypsum is used to establish quality. Unimast Incorporated, Georgia Pacific and Gold Bond are approved as equal manufacturers. No others will be considered for substitution.

*Standard Gypsum Board --*

- 1/2" thickness type SW, unless noted otherwise on the Drawings.

*Fire Code Gypsum Board --*

- Conforming to ASTM C-36 for Type X, 5/8" thickness type Fire Code "C", unless noted otherwise on the Drawings.

*Dens Exterior Sheathing --*

Georgia-Pacific DensGlass Exterior Guard Gold

- 1/2" thickness, unless noted otherwise on the Drawings.

*Water-Resistant Gypsum Board --*

- 1/2" thickness, unless noted otherwise on the Drawings.  
Interior - type W/R  
Exterior - Gyp-Lap gypsum sheathing.

*Screws --*

Use size, type and length as per "Selector Guide for USG Screws" at all other applications, unless specifically noted otherwise.

- Super-Tite II for interior gypsum board to steel studs.
- Type S-12 Climaseal for WR board.
- Type S-12 Climaseal pancake head for masonry ties and accessories to W/R board.

*Metal Studs --*

All Studs and Runners shall be 20 gauge minimum. "Unless noted otherwise" shall only be applicable if notation is for gauge to be of greater thickness.

- 1-5/8", 2-1/2" & 3-5/8": Type ST Studs and CR Runners, 20 gauge, at 16" centers; unless noted otherwise.
- 4" & 6" Metal Studs: Type CS punched studs and CR Runners, 18 gauge, at 16" centers, unless noted otherwise.
- 8" Metal Studs: Type SJ punched studs and CR Runners, 18 gauge, at 16" centers, unless noted otherwise.

*Corners --*

- Dur-A-Bead, #800, or #900

*Edges --*

- #400 series metal trim

*Control Joints --*

- #093, 1/4" opening, 7/16" deep, 30' o.c. maximum spacing, unless noted otherwise on the Drawings.

*Furring Channels --*

- DWC-25, 7/8" x 2-9/16", 25 gauge, unless noted otherwise on the Drawings.

*Suspension Channels --*

- 3/4", 1-1/2" or 2", 16 gauge cold rolled channels as noted on the Drawings.

*Hanging Wire --*

- 9 ga. galvanized for suspension and double 18 ga. galvanized for ties.

*Wire Cloth --*

- 4" x 4" mesh spacing, 6 gauge wire diameter (unless noted otherwise on the Drawings), Pre-Galvanized Welded Industrial Grade wire fencing material as manufactured by McNichols Co., or approved equal.

**INSTALLATION:**

Install drywall with the separate boards in moderate contact; not forced into place. Stagger boards so corners of any four boards will not meet a common point except in vertical corners. Do all cutting required to accommodate Work of other trades to fit within 1/4". Patches will be allowed only for configurations which cannot be fitted within joining of whole pieces and only where approved by Brookshire's.

Install drywall ceilings, where indicated, with long dimension of board at right angles to supporting members, except that board may be installed with long dimension parallel to any supporting members that are indicated as spaced 16" on center, when attachment members are



provided at end joints. For suspended gypsum board ceilings not indicated otherwise on the Drawings, use USG furring channels at 16" o.c. to suspension channels with USG metal furring channel clips or double strand tie wire. Use 2" suspension channels at 4'-0" o.c. maximum spacing and within 6" of ends. Suspend from structure with 9 ga. galvanized wire at 4'-0" o.c. maximum spacing and within 6" of ends. Provide extra support at light fixtures, grilles, etc. per US Gypsum printed recommendations.

If framing members are out of alignment, bowed or warped, correct to make true surfaces before application of board; use correction method or replace as directed by Brookshire's. Make finish walls and ceilings plumb and level, free of unevenness at joints and without ridges, bows or warps.

Attachment/Anchorage shall be in accordance with USG printed specifications and installation instructions.

*Internal Corners --*

Per GYPSUM BOARD TAPING AND FINISHING.

*External Corners --*

Metal corner trim is required at all external corners. Fit corner bead neatly over corner; secure with same type fasteners used for wallboard, spacing fasteners approx. 6" on center and anchoring through wallboard into framing or furring member.

*Metal Edge Trim --*

Is required where gypsum board adjoins all other materials and as otherwise indicated on the Drawings. Allow 1/16" to 1/8" unobstructed gap between trim and other material. Install metal trim in strict accordance with manufacturer's recommended installation methods.

*Control Joints --*

Install at 30' o.c. maximum horizontal spacing, unless noted otherwise on the Drawings, for all walls, furr-downs, and ceilings in excess of 30' in any dimension. Exact locations of all control joints shall be acceptable to Brookshire's.

Furnish double studs, furring channels, etc. as applicable to the installation and interrupt gypsum board surface per manufacturer's printed installation standards or as detailed on the Drawings.

**CLEAN-UP:**

Per GENERAL CONDITIONS.

Use all necessary care during execution of the Work of this Section to prevent undue scattering of drywall scraps and dust and to prevent tracking of joint and finishing compounds onto floor surfaces.

At the end of every day, all metal cuttings and shavings resulting from metal stud fabrication shall be swept up and removed from the building to protect the surface of the concrete slab from rust stains.

On completion of each installation segment in a room or space, promptly pick up and remove from the working area all excess compound, dust, scraps, debris and surplus materials prior to commencing next segment.

- END OF SECTION 09250 -

**SECTION 09305  
CEMENT BOARD**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide, in place, all Work and accessories as shown on Drawings, as specified herein, and as required for the complete installation.

**REFERENCE STANDARDS:**

- Comply with all applicable Federal, State and local codes, safety regulations, and all other references herein. In any conflict between referenced standards and this specification, the more stringent requirements shall govern.
  
- American National Standards Institute (ANSI):
  - ANSI A108.11 – Specifications for Interior Installations of Cementitious Backer Units.
  
  - ANSI A118.9 - Specification for Cementitious Backer Units.
  
- American Society for Testing and Materials (ASTM):
  - ASTM C954 - Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 inch to 0.110 inch in Thickness.
  
  - ASTM C1002 – Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  
  - ASTM C1280 – Standard Specification for Application of Gypsum Sheathing.
  
  - ASTM C1325 – Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Interior Substrate Sheets.
  
  - ASTM D226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
  
  - ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
  
  - ASTM E119 – Test Method for Fire Tests of Building Construction and Materials.
  
  - ASTM E1677 – Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls.
  
- Gypsum Association (GA):
  - GA 253 – Recommended Specification for the Application of Gypsum Sheathing.

**SUBMITTALS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Submit complete materials list of all items proposed for the Work of this Section and manufacturer's specifications and all other data required to demonstrate compliance.

**MATERIALS HANDLING:**

Use necessary means to protect all materials before, during and after installation and to protect installed Work of all other trades.

In event of damage, immediately make all repairs and replacements necessary to the approval of and at no cost to Brookshire's.

Deliver all materials to job site in original unopened containers with all labels intact and legible at time of use. Store in strict accordance with manufacturer's recommendations.

**PRECONDITIONS:**

All Work herein requires coordination with trades whose work connects with, is affected or concealed by cement board. Prior to cement board installation, carefully inspect the installed Work of all other trades and verify such Work is complete and that cement board may be installed in strict accordance with all pertinent codes and regulations, and manufacturer's recommendations.

**MATERIALS:**

US Gypsum DUROCK Brand cement board is used to establish quality. Other manufacturers will be considered for substitution.

*Standard Cement Board -*

1/2" thickness, unless noted otherwise on the Drawings.

*Screws -*

Use DUROCK Brand Steel or USG Sheathing SF steel drill screws with corrosion-resistant coating, size and length as per "Selector Guide for USG Screws" at all applications, unless specifically noted otherwise.

**INSTALLATION:**

Install cement board leaving a 1/8" to 3/16" space at all joints and corners. Stagger boards so corners of any four boards will not meet a common point except in vertical corners. Do all cutting required to accommodate Work of other trades to fit within 1/4". Patches will be allowed only for configurations which cannot be fitted within joining of whole pieces and only where approved by Brookshire's.

If framing members are out of alignment, bowed or warped, correct to make true surfaces before application of cement board; use correction method or replace as directed by Brookshire's. Make finish walls plumb and level, free of unevenness at joints and without ridges, bows or warps.

Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

Attachment/Anchorage and filling all joints shall be in accordance with manufacturers printed specifications and installation instructions.

**CLEAN-UP:**

Per GENERAL CONDITIONS, and use all necessary care during execution of the Work of this Section to prevent undue scattering of cement board scraps and dust and to prevent tracking onto floor surfaces. On completion of each installation segment in a room or space, promptly pick up and remove from the working area all excess dust, scraps, debris and surplus materials prior to commencing next segment.

- END OF SECTION 09305 -

**SECTION 09330**  
**TILE**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Tile Work as shown on Drawings and as specified herein.

**SAMPLES:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Submit two samples of each type of tile specified. Mark with manufacturer's name and space where tile is to be installed.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**COORDINATION:**

Coordinate all with other Trades whose Work affects, connects with or is concealed by tile installations. Before proceeding, make certain all required inspections have been made.

**INSPECTION:**

Examine all subsurfaces to receive Work and report in writing to General Contractor, with a copy to Brookshire's, any conditions detrimental. Failure to observe this injunction constitutes a waiver to any subsequent claims. Commencement of Work will be construed as acceptance of all subsurfaces.

**DELIVERY AND STORAGE:**

Deliver all manufactured materials in original, unbroken containers bearing name of manufacturer, brand and grade seals. Keep materials dry, clean and protected against deterioration in any form.

**STANDARDS:**

Conform with all applicable requirements of the latest Edition of American National Standards Institute (ANSI) A-108 Series and the "Tile Handbook" of the Tile Council of America. Tile shall bear the seal of Tile Council of America, Inc. and be equal to or exceed Standard Grade. Have all tiles set by expert journeymen tile setters.

**MATERIALS:**

Laticrete International, Inc. is used to establish quality for mortars, grouts, and additives, others will be considered for substitution, unless otherwise noted.

Ceramic Floor, Wall Tile and Base –

Color and size as indicated on the Drawings, no substitutions. Furnish bullnose, caps, corners, and the like as detailed on the Drawings and as necessary for a complete installation.

Standard "Non-Skid" Quarry Tile -

Sure Step series, 6" x 6" square x 1/2" thick unglazed, square edge quarry tile. Color as indicated on the Drawings, no substitutions.

Quarry Tile Base -

Cove Round Top 5" x 6" square (unless noted otherwise on the Drawings) x 1/2" thick unglazed of runners, in/out corners, etc as necessary for complete installation. Color as indicated on the Drawings, no substitutions.

Latex Mortar Additive -  
Laticrete 333, Super Flexible liquid mortar additive.

Standard Floor & Base Mortar -  
Laticrete 317 Floor N' Wall Thin-Set Mortar, others will be considered for substitution, color Grey (Natural).

Standard Wall Mortar -  
Laticrete 317 Floor N' Wall Thin-Set Mortar, others will be considered for substitution, color Grey (Natural).

Epoxy Mortar -  
Laticrete LATAPOXY 300 Epoxy Adhesive, no others will be considered for substitution.

Epoxy Floor and Wall Grout -  
Laticrete SpectraLOCK PRO Grout Part AB Liquids, no others will be considered for substitution. Color shall be as indicated on the Drawings, no substitutions.

Epoxy E.J. Sealant -  
Sonneborn, Sonolastic SL-1, no substitutes, one-part, urethane, self-leveling, color gray.

#### SYSTEMS:

Unless specifically noted otherwise on the Drawings, the following combinations of materials shall be used --

Ceramic Floor Tile & Base -  
- Standard Mortar with Latex Additive (water allowed) for Floor & Base  
- Epoxy Grout for Floor & Base

"Non-Skid" Quarry Tile Floor & Base -  
- Standard Mortar with Latex Additive (100% - no water) for Floor  
- Standard Mortar with Latex Additive (100% - no water) for Base at all wall surfaces, except Epoxy Mortar at Base to Metal Cooler/Freezer Panels without Concrete Curb  
- Epoxy Grout for all Floor & Base

Wall Tile & Glazed Wall Tile Style Base -  
- Standard Mortar  
- Epoxy Wall Grout

#### INSTALLATION:

Lay out all Work so that where possible no tiles less than half size occur, and cuts of equal size occur at opposite walls or obstructions at which tile pattern ends. In any event install no half tiles above first course up from the bottom or away from first vertical course at internal and external corners. Align all joints, vertically and horizontally. Cut and drill neatly without marring tile. Rub smooth any necessary cuts with a fine stone and set no cut edge against any fixture, cabinet, or other tile without a joint from 1/16" minimum to 1/8" maximum width. Cut, fit, adjust, and establish tiles neatly and accurately to accommodate accessories, interruptions, chases, returns, mechanical and electrical outlets, and finish at their exact location (as determined by job-site conditions).

Maximum finished surface variation shall be 1/8" plus or minus in 10 feet horizontal, and 1/16" plus or minus in 4 feet vertical, when a straightedge is laid on the surface. Joint spacing shall be per manufacturer's standard for pre-mounted Glazed Wall and Ceramic Mosaic Tiles with 1/32" plus to minus maximum variation in joint size. Joint spacing for Quarry Tile and Base shall be 3/16" width, with 1/32" plus to minus maximum variation in joint size.

Provide all required trim pieces as detailed for the various tiles specified.

Provide Expansion Joints (E.J.) where specifically indicated on the Drawings, of same size as typical joints, and of Sealant material as specified.

Thoroughly clean all joints before grouting. Grout shall be installed at all joints to thoroughly fill entire length and depth. Fill flush with face of tiles making a neatly finished, smooth surface. Prevent staining of grouted joints.

**EXECUTION:**

Installation shall be in accordance with Tile Council of America, Inc. (Latest Edition) Handbook for Ceramic Tile Installation.

**Quarry Floor Tile & Base -**

Method F115 using Mortar as Specified with 100% Liquid Polymer Additive, no water. For adhering Base to Metal Cooler/Freezer wall panels, use Epoxy Mortar as Specified. All to receive Epoxy Grout full depth of joints.

**Ceramic Floor Tile & Base -**

Method F115 using Mortar as Specified with 100% Liquid Polymer Additive, no water. Sanded Floor Grout full depth of joints.

**Wall Tile -**

Method W242 Organic adhesive or W243 Dry-Set Mortar. Dry-Set or Commercial Portland Cement Grout, color as indicated on the Drawings.

**CLEANING AND PROTECTION:**

Maintain tile surfaces as clean as possible during the grouting procedure. As soon as possible after initial set of each phase of the work, remove all traces of mortar and grout from the finish surfaces. Do not use acid solution for cleaning glazed tile.

Close spaces to traffic or other Work until tile is firmly set. Protect from damage until acceptance. Repair all damaged Work at no additional cost to Brookshire's.

**CLEAN-UP:**

Per GENERAL CONDITIONS.

*- END OF SECTION 09330 -*

SECTION 09510  
**EXPOSED GRID SUSPENDED CEILINGS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Ceiling Grid and Materials work as shown on Drawings and as specified herein.

SHOP DRAWINGS: Per SUBMITTALS.

GUARANTEE: Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

**COORDINATION:**

Coordinate with all other trades whose Work relates to Ceiling Grid and Material for placing of all required backing, attachments, furring, etc., to insure proper locations.

**DELIVERY AND STORAGE:**

Deliver and store materials in dry, protected areas as defined in Installation. Keep free of corrosion or other damage.

**MATERIALS:**

Listed manufacturers are used to establish quality. Other manufacturers will be considered for substitution unless specifically noted otherwise.

*Standard* - Ceiling System

- Grid: USG Corp. DONN DX/DXL-24-050 main, DX/DXL 216/424-050 cross, and M7 wall angle. Cold-rolled steel corrosion resistant per ASTM C635 system with Flat White finish unless specifically noted otherwise on the Drawings.
- Tile: Armstrong Cortega Minaboard, standard 5/8"x 2'x 4' lay-in panels #769A. No substitutes.

*Washable* - Ceiling System

- Grid: USG Corp. DONN AX-26-050 main, AX 224/424-050 cross, and M7A wall angle. All Aluminum composition system (not clad) with Flat White finish unless specifically noted otherwise on the Drawings.
- Tile: NUDO Products, Inc. (800/826-4132) FiberCorr F3C400-D-CT Corrugated/Fluted 2'x 4' lay-in panels. Surface to be .030" FRP with textured finish factory laminated to both sides of corrugated plastic core. Class "C". Color White – Texture Pebbled. No substitutes.

**GENERAL PROVISIONS:**

Provide all materials and accessories for complete installation per the Drawings and manufacturer's printed instructions and recommendations.

Install units to subsurfaces from set-out points and to pattern shown on Drawings. Cuts less than 6" in any dimension are not acceptable. Verify location of Work of other trades so their items occur within a whole unit or at joints as shown.

Install units in place, fitting snugly. Provide spacers or hold-down clips where shown or required.

After installation, clean any soiled grid surfaces. Replace any damaged units at no cost to Brookshire's until final acceptance.

**EXTRA STOCK:**

Provide a minimum of 12, in unbroken carton(s), of each type and size ceiling tile at completion of the project.

**FIRE-RATING:**

Install system in strict accordance with UL Assembly (P-204 unless specifically noted otherwise) Requirements when called for on the Drawings and as per manufacturer's "exposed fire rated FXT series" specifications.

**INSTALLATION:**

All acoustical materials, ceilings, suspension systems, and accessories shall be installed in strict accordance with the manufacturer's printed recommendations.

Installation of Grid shall be in accordance with ASTM C 636-86. Deflection of any component shall not exceed 1/360 of the span. Main beams shall be spaced 48" o.c. maximum and suspended from the overhead construction with 12 gauge steel hanger wires, spaced 48" along the length of the main beams. Use additional wire, cross-bars, and accessories as necessary to support fixtures and devices which are integrated with the Ceiling System, such as, Lighting Fixtures, A/C Outlets, etc.

Perimeter angle molding shall be installed at the specified ceiling height at the intersection of the suspended ceiling and all vertical surfaces. Attach Angle by non-corrosive self-tapping screws (stainless steel only at Aluminum Grid) of sufficient length to pass through substrate and connect to metal studs at 32" o.c. max. spacing. Any deformation, dimpling, etc. to any grid components, or scratching, scraping, etc. of the finished surface shall be cause for rejection.

Installation of Tile shall occur after all components in the ceiling plenum are installed. The building shall be at the appropriate stage of construction to receive the acoustical materials and suspension system before any of the material shall be installed. The acoustical material shall be installed under conditions of normal occupancy. All wet work shall be completed, with the building dry and fully enclosed prior to any ceiling system work. Heating, Ventilating and Air Conditioning system shall be in full operation and operating continuously a minimum of 72 hours prior to installation of any ceiling board and shall remain in operation, maintaining a temperature range of from 60 degrees F to 85 degrees F with a maximum relative humidity of 70%. Brookshire's shall be notified a minimum of 72 hours prior to installation of any ceiling board and shall have the right, but is not required, to monitor temperature and relative humidity during the afore mentioned time period.

**CLEAN-UP:** Per GENERAL CONDITIONS.

*- END OF SECTION 09510 -*



SECTION 09652  
**RESILIENT SOLID VINYL TILE FLOORING**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Resilient vinyl tile flooring.

1.2 ACTION SUBMITTALS

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

B. Manufacturer Certifications:

1. Provide certification that accurately identifies the Original Equipment Manufacturer (OEM) of flooring furnished for this project including manufacturer's name, address and factory location.
  - a. Suppliers of Private-Label flooring for this project must identify themselves as such and fully disclose the OEM information listed above.
  - b. All "manufacturer" requirements in these specifications must be complied with by the OEM, including warranties, certifications, qualifications, product data, test results, environmental requirements, performance data, etc.
2. Provide ISO 9001 certification for the OEM of the specified products.
3. Provide ISO 14001 certification for the OEM of the specified products.

- C. Shop Drawings: Showing installation details and locations of borders, patterns, locations of any floor inserts and seams.

D. Samples:

1. Manufacturer's color chart for selection of available floors
2. Color samples:
  - a. Samples per SUBMITTALS.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data:

1. For a qualified resilient flooring Manufacturer.
2. For a qualified resilient flooring Installer.

1.4 CLOSEOUT SUBMITTALS

A. Submit three copies of the following:

1. Manufacturer maintenance instructions.
2. Manufacturer material warranty.
3. Installer installation warranty.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. ISO 9001 Certified.
2. ISO 14001 Certified.
3. At least ten years active experience in the manufacture and marketing of commercial resilient flooring.
4. A provider of authorized installer training.

- B. Installer Qualifications:
  - 1. Certified Gerflor installer for Gerflor flooring with at least five years installation experience of the specified materials.
  - 2. Experience on at least five projects of similar size, type and complexity as this project.
  - 3. Employer of workers for this Project who are competent in techniques required by manufacturer for resilient flooring installation indicated.
  
- C. Fire Test Characteristics: As determined by testing identical products according to ASTM E 648, Class 1, by a qualified testing agency acceptable to authorities having jurisdiction.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store flooring and installation materials in protected dry spaces, with ambient temperatures maintained within range recommended by manufacturer, but not less than 55 deg F (13 deg C) nor more than 85 deg F (29 deg C).
  
- B. Store the indoor resilient surfacing rolls in an upright position on a smooth flat surface immediately upon delivery to Project.

#### 1.7 FIELD CONDITIONS

- A. Product Installation:
  - 1. Maintain temperatures during installation within range recommended by manufacturer, between 65 deg F (18 deg C) and 85 deg F (29 deg C) in spaces to receive flooring one week before installation, during installation, and thereafter installation.
  - 2. After installation, maintain temperatures within range recommended by manufacturer, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C).
  - 3. Prohibit traffic during flooring installation and for at least 48 hours after flooring installation.
  
- B. Install flooring only after all other trades, including painting and overhead work, has been completed.

#### 1.8 WARRANTY

- A. Special Limited Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace flooring that fails within specified warranty period.
  - 1. Material warranty must be direct from the product manufacturer.
    - a. Material warranties from separate or third-party insurance providers are not valid.
    - b. Material warranties from private label distributors are not valid.
  - 2. Failures include, but are not limited to, the following:
    - a. Material manufacturing defects.
    - b. Surface abrasion and deterioration to the point of wear-through where normal foot and wheeled traffic is occurring or where the material is being properly maintained.  
Failure due to substrate moisture exposure not exceeding 90% relative humidity (RH) (when tested in accordance with ASTM F2170) or 8 pounds moisture vapor emission rate (MVER) (when tested in accordance with ASTM F1869).

3. Warranty Period:
    - a. For materials: 2 years from date of Substantial Completion.
    - b. For surface wear: 10 years from date of Substantial Completion.
    - c. For moisture vapor tolerance: 1 year from date of Substantial Completion.
  - B. Special Limited Warranty: Installer's standard form in which installer agrees to repair or replace flooring that fails due to poor workmanship or faulty installation within the specified warranty period.
    1. Warranty Period: Two years from date of Substantial Completion.
- 1.9 ENVIRONMENT AND INDOOR AIR QUALITY
- A. Indoor Air Quality Certification:
    1. Flooring products must be FloorScore® Certified.
      - a. FloorScore® certification proves compliance with the volatile organic compound emissions criteria of the California Section 01350 standard.
      - b. FloorScore® certification proves compliance with the testing and product requirements of the California Department of Health Services "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
      - c. FloorScore® documentation must include certificate number for specified product.
  - B. Manufacturer Certification of Environmental Procedures:
    1. Original Equipment Manufacturer's (OEM) ISO 14001 Certification
- 1.10 COORDINATION
- A. Coordinate layout and installation of flooring with other equipment.

## PART 2 - PRODUCTS

- 2.1 COMMERCIAL RESILIENT / VINYL TILE FLOORING
- A. Basis-of-Design Manufacture: Subject to compliance with requirements, provide Gerflor Creation Clic a 6.0mm thick vinyl tile product in plank or tile format with a printed design protected by a 28mil (0.70mm) thick transparent wear layer and including the PUR+ surface treatment for ease of maintenance. Flooring installed with full-spread standard adhesive.
  - B. Substitution Limitations:
    1. No substitutions.
  - C. Product Description: Resilient / Vinyl Tile flooring as per ASTM F1700.
    1. Overall Thickness: Not less than 0.25 inch (6.0 mm)
    2. Wear-Layer Thickness: Not less than 28mil (0.70 mm)
    3. Max static load limit must meet 500 PSI or better
    4. Adhesive Method:
      - a. Flooring to be adhered to the concrete slab as recommended in the installation instruction to prevent floor from shifting.
    5. 100% REACH Compliant.
    6. Applied Finish: Manufacturer's, factory-applied, permanent, UV-cured.
      - a. Polyurethane surface treatment PUR+.

7. Color, pattern, size:
  - a. As selected by owner from manufacturer's standard colors, patterns, and as shown on the Drawings, and sizes.

D. Performance Criteria:

1. Meets ASTM F1700 for resilient / vinyl tile flooring.
2. Meets ASTM F970 static load limit or better.
3. Meets ASTM F1914 or better.
4. Provides excellent results for Chemical & Stain Resistance: ASTM F925.
5. Impact Insulation Class: (ASTM E989) 46dB.
6. Fire Performance: ASTM E 648; Class 1.
7. Slab Moisture Design Tolerance: See type of adhesives at 2.2 Accessories.

2.2 ACCESSORIES

- A. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by the flooring manufacturer.

- B. Adhesives types recommended by flooring manufacturer for substrate and conditions indicated.

1.
  - a. Basis-of-Design Product: Gerflor Gerfix LVT Spray.
  - b. Coverage Type: Full-surface application.
  - c. Maximum relative humidity of 95% when tested in accordance with ASTM F 2170.
  - d. Maximum moisture vapor emission rate of 8 pounds per 1000 sq. ft. in 24 hours when tested in accordance with ASTM F1869.

C. EXECUTION

2.3 EXAMINATION

- A. Verify the Following:

1. The area in which the indoor resilient tile flooring will be installed is dry, weather-tight and in compliance with specified requirements.
2. Permanent heat, lighting and ventilation systems are installed and operable.
3. Other work, including overhead work, that could cause damage, dirt, dust or otherwise interrupt installation has been completed or suspended.
4. No foreign materials or objects are present on the substrate and that it is clean and ready for preparation and installation.
5. Tests to verify that the moisture vapor emission rate or substrate relative humidity is within the specified ranges.
6. The concrete slab surface pH level is within the specified range.
7. The surface of concrete floors shall be flat to within the equivalent of 3/16 in. (3.9 mm) in 10 ft, (as described in ACI 117R).
8. The concrete slab complies with ACI 302.2R for concrete design including use of a low-permeance vapor barrier directly beneath the concrete subfloor with sealed penetrations.

2.4 PREPARATION

- A. Prepare substrates according to manufacturer's written recommendations to ensure proper adhesion of resilient flooring system.

- B. Concrete Substrates: Prepare according to ASTM F 710.
  - 1. Verify that substrates are dry and free of sealers, curing compounds and other additives. Remove coatings and other substances that are incompatible with adhesives using mechanical methods recommended by manufacturer.
  - 2. Alkalinity Testing: Perform pH testing according to ASTM F 710. Proceed with installation only if pH readings are between 7.0 and 11.
- C. Moisture Testing: Perform ASTM F 2170 relative humidity test; proceed with installation only after it is confirmed that the concrete relative humidity does not exceed 95% (Gerfix Spray) RH. Or perform ASTM F 1869 calcium chloride test and proceed with installation only after substrates have maximum moisture-vapor-emission rate of 8 lb/1000 sq. ft. in 24 hours. Where only one test can be performed, ASTM F 2170 is preferred.
- D. Use cementitious based leveling and patching compound with the same moisture vapor tolerance as the adhesive to fill depressions, holes, cracks, grooves or other irregularities in substrate.
- E. Place flooring and installation materials into spaces where they will be installed at least 48 hours before installation. Install flooring materials only after they have reached the same temperature as space where they are to be installed.
- F. Sand the surface of the concrete slab.
- G. Sweep and then vacuum substrates immediately before installation. After cleaning, examine substrate for moisture, alkaline salts, grit, dust or other contamination. Proceed with installation only after unsatisfactory conditions have been corrected.

## 2.5 VINYL TILE FLOORING INSTALLATION

- A. General:
  - 1. Comply with resilient tile flooring manufacturer's installation instructions.
  - 2. Take necessary precautions to minimize noise, odors, dust and inconvenience during installation.
  - 3. Fit flooring neatly and tightly to vertical surfaces, equipment anchors, floor outlets, and other interruptions of floor surface. Slight gap  $\frac{1}{4}$  to  $\frac{5}{8}$
  - 4. Extend flooring into toe spaces, door reveals, closets, and similar openings unless otherwise indicated.
- B. Lay out flooring per manufacturer's recommendations:
  - 1. Work from center marks established between primary walls so that opposite edges of plank flooring are approximately equal in width.
  - 2. Lay planks starting at center marks in rooms and corridors.
  - 3. Arrange planks towards main window or parallel to longest wall.
  - 4. Arrange planks in direction of traffic in corridors.
  - 5. Lay out so that beginning and ending plank will equal one-half or more of full plank width.

- C. Cut plank flooring to accommodate vertical surfaces, fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames. Fit plank flooring neatly at equipment anchors, floor outlets, and other interruptions of floor surface.
  - 1. For loose-laid installation leave an expansion gap of 1/4 to 5/8 inch (6 to 10mm) at all vertical objects and surface intersections.
- D. Adhered Flooring to substrates to comply with adhesive and flooring manufacturer instructions.

## 2.6 CLEANING AND PROTECTION

- A. Perform cleaning 72 hours after completing resilient flooring installation:
  - 1. Remove marks and blemishes from flooring surfaces.
  - 2. Sweep and then vacuum flooring.
  - 3. Damp-mop flooring to remove soiling.
- B. Protect flooring from abrasions, indentations, and other damage from subsequent operations and placement of equipment, during remainder of construction period.

*- END OF SECTION 09652 -*

SECTION 09660  
**RESILIENT PRODUCTS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide and install all Resilient Products as shown on Drawings and as specified herein with each type being produced by a single manufacturer, or having manufacturer's certification of compatibility, including flooring, base, stair treads & risers, primers, adhesives, sealants, and leveling compounds as necessary for the complete installation.

**SAMPLES:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Submit two samples of each type of tile specified. Mark with manufacturer's name and space where tile is to be installed.

**GUARANTEE AND CERTIFICATION:**

Per GENERAL CONDITIONS.

Provide original manufactures' printed documentation to Brookshire's of **ALL** Resilient Products used, including adhesives and fillers, certifying material as Non-Asbestos Containing.

**COORDINATION:**

Coordinate all with other Trades whose Work affects, connects with or is concealed by tile installations. Before proceeding, make certain all required inspections have been made.

**INSPECTION:**

Examine all subsurfaces to receive Work and report in writing to General Contractor, with a copy to Brookshire's, any conditions detrimental. Failure to observe this injunction constitutes a waiver to any subsequent claims. Commencement of Work will be construed as acceptance of all subsurfaces.

**DELIVERY AND STORAGE:**

Deliver all manufactured materials in original, unbroken containers bearing name of manufacturer, brand and grade seals. Keep materials dry, clean and protected against deterioration in any form.

Store materials in dry spaces protected from the weather with ambient temperatures maintained between 50°F and 90°F.

Store on flat surfaces. Hold all products and accessories in spaces where they will be installed at least 48 hours in advance of installation. Do not install tiles until they are at the same temperature as the space where they are to be installed.

Maintain a minimum temperature of 75°F in spaces to receive tiles for a least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55°F or greater than 90°F.

**PREPARATION:**

Verify that concrete slabs comply with ASTM F710 and the following:

Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture test recommended by tile manufacturer.

Subfloors are free of cracks, ridges, depressions, alkaline salts, scale and foreign deposits of any kind.

Use leveling and patching compounds as recommended by resilient flooring manufacturer and approved by Brookshire's, for filling small cracks, holes and depressions in subfloor.

Start of flooring installation indicates acceptance of subfloor conditions and full responsibility for completed work.

For overlay of existing resilient tile subfloors, and/or relaying of resilient products after removal of previous, comply with tile manufacturer's printed installation requirements.

#### MATERIALS:

Listed products are specified to establish manufacturing, performance, quality, color, etc. standards. Others will be considered for substitution, unless noted otherwise.

#### *Resilient Base -*

Armstrong 4", 0.080" gauge Colonite Vinyl Wall Base, color as noted on Drawings (No substitutes).

#### *Wall Base Adhesive -*

Roppe 205 (No Substitutes).

#### INSTALLATION:

Contractor shall be approved by manufacturer and comply with manufacturer's written instructions.

Lay tile symmetrically about centerlines of spaces with either joint or centerline of tile occurring in center. Cutting/trimming of field tiles is not acceptable.

Seat all units firmly into adhesives; make joints tight, straight, and inconspicuous. Any door opening between spaces having different types of flooring at which no threshold occurs, shall have change of material made under door in closed position.

Make finish Work free of buckles, cracks, breaks, saves and projecting edges, neatly fitted to projections. Apply edging strips at exposed edges of material not otherwise protected so top of strip is at same level as flooring.

Set all specified bases in adhesive thoroughly coated and firmly set so lower edge fits tightly against flooring. Make all joints in bases, including those at any preformed corners, plumb, flush, tight and inconspicuous. Seat top edge and back of base firmly against wall. Miter and tightly fit interior corners.

#### CLEANING, PROTECTION AND FINISHING:

Per GENERAL CONDITIONS.

After installation, sweep floors of particles and other foreign material harmful to flooring.

Close spaces to traffic or other Work until tile is firmly set. Protect from damage until acceptance. Repair all damaged Work at no additional cost to Brookshire's.

- END OF SECTION 09660 -



SECTION 09770  
**FIBERGLASS REINFORCED PLASTIC PANELS (FRP)**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide and install all Fiberglass Reinforced Plastic Panels (FRP), trim and accessories as shown on Drawings and as specified herein with each type being produced by a single manufacturer, or having manufacturer's certification of compatibility, including adhesives as necessary for the complete installation.

**REFERENCE STANDARDS:**

- American Society for Testing and Materials (ASTM) -
  - ASTM D2583 – Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor;
  - ASTM D5319 – Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels;
  - ASTM D5420 – Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact);
  - ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

**SAMPLES:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Submit two 3 inch x 3 inch samples of each surface and color of FRP specified.

Submit two 3 inch samples of each trim profile and trim color specified.

Submit Shop Drawings showing layout, profiles and product components, including accessories, finish colors, patterns and textures.

**GUARANTEE AND CERTIFICATION:**

Per GENERAL CONDITIONS.

Provide original manufactures' printed documentation to Brookshire's of **ALL** FRP and trim used, including adhesives, certifying material as Non-Asbestos Containing.

**COORDINATION:**

Coordinate all with other Trades whose Work affects, connects with or is concealed by FRP installations. Before proceeding, make certain all required inspections have been made.

**INSPECTION:**

Examine all subsurfaces to receive Work and report in writing to General Contractor, with a copy to Brookshire's, any conditions detrimental. Failure to observe this injunction constitutes a waiver to any subsequent claims. Commencement of Work will be construed as acceptance of all subsurfaces.

**DELIVERY AND STORAGE:**

Deliver all manufactured materials in original, unopened, undamaged containers with identification labels intact. Package sheets on skids or pallets for shipment to project site. Keep materials dry, clean and protected against deterioration in any form.

Store materials in a location protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store panels indoors in a dry place at the project site.

Prior to installation, remove any foreign matter from face of panel by using soft bristle brush, avoiding abrasive action.

#### PREPARATION:

Installation shall not begin until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from plaster or concrete work has dissipated.

Prior to installation, and for not less than 48 hours, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.

Verify actual measurements by field measurements before fabrication and show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

Verify that substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

Examine backup surfaces to determine that corners are plumb and straight; surfaces are smooth, uniform, clean and free from foreign matter; nails or screws are countersunk; and joints and cracks are filled flush and smooth with the adjoining surface.

Start of installation indicates acceptance of subsurface conditions and full responsibility for completed work.

#### MATERIALS:

Marlite is used to establish manufacturing, performance, quality, color, etc. standards. Other manufacturers will be considered for substitution unless specifically noted otherwise. Locate each type of panel product as indicated on the Drawings. No mixing of panel types will be accepted unless indicated on the Drawings.

Contractor shall supply all manufactured trim and accessories as required.

Materials shall have a Class III (C) interior finish. Class C flamespread of 200 or less, smoke developed of 450 or lower per ASTM E84 latest version.

All materials shall meet USDA/FSIS requirements.

#### *Panels -*

Marlite P-100 White with Special Embossed Texture. No color variations accepted.

Marlite S-100G White. No color variations accepted.

#### *Moldings -*

Marlite P-100 White PVC (polyvinyl chloride) moldings. Provide longest length possible and avoid all horizontal division bars.

#### *Outside Corner guards -*

Marlite M961 White PVC (polyvinyl chloride) outside corner guards. Provide longest length possible to avoid all joints possible on all vertical outside corners.

*Adhesive -*

Marlite C-551 FRP Adhesive for approved porous subwalls for trowel type applications shall be applied using full coverage to back of each panel. Marlite C-375 FRP Adhesive for approved moisture resistant non-porous subwalls.

**INSTALLATION:**

Contractor shall be approved by manufacturer and comply with manufacturer's written instructions. Contractor shall be experienced in performing work of this section and shall have specialized in installation of work similar to that required for this project.

Provide ventilation to disperse fumes during application of adhesive as recommended by adhesive manufacturer.

Cut and drill panels with carbide tipped saw blades or drill bits, or cut with metal shears.

Install panels with manufacturer's recommended gap for panel field and corner joints. Seal all trim moldings with USDA silicone at time of installation to avoid any water penetration to the subwalls.

Contractor shall install FRP with all manufactured trim and accessories as required.

Avoid all horizontal division bars on panels under 12 feet in height.

**CLEANING, PROTECTION AND FINISHING:**

Per GENERAL CONDITIONS.

Remove temporary coverings and protection of adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owners acceptance.

Remove construction debris from project site and legally dispose of debris.

Remove any adhesive or excessive sealant from panel face using solvent or cleaner recommended by panel manufacturer.

Protect from damage until acceptance. Repair all damaged Work at no additional cost to Brookshire's.

*- END OF SECTION 09770 -*

**SECTION 09900**  
**PAINTING & WALL COVERING**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all labor, materials, tools, and accessory items for Painting, Wall Covering, and other Job Applied Surface Coatings as required for a complete installation for finishes as called for on Drawings, as specified herein, and as Acceptable to Brookshire's.

**APPLICATION AND REFERENCE STANDARD:**

Comply with all applicable requirements of the EPA and OSHA Guidelines and Specifications, for Workers Safety, Disposal of Materials and by-products, and for protections of the Environment and the other persons or property.

All preparation, application, curing, materials handling, clean-up, etc. shall be in strict compliance with the most current issue of the appropriate Manufacturer's printed Specification/Instruction literature.

Should conflicts or inconsistencies occur between this Specification, the Manufacturer's Printed materials, Governmental Statutes/Codes/Ordinances, the most stringent requirements shall apply to the Work.

The standard for quantity of painting/coatings shall be Dry Film Thickness (DFT) after proper curing which shall be established by Manufacturer's Printed Standards with respect to time, temperature, and relative humidity. Wet Film Thickness (WFT) is furnished as the manufacturer's suggested application rate, assuming a uniform application of unthinned materials. Listing of WFT within this Specification or the Manufacturer's Literature, or testing for WFT during the application by Brookshire's and/or manufacturer's representatives shall be Preliminary in nature, and does not relieve the Contractor of the responsibility to furnish the completed Work in the minimum Dry Film Thickness.

**SUBMITTALS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Submit complete materials list of all items proposed for the Work of this Section and manufacturer's specifications and all other data required to demonstrate compliance.

**MATERIALS HANDLING:**

Use necessary means to protect all materials before, during and after installation and to protect installed Work of all other trades.

In event of damage, immediately make all repairs and replacements necessary to the approval of and at no cost to Brookshire's.

Deliver all materials to job site in original unopened containers with all labels intact and legible at time of use. Store in strict accordance with manufacturer's recommendations.

**PRECONDITIONS AND NOTIFICATIONS:**

Prior to application of any spot priming, prime coat, finish coat, sizing, or wallcoverings this Contractor shall carefully inspect the installed Work of all other trades and verify such Work is complete to the extent that his work is to begin.

After surfaces are acceptable to Contractor to receive coatings/finishes, notify Brookshire's, no less than 3 nor more than 10 working days, where noted within this Specification as "*Inspection by Brookshire's Required prior to Application*". Brookshire's reserves the right to perform Inspections at any time without notice to the Contractor.

#### PREPARATION & APPLICATION:

This Contractor shall be responsible for assurance of proper surface preparation of all surfaces to which he is to apply coatings and/or coverings whether within the scope of his work or to be performed by other trades. Each type surface shall be prepared, and maintained in that state until properly covered, in strict accordance with the Manufacturer's Printed Instructions and as called for within this Specification.

##### *Coating Application Parameters -*

Exterior: All Paints, Primers, Sizing, Glues, and other Coatings Materials shall be applied while the ambient temperature and the temperature of the material being coated is from 40° F to 100° F, and the effective temperature, including wind chill factor, is not predicted by the National Weather Service to be below 40° F within 24 hours.

Interior: No Paints, Primers, Sizing, Glues, and other Coatings Materials shall be applied until the Heating, Ventilation, and Air Conditioning System has been operating for a minimum of 96 continuous hours, and until the ambient temperature and the temperature of the material being coated is from 60° F to 85° F, and the relative humidity is from 40% to 75%. Once Coating Processed have been commenced, said temperature and relative humidity ranges must be maintained by the Contractor until Final Acceptance of the Project by Brookshire's. Waterborne Dry Fall may be applied from 50° F and 120° F, at 5% minimum above Dew Point, and Relative Humidity less than 85%. Roofing, Walls, Windows, Doors, etc. must be substantially complete so as not to allow infiltration of moisture or changes in temperature.

##### *Power Washing -*

All exposed exterior surfaces shall be thoroughly cleaned with Potable Water from a Mechanical Washing device capable of delivering at a continuous rate from 2000 to 2500 pounds per square inch (psi) in sufficient volume, ranging from 4 to 14 gallons per minute (gpm), to remove surface adherents and blemishes which would interfere with the proper bond of coatings to be applied; including, but not limited to, Oil, Grease, Dirt, Loose Rust, Loose Mill Scale, and Loose Paint/Primer. Contractor shall take care in adjusting pressure, volume, duration of time, and number of passes to assure material being cleaned is not damaged during the cleaning process. Protect all adjacent workers, work, and materials as necessary to prevent damage from this process or its by products.

##### *Spraying of Coatings -*

All Sprayed application of materials shall be by use of Power Actuated "Airless" Spraying device, only, capable of continuous operation at a minimum pressure of 2400 psi, using Spray Tip and Filter of size as recommended by the Manufacturer for that material being used.

#### COATING SYSTEMS:

Sherwin Williams shall be used for all Painting Materials, unless specifically listed otherwise within this section. No others will be considered for substitution. All colors shall be as selected by Brookshire's. Contractor shall allow for "Custom Mixing".

- *Exposed Metal Decking, Structural Steel, Joists & Girders, and accessories within that area, such as: HVAC Ductwork & Grilles, Sprinkler, Water, Plumbing Vent, Refrigeration Piping, Electrical Conduits, etc. -*
- Remove all Joist Tags, steel tie wires, labels, tape, etc.
- Power Wash entire area

- Properly prepare all Exposed Welds and any areas exposed to view not having proper coverage of Factory Primer. Spot Prime with Kem Kromik Universal Alkyd Metal Primer using brush only.
  - Adequately Mask/Cover all Prefinished Materials which are not to receive Paint, including but not limited to Light Fixture & Ballasts, Sprinkler Heads, Electrical Outlets, etc.
  - Apply 1 Coat minimum of *Galvite HS B50W230* Alkyd yielding 4.5 mils DFT (approx. 7 mils WFT) by Spraying only. *Inspection by Brookshire's Required prior to Application*
  - Apply 2 Coats minimum of *Waterborne Dry Fall* yielding 6 mils total DFT (approx. 8 mils WFT = 3 mils DFT per coat). Product and color to be selected by Owner.
- *Sales Area Pipe Bollards & Overhead Door Protectors -*
    - Spot Prime as required. Sand with 100 Grit Sand Paper to achieve a smooth surface. Wipe with non-lint type rag saturated with Lacquer Thinner.
    - Apply 3 Coats minimum of *Industrial Enamel Standard B54W101* Alkyd, color as selected, yielding 6 mils total DFT (approx. 5 mils WFT = 2 mils DFT per coat).
- *All Interior & Exterior Pipe Bollards & Overhead Door Protectors not in Sales Area, and "Safety Yellow" Metals (not noted otherwise) -*
    - Spot Prime as required. Sand with 100 Grit Sand Paper to achieve a smooth surface. Wipe with non-lint type rag saturated with Lacquer Thinner.
    - Apply 2 Coats minimum of *Industrial Enamel Standard B54Y37 "Safety Yellow"* Alkyd yielding 4 mils total DFT (approx. 5 mils WFT = 2 mils DFT per coat).
- *Exterior Handrails -*
    - Spot Prime as required. Sand with 100 Grit Sand Paper to achieve a smooth surface. Wipe with non-lint type rag saturated with Lacquer Thinner.
    - Apply 3 Coats minimum of *Industrial Enamel Standard HS and VOC B54WZ101* Alkyd, color as selected, yielding 6 mils total DFT (approx. 5 mils WFT = 2 mils DFT per coat).
- *Interior Pit Plates -*
    - Spot Prime as required. Sand with 100 Grit Sand Paper to achieve a smooth surface. Wipe with non-lint type rag saturated with Lacquer Thinner.
    - Apply 2 Coats minimum of *Tile Clad High Solids Epoxy B62WZ101*, color as selected, yielding 8 mils total DFT (approx. 7 mils WFT = 4 mils DFT per coat).
- *Sales Area Exposed Wood Trims & Décor Items -*
    - Prime all exposed surfaces with 1 Coat *Preprite Wall and Wood Primer B49W2* Alkyd, standard white.
    - Caulk and Putty all cracks, blemishes, nail holes, etc.
    - Sand with 220 Grit Sand Paper to achieve a smooth surface.
    - Apply 3 Coats minimum of *Industrial Enamel Standard B54W101* Alkyd, color as selected, yielding 6 mils total DFT (approx. 5 mils WFT = 2 mils DFT per coat). Sand between coats to provide a smooth, unblemished finished surface.
- *Cabinets, Millwork, & Painted Wall Paneling -*
    - Prime all exposed surfaces with 2 Coats *Fast Dry Water-Reducible Basecoat E60WJ500* Latex, standard white.
    - Caulk and Spackle all cracks, blemishes, nail holes, etc.
    - Sand with 220 Grit Sand Paper to achieve a smooth surface.
    - Apply 2 Coats minimum of *Incredicoat Interior Latex Semi-Gloss B31WJ2*, color as selected, yielding 4 mils total DFT (approx. 5 mils WFT = 2 mils DFT per coat). Sand between coats to provide a smooth, unblemished finished surface.

- *Painted Waferboard & Wood Trim in Service Areas -*
  - Prime all exposed surfaces with 2 Coats *ProMar 200 Interior Flat B30W201* Latex, standard white.
  - Caulk and Spackle all cracks, blemishes, nail holes, etc.
  - Apply 2 Coats minimum of *ProMar 200 Interior Egg Shell B20W201* Latex, color as selected, yielding 3 mils total DFT (approx. 4 mils WFT = 1.5 mils DFT per coat).
  
- *Sales Area Painted Gypsum Board Walls -*
  - Caulk Gyp. Bd. to Ceiling, Penetrations, and other joinings to dissimilar materials.
  - Apply 1 Coat of *ProMar 200 Interior Egg Shell B20W201* Latex, color as selected, yielding 1.5 mils total DFT (approx. 4 mils WFT).
  - Apply 3 Coats minimum of, product and color as selected by Owner, yielding 4.5 mils total DFT (approx. 4 mils WFT = 1.5 mils DFT per coat).
  - Roller applied only with Brush edge cuts and touch-up.
  
- *Service Areas Painted Gypsum Board Walls -*
  - Caulk Gyp. Bd. to Ceiling, Penetrations, and other joinings to dissimilar materials.
  - Apply 2 Coats minimum of *ProMar 200 Interior Egg Shell B20W201* Latex, color as selected, yielding 3 mils total DFT (approx. 4 mils WFT = 1.5 mils DFT per coat).
  - Roller applied only with Brush edge cuts and touch-up.
  
- *Metal Doors & Frames (Interior & Exterior) -*
  - Caulk all joints, cracks, etc. in Doors and Jambs, Putty all holes, and repair any dents with auto quality Bondo.
  - Spot Prime as required. Sand with 220 Grit Sand Paper to achieve a smooth surface. Wipe with non-lint type rag saturated with Lacquer Thinner.
  - Apply 3 Coats minimum, product and color as selected by Owner, yielding 6 mils total DFT (approx. 5 mils WFT = 2 mils DFT per coat):
    - For Sales Area use product and color selected by Owner.
    - For All other areas use *ProMar 200 Interior Acrylic Egg Shell Enamel B33W201* Alkyd
  - Allow for 2 color application for all Doors & Frames from Sales Area. Color Change Line shall be straight and true. Color change shall occur where Jamb surface meets Stop, and along corner where face meets edge of door such that color will not be exposed with door in closed position.
  
- *Exterior Painted Concrete Block (CMU) -*
  - Apply 2 Coats minimum of *Loxon Block Surfacer A24W200* Acrylic, yielding 16 mils total DFT (approx. 16 mils WFT = 8 mils DFT per coat).
  - After completion of Backer Rod & Sealants in Expansion Joints, caulking of Window & Door Frames, etc.
  - Apply 2 Coats minimum of *A-100 Exterior Satin Latex 82W596* Acrylic, color as selected, yielding 3 mils total DFT (approx. 4 mils WFT = 1.5 mils DFT per coat).
  - Roller applied only with Brush edge cuts and touch-up.
  
- *Exterior Stone or Brick -*
  - Apply 2 flood coats of *H&C HB-150 Water Repellant*.
  - Verify joint sealants are installed and cured.
  - Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, loose particles, or other matter detrimental to application of coating.
  - Scrub and rinse surfaces with water and let dry.
  - Apply coating in accordance with manufacturer's instructions in one uniform coat.

- *Interior Painted Concrete Block (CMU) -*
  - Apply 1 Coat of *Heavy Duty Block Filler B42W46* Acrylic, yielding 8 mils total DFT (approx. 16 mils WFT).
  - After completion of Backer Rod & Sealants in Expansion Joints, caulking of Window & Door Frames, etc.
  - Sales Area = Apply 3 Coats minimum, product and color as selected by Owner, yielding 4.5 mils total DFT (approx. 4 mils WFT = 1.5 mils DFT per coat).
  - Service Areas = Apply 2 Coats minimum of *ProMar 200 Interior Egg Shell B20W201* Latex, color as selected, yielding 3 mils total DFT (approx. 4 mils WFT = 1.5 mils DFT per coat).
  - Roller applied only with Brush edge cuts and touch-up.

- *Exterior Gas Piping -*

All exposed exterior gas piping on roof (starting at top of gutter/flashing line) shall be coated with the following method, others will be considered for equality. Prior to application of Coatings, surfaces shall be dry and cleaned of all rust, scale, welding residue, joint sealant, soil, mud, oil, grease, moisture, and other contaminants by wire brushing, sanding, sand blasting, and/or approved chemical cleaner. Application may be by Brush, Roller, or Glove Application. Thickness indicated are minimum wet film. Apply prior to placement of attachment clips, and between piping and blocking.

- Primer - Sherwin-Williams Macropoxy 646 PW Potable Water Epoxy. 2 Coats at 7 wet mils per coat.
- Finish - Sherwin-Williams Acrolon 218 HS Acrylic Polyurethane. 2 Coats at 6 wet mils per coat.

Piping below top of gutter/flashing line shall be primed and painted 3 Coats minimum of *Industrial Enamel Standard HS and VOC B54WZ101* Alkyd, tinted to match color of adjacent building materials, yielding 6 mils total DFT (approx. 5 mils WFT = 2 mils DFT per coat) by Painting Contractor. Tinted primer and paint color shall be submitted to and approved by Brookshire's prior to application.

**CLEAN-UP:**

Per GENERAL CONDITIONS, and use all necessary care during execution of the Work of this Section to prevent undue spreading of overspray, fumes/odors, etc., and to prevent tracking or other infiltration of dust, scrapings, fall-out, drips, etc. to other areas of the work or onto other properties.

On completion of each installation segment in a room, general area, or space, promptly pick up and remove from the working area all dust, debris, containers, rags, masking materials, etc. prior to commencing next segment.

Any spillage, overrun of coverage, etc. will be immediately retrieved, properly disposed of, and the surface fully restored to its original condition, or replaced if necessary.

- END OF SECTION 09900 -



SECTION 09950  
**GYPSUM BOARD TAPING & FINISHING**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all Taping, Bedding, Texturing, etc. as required for Drywall Work and accessories as shown on Drawings, as specified herein, and as required for the complete installation.

**REFERENCE STANDARD:**

Comply with all applicable requirements of Gypsum Association (GA) GA-216 "Recommended Specifications for the Application and Finishing of Gypsum Board", except where more stringent requirements are called for herein, in local codes, or by wallboard/accessories manufacturer(s).

**SUBMITTALS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Submit complete materials list of all items proposed for the Work of this Section and manufacturer's specifications and all other data required to demonstrate compliance.

Submit two 12" x 12" minimum samples of finished texture for approval.

**MATERIALS HANDLING:**

Use necessary means to protect all materials before, during and after installation and to protect installed Work of all other trades.

In event of damage, immediately make all repairs and replacements necessary to the approval of and at no cost to Brookshire's.

Deliver all materials to job site in original unopened containers with all labels intact and legible at time of use. Store in strict accordance with manufacturer's recommendations.

**PRECONDITIONS:**

Prior to application of any drywall finishes, carefully inspect the installed Work of all other trades and verify such Work is complete and that taping and finishing may be installed in strict accordance with all pertinent codes and regulations, and manufacturer's recommendations.

**MATERIALS:**

US Gypsum is used to establish quality. Georgia Pacific and Gold Bond are approved as equal manufacturers. No others will be considered for substitution.

Joint Compound --  
USG Powder or Ready-Mixed all purpose, or Durabond.

Tape --  
USG Perf-A-Tape

**TEXTURE:**

Texture shall be light grade Orange Peel and shall be sprayer applied only. Submit sample to Brookshire's for approval per SUBMITTALS prior to beginning any work.

All walls to receive paint shall be textured. Install new texture to existing walls that are currently textured as directed by Brookshire's.

#### JOINTING AND FINISHING:

Inspect all joint areas; be certain wallboard fits snugly against supporting framework.

In jointing and finishing areas, maintain temperature not less than 55 for 24 hours prior to starting, for entire period of jointing, and until all compounds have dried.

Apply jointing and finishing compound by machine or hand tool. Provide minimum 24 hours drying time between coats, with additional drying time in poorly ventilated areas.

##### Embedding compound --

Apply to joints and fastener heads in thin, uniform layer. Spread not less than 3" wide at joints; center reinforcing tape in the joint and embed tape in compound. Then spread thin layer of compound over tape. After compound has dried, apply second coat to joints and fastener heads, spreading in thin, uniform coat to not less than 6" wide at joints, feather-edged. When thoroughly dry, sandpaper to eliminate ridges and high points.

##### Finishing compound --

After embedding compound is thoroughly dry and completely sanded, apply a coat of finishing compound to all joints and fastener heads. Feather compound to not less than 12" wide. When fully dry, sandpaper to effect uniformly smooth surfaces, taking all necessary care not to scuff the paper surface of the wallboard.

##### Internal corners --

Treat as specified above for joints, except fold reinforcing tape lengthwise through the middle and fit neatly into corner.

##### Metal corner trim --

Assure that cornerpiece is secured in position, treat corner with joint compound as specified for joints, feathering compound out from 8" to 10" on each side of corner. Provide no lesser embedment and finishing than specified above for corner treatment.

#### CLEAN-UP:

Per GENERAL CONDITIONS, and use all necessary care during execution of the Work of this Section to prevent undue scattering of mud, containers and dust and to prevent tracking of joint and finishing compounds onto floor surfaces. On completion of each installation segment in a room or space, promptly pick up and remove from the working area all excess compound, dust, scraps, debris and surplus materials prior to commencing next segment.

*- END OF SECTION 09950 -*

**SECTION 10155  
TOILET PARTITIONS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Toilet Partitions with floor anchored/overhead bracing work as shown on Drawings and as specified herein.

**SHOP DRAWINGS:** Per SUBMITTALS.

**GUARANTEE:** Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

**COORDINATION:**

Coordinate with all other trades whose Work relates to Toilet Partitions for placing of all required accessories, blocking and anchorage for attachment of partitions.

**DELIVERY AND STORAGE:**

Deliver and store materials in dry, protected areas as defined in Installation. Keep free of corrosion or other damage.

**MATERIALS:**

Accurate Partitions Corp. is used to establish quality. Other manufacturers will be considered for substitution unless specifically noted otherwise.

The toilet partitions shall be high-density polyethylene (HDPE) polymer with floor anchored/overhead braced mounting style. The HDPE material shall have homogenous color throughout each component with 1/4" machined edges for uniformity. Self-lubricating surface shall resist markings from pens, pencils and other writing instruments.

Doors, Panels, Pilasters and Urinal Screens shall be 1" thick (door and panels 55" high, pilasters 82" high) HDPE polymer that is water resistant and non-absorbent. A heat sink shall be attached as standard to the bottom of all doors and panels.

Color of all doors, panels, pilasters and urinal screens shall be as indicated on the Drawings, no substitutions.

**DOORS AND HARDWARE:**

Integral hinges shall be integrated into the door and pilaster with no exposed metal parts. The 1/2" nylon gravity hinge with a 3/16" stainless steel center pin (bottom) and 1/2" nylon rod (top) shall be set during installation to desired open position when not locked.

Slide latch and strike shall be a die cast Zamac alloy with a brushed chrome plated finish to resist corrosion. Latch and strike shall be through bolted with tamper resistant barrel nuts and shoulder screws. Slide latch assembly shall allow for emergency access by lifting the door from the bottom.

Panel brackets shall be 54" long and extruded aluminum with 6 through bolt panel attachment points. Panels shall be through bolted with tamper resistant barrel nuts and shoulder screws.

**GENERAL PROVISIONS:**

Provide all materials and accessories for complete installation per the Drawings and manufacturer's printed instructions and recommendations.

After installation, clean any soiled surfaces. Replace any damaged units at no cost to Brookshire's until final acceptance.

**INSTALLATION:**

Toilet partitions shall be installed in accordance with manufacturer's installation instructions with partitions rigid, straight and plumb.

Doors and panels shall be mounted 12" above the finished floor.

Partitions shall be anchored to the floor by a 1/4" x 1" stainless steel mounting bar attached to the bottom of the pilaster. Each mounting bar shall be anchored to the floor with 3/8" cadmium-plated studs.

The mounting system shall be concealed by molded plastic trim shoes secured with two metal clips incorporated into the floor anchor assembly.

Aluminum headrail with anti-grip profile shall provide overhead bracing and span all compartments and brace the end pilaster back to the wall.

**WARRANTY:**

Manufacturer shall guarantee its solid plastic HDPE material against breakage, corrosion, and delamination for 15 years from the date of receipt by Brookshire's. If material is found defective during that period, the material shall be replaced free of charge. No credits or allowances shall be issued for any labor or expenses relating to the replacement of components covered under this warranty plan.

**CLEAN-UP:** Per GENERAL CONDITIONS.

*- END OF SECTION 10155 -*

**SECTION 10800  
TOILET ACCESSORIES**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Toilet Accessories as shown on Drawings and as specified herein.

**SHOP DRAWINGS:** Per SUBMITTALS.

**GUARANTEE:** Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all accessories is required.

**COORDINATION:**

Coordinate with all other trades whose Work relates to Toilet Accessories for placing of all required anchorage for attachment of accessories.

**DELIVERY AND STORAGE:**

Deliver and store materials in dry, protected areas as defined in Installation. Keep free of corrosion or other damage.

**MATERIALS:**

Listed manufacturers are used to establish quality. Other manufacturers will be considered for substitution unless specifically noted otherwise.

*Grab Bars –*

American Specialties, Inc. Model 3800 Grab Bar with Snap-On flange covers for concealed mounting. Tubing shall be 1-1/2" diameter x 18 gauge stainless steel type 304. Snap-On cover shall be 22 gauge with locking dimples. Flange shall be 1/8" thick and shall be heliarc welded to tubing with a continuous concealed bead. End flanges shall have two 3/8" diameter mounting holes. All exposed surfaces shall have a No. 4 satin finish. Verify exact lengths and configurations with plans.

*Electric Paper Towel Dispenser –*

Georgia-Pacific enMotion® Impulse® 10 Touchless Roll 59488A paper towel dispenser with 59477A hardwired adapter kit and Edwards 592 120-24VA-10-20 transformer. Color to be Black.

*Tissue Dispenser – Furnished & Installed by Brookshire's*

Bay West 80300 Silhouette Revolution 3-Roll Opticore tissue dispenser. Color to be Black Translucent.

*Soap Dispenser – Furnished & Installed by Brookshire's*

Best Sanitizers Inc. SANiSHOT MD10017 manual foaming hand soap dispenser. Color to be White.

*Hand Sanitizer – Furnished & Installed by Brookshire's*

Best Sanitizers Inc. Atomized Sanitizer AD10020 battery operated touchless dispenser. Color to be White.

*Diaper Table Bed –*

Safe Strap Diaper-Depot #4318 changing station. Color to be Speckled Gray.

**GENERAL PROVISIONS:**

Provide all materials and accessories for complete installation per the Drawings and manufacturer's printed instructions and recommendations.

After installation, clean any soiled surfaces. Replace any damaged units at no cost to Brookshire's until final acceptance.

**INSTALLATION:**

Toilet accessories shall be installed in accordance with manufacturer's installation instructions with accessories rigid, straight and plumb.

**CLEAN-UP:** Per GENERAL CONDITIONS.

*- END OF SECTION 10800 -*

SECTION 11330  
**LOADING DOCK ACCESSORIES**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Loading Dock Accessories as shown on Drawings and as specified herein.

**SHOP DRAWINGS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

**GUARANTEE:** Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required. Furnish exact manufacturer's dimensions for components used, required tolerances and anchorage requirements when such is to be incorporated with components of the building construction.

**COORDINATION:**

Coordinate with all other trades whose Work relates to loading dock accessories for placing of all required backing and attachments, to insure proper locations.

**DELIVERY AND STORAGE:**

Do not store loading dock accessories on site. Keep free of corrosion or other damage. Replace any damaged parts at no cost to Brookshire's.

**MATERIALS:**

Overhead Door Co. is used to establish quality. Others will be considered for substitution only when noted.

*Dock Leveler -*

McGuire Company, Inc. only, no substitutes, MP66 series 6' x 6' for recessed installation, 25,000 lbs. CIR capacity, "Brush" weather seal, 20" minimum length lip, 1/4" 4-way safety tread plate 50,000 psi yield with chamfered leading edge and holes to receive lift bar. Platform is reinforced and supported full length w/ 6" height "C" channels. Furnish with manufacturer's "Pan Kit - 3 Sides" for fully recessed installation as detailed on the drawings and per manufacturer's printed specifications and installation instructions. Weld continuous top and bottom of base plate and grind smooth. Hinge shall be 1-3/4" o.d. x 5/16" wall seamless steel tubing and 1" diameter x M1044 grade steel hinge pin minimums, with grease fittings on each hinge section. No part of leveler shall extend above the dock. Operating range is 12" minimum above and 12" minimum below dock level. Unit is powered by extension springs and guided by counterbalance assembly. Furnish with Release Chain and Maintenance strut with lockout/tagout capability. Factory finished of rust inhibitive industrial grade paint. Furnish with standard dock bumpers. Unit shall comply with all applicable Safety Standards, including but not limited to, OSHA, U.S. Dept. of Commerce CS-202-56, and ANSI MH 30.1.

*Dock Bumpers -*

Durable Corp. is used to establish quality. Others will be considered for substitution. VB424-11F, 4 1/2" projection x 10 3/8" wide x 23 1/2" height for vertical installations, and B410-14F, 4 1/2" projection x 13 3/8" wide x 10" height for horizontal installations from rubberized fabric truck tires cut to uniform size pads closed with two 3" x 2-1/2" x 1/4" (min) structural steel angles welded to 6 each for vertical and 3 each for horizontal 3/4" rods at one end and closed with threaded rod and nut at the end toward dock leveler. Anchor leg of angle shall extend a minimum of 2-1/2" beyond rubber surface at ends and contain three 13/16" anchor bolt holes. Steel factory primed or painted. Weld outer edges of bumper support angles continuous and

grind smooth where in contact with steel dock edges. Anchor all holes not adjacent to said weld to concrete with Hilti Kwik-Bolt 34-512.

*Dock Seal -*

McGuire Company, Inc., Hudson, NY is used to establish quality. Others will be considered for substitution.

- Model TS-121, 12" wide x 8" deep x sized for opening, 40 oz. vinyl cover, color as selected from manufacturers standard and with full length yellow stripe at verticals. Square Pads with no bevels, polyurethane foam filler, 1-1/2" thick preservative treated KD integral lumber back with galvanized steel mounting brackets sized and spaced by manufacturer for this application.

**INSTALLATION:**

Install accessories per manufacturer's directions, with all moving parts operating smoothly.

Install in a sturdy, substantial manner, straight, true and plumb.

All welding shall be as specified for structural steel. Use complete penetration fillet welds continuous to fully bond equipment with steel embedded members. Grind all welds smooth where exposed to view. Touch-up paint/primer as per structural steel specifications.

CLEAN-UP: Per GENERAL CONDITIONS.

*- END OF SECTION 11330 -*



SECTION 11406  
**COOLER AND FREEZER PANELS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all cooler and freezer panels with doors and accessories, complete in place, as indicated on the Drawings and as specified herein.

Provide all ceiling panels with accessories and supports, complete in place as indicated on the Drawings and as specified herein.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**GENERAL REQUIREMENTS:**

Cooler, freezer and ceiling panels provided under this Specification, related provisions and Drawings shall be of prefabricated, modular design and construction. This design shall allow for accurate and convenient field assembly which will facilitate future enlargement or relocation provisions. The cooler, freezer and ceiling panels shall be provided complete by one manufacturer and clearly labeled with code approvals and industry standard markings.

**SHOP DRAWINGS:**

Per SUBMITTALS, all materials required by this section shall be submitted whether as specified or for substitution.

Shop Drawings showing scaled plans, elevations and details of all cooler, freezer and ceiling panels.

Complete materials list of items proposed for the Work of this Section.

Manufacturer's specifications and other data as necessary to demonstrate compliance with the specified requirements.

Manufacturer's recommended installation procedures.

**MATERIALS HANDLING:**

Use all means necessary to protect materials before, during and after installation and to protect installed Work and materials of other trades.

In the event of damage, immediately make all repairs and replacements necessary to approval of and at no additional cost to Brookshire's.

**MATERIALS:**

KPS Global is used to establish quality. Other manufacturers will be considered for substitution.

**PANEL FABRICATION:**

The prefabricated, insulated panels shall be of modular design with standard sizing to be completely interchangeable in the field.

Cooler, freezer and ceiling panels to be constructed with wolmanized wood around perimeter of panel and around any opening. All panel corners shall be a true ninety degree angle. Vertical corner interior of corner panels and tee panels to be fabricated with a NSF radius.

Panels are to be injected with "Poured-in-Place" urethane insulation and have PVC channel (1 1/2" Deep) tongue and groove mating edges. PVC channel tongue and groove shall match panel width.

The tongue edge of each panel shall provided with a NSF Listed gasket to provide an air tight joint.

Panels shall be rigidly coupled by cam action locking device located a maximum of four feet on center apart from each other. The cam locks shall be operated from the interior of the cooler or freezer panel by use of a hex wrench. Each hex wrench access port shall be covered with a snap-in button plug.

Maximum deflection of ceiling panels shall not exceed L/240 of span under a load of 15 pounds per square foot.

#### INSULATION:

Each cooler and freezer panel shall be "Poured-in-Place" (injected) with U.L. Listed, Class 1 urethane foam insulation which has a flame spread rating of less than 25 and smoke density less than 450 when tested in accordance to ASTM E84 (UL 723).

Each ceiling panel shall be constructed with expanded polystyrene insulation with U.L. Listed, Class 1 polystyrene insulation which has a flame spread rating of less than 25 and smoke density less than 450 when tested in accordance to ASTM E84 (UL 723).

Overall wall panel thickness shall be 3 1/2" for coolers and 5" for freezers. All ceiling panels shall be 3-1/2" thickness, except for 5" thickness at freezers as indicated on the Drawings unless noted otherwise.

Insulation shall be dimensionally stable from -100 degrees Fahrenheit to +200 degrees Fahrenheit.

#### METAL FINISHES:

Cooler and freezer wall panels shall be 26 gauge natural embossed galvanized steel (ASTM A527) on all exterior finishes and 26 gauge white embossed galvanized steel (ASTM A525) on all interior finishes unless noted otherwise on the Drawings. Interior finish of the ceiling panels shall be 26 gauge white embossed galvanized steel (ASTM A525). Verify all finishes with Brookshire's prior to fabrication.

#### DOORS AND HARDWARE:

The door clear opening size shall be as indicated on the Drawings.

Swing doors shall be flush, infitting style constructed with an 18 gauge stainless steel jamb guard at perimeters.

Doors shall be finished to match the metal finish of wall panels unless otherwise specified.

Each door shall be provided with a three sided snap-in magnetic gasket with an adjustable sweep gasket to seal the bottom of the door.

The door and door frame section shall be of the same core thickness and construction as specified for the other panels.

Doors 42" wide and less shall be mounted with a minimum of two Kason #1248 or equal cam lift hinges. Doors wider than 42" shall be mounted with a minimum of two Kason #1277S or equal

cam lift hinges. All doors shall be provided with one Kason #486 or equal interior safety release and Kason #56 latch and strike assembly.

All doors shall have 36" high aluminum diamond tread kick plates supplied and installed on both the exterior and the interior of the door.

Freezer door shall require heat distributed around perimeter of door. No heat shall emanate from stainless steel threshold provided.

One heated air vent is required for freezers to equalize pressure between the interior compartment and exterior spaces.

Provide a 2" dial thermometer.

#### GLASS DISPLAY DOORS:

Glass doors at Dairy Cooler shall be supplied by cooler/freezer panel contractor.

Anthony model VSTC (Vista C) doors and shelving shall be used only, no substitutions. Size of each door shall be 30" x 75".

Doors shall have a smooth silver finish.

Doors shall have vertical LED luminaries at all door jambs. All LED luminaries shall be LM79 tested and photometric results shall be submitted from those tests per SUBMITTALS. All LED luminaries shall be 4100K with a tolerance of +/- 200K. The CRI value shall be 75 or higher with Ra = 95 and R9 (Red) value of 90. The length of the lamina shall provide complete coverage of the products from the bottom shelf to above the top shelf. Luminaries shall be rated at 50,000 hours. Products of GE Immersion® (3rd generation product), TSM Associates, Inc. – LEDing EDGE, LED Power Inc., Philips Lighting, American Bright Optoelectronics Corp. and Gemtron are used to establish quality. Other manufacturers will be considered for substitution.

Shelving shall be provided with 6 shelves per door with metal price tag moldings. Shelving to be provided and installed by Brookshire's.

#### INSTALLATION:

Install panels and doors plumb, level and rigidly secure in place. Install per manufacturer's instructions for assembly.

Ceiling panels shall not span more the manufacturer's recommendations without approved additional support.

3 1/2" thick and 4" thick ceiling panels should not exceed 16' span and 5" thick ceiling panels should not exceed 22' span. Ceiling panels that exceed these span limits shall be supported from the structure above per manufacturer's recommendations. All connections shall be approved prior to installation.

4" ceiling panels shall be attached to 3" x 3" 14 gauge galvanized angle around the perimeter of room. Ceiling panels that exceed 16' of span shall be supported from the structure above per manufacturer's recommendations. All connections shall be approved prior to installation.

#### WARRANTY:

Manufacturer warrants that the panels shall be free from defects in materials and workmanship under the intended normal use and service for a period of ten years from the date of the original installation, not exceeding ten years and six months from the date of the original shipment. All

metals and painted surfaces shall be warranted for a period of eighteen months from the original date of shipment.

Hardware and accessory components shall be warranted against defects in materials and workmanship under its intended normal use and service for a period of one year from the date of the original installation, not exceeding fifteen months from the date of the original shipment.

Manufacturer shall repair or replace any panel or component found by the manufacturer to be defective within the warranty period.

CLEAN-UP:

Per GENERAL CONDITIONS.

- END OF SECTION 11406 -

SECTION 15010  
**GENERAL REQUIREMENTS FOR MECHANICAL WORK**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

ALL WORK shall be in conformance with the Drawings and Specifications in their entirety. It is the responsibility of EVERY CONTRACTOR, MATERIAL SUPPLIER, etc. to comply with such, and to be familiar with the Construction Documents in their entirety. Numbering and Labeling Systems are for the purposed of organization only, and do not constitute division of the work.

PLUMBING CONTRACTOR work shall include, but not be limited to:

- sanitary sewer soil, waste and vent piping
- domestic water piping and distribution
- natural gas service and distribution
- plumbing fixtures
- stops, supports, valves, cabinets/boxes/enclosures, hangers, insulation, and accessories as necessary for a complete installation
- roughing in and final connections of equipment furnished by Brookshire's as called for
- Air Conditioning Equipment condensate drain piping

HEATING, VENTILATING and AIR CONDITIONING CONTRACTOR (also referred to as MECHANICAL CONTRACTOR) work shall include, but not be limited to:

- air movement systems, including but not limited to, heating and cooling units, exhaust and supply fans, air curtains, cooking & vapor removal hoods, etc., whether furnished by this Contractor or Brookshire's, unless specifically noted otherwise
- complete duct system including grilles, registers, diffusers, dampers, insulation and accessories for air handling equipment and devices as necessary for a complete installation
- refrigeration gas and related piping for air handling equipment (i.e. excluding that related to Store Product Refrigeration Equipment)
- thermostatic/temperature control devices

FIRE PROTECTION CONTRACTOR work shall include, but not be limited to:

- complete design and installation of the Fire Protection Sprinkler System as to provide an approved fire sprinkler protection systems
- piping, valves, sprinkler heads, fire department connections, hose stations, racks, cabinets/enclosures, and other required items of equipment necessary for a complete installation

**CODES:**

All labor, equipment and materials shall be in strict accordance with applicable laws, codes, regulations, rules, practices, and recommendations of all Governmental/Regulatory Agencies having lawful jurisdiction over the work, including but not limited to:

- National Board of Fire Underwriters
- American Gas Association
- National Electrical Code
- City/Municipality, County/Parish, and State
- All work shall be accomplished in full compliance with the Occupation Safety and Health Act (OSHA) latest edition

Each Contractor shall secure all necessary permits, licenses, and inspections required by law for the work, the cost of which shall be paid for by the Contractor. Contractor shall secure such pay for all certificates of approval that may be required and deliver them to Brookshire's before final acceptance of the work.

#### GENERAL PROTECTION:

Contractor will be responsible for properly storing and protecting his materials, supplies, tools and equipment on the site and in the building. After materials, equipment and machinery are installed, he is responsible for properly protecting his installation until the work is completed and accepted. Any damage from whatever cause will be made good by the Contractor whose work is damaged, without cost to Brookshire's, whether the repair is made with his own materials and by his own workman, or by others under his direction.

#### DRAWINGS AND SPECIFICATIONS:

Drawings accompanying these specifications show the extent of the work to be done. The evident intent of these documents shall be carried out in every particular.

Plans are intended to show the general arrangement and the extent of the work contemplated. The exact location and arrangement of all parts shall be determined after equipment has been approved by Brookshire's, as the work progresses, to conform in the best possible manner with the surroundings, and as directed by Brookshire's.

Dimensions shall be followed without regard to scale. Scaling of the plans is specifically prohibited. Any omissions, conflicts, errors, etc. shall be reported to Brookshire's Facility Services Office immediately for clarification, interpretation, or resolution.

#### SHOP DRAWINGS AND SUBMITTAL DATA:

Per SUBMITTALS section of this specification.

HVAC Contractor shall furnish complete wiring diagrams showing power wiring, interlock wiring and temperature control wiring. Diagrams shall be submitted to Brookshire's per SUBMITTALS Section. After approved by Brookshire's, copies of appropriate Submittals shall be furnished to the Electrical Contractor by the HVAC Contractor.

#### RECORD DRAWINGS:

Contractor shall maintain a complete set of drawings upon which all deviations and changes shall be legibly recorded and actual installed position of all items shown in accordance with requirements of General Provisions. Drawings shall include equipment, piping, conduits, circuiting, ducts, dampers access panels, control valves, drains, and manholes. Water, gas and sanitary mains shall be accurately located by dimensions.

Record drawings shall be delivered to Brookshire's in good condition upon completion and acceptance of the work and before final payment is made.

Contractor shall furnish to Brookshire's a bound manual, in triplicate, containing complete repair parts list as well as complete operating maintenance, and service instructions as prepared by the Manufacturer, for items listed in DIVISION 15 of Specifications. In addition, Contractor shall thoroughly instruct Brookshire's operating personnel in the proper operation of each portion of the system.

#### EXAMINATION OF PREMISES:

Contractor shall visit this site to become fully acquainted with the immediate and surrounding premises and the conditions under which the work will be executed. Submission of a bid will be taken as evidence that this inspection has been made.

#### UTILITIES:

Location and sizes of sewer, water and gas lines are shown in accordance with data secured from available sources, such as Utility Companies. Data shown is offered as an estimating guide without guarantee of accuracy; each bidder shall make complete investigations of the site and shall check and verify all data given. Each Contractor will be responsible for coordinating Locator Services and physically verifying the exact location of all utility services related to his work.

#### INTERPRETATION OF REQUIREMENTS:

Any questions as to interpretation of drawings and specifications or any questions arising after examination of premises must be referred to Brookshire's in writing. No interpretation nor instructions given verbally by any person or persons will be considered valid.

#### SUBCONTRACT AND LABOR:

Per CONTRACT AND GENERAL CONDITIONS, all provisions of this section shall apply to all Contractors and suppliers to the extent that they are applicable.

#### PRECEDENCE:

The Mechanical and Electrical work shall have precedence over each other in the following sequence:

- Soil and Waste Piping
- Lighting Fixtures
- A/C Grilles, Registers, Diffusers & Ductwork
- Domestic Water Piping
- Fire Protection Sprinkler Heads & Piping
- Electrical conduits & wiring

#### MATERIALS AND WORKMANSHIP:

All materials shall be new, unless otherwise specified, and of quality grade standard manufacture and first class in every respect. All materials of a type for which the Underwriter's Laboratories, American Refrigeration Institute, etc., have established a standard shall be listed by the agency and shall bear their label.

All work shall be performed by competent mechanics, skilled in their trade, and shall be executed in a thorough, substantial and workmanlike manner.

Every Contractor will be responsible for the timely placing of all his materials and equipment in walls, ceilings, and slabs as construction progresses.

All Fixtures, Equipment, Piping, Fittings, Connectors, Gaskets, Solder, Flux, etc. which have the ability to come in contact with, or are otherwise used in connection with Serving, Storing, and/or Delivering Domestic Water to the Point of Use shall be "No Lead" or "Lead Free" which is defined as containing not more than 8.0 percent lead in Piping, Fittings, Castings, Extrusions, etc., and not more than 0.2 percent lead in Solder and Flux, unless more stringent requirements are established by Governmental Authority having jurisdiction over this project.

#### STANDARD FOR MATERIALS:

All components of the work shall be new and unused unless specifically noted otherwise in the Construction Documents. It is the intention of these specifications to indicate a standard of quality for all materials incorporated in this work. Manufacturer's names and catalog numbers are used to designate the item of equipment or material as a means of establishing grade and quality. Where several manufacturers are named, only these named manufacturer's products will be considered and the Contractor's bid shall be based on their products.

Refer to SUBMITTALS for substitutions.

Should electrical, gas, water, or drain, etc. requirements for substituted equipment differ from the Construction Documents and/or the named manufacturer, it shall be the responsibility of the Substituting Contractor to provide the proper services, whether greater or lesser, at no additional expense to Brookshire's.

#### CUTTING AND PATCHING:

Contractor shall be responsible for all cutting and patching required for the proper installation of his own work, and shall obtain permission from Brookshire's before doing any cutting. Cutting shall be done in such a manner that the surrounding work will be restored to its original condition.

All cutting and patching of finished surfaces shall be performed by the appropriate installing Contractor at the expense of this Contractor. **NO STRUCTURAL MEMBER MAY BE CUT/DRILLED WITHOUT APPROVAL OF BROOKSHIRE'S.**

CUTTING-TORCH is NOT ACCEPTABLE for any use on this project.

Openings cut through the roof or exterior walls shall be provided with a temporary water tight cover during construction or until equipment installation or repair has been made.

Contractor shall be responsible for providing correct sizes and locations of all such, slots, etc., on sufficient time that they may be built in as the building construction progresses.

#### CONSTRUCTION REQUIREMENTS:

Refer to EXCAVATING, BACKFILLING AND COMPACTING and all other related Specification Sections for Below Grade Work.

Location of all pipes, ducts, outlets, appliances, etc., as shown on the Drawings, are approximately only and are understood to be subject to such revisions as may prove necessary or desirable at the time the work is installed. Contractor will be required to install his work with relation to existing building conditions and shall be entirely responsible for the correctness of his work with reference to finish elevations, etc. Exterior utilities shown on the Drawings are diagrammatic only and their exact locations, depth and invert elevations shall be as required for proper flow and coordination with other trades.

The Drawings show the arrangements of piping and ductwork. Should project conditions necessitate any rearrangement, or if the piping or ductwork can be installed to better advantage in a different manner, this Contractor shall, before proceeding with the work, prepare and submit five (5) copies of drawings of the proposed arrangement for Brookshire's review.

If Contractor proposes to install equipment, including piping and ductwork, requiring space conditions other than those shown, or to arrange the equipment, he shall assume full responsibility for the rearrangement of the space and shall have Brookshire's review the change before proceeding with the work. The request for such changes shall be accompanied by shop drawings of the space in question.

Contractor shall so harmonize his work with that of the several other trades that it may be installed in the most direct and workmanlike manner without hindering or handicapping the other trades. Piping interference shall be handled by giving precedence to pipe lines which require a stated grade for proper operation.

#### COORDINATION OF WIRING & ELECTRICAL CONNECTION TO EQUIPMENT:

Each Contractor shall furnish and install all equipment, motors, motor starters, thermostats, shunts/cut-offs, controls, etc. as specified herein and as necessary for the complete installation of his work. Contractor shall pre-set these devices in place and shall coordinated with and furnish necessary wiring diagrams, cut-sheets, instructions, etc. to the Electrical Contractor as appropriate to determine proper wire/circuit sizing and connections. Electrical wiring, conduit, junction boxes, and related devices will be furnished and installed by the Electrical Contractor. Electrical Contractor shall make all "Line Voltage" connections (110 volt and greater). Each respective Contractor shall make connection of all lower voltages to devices furnished within his contract, unless specifically noted otherwise in the Construction Documents.



## MOTORS AND CONTROLLERS:

All motors shall meet the requirements of the latest motor standard of the NEMA, and shall be as manufactured by Century, U.S. Motors, or G.E., and of a type recommended by the manufacturer for the service intended. All motors shall be rated to operate at a temperature of 40 degrees C., above the ambient room temperature. Oiling devices shall be so located that they will be readily accessible. Motors for belt driven equipment shall be provided with adjustable slide rails. Motors for outdoor installation shall be T.E.F.C. Motor starters shall include overload and undercurrent protection in all phases. Unless otherwise noted, all motors shall be squirrel cage, continuous rated standard frame type, and of the horsepower, speed, phase and voltage as specified or as called for on the Drawings.

Controllers for all three-phase motors shall be the automatic magnetic type complete with thermal overload protection and Controllers for single phase motors shall provide thermal overload protection. Where required for interlocking purposes, the controllers shall have extra sets of contacts.

Contractor shall furnish and install nameplates for all switches, starters, etc. Plates shall be made of plastic or of black anodized aluminum, suitably engraved and shall be mounted below the device.

If Contractor proposes to furnish motors varying in horsepower and characteristics from those specified, he shall first obtain approval from Brookshire's for the change. If these proposed changes were approved, the Contractor shall then coordinate the change with the Electric Contractor and shall pay all additional charges in connection with the change. The Contractor shall remain responsible for the proper operation of the system.

### *Motor Starters -*

- Starter for single phase non-electrically interlocked motors shall be single or double pole switches as required with red filament type pilot light and stainless steel face plates, equal to "Allen Bradley" Bulletin 600. Install flush mount type in finished areas.
- Starters for single phase electrically interlock motors, and three-phase motors up to 50 horsepower shall be 60 Hz, 600 volts across the line magnetic contactors, with thermal overload protection.
- Starter for three-phase motors larger than 10 horsepower shall be 60 Hz, part winding, with general purpose enclosures, thermal overload protection on each phase and undervoltage protection.
- Starters requiring electrical interlock contact points shall be so furnished as indicated or required.
- Starters installed outside the building or otherwise exposed to the weather, shall be furnished with weather resistant NEMA Type 3R enclosures, in lieu of general purpose enclosures.
- All starters of any type furnished under a single contact shall be of the same manufacturer.
- Starters furnished as integral parts of factory-assembled prewired equipment shall conform to the above requirements applicable in the opinion of Brookshire's. Starters not conforming to the above paragraphs shall be replaced by this Contractor at his expense.
- Starters shall be wall mounted beside hood below ceiling.

### *Pushbutton and Switch Stations -*

- All magnetic contactors shall be provided with a heavy duty type pushbutton station, rated for 10 amperes continuous load at 600 volt or less.
- Enclosures shall be general purpose NEMA Type 1, except that pushbutton stations installed outside the building or otherwise exposed to the weather shall be dust and weathertight, NEMA Type 4. Enclosure shall be provided for surface mounting, except as otherwise indicated.
- Pushbutton stations for non-interlocked contacts shall be momentary contact type with start button, stop button, and red indicator light. Where required for delayed "seal-in" or where otherwise noted, pushbuttons shall be maintained contact type.

#### ACCESS PANELS:

Contractor shall furnish for installation steel access door(s) for each of his valves, group valves, or other controlling mechanism which otherwise be concealed in the building construction. Locations and installation methods shall be as approved by Brookshire's.

Access doors shall be similar and equal to "Milcor" steel access doors and shall be Type 'M' for masonry walls and Type 'K' or 'L' for gyp. board or for lath and plaster walls, as the condition requires. Each door shall be furnished with a flush screwdriver-operated lock and shall be furnished with one prime coat of gray rust-inhibitive paint. Each access door shall be of the minimum size necessary to properly operate and maintain the enclosed device. Equivalent units as manufactured by Karp Associates, Inc. will be acceptable.

#### PAINTING:

All equipment shall be delivered to the job with suitable factory finish. Should the finish be marred in transit or during installation, it shall be finished to present a neat, workmanlike appearance.

Except as elsewhere hereinafter specifically required, any painting of equipment, piping, insulation, etc., furnished and installed under this Section of the Specifications will be done by the Painting Contractor. However, the HVAC Contractor shall leave equipment clean and free from any grease, dirt, rust, etc., in suitable condition for painting.

#### CLEANUP:

Per GENERAL CONDITIONS. Each Contractor must be responsible for all equipment, unused material, rubbish and debris of any kind which is generated during the execution of his portion of the work. Keep premises, including the outside area, broom clean and free from unnecessary impediments and debris at all times.

*- END OF SECTION 15010 -*

## SECTION 15250 INSULATION

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### SCOPE:

Furnish and install all labor, materials, equipment, tools and services and perform all operations required in connection with or properly incidental to the complete insulation installation as indicated on the Drawings reasonably implied therefrom or as specified herein unless specifically excluded.

### DOMESTIC WATER PIPING:

Installation of all above slab domestic water piping shall be by *Insulation Contractor*, not by Plumber.

All domestic water piping, except where buried below grade, shall be insulated with Owens-Corning SSL-II, or approved equal, 1/2" min. thick,  $k=0.23$ , "One-Piece" molded fibrous glass piping covering with fire retardant jacket and self-sealing flap.

Valves and like fittings shall be completely covered with 1/2" thick molded fiberglass, with only the necessary operating device (such as lever, handle, wheel, etc.) left exposed.

Staple all factory flaps.

Seal all non-factory connections, joints, terminations, etc. with Childers VI-CRYL CP-10/11 Mastic, Standard White. Apply with brush or trowel only – no spray. Tape not required.

All jacket material shall be factory applied.

All joints shall be mitered or otherwise cut neatly to fit tight at ends, tees, elbows and like fittings.

PVC or like manufactured fitting cover will NOT be ALLOWED.

Insulation shall be applied to achieve a continuous and complete thermal barrier with the only unenveloped portions being necessary operable or moving devices. Hanging devices shall be properly sized to allow insulation to pass through without interruption. Fit neatly and tight to masonry walls and fixtures to which piping is terminated. Insulation shall be continuous through drywall partitions, suspended ceilings, etc.

For all locations where domestic water piping passes through or otherwise comes in contact with concrete, provide Armaflex type flexible pipe insulation with 4 mil polyethylene outer jacket; or Schedule 40 PVC sleeve leaving 1/4" minimum clearance all-around pipe, and fill with fiberglass insulation; for the entire concrete contact area.

### DUCTWORK INSULATION:

Refer to AIR DISTRIBUTION SYSTEM section for internal duct insulation. Where ducts are lined internally, no exterior insulation will be required.

Where internal and external insulation join, they shall lap a minimum of 24".

All ductwork not internally lined shall be insulated with a minimum of R-8 insulation and faced with factory installed reinforced aluminum foil, flame resistant kraft paper backing.

Insulation shall be held in place by fire retardant adhesive applied in four inch (4") wide brush widths on 12" centers, or No. 16 gauge galvanized annealed wire on 24" centers.

Ducts 18" and over in any dimension shall be both glued and wired.

Insulation shall lap at least four inches (4") at all joints.

#### HVAC REFRIGERATION LINES:

All interior refrigerant suction lines shall be insulated the entire length of the run with Armacell Armaflex II, Rubatex R-180FS with 1" wall thickness.

All liquid lines shall be insulated; including liquid lines from the liquid manifolds to the evaporator coils with 1/2" insulation.

Insulation joints shall be sealed with rubber cement to insure "drip-tight" seal. Insulation shall be slipped on the tubing prior to joint brazing where possible, in preference to splitting, and then sealing the joint. Each joint must then be covered with an insulating sleeve glued around the joint.

All the suction valves, fittings, elbows and other connections must be properly insulated with preformed insulation material, designed for this purpose, securely fastened to each component. Wrapping with insulated tape is unacceptable as the only method of component insulation.

Insulation shall be mitered, pre-adhered (except for reclaim piping, whereby pre-adhered insulation is not permitted) and longitudinally slit to fit over p-traps, tees and elbows or bends over 90°.

All refrigeration lines which run through plenum spaces must be insulated with AP Armaflex Elastometric Foam Insulation with a 25/50 flame-spread and smoke developed ratings.

All openings for piping access shall be completely sealed with "silicone" sealant or Insta-Foam products. Refer to the Drawings or Architectural specifications for fire stopping materials required for sealing of penetrations through rated assemblies.

Armaflex insulation which is located on the exterior of the building envelope, must incorporate a weather resistant protective finish, such as Nomaco K-Flex Clad AL.

Insulation shall be installed in strict accordance with the manufacturer's recommendations.

#### DRAIN LINES:

Condensate drain lines inside the building from AC units shall be insulated with Armaflex insulation 3/8" thick. Cover fittings with cut or mitered section of pipe insulation.

Seal all joints in the insulation with Armstrong 520 adhesive to provide a continuous vapor seal.

Insulation shall be installed in strict accordance with the manufacturer's recommendations.

#### GENERAL:

All surfaces to be insulated shall be clean and dry before applying the insulation.

All sections of molded pipe covering shall be firmly butted together. Where coverings are used, they shall lap the adjoining section of insulation by at least three inches (3").

Where insulation terminates, it shall be neatly beveled and finished.

No insulation shall be applied until the pipe, duct, etc., have been pressure tested and found tight.

Flexible connections on duct shall not be covered.

All materials used shall be fire retardant or non-flammable.

Where vapor barriers are required, the vapor barrier shall be on the outside.

Extreme care shall be taken that the vapor barrier is unbroken. Joints, etc., shall be sealed.

Where insulation with a vapor barrier terminates, it shall be sealed off with the vapor barrier being continuous to the surface being insulated.

Ends shall not be left raw.

All insulation shall be neatly applied by experienced insulation appliers strictly in accordance with the manufacturer's directions and to the complete satisfaction of Brookshire's.

**PIPING:**

Where hangers or supports are on the outside of the insulation, use a section of Foamglas insulation at hanger or support locations and provide No. 16 gauge galvanized steel sleeves, 12" long, to protect the insulation.

Sleeves shall be half cylinder with the edges hemmed to prevent cutting the insulation.

*- END OF SECTION 15250 -*

SECTION 15301  
**AUTOMATIC SPRINKLER FIRE PROTECTION**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Supply and install all Automatic Sprinkler Fire Protection Work as shown on Drawings and as specified herein.

Electronic Fire Alarm Systems and hand-held fire extinguishers are not included within the work of this section.

**SHOP DRAWINGS:**

Per SUBMITTALS.

Automatic Sprinkler Contractor shall prepare complete Shop Drawings and dimensional working drawings for the entire installation. First submit to Brookshire's for approval of the basic arrangement and layout. Such submittal will be noted for corrections or changes if required. Contractor shall note any field changes or alteration to the original drawing through the course of the work and with request for final payment shall submit to Brookshire's reproducible mylar sepias of the "as built" drawings for the installation.

**CODES AND AUTHORITIES:**

All aspects of design, installation and equipment shall conform in all respects to the rules, regulations and requirements of the State Fire Marshal, State Board of Insurance, all City and Local Fire Prevention Bureaus, Factory Mutual Engineering Published Standards, and the latest edition of all applicable National Fire Protection Association (NFPA) Standards, including but not limited to NFPA 13, NFPA 24 and NFPA 231. In the event of conflict between standards/requirements, the most stringent shall apply.

**CERTIFICATION:**

Contractor shall prepare all design, fabrication, and construction drawings and calculations per referenced and applicable standards for a complete automatic sprinkler fire protection system as described within this specification.

Contractor shall provide to Brookshire's any and all certification(s) required by and obtain acceptance from authorities having jurisdiction over this project prior to beginning this Work.

Water supply tests shall be conducted as near as possible to tap location for service to this project. Test(s) shall be administered within 90 days of the date hydraulic calculations are made, and witnessed or administered by appropriate Fire Department and/or Utilities Department representative. Brookshire's may require retest of water supply at any time. Contractor shall bear the responsibility of obtaining appropriate Flow/Pressure Test(s) from which to design system.

Should characteristics of the Water Utilities Supply System to the Site change significantly between date of bidding and aforementioned calculation date, and Contractor furnish documentation acceptable to Brookshire's that bid was based on Certified Test performed within 180 days of bid date, the applicable charges for re-design, modification of work in place or replacement of fabricated/ordered materials shall be paid by Brookshire's on a time and materials basis plus agreed Change Order percentage.

Fire Protection Sprinkler Contractor Work shall begin at Existing Flange at the location of Existing Riser as indicated on the Drawings. Contractor may reuse any portion, or portion(s), of the existing Fire Protection System, however, Contractor shall bear the complete responsibility for Certification/Compliance of the Finished Work.

All horizontal piping shall be within Fire Sprinkler Pipe Zone where detailed on the Drawings.

Minimum coverage shall be hydraulically calculated for Commodity Class III as defined by NFPA 231, for single row palletized rack storage with wire shelving throughout the entire applicable area indicated on the "Fixture Plan" as containing "rack"; maximum rack storage height is 19'-6"; In-Rack Sprinklering and Hose Reels/Connections are not acceptable.

Brookshire's reserves the right to increase requirements or make changes at any stage of design or construction. Any charges for re-design, modification of work in place or replacement of fabricated/ordered materials shall be paid by Brookshire's on a time and materials basis plus agreed Change Order percentage.

**GUARANTEE:**

Per GENERAL CONDITIONS.

**MEASUREMENTS:**

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

**COORDINATION & SYSTEM REQUIREMENTS:**

Coordinate with all other trades whose Work relates to Automatic Sprinkler Fire Protection for placing of all required backing, attachments, furring, etc., to insure proper locations.

All piping for all systems shall be coordinated with lighting fixtures, skylights, clerestories, air conditioning ducts, piping and air handling units. Sprinkler heads shall be located as closely as possible to the center of the ceiling tiles and shall not interrupt lighting, A/C grilles or ceiling grid. Final exact locations shall be verified with Brookshire's upon shop drawings submittal and immediately prior to installation.

Furnish off-set or otherwise extended sprinkler coverage below permanent building equipment or devices of plan width greater than 48".

Plans do not have exact details as to elevations and locations of all items of equipment, etc. Contractor shall carefully layout his work at site to conform to Architectural and Structural conditions to provide an integrated, satisfactory operating installation.

If deviations from arrangements described are necessary to meet structural conditions, ductwork, lighting, etc., make changes without expense to Brookshire's.

Verify operating temperatures and determine non-conditioned areas, such as Motor Rooms, Charge Rooms, open air Covered Loading Docks, etc., and provide appropriate special protection equipment or systems.

Brookshire's reserves the right to make any reasonable change in location of any outlet or equipment, before installation, without additional cost.

**DELIVERY AND STORAGE:**

Deliver and store materials in dry, protected areas. Keep free of corrosion or other damage. Delivery of materials shall be sequenced with the installation to prevent stockpiled materials from inhibiting the work of others. Replace any damaged parts at no cost to Brookshire's.

**MATERIALS & INSTALLATION:**

All materials shall be Underwriter's Laboratory listed and Factory Mutual approved as manufactured by Globe, Nibco, System Sensor/Pittway, American Tube, Victaulic, Potter Roemer or approved equal.

All on-site fabrication shall be performed outside of the building. All fabricated pieces shall be cleaned prior to entering building to avoid any oil or metal shavings from staining any concrete slabs inside the building.

*Automatic Sprinkler Heads -*

Upright or pendent, of proper temperature rating, shall be installed throughout the areas as required. Where furred or finished ceilings occur, the piping shall be installed above the ceiling with the sprinkler heads nipped through the ceiling and set in metal escutcheon plates approximately 1 inch deep. Sprinkler shall be chrome finish in all finished ceilings. The exposure of head/escutcheon shall not vary greater than 1/2" throughout each ceiling height.

*Motor Rooms and Storage Docks -*

Provide anti-freeze loop or acceptable dry system for enclosed "Motor Room(s)" with louvers to the exterior and exhaust fan systems; and for covered exterior areas under which storage is anticipated.

*Sprinkler Riser -*

Shall be equipped with a variable pressure alarm valve including retarding chamber, drain valve, standard trimming and gauges.

*Water Motor Gongs -*

Shall be furnished for alarm valve, and/or dry pipe valve when required by local codes and authorities, and located as required.

*Drains -*

Shall be piped to outside of building as part of this work, except in locations where a drain fixture is provided by the plumbing design specifically. All drain locations shall be at location acceptable to Brookshire's.

*Piping System Valves -*

Shall be approved for fire protection piping systems and shall be installed as required by the NFPA.

*Overhead Piping -*

Shall be standard weight wrought steel pipe. Thin wall piping may be used when acceptable to local authorities. Pipe and fittings shall be UL listed for use in sprinkler work. Piping layout shall be such as to avoid, wherever possible, conflicts or interference with building lighting, multiple pipe runs and mechanical equipment, including refrigeration equipment and piping not in the contract. Locations of these items will be shown or called for on the Drawings, or will be made available from Brookshire's during system design/approval.

In all storage areas it is intended that maximum headroom be maintained.

*Cooking Hood Suppression System -*

Provide 1" line from nearest Automatic Fire Sprinkler supply branch to each Type I hood down to 1'-0" above finished ceiling. Install 1" locking ball valve supplied by the Hood Suppression contractor at 1'-0" above finished ceiling. Make final connection from 1" locking ball valve to hood suppression system cabinet.

*Hangers -*

Shall be installed as required and shall be UL listed for use in a sprinkler system. Hangers shall be spaced in accordance with the requirements of the NFPA.

*System Sign -*

Permanently attach a minimum 8" square metal "Hydraulic Calculation" sign with baked enamel paint information form. Permanently engrave or etch all information applicable to installed system.

*Cabinets -*

One cabinet with 6 sprinkler heads of each type used, and 1 head wrench for each head type, shall be installed in the project in the immediate area of the riser and acceptable to Brookshire's.



**TESTING:**

All piping shall be tested for two hours at 200 psi in the presence of Brookshire's representative; Official as designated by the local Municipality (i.e. Building Official, Director of Public Works, Fire Department); and the State Fire Marshal's representative (when applicable); and shall be proved tight. It shall be the responsibility of this Contractor to determine those having jurisdiction over the work, and for scheduling of required Inspections. Unsatisfactory workmanship shall be corrected to the satisfaction of the above mentioned. Defective materials shall be replaced with new materials and the defective materials removed from the premises.

No cutting of structural steel members will be allowed.

All penetrations of any work in place whether finished materials, studs, decking, insulation, concrete masonry, etc. shall be accomplished by coring, drilling, punching, sawing or other acceptable method of neatly cutting. Holes shall be of minimum size and appropriate shape for item being placed. Cutting torch is unacceptable for any material.

Install in a sturdy, substantial manner, straight, true and plumb.

Location and type of hangers and attachments in exposed areas shall be approved by Brookshire's.

**CLEAN-UP:**

Per GENERAL CONDITIONS.

- END OF SECTION 15301 -

## SECTION 15400 PIPING SYSTEMS

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

Refer to UTILITIES section of specification for responsibilities for connection and fees.

### SCOPE:

Furnish and install all labor, material, equipment, transportation, tools, devices, and appliances and perform all operations required in connection with or properly incidental to the construction of plumbing utilities and services and the various piping systems and accessories, in accordance with the materials contained herein and the applicable drawings and subject to terms and conditions of the Contract.

The entire work shall be delivered complete and in working order as acceptable to Brookshire's.

### SANITARY SEWER SERVICE:

Install all exterior and interior sanitary service lines as indicated or reasonable implied by the Drawings.

Provide Connection to and Extend from Service Point as required.

Verify location and depth at each end of work and determine that proper flow elevations are available before commencing any work.

All sanitary drainage lines (soil, waste and vent) shall be ASTM A-74 service weight cast iron soil pipe and fittings, coated inside and out. Joints shall be fabricated by the use of dry oakum packing, forced into the annular space, and then the joint shall be filled with ingot lead, poured in, with one pound of lead used for each 1" diameter of pipe. The joint shall then be well caulked and the lead shall be 1" minimum depth and brought to the top of the joint and faced. Compression type joints similar to Tyler Pipe Foundry's "Ty-Seal" or "No-Hub" piping will be acceptable if approved by Plumbing Inspector. "No-Hub" piping shall be limited to above ground installation.

At the Contractor's option, and where approved by local authority, vent piping and sanitary sewer waste piping may be type DWV Schedule 40 PVC pipe and fittings.

Horizontal waste and soil pipe shall be given a grade of 1/4" per foot where possible for 2" pipe and smaller, and not less than 1/8" per foot for pipe larger than 2". Where practical multiple vents shall be connected together and extended as one vent through the roof. Vent and waste connections to stacks shall be made by the appropriate use of 45 degree wyes, long sweep quarter bends, sixth, eighth, or sixteenth bends except that sanitary tees may be used on the vertical stacks.

Vents shall be extended at least 15" above roof and then properly flashed with 4 pound lead with the base extending at least 4" in every direction from stacks. Verify that vent openings do not occur within 12'-0" of Fresh Air Inlets for Heating, Ventilation, & Air Conditioning Units and/or Supply Fans.

Vertical portion of the flashing shall be turned down inside the pipe at least 2" to provide a weathertight joint. Deliver flashings to Roofing Contractor for installation.

Cleanout shall be provided at each change in direction of the soil lines, at the end of each continuous water line, at the foot of each riser within the building, and at 50'-0" maximum intervals in horizontal lines within the building, unless specifically indicated otherwise on the Drawings; and 100'-0" maximum intervals in lines outside the building. All locations not specifically indicated on the Drawings shall be acceptable to Brookshire's. Inside Diameters of

cleanout openings shall be equal to or larger than the size of soil or waste lines in which they placed, except 5" to 8" diameter may be served with 4" diameter cleanouts. Waste Piping of 8" and greater diameter must be serviced by Manholes where indicated on the Drawings and in conformance with applicable Codes.

Cleanouts must be placed in accessible locations and where they occur in pipe chases, said cleanouts shall be Wade #W-6000 Series, unless noted otherwise on the Drawings, placed above the floors in such a manner that they will be accessible through doors or they shall be brought through wall and provided with flush covers. Exact locations of each shall be approved by Brookshire's before installation. All cleanouts shall be of the types specifically designed for installation in the types of wall in which they are installed. All exterior cleanouts, not located within pavement shall be encased in 18" x 18" x 6" concrete pad, or as detailed on the Drawings.

Plumbing Contractor shall include in their scope of work to raise or lower the top of all cleanout covers to match flush with the final floor finishes. Core concrete full depth centered over the cleanout to adjust the height. Remove and dispose of cored concrete. Fill back around adjusted cleanout with 3,000 psi concrete full depth of slab.

Each fixture and piece of equipment requiring connection to the sanitary drainage system, except fixtures with integral traps, shall be equipped with a trap. Each trap shall be placed as near to the fixture as possible and no fixture shall be double-trapped unless required by Brookshire's and permitted by governing codes.

#### DOMESTIC WATER SYSTEM:

Provide all materials, labor, equipment, etc. and obtain taps, connections, etc. as required to provide water service to the building and as indicated on the Drawings. All valves, fittings, and devices which come in contact with Domestic Water shall be certified as such by applicable Standard, such as: ASSE, IAPMO, AWWA, CSA, USC/FCCC & HR.

Provide domestic water service of the size shown on the Drawings, including main shut off valve in underground concrete box with cast iron locking cover, labeled "WATER". Furnish and install all other required valve boxes where indicated on plans and as required by the City. Boxes and cover shall be cast iron and the cover shall have the work "WATER" in raised letters on casting. Valve box shall be sufficient size for installation and maintenance valves. Top of boxes shall be installed flush with final finished grade.

Coordinate with Municipality, or appropriate Water Utility, to provide taps and water meter(s) installation facilities.

Underground water piping outside the buildings shall have 30" minimum cover to final finished grade.

All Fixtures, Equipment, Piping, Fittings, Connectors, Gaskets, Solder, Flux, etc. which have the ability to come in contact with, or are otherwise used in connection with Serving, Storing, and/or Delivering Domestic Water to the Point of Use shall be "No Lead" or "Lead Free" which is defined as containing not more than 8.0 percent lead in Piping, Fittings, Castings, Extrusions, etc., and not more than 0.2 percent lead in Solder and Flux, unless more stringent requirements are established by Governmental Authority having jurisdiction over this project.

All exterior Domestic water service lines from meter to the building shall be Schedule 40 PVC, unless superior grade is indicated on the Drawings and/or required by governing authority, to within 2' of the point of entry to the building.

Main shut off valve shall be line size AWWA 175 lb. NRS, square nut operated valve complete with Tyler Pipe and Foundry #6895 medium duty valve box with extension collar cast in a 12" x 12" x 6" concrete pad.

Furnish and install backflow preventer and shut off valve as near as possible to the point of entry of main domestic service to the building as indicated on the Drawings.

Domestic water service and piping below the building slab shall be Type "K" soft drawn copper. The use of joints in the piping beneath concrete slabs will be avoided and will be permitted only to the extent of long runs where a single roll or length of copper tubing is not of sufficient length to complete the piping run. Should a joint be required, the joint shall be made with no lead solder and wrought solder joint copper fittings and the exact dimensional location noted on the "As-Built" drawings furnished to Brookshire's at final completion.

Domestic water piping above the building slab shall be Type "L" (minimum grade) hard drawn copper. Piping shall be assembled with cast brass or wrought copper fittings and no lead solder. Flux shall be of non-corrosive paste type.

Water piping connections to fixtures or equipment shall be made by the use of brass pipe or nipples, chrome plated where exposed to view in finished areas, screwed into copper-to-IPS adapter fittings. Ferrous piping connections will not be used in copper piping systems.

Water piping control valves shall be provided by this Contractor where required to adequately control and isolate the various domestic water piping systems. Valves shall be provided in branch mains as indicated on the Drawings, and at the connection to all fixtures and equipment. Valves shall be as manufactured by Watts, Nibco, Febco, Wilkins, Grinnel, or approved equal:

- Gate valves shall be bronze Grinnel #3000 SJ for solder joint or #3000 for thread joint.
- Globe valves shall be bronze Grinnel #3210 SJ for solder joint or #3210 for thread joint.
- Single Check valves shall be bronze Grinnel #3300 SJ for solder joint or #3300 for thread joint.
- Double Check valves for Domestic Water Service up to 3" shall be Grinnel #007, Wilkins #975XL, or Febco #850 Series, complete with replaceable seats, silicone rubber check discs, and shut-offs.

Provide separate accessible "stops" at Hot and Cold Water supplies to all fixtures as appropriate for the installation similar to McGuire Manufacturing Company LFST-X, Chrome Plated Brass, Commercial Grade, Heavy Brass Cross Handle.

On each flush valve on a header, provide a manufactured water hammer protective device equal to Wade 4480 Water Hammer Arrestor. On all other hot and cold water service points to plumbing fixtures provide a 12" minimum height Air Chamber, of same pipe diameter as Service Header or 1" minimum, whichever is larger. These air chambers shall be located directly behind the supply connection to the fixture, with capped top, and constructed of same material as the piping system in which they are installed. Completely insulate all Air Chambers/Shockstops in the same manner as the balance of the piping system in which they are installed.

All outlets with hose threads shall be provided with vacuum breakers. Where fixture trim is not specified as having an integral vacuum breaker, or device is not clearly indicated on the Drawings as being after vacuum breaker, furnish and install Watts #9 Series Backflow Preventer in location and manner acceptable to Brookshire's, whether inside or outside of building.

#### FIRE PROTECTION SERVICE:

Extend fire protection service from main to the building in accordance with the Municipality's requirements.

Piping per AUTOMATIC SPRINKLER FIRE PROTECTION Specification Section.

#### GAS SERVICE:

Provide all materials, labor, equipment, etc. and obtain taps, meters, connections, extensions, etc. as required to provide natural gas service to the building. Provide all gas piping, fittings, valves, etc. as indicated on or reasonably implied by the Drawings.

No gas piping shall be run below floor slab or concealed in walls or chases.

*Gas Piping -*

Schedule 40 black steel, ASTM A53, unless specifically noted otherwise.

*Gas Fittings -*

Threaded, 125 psi malleable iron: 2" and Smaller, Above Grade, Standard Pressure. Screw thread joints shall be made with an approved compound.

"Tube-Turn" forged welding type, or approved equal: Standard Pressure over 2"; and all Intermediate Pressure piping regardless of size.

Installation of piping and equipment shall be in accordance with the requirements of the local Municipality, gas company and other authorities having jurisdiction.

All piping shall be run straight without sags or traps and shall be so pitched as to drain back to the riser. A drip pocket consisting of a nipple and a cap shall be screwed into the bottom of each riser and at all low points of the gas distributing system. All gas piping within the building shall be run exposed unless specifically shown otherwise on the Drawings.

All exposed exterior gas piping shall be painted per PAINTING & WALL COVERING Specification Section.

**PIPING INSTALLATION:**

General arrangement of underground piping shall be as indicated on the Drawings and as follows:

*Sanitary Sewer Lines -*

Shall not be closer horizontally than 5'-0" to a potable water line, except that where the bottom of the water line will be at least 1'-0" above the top of the sewer line, the horizontal spacing may be minimum of 6'-0".

Where sanitary sewer lines cross above water lines, the sewer pipe shall be a full joint of pipe centered on the water line for a distance of 5'-0" each side of the crossing, shall be cast iron and without any joint closer horizontally than 3'-0" to the crossing or shall be fully encased in a minimum 4" thick concrete envelope.

All Sanitary sewer and Water lines shall have a minimum of 48" cover to finished grade.

Install all piping in a neat and workmanlike manner. Hangers shall be of the type mentioned in this section and shall be so spaced and installed as to maintain a rigid piping system, adequately supported both laterally and vertically.

*Domestic Water Lines -*

All water piping systems shall be installed level and the low points of all risers shall have gate valves 1/2" in size installed with hose ends in order to adequately drain the system.

At each group of plumbing fixtures there shall be furnished and installed by this Contractor, gate valves on each and every piping system so that these groups of fixtures may be isolated from access line locations.

The entire piping system shall be installed to provide for expansion and contraction and the joints shall be soldered at such time that the system is not under strain.

Necessary spring pieces and offsets shall be furnished by this Contractor as required.

Each of the piping systems shall be concealed in several chases and above ceilings and in walls and in all finished areas and shall be run exposed only as specifically specified or as shown on the Drawings in machinery spaces on unfinished areas.

Exposed piping shall be held close to the walls and ceilings and necessary fittings shall be provided and installed to allow for offsets to hold the piping close to walls and ceilings. Where these lines run exposed, location, clearance, etc. shall be approved by Brookshire's before making the installation.

All valves shall be so located as to make the removal of their bonnets possible. Screwed pattern valves placed in horizontal lines shall be "made-up" with their valve stem inclined at an angle of 30 degrees above the horizontal position. All valves stems must be true and straight at the time the system is tested for final acceptance.

All piping shall have reducing fittings used for reducers or increasers where any change in the pipe sizes occur. No bushings of any nature shall be allowed in piping.

Install all piping at right angles and parallel to building lines. All piping in exposed structure areas shall be within "Zone" indicated on the Drawings.

#### UNIONS:

No unions are to be placed in any pipe in a location which will be inaccessible after completion of the building.

Unions must be installed on each side of all special valves, control valves, regulators, etc., and one side of all check valves, tanks, etc., so that such equipment may be readily disconnected without having to disturb adjacent pipe or equipment.

Di-electric, or insulating, unions shall be provided wherever piping of dissimilar materials is connected, (i.e.: steel to copper, etc.).

#### PIPE SLEEVES:

Pipe sleeves made of Schedule 40 PVC or galvanized steel pipe properly secured in place with approximately 1/2" space between each sleeve and the surface of the pipe and/or insulation passing through it, shall be provided for all pipes passing through concrete floors or masonry walls. All pipe sleeves shall be built in place as the walls or floors are built up. This Contractor shall furnish and locate all sleeves for insertion into the structural parts of the building. The spaces between sleeves and pipes passing through concrete and exterior masonry walls shall be made watertight with non-hardening mastic material. Sleeves passing through floors shall project a minimum of 1" above the finished floor surface. Sheet metal sleeves will not be permitted.

Install Pipe-Tite gasketed system at all penetrations of metal studs, using proper size fitting in punched hole per manufacturer's printed instructions.

#### VALVE IDENTIFICATION:

Contractor shall wire onto the angle of each valve installed under this contract a bronze disc not under 1" diameter, stamped with prefix "P" or "AC" followed by identifying number not less than 1/2" high.

Number, location, and purpose corresponding to each valve shall be listed in sequence, properly typewritten on a schedule sheet framed under glass to be turned over to the Owner and mounted where directed.

Valve tags and schedule sheets shall be as manufactured by "Seton Name Plate Co.," New Haven, Conn.

#### PIPE HANGERS:

Pipe hangers shall be Grinnell, Fee and Mason or F&S Central of a type suitable for each use. Perforated straps shall not be used in any work. For ferrous pipes up to and including 4" in size, use Grinnell Fig. 104 malleable iron, adjustable, split ring, swivel hangers. For plumbing piping larger than 4", use Grinnell Fig. 260 steel clevis hanger.

Where several pipes are parallel at the same elevation, trapeze hangers may be used. Where trapeze hangers are used, the pipes shall be supported on rollers where rollers are called for by the above specifications.

For copper pipes up to and including 3" in size, use Grinnell Fig. CT-99C wrought iron, copper plated plastic coated hangers. Trapeze hangers shall be used where ducts or other obstructions interfere with the use of a single hanger.

Hanger rods shall conform to the following schedule --

- Pipe up to and including 2" -- 3/8" rods.
- Pipe 2-1/2" and including 3-1/2" -- 1/2" rods.

Unless shown otherwise on the plans, all horizontal runs of ferrous piping shall be suspended from the floor or roof construction, as the case may be, by means, of hangers with the following maximum spacing:

- Pipe up to and including 1" -- 6".
- Pipe 1-1/4" and larger -- 10'.

Unless shown otherwise on plans, all horizontal runs of copper piping shall be suspended from the floor or from roof construction, as the case may be, by means of hangers with the following maximum spacing:

- Pipe to 3/4" in size -- 5'.
- Pipe to 1" to 1-1/4" --- 8'.
- Pipe to 1-1/2" and larger -- 10'.

Hanger spacing, regardless of schedule, shall be close enough to prevent sagging.

Wall supports shall be galvanized steel band iron or fabricated angle brackets.

Hangers occurring at steel beams or joists shall have angle or channel clips secured to top chord of beam or joist for supporting rods.

Provide a hanger within 2' of each elbow or tee. Additional supports shall be provided for valves, strainers, etc. Cast iron pipe shall have not less than one hanger per length of pipe. Vertical risers shall be supported by approved riser clamps at each floor. Vertical pipes within a space shall not have less than two (2) supports. Riser clamps shall be equal to Fee and Mason Fig. 241 and shall be properly anchored to the building structure.

Supports and hangers shall be installed to permit free expansion and contraction in the piping systems. Where necessary to control expansion and contraction, the piping shall be guided and firmly anchored. No piping shall be self-supporting nor shall it be supported from equipment connections. Roller hangers, where required, shall be equal to Fee and Mason Fig. 272, or 161 as appropriate.

Inserts shall be used where piping or equipment is to be hung from concrete construction. Concrete inserts shall be equal to Grinnell Fig. 282. After the forms are removed, clip off all nails with the exposed surface of the inserts. Expansion bolts shall be equal to Grinnell Fig. 117.

Piping hangers for all insulated lines shall be sized to go around the insulation with saddles being provided to protect the insulation. Provide rigid-type insulation at support points.

#### EQUIPMENT CONNECTIONS:

Contractor shall rough-in for and make final connections to all equipment.

Contractor shall make all final connections to all pieces of equipment furnished under this (General) contract that require natural gas, water, drain, waste or vent connections, furnishing all required shut off cocks, valves, drain valves and traps.

STERILIZATION AND TESTING:

Refer to CLEANING AND TESTING specification section.

*- END OF SECTION 15400 -*



SECTION 15410  
**PIPING SYSTEMS - SITEWORK**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

Refer to UTILITIES section of specification for responsibilities for connection and fees.

**SCOPE:**

Furnish and install all labor, material, equipment, transportation, tools, devices, and appliances and perform all operations required in connection with or properly incidental to the construction of plumbing utilities and services and the various piping systems and accessories, in accordance with the materials contained herein and the applicable drawings and subject to terms and conditions of the Contract.

The entire work shall be delivered complete and in working order as acceptable to Brookshire's.

**SANITARY SEWER SERVICE:**

Install all sanitary service lines as indicated or reasonable implied by the Drawings.

Provide Connection to and Extend from Service Point as required.

Verify location and depth at each end of work and determine that proper flow elevations are available before commencing any work.

All sanitary drainage lines (soil, waste and vent) shall be ASTM A-74 service weight cast iron soil pipe and fittings, coated inside and out. Joints shall be fabricated by the use of dry oakum packing, forced into the annular space, and then the joint shall be filled with ingot lead, poured in, with one pound of lead used for each 1" diameter of pipe. The joint shall then be well caulked and the lead shall be 1" minimum depth and brought to the top of the joint and faced. Compression type joints similar to Tyler Pipe Foundry's "Ty-Seal" or "No-Hub" piping will be acceptable if approved by Plumbing Inspector. "No-Hub" piping shall be limited to above ground installation.

At the Contractor's option, and where approved by local authority, vent piping and sanitary sewer waste piping may be type DWV Schedule 40 PVC pipe and fittings.

Horizontal waste and soil pipe shall be given a grade of 1/4" per foot where possible for 2" pipe and smaller, and not less than 1/8" per foot for pipe larger than 2". Where practical multiple vents shall be connected together and extended as one vent through the roof. Vent and waste connections to stacks shall be made by the appropriate use of 45 degree wyes, long sweep quarter bends, sixth, eighth, or sixteenth bends except that sanitary tees may be used on the vertical stacks.

Cleanout shall be provided at each change in direction of the soil lines, at the end of each continuous water line, at the foot of each riser within the building, and at 50'-0" maximum intervals in horizontal lines within the building, unless specifically indicated otherwise on the drawings; and 100'-0" maximum intervals in lines outside the building. All locations not specifically indicated on the Drawings shall be acceptable to Brookshire's. Inside Diameters of cleanout openings shall be equal to or larger than the size of soil or waste lines in which they placed, except 5" to 8" diameter may be served with 4" diameter cleanouts. Waste Piping of 8" and greater diameter must be serviced by Man Holes where indicated on the Drawings and in conformance with applicable Codes.

Cleanouts must be placed in accessible locations and where they occur in pipe chases, said cleanouts shall be Wade #W-6000 Series, unless noted otherwise on the drawings, placed above the floors in such a manner that they will be accessible through doors or they shall be brought through wall and provided with flush covers. Exact locations of each shall be approved by the Brookshire's before installation. All cleanouts shall be of the types specifically designed for

installation in the types of wall in which they are installed. All exterior cleanouts, not located within pavement shall be encased in 18" x 18" x 6" concrete pad, or as detailed on the Drawings.

#### DOMESTIC WATER SYSTEM:

Provide all materials, labor, equipment, etc. and obtain taps, connections, etc. as required to provide water service to the building and as indicated on the drawings. All valves, fittings, and devices which come in contact with Domestic Water shall be certified as such by applicable Standard, such as: ASSE, IAPMO, AWWA, CSA, USC/FCCC & HR.

Provide domestic water service of the size shown on the drawings, including main shut off valve in underground concrete box with cast iron locking cover, labeled "WATER". Furnish and install all other required valve boxes where indicated on plans and as required by the City. Boxes and cover shall be cast iron and the cover shall have the word "WATER" in raised letters on casting. Valve box shall be sufficient size for installation and maintenance valves. Top of boxes shall be installed flush with final finished grade.

Coordinate with Municipality, or appropriate Water Utility, to provide taps and water meter(s) installation facilities.

Underground water piping outside the buildings shall have 30" minimum cover to final finished grade.

All Fixtures, Equipment, Piping, Fittings, Connectors, Gaskets, Solder, Flux, etc. which have the ability to come in contact with, or are otherwise used in connection with Serving, Storing, and/or Delivering Domestic Water to the Point of Use shall be "No Lead" or "Lead Free" which is defined as containing not more than 8.0 percent lead in Piping, Fittings, Castings, Extrusions, etc., and not more than 0.2 percent lead in Solder and Flux, unless more stringent requirements are established by Governmental Authority having jurisdiction over this project.

All exterior Domestic water service lines from meter to the building shall be Type "L" copper tube (minimum), unless superior grade is indicated on the drawings and/or required by governing authority, to within 2' of the point of entry to the building.

Main shut off valve shall be line size AWWA 175 lb. NRS, square nut operated valve complete with Tyler Pipe and Foundry #6895 medium duty valve box with extension collar cast in a 12" x 12" x 6" concrete pad.

Furnish and install backflow preventer and shut off valve as near as possible to the point of entry of main domestic service to the building as indicated on the drawings.

Domestic water service and piping below the building slab shall be Type "K" soft drawn copper. The use of joints in the piping beneath concrete slabs will be avoided and will be permitted only to the extent of long runs where a single roll or length of copper tubing is not of sufficient length to complete the piping run. Should a joint be required, the joint shall be made with no lead solder and wrought solder joint copper fittings and the exact dimensional location noted on the "As-Built" drawings furnished to Brookshire's at final completion.

Domestic water piping above the building slab shall be Type "L" (minimum grade) hard drawn copper. Piping shall be assembled with cast brass or wrought copper fittings and no lead solder. Flux shall be of non-corrosive paste type.

Water piping connections to fixtures or equipment shall be made by the use of brass pipe or nipples, chrome plated where exposed to view in finished areas, screwed into copper-to-IPS adapter fittings. Ferrous piping connections will not be used in copper piping systems.

#### FIRE PROTECTION SERVICE:

Extend fire protection service from main to the building in accordance with the Municipality's requirements.

Underground Piping --

Shall be Class 150 cast iron pipe, with mechanical joints, tar coated and UL approved. Fittings for this pipe shall be mechanical joint type, Class 250, tar coated. Underground piping shall be braced and clamped in an approved manner acceptable to the Rating Bureau. "Blue Brute" Class C-900 as manufactured by Manville may be used, if permitted by local codes and authorities, outside building area. Provide concrete thrust blocks at each change in direction and at all tees, plugs, caps and bends in strict accordance with NFPA 24, Section 10.6.1.

Trenching and Backfill --

Sprinkler lines included under this section shall conform to applicable portions of the specifications for EXCAVATING, BACKFILLING, AND COMPACTING and TESTING LABORATORY CONTROL.

PIPING INSTALLATION:

General arrangement of underground piping shall be as indicated on the Drawings. Sanitary Sewer and Water lines shall be designed and installed per TCEQ Chapter 217.53.

All Sanitary Sewer and Water lines shall have a minimum of 24" cover to finished grade.

Install all piping in a neat and workmanlike manner. Hangers shall be of the type mentioned in this section and shall be so spaced and installed as to maintain a rigid piping system, adequately supported both laterally and vertically.

All water piping systems shall be installed level and the low points of all risers shall have gate valves 1/2" in size installed with hose ends in order to adequately drain the system.

At each group of planning fixtures there shall be furnished and installed by this Contractor, gate valves on each and every piping system so that these groups of fixtures may be isolated from access line locations.

The entire piping system shall be installed to provide for expansion and contraction and the joints shall be soldered at such time that the system is not under strain.

Necessary spring pieces and offsets shall be furnished by this Contractor as required.

All piping shall have reducing fittings used for reducers or increasers where any change in the pipe sizes occur. No bushings of any nature shall be allowed in piping.

STERILIZATION AND TESTING:

Refer to CLEANING AND TESTING specification section.

- END OF SECTION 15410 -

SECTION 15450  
**PLUMBING FIXTURES**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**DESCRIPTION:**

All plumbing fixtures set and connected as listed herein and shown on the plans.

**FITTINGS AND PIPING:**

Provide trim for a complete installation of each fixture including, but not limited to, faucets, stops (both hot and cold water connections), drains, tail pieces, traps and escutcheons.

Fixtures fitted to walls shall have backs ground square and true.

*Exposed Pipe* - Exposed flush, waste and supply pipes at fixtures shall be chromium plated brass pipe, iron pipe sizes.

*Water Closet Support* - When the water closet pipe nipple exceeds 6-inches, provide additional wide pipe chase support as recommended by manufacturer.

**FIXTURES AND EQUIPMENT:**

Contractor shall provide plumbing fixtures where indicated on the Drawings. The fixtures shall be free from marks or chips and shall be new, first quality and shall be furnished with sufficient supports in order to adequately hang each and every unit. The space between fixtures and masonry or tile walls shall be grouted with White General Electric Silicone flexible grout. The space between fixtures and gyp. bd. or wood panel walls shall not be grouted, but the fixtures shall fit flat against the wall surface with no more than 1/16-inch gap. No fixture carriers utilizing non-metallic piping shall be used.

All faucets, fittings, supply stops and similar devices shall be of one manufacturer and made in the U.S.A. unless otherwise specified. All water faucets and valve bodies shall be cast bronze with a minimum copper content of 85%. They shall contain standardized interchangeable operating units made up of a removable and replaceable unit containing all parts subject to wear.

Seats and seat washer retainers and screws shall be model and contain a locking device. All water faucet shall contain an adjustable internal volume control unit. Spouts shall have vacuum breaker where specified. All exposed parts shall be furnished with chromium plating.

All porcelain or vitreous china shall be clean, smooth, and bright and shall be warranted not to craze, color or scale.

**EXECUTION:**

Furnish and install all required water, waste, soil, and vent connections to all plumbing fixtures together with all fittings, supports, fastening devices, cocks, valves, and traps, leaving all in complete working order.

**PROTECTION OF FIXTURES:**

Protect all fixtures and trim during construction. Thoroughly clean fixtures and remove all tape and adhesive prior to final acceptance.

**FITTINGS AND TRIM:**

Furnish and install all fittings and trim required to make all fixtures operable and comply with all local codes and regulations.

Provide tight fitting wall or floor escutcheons of chrome-plated brass with set screws wherever pipes pass through floors, walls and ceiling.

Insulate or otherwise protect from contact all hot water and drain pipes under lavatories provided for wheelchair accessibility.

**SUPPORTS:**

Furnish and install all necessary supports in connection with all fixtures to be installed. Fixtures shall not be supported by piping connection. All wall hangers or supports shall be installed by means of through bolts and secured with back plates where possible. Otherwise, heavy expansion bolts or toggle bolts shall be used.

Unless otherwise noted, each wall hung plumbing fixtures shall be supported on an appropriate type chair carrier.

Firmly brace flush valve piping on the interior of plumbing chases so that flush valves, as finally installed, will not move when pushed or pulled.

All stainless steel sinks shall be firmly secured to walls using stainless steel 1/4" hex head lag bolt with stainless steel flat washer through the backsplash. Length of lag bolt shall accommodate the thickness of the backsplash plus 1 1/2". Minimum of 2 lag bolts per sink within 2" of end of backsplash. Exact count of lag bolts to be determined by Brookshire's.

**MOUNTING HEIGHT:**

Verify location and mounting of all plumbing fixtures with the Drawings before installation.

*- END OF SECTION 15450 -*

SECTION 15470  
**CLEANING AND TESTING**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Contractor shall during the progress of the work or upon its completion, make such tests of his work as are herein specified in accordance with all law governing authorities, or as are required by Brookshire's or by state or municipal bureaus having jurisdiction and under their supervision.

Contractor shall provide all apparatus, temporary piping connections or any other requirement necessary for such tests, and shall take all due precautions to prevent damage to building or its contents incurred by expense, any damage so caused.

Any leaks, defects or deficiencies discovered as a result of the tests shall be immediately repaired or made good and tests shall be repeated until the test requirements are in full compliance.

NO CAULKING of pipe joints to remedy leaks will be permitted.

No work of any nature shall be covered, enclosed or otherwise concealed until properly inspected, tested and approved. Any leaks which develop during any of the tests shall be corrected with new material and made a good as required; said tests shall be repeated until the work is satisfactory to Brookshire's.

Each separate system with its various components shall be operated by this Contractor for a reasonable length of time to demonstrate the performance of all equipment and piping in accordance with the true intent and purpose of the plans and specifications. All necessary adjustments shall be made to the satisfaction of the Brookshire's.

All motor driven equipment shall be proven operable generally in accordance with the intent of these specifications.

**TESTING AND ADJUSTING:**

*Water Piping System -*

Shall be properly tested to a hydrostatic pressure of 150 psi (pounds per square inch) gauge for a period of not less than eight hours. During this test period, all leaks in pipe, fittings and accessories, in the particular piping system which is being tested, shall be stopped and the hydrostatic test shall again be applied.

This procedure shall be repeated for an entire eight hour period and no leaks can be found while the system being tested is subject to the pressure mentioned above.

*Sanitary Sewer System -*

Pipe shall have all outlets temporarily plugged. The pipes shall be filled with water testing the system in sections such that no section shall be tested with less than ten (10) foot head of water. If, after 24 hours, the level of the water has been lowered by leakage, the leaks must be found and stopped by this Contractor, and the water level shall again be raised and the test repeated until after 24 hour retention period there shall be no perceptible lowering of the water level of the system being tested.

*Gas Piping System -*

Shall be subjected to a pneumatic pressure test of 100 psi. While the systems are subjected to this air pressure all joints shall have a soapy water solution applied for the purpose of detecting minute, as well as large, leaks. If leaks are found in welded lines they shall be repaired by clipping and rewelding operations. Alternate testing and rewelding operations shall be repeated until the gas piping systems are absolutely tight. If leaks occur in the case of threaded joints such leaks may be eliminated by replacing the fittings or properly tightening them. The entire

gas piping system shall be subjected to a pneumatic test pressure to 100 psi for a period of 24 hours and demonstrated to be absolutely tight.

**AUTOMATIC SPRINKLER FIRE PROTECTION:**

Refer to AUTOMATIC SPRINKLER FIRE PROTECTION specification section.

**DOMESTIC WATER PIPING SYSTEM STERILIZATION:**

Sterilization process shall be conducted under the direction of the local health department and upon completion of the process, health department shall test and verify the cleanliness of the water piping system.

On the house side of the water meter assembly, provide a 3/4" connection through which chlorine shall be introduced into the house water piping systems to sterilize those systems thoroughly. This sterilization procedure is inclusive of any and all underground mains whether dedicated only to Domestic service, or common to Fire Protection and Domestic service. Sterilization is not required after Fire Protection piping becomes segregated from Domestic service.

After completion of the testing, entire cold and hot water piping systems, with attached equipment shall be thoroughly sterilized with a solution containing not less than 50 parts per million of available chlorine, conforming to U.S. Army Specification No. 4-1, or calcium hypochlorite or chlorinated lime conforming to the requirements of Federal Specifications 0-C-114, and shall be pumped into the system throughout the connection described above. Sterilizing solution shall be allowed to remain in the system for a period of 24 hours, during which time all valves and faucets shall be opened and closed several times. After sterilization, the solution shall be flushed from the system with clean water until the residual chlorine content is not greater than 0.2 parts per million.

**SANITARY SEWER CLEANING:**

After completion of testing and prior to building hand over, the Plumbing Contractor shall clean each section of waste line in the presence of the Owner's representative. This shall be done by rodding each main and individual branch runouts.

Notify Brookshire's in writing 48 hours in advance of cleaning schedule.

**CERTIFICATE OF APPROVAL:**

Upon the satisfactory completion and final test of the mechanical systems, the Contractor shall obtain from the proper authority having jurisdiction and shall deliver to Brookshire's an appropriate certificate of approval.

*- END OF SECTION 15470 -*

SECTION 15471  
**CLEANING AND TESTING - SITEWORK**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Contractor shall during the progress of the work or upon its completion, make such tests of his work as are herein specified in accordance with all law governing authorities, or as are required by Brookshire's or by state or municipal bureaus having jurisdiction and under their supervision.

Contractor shall provide all apparatus, temporary piping connections or any other requirement necessary for such tests, and shall take all due precautions to prevent damage to building or its contents, and shall incur all expense to repair any damage so caused.

Any leaks, defects or deficiencies discovered as a result of the tests shall be immediately repaired or made good and tests shall be repeated until the test requirements are fully complied with.

NO CAULKING of pipe joints to remedy leaks will be permitted.

No work of any nature shall be covered, enclosed or otherwise concealed until properly inspected, tested and approved. Any leaks which develop during any of the tests shall be corrected with new material and made a good as required; said tests shall be repeated until the work is satisfactory to Brookshire's.

Each separate system with its various components shall be operated by this Contractor for a reasonable length of time to demonstrate the performance of all equipment and piping in accordance with the true intent and purpose of the plans and specifications. All necessary adjustments shall be made to the satisfaction of the Brookshire's.

All motor driven equipment shall be proven operable generally in accordance with the intent of these specifications.

**TESTING AND ADJUSTING:**

*Water Piping System -*

Shall be properly tested to a hydrostatic pressure of 150 psi (pounds per square inch) gauge for a period of not less than eight hours. During this test period, all leaks in pipe, fittings and accessories, in the particular piping system which is being tested, shall be stopped and the hydrostatic test shall again be applied.

This procedure shall be repeated for an entire eight hour period and no leaks can be found while the system being tested is subject to the pressure mentioned above.

*Sanitary Sewer System -*

Pipe shall have all outlets temporarily plugged. The pipes shall be filled with water testing the system in sections such that no section shall be tested with less than ten (10) foot head of water. If, after 24 hours, the level of the water has been lowered by leakage, the leaks must be found and stopped by this Contractor, and the water level shall again be raised and the test repeated until after 24 hour retention period there shall be no perceptible lowering of the water level of the system being tested.

*Gas Piping System -*

Shall be subjected to a pneumatic pressure test of 100 psi. While the systems are subjected to this air pressure all joints shall have a soapy water solution applied for the purpose of detecting minute, as well as large, leaks. If leaks are found in welded lines they shall be repaired by clipping and rewelding operations. Alternate testing and rewelding operations shall be repeated until the gas piping systems are absolutely tight. If leaks occur in the case of threaded joints such leaks may be eliminated by replacing the fittings or properly tightening them. The entire



gas piping system shall be subjected to a pneumatic test pressure to 100 psi for a period of 24 hours and demonstrated to be absolutely tight.

**AUTOMATIC SPRINKLER FIRE PROTECTION:**

Refer to AUTOMATIC SPRINKLER FIRE PROTECTION specification section.

**DOMESTIC WATER PIPING SYSTEM STERILIZATION:**

Sterilization process shall be conducted under the direction of the local health department and upon completion of the process, health department shall test and verify the cleanliness of the water piping system.

On the house side of the water meter assembly, provide a 3/4" connection through which chlorine shall be introduced into the house water piping systems to sterilize those systems thoroughly. This sterilization procedure is inclusive of any and all underground mains whether dedicated only to Domestic service, or common to Fire Protection and Domestic service. Sterilization is not required after Fire Protection piping becomes segregated from Domestic service.

After completion of the testing, entire cold and hot water piping systems, with attached equipment shall be thoroughly sterilized with a solution containing not less than 50 parts per million of available chlorine, conforming to U.S. Army Specification No. 4-1, or calcium hypochlorite or chlorinated lime conforming to the requirements of Federal Specifications 0-C-114, and shall be pumped into the system throughout the connection described above. Sterilizing solution shall be allowed to remain in the system for a period of 24 hours, during which time all valves and faucets shall be opened and closed several times. After sterilization, the solution shall be flushed from the system with clean water until the residual chlorine content is not greater than 0.2 parts per million.

**SANITARY SEWER CLEANING:**

After completion of testing and prior to building hand over, the Plumbing Contractor shall clean each section of waste line in the presence of the Owner's representative. This shall be done by rodding each main and individual branch runouts.

Notify Brookshire's in writing 48 hours in advance of cleaning schedule.

**CERTIFICATE OF APPROVAL:**

Upon the satisfactory completion and final test of the mechanical systems, the Contractor shall obtain from the proper authority having jurisdiction and shall deliver to Brookshire's an appropriate certificate of approval.

*- END OF SECTION 15471 -*

SECTION 15530  
**WET CHEMICAL FIRE SUPPRESSION SYSTEM**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Unless specifically designated otherwise herein, this Contractor shall furnish and install each and every item of equipment described in this Section and/or shown on the plans, together with all components and incidentals (materials, labor, fees, transportation, tools, storage, cuttings, patching, clean ups, etc.) necessary to complete the work.

*Principal work is as follows -*

- Automatic Wet Chemical Fire Suppression System for Cooking Exhaust Hood(s) as manufactured by Ansul Fire Protection, Walter Kidde and Co., or approved equal.
- Refer to Heating, Ventilation, & Air Conditioning plan(s) for location of cylinders, size of hood, etc.,

**APPROVALS:**

Contractor shall obtain approvals and permits from, and hold current license(s) required by all authorities having jurisdiction over this installation.

Entire installation shall be installed in accordance with all applicable NFPA and UL guidelines including, but not limited to, NFPA 17A, NFPA 96, and UL 300.

All equipment shall be U.L. listed and/or labeled.

**SHOP DRAWINGS:**

Per SUBMITTALS.

- Location, size and number of cylinders.
- Location of nozzles.
- Route and sizes of piping.
- Locations of remote releases.
- Location of detectors.
- Fuel shut-off gas valves and electrical contactors.
- Copy of current license(s) or permits required by governing authorities for this project location.

**GENERAL DESCRIPTION:**

System shall be Ansul *PIRANHA*™ with Ansul Automan Mechanical Regulated Release Assembly, or approved equal, pre-engineered, fixed, automatic fire suppression system developed specifically for commercial cooking appliances, exhaust hoods, and ducts, capable of automatic detection and actuation and/or remote manual actuation. Each Hood System must be capable of independent operation. System design shall be to provide *Full Hood Continuous Overlapping Protection*. External water source shall be integrated with Fire Protection Sprinkler System.

Provide with *PRX*™ Liquid Fire Suppressant, specially- formulated, aqueous solution of inorganic salts designed for flame knockdown and securement of grease related fires.

Furnish and install complete in all respects including piping, nozzles, release mechanism(s), water flow valve, anti-siphon vacuum breaker, automatic water shutdown timer (#42694 set at 10 minutes), water pressure test outlet, expellant gas hose, and accessories such as cable pulleys, detectors, etc., deep drawn carbon steel wet chemical agent tank, painted red, in Stainless Steel enclosure cabinet surface or flush mounted as acceptable to Brookshire's.

Furnish 1" locking ball valve for each Type I hood to Automatic Fire Sprinkler contractor to install to nearest Automatic Fire Sprinkler supply branch at 1'-0" above finished ceiling.

This Contractor shall be responsible for furnishing, installing, and connecting all mechanical or electrical "shut-down" devices necessary for gas and/or electrical services to cooking equipment. Connect Suppression System as required so that power to equipment will automatically be turned off upon activation of fire system.

Electric equipment under hood shall have shunt-trip circuit breaker(s) furnished and installed by Electrical Contractor.

Furnish "dry contact" as an integral component of the Manufacturers System for connection by Fire Alarm Contractor to initiate signal to Central Panel upon discharge of the system.

**INSTALLATION:**

All piping shall be Schedule 40 galvanized steel pipe in accordance with NFPA No. 17 and 96.

All piping under hood shall be Chromium Plated.

All exposed piping outside of hood shall left clean of rust, oils, etc. to allow for painting by others.

Escutcheons shall be provided where required and shall be Chromium Plated or Stainless Steel in ALL areas and shall be of the set screw type.

Contractor shall not use ducts, duct supports, piping or supports as a means of support for any material, accessories or workmen in the installation of this system.

**GUARANTEE & DOCUMENTATION:**

Entire installation shall be guaranteed for a period of 1 year from the building acceptance date by the Installing Contractor, and all Fire Suppression components shall be warranted by the manufacturer for a period of 5 years.

Furnished and install in location as directed, a printed sheet framed under Plexiglas giving brief instructions regarding control, emergency procedure and other data deemed necessary.

Furnish Owner's Operation and Maintenance Manuals with detailed information for operation and maintenance of system, and technical information, such as, parts list(s), recharge procedure, clean-up and disposal of chemical and residue after discharge, resetting, and "trouble-shooting" as necessary for recharge and maintenance of system.

**CLEAN-UP:**

Per General Conditions.

*- END OF SECTION 15530 -*

SECTION 15650  
**AIR CONDITIONING EQUIPMENT**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Furnish and install all labor, materials, equipment, tools, and services and perform all operations required in connection with or properly incidental to the construction of complete Air Conditioning Equipment Systems as indicated on the Drawings reasonably implied therefrom or as specified herein unless specifically excluded. This Contractor shall furnish all devices related to equipment furnished within this section in compliance with ROOFING ACCESSORIES section of this specification, except when noted as being furnished by Brookshire's within this Specification Section or on the Drawings.

**SCHEDULES ON DRAWINGS:**

In general, all capacities of equipment, and motor and starter characteristics are shown in schedules on the Drawings.

Reference shall be made to the schedules for such information.

The capacities shown are minimum capacities.

Variations in the characteristics will be permitted only on written approval of Brookshire's.

All equipment shall be shipped to the job with not less than a prime coat of paint.

Where installation instructions are not included on these specifications or on the plans, the manufacturer's instructions shall be followed.

**RTU-1:**

Unit furnished by Brookshire's F.O.B. Job Site, including but not limited to the following:

HVAC Contractor shall receive delivery of RTU-1 and Accessories, including unloading, stockpiling, handling, and install same at the proper time during the Work; and shall furnish and install supply and return duct work from this unit. This Contractor shall have primary supply and return ducts flanged-over, and sealed to roof curb frame prior to installation of unit. Coordinate timing of installation, sizes and exact location of ducts with actual unit furnished by Brookshire's.

RTU-1 shall be provided and warranted by manufacturer as furnished by Brookshire's. Manufacturer to provide a factory installed start-up program in RTU-1 controller prior to delivery to site. RTU-1 WILL NOT BE STARTED UNTIL A MANUFACTURER AND BROOKSHIRE'S REPRESENTATIVE HAVE SIGNED OFF ON PRESSURE EVACUATION TESTS.

**ROOF-TOP AIR CONDITIONING UNITS:**

Units and Curbs shall be furnished by Contractor. This Contractor shall receive delivery of Units, Curbs, and Accessories, including unloading, stockpiling, handling, and install same at the proper time during the Work. Actual Units and Accessories purchased by Contractor may vary from those scheduled unless noted otherwise. Contractor and related trades shall verify actual units to be furnished by Contractor prior to fabrication of any ductwork, devices, burglar bars, structural supports, etc.

This Contractor shall furnish and install ALL ductwork, including supply and return duct work from the bottom of unit housings. Primary supply and return ducts shall be flanged-over, and sealed to roof curb frames prior to installation of units.

All units shall be installed level. Shim unit to level per manufacturer's instructions. All openings between unit and curb shall be sealed full depth.

*Characteristics of Units:*

Cabinet: suitable for outdoor installation with a baked enamel finish and 1" glass fiber insulation.

Compressor: accessible hermetic type, with external vibration isolation, crankcase heaters and shall be a product of the manufacturer supplying unit.

Condenser and Evaporator Coils: of copper tubes with mechanically bonded aluminum fins.

Condenser Fan: direct driven propeller type arranged for vertical air discharge. Motor shall be permanently lubricated, resiliently mounted and have thermal overload protection.

Evaporator Fan: shall be centrifugal type. Motor shall be permanently lubricated, resiliently mounted, and have thermal overload protection and will be adjustable belt drive.

Heat Exchanger: shall be ceramic coated steel. Burner and gas train to include automatic gas valve, pressure regulator, main shut-off valve, pressure regulator, main shut-off valve, automatic safety pilot (100% shut-off) fan switch and high limit switch and electric ignition.

O.A. damper with controls as indicated on the Drawings.

Controls: in lieu of a thermostat, units shall be controlled by computer process controls (CPC) which is a part of the building environmental control system (BEC). Controls shall be factory wired and connected to terminal strip.

Specialties: provided with unit shall include service valves, sight glass and strainer-dryer.

Filter: shall be 2" replaceable media in holding frame.

Roof curb: as specified in ROOFING ACCESSORIES and as indicated on the Drawings.

Capacities: as scheduled on the Drawings.

**ROOF CURB FRAMES:**

Metal roof curb frames shall be provided by the steel fabricator and installed by the steel erector contractor. Metal roof curb frames have been shown to accommodate Aaon units as indicated in the Drawings. Any change in unit manufacturer shall require the contractor to provide drawings for metal roof curb frame to be similar to those indicated in the Drawings. Drawings shall be completed in time to allow all work to be completed when the appropriate contractors are on the job.

**EXHAUST FANS:**

Exhaust fans shall be Jenn-Air Exit-Air, ILG, Cook, Penn, Acme, Greenheck, Barbrook, Power Line, or approved equal.

Roof type fans shall be complete with weatherproof protection for fans and motors, centrifugal wheels, automatic shutters, non-fused disconnect switches, birdscreens, belt-drive, aluminum construction.

In-Line centrifugal fans shall be complete with 1-piece inlet cone, heavy gauge welded steel casings, steel shaft, internal and external belt guards, and adjustable motor mounts. Air will flow axially. Enclose fan bearings and drive shaft to isolate them from the air stream. Provide lubrication tubes extending from the shaft bearings to the housing or otherwise make the bearings accessible for lubrication.

Ceiling fans shall be direct drive, with permanently lubricated, resilient mounted thermal overload protection. Unit complete with housing and ceiling grilles.

Fans shall be AMCA rated and as scheduled on the Drawings.

#### EXHAUST HOODS SYSTEMS:

Provide with a roof-mounted make-up air unit including all ductwork, blowers, master electric controls and filter sections. Hood shall be wall canopy type as manufactured by Captivaire. Greenheck is not acceptable.

Hood System shall be package type, with all components being assembled by one manufacturer who is regularly engaged in the production of this type of equipment. All features considered standard by the manufacturer and which are required to complete the system, and to make it functional shall be included without respect to specific detailing in these specifications.

Manufacturer of the complete packaged system shall warrant all parts and components for one year from date of building acceptance. A one year service contract shall be provided.

All systems shall be field balanced by an independent air balance company, selected by Brookshire's and to whom the Contractor has no reasonable objection, as called for in the Drawings and Specifications. Balancing shall be at the expense of Brookshire's unless specifically noted in the Construction Documents as furnished by the Contractor.

Submit detailed shop drawings of system specific for this project to Brookshire's and complete wiring diagram indicating proper connections to the Electrical Contractor. Switches for hoods shall be wall mounted beside hood as directed by Brookshire's at 52" A.F.F. to bottom of switch.

Capacities and sizes as scheduled on the Drawings.

Install grease filters at start-up. At Final Acceptance remove soiled filters, wash with detergent and hot water, and re-install. Hood Contractor shall provide and install these grease filters in all hoods at all prep areas with grease producing appliances and where scheduled on plans.

#### IDENTIFICATION:

All Roof-top Units, Fans and Hoods will be required to have engraved labels pop-riveted (minimum of two rivets) to each piece of equipment. Provide white backgrounds with 1-1/2" tall black lettering. Labeling equipment will be per the designation and service shown on the Drawings. For example:

RTU-2	EF-1
RECEIVING	DELI HOOD

#### EXECUTION:

Where these Plans and Specifications do not indicate exact procedures, the manufacturer's instructions shall be followed.

All RTU units shall be installed level. Shim unit to level per manufacturer's instructions. All openings between unit and curb shall be sealed full depth.

Plumbing Contractor shall run the condensate drain lines to sanitary sewer inlet as indicated on the Drawings.

During the construction period on both new and remodel stores, when air handlers are started and/or in operation, the HVAC Contractor shall be responsible for replacing filters once a week during the entire construction period up to Final Acceptance for coil protection. At Final Acceptance, filters shall be replaced prior to Substantial Completion. Any damage to the coil or air handling equipment and cleaning of the coil will be borne by the HVAC Contractor.

#### ACCEPTANCE:

Refer to SYSTEM BALANCING AND ADJUSTING section of this specification.

Contractor shall start up and operate all air conditioning systems, except RTU-1 shall be started and operated by Brookshire's Refrigeration Personnel ONLY. Contractor shall demonstrate that the system heats and/or cools properly without undue noise and vibration.

All units shall be tested and proved free of leaks or defects.

CLEAN-UP:  
Per General Conditions.

*- END OF SECTION 15650 -*

SECTION 15800  
**AIR DISTRIBUTION SYSTEM**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Furnish and install all labor, materials, equipment, tools, and services and perform all operations required in connection with or properly incidental to the construction of complete ductwork and accessories system as indicated on the Drawings, reasonably implied therefrom or as specified herein unless specified herein unless specifically excluded.

**STANDARD DUCTWORK:**

Except for *Special Exposed Round Duct, Fabric Duct*, or specified elsewhere herein, ductwork shall be constructed of new galvanized prime grade steel sheets of the following minimum gauges:

Largest <u>Dimension of Ducts</u>	<u>Gauge of Metal</u>
All Round	No. 28 U.S. Gauge
Up to 12"	No. 26 U.S. Gauge
13" to 30"	No. 24 U.S. Gauge
31" to 54"	No. 22 U.S. Gauge
55" to 84"	No. 20 U.S. Gauge
85" and above	No. 18 U.S. Gauge

The above ducts shall be constructed in accordance with Table 1, Page 11, of the "Duct Manual" published by the Sheet Metal and Air Conditioning Contractors National Association.

*Flexible Duct* shall be as manufactured by Hart & Cooley, or approved equal.

- Use only at final connection to outlets/inlets, and within concealed attic spaces. Maximum length of 5'.
- Manufactured in compliance with UL181 (min. 10" W.C. positive and 1/2" W.C. negative); NFPA 90A & 90B with max. flame spread of 25 and smoke developed of 50.
- Two-ply polyester core encapsulating a galvanized steel wire helix.
- Foil Faced durable cover over min. Insulation 1 1/4" thickness glass fiber ( 0.23 C factor).
- All connections to Rigid Ductwork shall be Shop-Fabricated or Manufactured Fittings equal to Flexmaster STO-Series, 26 ga. min. G-90 galvanized, with Adhesive coated gasket. External Insulation must overlap Flex Duct Insulation and fully wrapped with Foil-Faced Tape (Rubberized or Plastic Faced Duct Tape is not acceptable).
- Connect to all fittings to collars of same size as Flex Duct being used by Tyton, or approved equal, Heavy-Duty Adjustable Clamps. 100% Nylon; min. tensile strength of 175 lbs.; adjustable. Use Tensioning Tool of same manufacturer for proper tightening.

All supply, return, and exhaust ductwork shall be insulated, except for cooking hood exhaust, and unless specifically noted on the Drawings as "uninsulated".

- The liner shall be applied to the inside of the duct with heavy density side to the air stream and shall be secured to the duct with adhesive, Minnesota Mining Tacky or equal, completely coating the clean sheet metal.
- All joints in the insulation shall be firmly butted and tightly sealed with adhesive.
- On ducts over 12" in width and/or depth, the liner shall further be secured with adhesive and mechanically fastened.
- Fasteners shall be non-welded, tapered teeth, withstanding minimum pull or 80 lbs., as manufactured by Gripnail, Banger, or approved equal, installed at 12" maximum spacing between fasteners and within 8" of edges, ends, corners, and change of direction. Fasteners shall be shop-applied to sheet metal ductwork material by pneumatically powered automatic machinery specifically designed for attachment of this fastening system, without penetrating or visibly deforming the exterior surface of the ductwork. Hand hammering or use of hand-held air hammering device is unacceptable.



- Liner shall be accurately cut and ends thoroughly coated with adhesive so that when the duct section is installed, the liner shall make a firmly butted and tightly sealed joint.
- Where ducts are lined, exterior insulation will not be needed (unless otherwise noted), except that the two insulation shall lap not less than 24".
- Dimensions given on the Drawings are inside the insulation.

#### FABRIC DUCT

- DuctSox® Corporation is used to establish quality. Other manufacturers will be considered for substitution per specification section SUBMITTALS.
- Extent of fabric ductwork shall be as indicated on the Drawings.
- Fabric duct system shall consist of:
  1. Fabric – Sedona-Xm
  2. Series – Standard
  3. Model – Comfort-Flow
  4. Suspension –H-Track Mounting System with SKELECORE-FTS Internal Framing and Tension System.
  5. Color – Gray
- Product must be Classified by Underwriter's Laboratories in accordance with the 25/50 flame spread / smoke developed requirements of NFPA 90-A and are also classified in accordance with ICC Evaluation Service AC167 and UL2518.
- All product sections must be labeled with the logo and classification marking of Underwriter's Laboratories.
- Product must be treated with an EPA registered antimicrobial agent. Antimicrobial agent shall be proven 99% effective after 10 laundry cycles per AATCC Test Method 100.
- Product must be constructed of a minimum 55% recycled content (80% post-industrial and 20% post-consumer), of a non-linting filament yarn to meet the requirements of ISO Class 3 application as defined by ISO 14644-1, and 100% flame retardant.
- Fabric weight shall be 6.8 oz. /yd<sup>2</sup> per ASTM D3776.
- Submit manufacturer's specifications on materials and manufactured products used for work of fabric duct. Manufacturer must have documented design support information including duct sizing, vent and orifice location, vent and orifice sizing, length, and suspension. Parameters for design, including maximum air temperature, velocity, pressure and fabric permeability, shall be considered and documented.
- Submit UL file number under which product is Classified by Underwriter's Laboratories for NFPA 90-A, ICC AC167 and UL2518.
- Manufacturer must provide a 10 Year Product Warranty for products supplied for the fabric portion of this system as well as a Design and Performance Warranty.
- Protect fabric air dispersion systems from damage during shipping, storage and handling. Where possible, store products inside and protect from weather. Where necessary to store outside, store above grade and enclose with a vented waterproof wrapping.
- Air dispersion accomplished by linear vent and permeable fabric. Linear vents must be sized in 1 CFM per linear foot increments (based on .5" SP), starting a 1 CFM through 90 CFM per linear foot. Linear vent is to consist of an array of open orifices rather than a mesh style vent to reduce maintenance requirements of mesh style vents. Linear vents should also be designed to minimize dusting on fabric surface.
- Size of vent openings and location of linear vents to be specified and approved by manufacturer.
- Inlet connection to metal duct via fabric draw band with anchor patches as supplied by manufacturer. Anchor patches to be secured to metal duct via zip screw fastener – supplied by contractor.
- Inlet connection includes zipper for easy removal / maintenance.
- Lengths to include required zippers as specified by manufacturer.
- End cap includes zipper for easy maintenance.
- System to include Adjustable Flow Devices to balance turbulence, airflow and distribution as needed. Flow restriction device shall include ability to adjust the airflow resistance from 0.06 – 0.60 in w.g. static pressure.

- Fabric system shall include connectors to accommodate suspension system.
- Any deviation from a straight run shall be made using a gored elbow or an efficiency tee.  
Normal 90 degree elbows are 5 gores and the radius of the elbow is 1.5 times the diameter of the fabric duct.
- Fabric air diffusers shall be limited to design temperatures between 0 degrees F and 180 degrees F (-17.8 degrees C and 82 degrees C).
- Install suspension system in accordance with the requirements of the manufacturer.  
Instructions for installation shall be provided by the manufacturer with product.
- Clean air handling unit and ductwork unit-by-unit prior to the fabric duct installation. Clean external surfaces of foreign substance which may cause corrosive deterioration of facing.
- At ends of ducts which are not connected to equipment or distribution devices at time of ductwork installation, cover with polyethylene film or other covering which will keep the system clean until installation is completed.
- If fabric ducts become soiled during installation, they should be removed and cleaned following the manufacturers standard terms of laundry.

#### AIR SUPPLIES AND RETURNS:

Grilles, registers and ceiling outlets shall be as scheduled and shall be provided with sponge rubber or soft felt gaskets.

- If a manufacturer other than the one scheduled is used, the sizes shown on the Drawings shall be checked for performance, noise level, face velocity, throw, drop, pressure drop, etc., before the submittal is made.
- Selections shall meet the manufacturer's own published data for the above performance criteria.
- Throw shall be such that the velocity at the end of the throw (5' occupancy zone) will not be more than 50 FPM or less than 25 FPM.
- Noise levels shall not exceed those published in the ASHRAE Guide for the type of space being served (NC level).

Locations of outlets on Drawings are approximate and shall be coordinated with other trades to make symmetrical patterns and shall be governed by the established pattern of the lighting fixtures or architectural reflected ceiling plan.

- Where called for on the schedules, the grilles, registers and ceiling outlets shall be provided with deflecting devices and manual dampers (opposed blade type).
- These shall be the standard product of the manufacturer, subject to review by Brookshires.  
Shop Drawings of all grilles, registers and ceiling outlets shall include color and type of finish.
- Grilles, registers and ceiling outlets shall not be released for shipment until the finish is approved by the Architect.

Air supplies and returns shall be as follows: Titus, Price, Tuttle and Bailey are acceptable manufacturers.

- Air supplies and return shall be as scheduled on the Drawings.

#### ELBOWS:

Where square elbows are shown or are required for good air flow, provide and install Barber-Coleman or Aero-Dyne turning vane.

Job fabricated turning vanes, if used, shall be double thickness vanes of galvanized steel sheets of the same metal as the duct in which they are installed.

Radius elbows shall have a centerline radius of not less than one and one-half (1-1/2) time the duct width.

Submit Shop Drawings on job fabricated turning vanes.

#### FIRE DAMPERS:

Furnish and install Air Balance fire dampers with fusible links where indicated and/or required by local codes.

The dampers shall have ratings equal to that of the fire wall or construction through which the duct is passing.

#### SHOP DRAWINGS:

Shop Drawings shall be submitted on turning vanes, volume dampers, fire dampers, access doors construction and hardware air supplies and returns, air valves, mixing boxes, constant volume regulators, automatic shutters and louvers.

#### WORKMANSHIP, QUALITY AND REQUIREMENTS:

All ductwork shown on the Drawings, specified or required for the heating, ventilating and air conditioning systems shall be constructed and erected in a first-class, workmanlike manner.

The work shall be guaranteed for a period of one (1) year from and after the date of acceptance of the job against noise, chatter, whistling, or vibration, and free from pulsation under all conditions of operation.

After the system is in operation, should these defects occur, they shall either be removed and replaced or reinforced as directed by the Architect.

Sizes shown on Plans are inside dimension (inside duct liners, where used) unless otherwise indicated.

All ducts shall be erected in the general locations shown on the Drawings, but must conform to all structural and finish conditions of the building.

- Before fabricating any ductwork, the Contractor shall check the physical conditions at the job site, and shall make all necessary changes in cross sections, offsets, etc., whether they are specifically indicated or not.

All holes in ducts for damper rods and other necessary devices shall be either drilled or machine punched (not pin punched), and shall not be any larger than necessary.

- All duct openings shall be provided with sheet metal caps if the openings are to be left unconnected for any length of time.
- All panels of uninsulated ducts 12" or larger shall be cross broken.
- In general, sheet metal screws shall not be used in duct construction unless the head (not the point) of the screw is in the air stream.

Transformations shall have a ratio of not more than 1" in transformation to each 7" of length.

Exhaust ducts from grease laden hoods shall be minimum 16 gauge MSG Carbon Steel, or 18 gauge MSG Stainless Steel with all joints and seams having a liquid tight, continuous external weld and installed in accordance with NFPA No. 96.

Exhaust ducts from grease laden hoods shall be required to be wrapped with a one layer, totally foil encapsulated, non-combustible, 2000° F (1093° C) rated, low biopersistence, flexible wrap specifically tested to provide a 2 hour fire rated enclosure. Wrap shall be installed with a perimeter and longitudinal overlap per the manufacturer's installation requirements. Thermal Ceramics FastWrap+ 1-1/2" thick is used to establish quality. Other manufacturers will be considered for substitution unless specifically noted otherwise.

Where ducts are exposed to view between top of hoods and finished ceilings, or pass through walls, floors or ceilings, furnish and install 20 ga. stainless steel metal enclosure/collar with approximate 3 inch clearance around supply and exhaust ducts.

- This shall not apply to plaster walls.

#### DUCT SUPPORTS:

Support all ductwork as follows, unless noted otherwise on the Drawings:

- All horizontal ducts up to and including 40 inches in their greater dimension shall be supported by means of band iron hangers attached to the ducts by means of screws, rivets or clamps and fastened to above inserts with toggle bolts, beam clamps, or other approved means. Duct shall have at least one pair of supports 8'-0" on centers. Clamps shall be used to fasten hangers to reinforcing on sealed ducts.
- Horizontal ducts larger than 40 inches in their greatest dimension shall be supported by means of hanger rods bolted to angle iron or Unistrut trapeze hangers. Duct shall have at least one pair of supports 8'-0" on centers according to the following:

<u>Span</u>	<u>Support</u>	<u>Min. Dia.</u>
4'-0"	L 1-1/2" x 1-1/2" x 1/8" or P3300 T Unistrut	1/4"
6'-0"	L 1-1/2" x 1-1/2" x 1/4" or P3000 T Unistrut	3/8"
8'-0"	L 2" x 2" x 1/4" or P3000 T Unistrut	3/8"
10'-0"	L 3" x 3" x 1/4" or P5000 T Unistrut	1/2"
12'-0" and Larger	Refer to Plans	

- All ductwork exposed to view in Sales Areas shall be suspended by Unistrut with Finish to match the finish of the roof structure as detailed on the Drawings.
- Vertical ducts shall be supported where they pass through the floor lines with 1-1/2" x 1-1/2" x 1/4" angles for ducts up to 60". Above 60", the angles must be increased in strength and sized on an individual basis considering space requirements.

#### FLASHING:

Where ducts connect to fans including roof exhausters, flexible connections shall be made using "Ventglas" fabric that is fire resistant, water proof, mildew resistant and practically airtight, and shall weigh approximately thirty ounces (30 oz.) per square yard.

There shall be a minimum of 1/2" slack in the connections, and a minimum of 2-1/2" distance between the edges of the ducts.

#### ACCESS DOORS:

Furnish and install in the ductwork, hinged access doors to provide access to all fire dampers, automatic dampers, etc.

Where ducts are insulated, the access doors shall be Double skin doors with 1" of insulation in the door.

Where the size of the duct permits, the doors shall be 18" x 16".

Hood exhaust ductwork shall have at least one access door for cleaning purposes if no other access is available. Doors 24" x 16" and larger shall be provided with Ventlock No. 260 latches.

Latches for doors smaller than 24" x 16" shall be Ventlock No. 100 or 140.

#### SCREENS:

Furnish and install screens on all duct, fan, etc., openings furnished by this Contractor which lead to or are outdoors.

Screens shall be 16 gauge, 1/2" mesh in removable galvanized steel frame.

#### DAMPERS:

Furnish and install dampers where shown on the Drawings and wherever necessary for complete control of the air flow, including all supply and return branches, "division" in main supply and return ducts, each individual air supply outlet, and fresh air ducts.

Where access to dampers through any ceiling is necessary, the Contractor shall be responsible for the proper location of the access doors.

Dampers located above any ceiling shall be installed at 2'-0" above the finished ceiling.

Splitter damper shall be fabricated of steel not lighter than 16 gauge.

- This leading edge of the damper shall be hemmed.
- Each splitter shall be large enough to cover complete the smaller of the two branches it controls, or as shown on the Drawings.
- Dampers shall be carefully fitted, and shall be controlled by locking quadrants equal to Young Regulator No. 1 on exposed ductwork and No. 315 (chromium-plated) on concealed ductwork.
- Furnish and install Young Regulators end bearings for the dampers rods on each end opposite the quadrant when No. 1 regulators are used and on both ends when No. 315 regulators are used.
- Dampers larger than three (3) square feet in area shall be controlled by means of rods hinged near the leading edge of the damper with provisions for firmly anchoring the rod and with end bearings supporting the axle.

Volume dampers shall be as manufactured by Air Balance.

- Blades shall not exceed 48" in length or 12" in width, and shall be of the opposed interlocking type.
- Blades shall be of not less than 16 gauge steel supported on 1/2" diameter rustproofed axles.
- Axle bearings shall be the self-lubricating ferrule type.

#### CLEANING OF SYSTEMS:

Before turning the installation over to the Owner, all ducts shall be blown clean of all dust and dirt that has collected in the ducts.

Grilles shall be removed before this operation and shall be installed when the ductwork is proven to be clean.

*- END OF SECTION 15800 -*

SECTION 15850  
**SYSTEM BALANCING AND ADJUSTING**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Balancing and Adjusting of all air distribution devices within this contract shall be performed by a firm certified by the National Environmental Balancing Bureau; selected by Brookshire's; not to be employed within, owned, or have any other direct business relationship with the HVAC contractor; and be mutually acceptable to the Contractor. All work under this section shall be performed at the expense of Brookshire's unless specifically noted in the Construction Documents as furnished by the Contractor.

Test, balance, and adjust all environmental systems, including but not limited to air distribution system(s) and the equipment serving same, exhaust, supply and make-up air systems.

Testing and balancing shall be provided in accordance with the latest published edition of NEBB Procedural Standards for Testing - Balancing and Adjusting of Environmental Systems. Balancing technician shall have a copy of said document in his possession at the job site along with appropriate instruments for testing and certification. Instruments used shall be accurate and calibration histories for each shall be furnished to Brookshire's upon request.

Prior to beginning any balancing, HVAC contractor shall insure that all equipment, distribution devices, dampers, grilles, registers, etc. are permanently connected; properly installed; clean of dirt, debris, and excessive materials.

Schedule with Brookshire's Representative, a minimum of 10 working days prior to proposed date of Balancing and Testing. Only certifications witnessed by Brookshire's Representative will be acceptable.

Balancing Agent shall be responsible for inspecting, adjusting, balancing, and logging the data on the performance of all heating and air conditioning units and fans, shall adjust all dampers in the duct system and all air distribution devices.

HVAC Contractor and the suppliers of the equipment installed shall all cooperate with the balancing agent to provide all necessary data on the design and proper application of the system components and shall furnish all labor and materials required to eliminate any deficiencies or poor performance.

During the balancing, the temperature regulators shall be adjusted for proper relationship between controlling instruments.

HVAC Contractor shall start up and operate all air conditioning systems furnished within his contract. Contractor shall demonstrate that the system heats and/or cools properly without undue noise and vibration.

**ONLY BROOKSHIRE'S REPRESENTATIVE SHALL START-UP Main Air Conditioning Unit furnished by Brookshire's.**

Test and Balance Contractor shall accompany and instruct HVAC Contractor's representative in the proper adjustment of Environmental Control devices to satisfy the requirement of the Drawings and Specifications, and to the satisfaction of Brookshire's Representative. Upon completion of each days testing and balancing, Contractor shall furnish Brookshire's a copy of field worksheets or notes.

A final typed report shall be furnished to Brookshire's indicating a minimum of:

- Signature of NEBB Person(s) performing Balancing/Testing Services
- Identification of all types of instruments used and their last dates of calibration
- Measured air quantities at each supply outlet, return outlet, exhaust device, etc. referenced in keeping with plan identification.
- Tabulation of simultaneous temperatures of within each separately controlled zone.

The entire HVAC system shall be tested and proven free of leaks or defects.

GUARANTEE:

Per GENERAL CONDITIONS.

CLEAN-UP:

Per GENERAL CONDITIONS.

*- END OF SECTION 15850 -*

SECTION 16010  
**GENERAL REQUIREMENTS FOR ELECTRICAL WORK**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

ALL WORK shall be in conformance with the Drawings and Specifications in their entirety. It is the responsibility of EVERY CONTRACTOR, MATERIAL SUPPLIER, etc. to comply with such.

This section of the work shall comprise the furnishing of all materials, equipment, tools, labor and transportation necessary for the complete installation of the electrical systems. Work is to be complete in every respect whether specifically mentioned in contract documents or not. This work and material includes, but is not limited to the following items:

- Switchboards, panelboards, wiring devices, complete feeder and branch circuit wiring
- Lighting Fixtures
- Power supply to motors, HVAC & plumbing equipment, including connection of motor starters, compressors, and other miscellaneous equipment furnished under other sections of work and/or by Brookshire's
- Installation of motor control interlocking work and alarm work
- Control board wiring to switches, relays, devices, etc., and installation of same
- Empty conduit systems for telephone service/distribution and other miscellaneous communication systems
- Fees, permits and provisions for metering equipment

**CODES:**

All labor, equipment and materials shall be in strict accordance with the rules and recommendations of the National Board of Fire Underwriters, National Electrical Code, State and Municipal regulations, and Light and Power Company, Telephone Company, and other authorities that may have lawful jurisdiction over the work being done. All work shall be done in conformity with the Occupational Safety and Health Act (OSHA) latest edition. Each piece of equipment to be installed shall bear a UL label for a complete unit.

Contractor shall secure all necessary permits, licenses, and inspections required by law for the completion of work, cost of which shall be paid for by the Contractor. Contractor shall secure such pay for all certificates of approval that may be required and deliver them to Brookshire's before final acceptance of the work.

**TEMPORARY SERVICES:**

Contractor shall provide complete 200A, 240V-1P Temporary Service, including Sawpole, Meter, Raintight Panel Enclosure with 4-50 amp GFI Main Breakers, 2 Temporary Pedestals (each with 50A GFI underground feed) at slab locations to be determined by Brookshire's, with maximum 8 GFI receptacles each. Verify location & receptacle requirements for Job Trailer and additional temporary power receptacles with Brookshire's.

**UTILITIES:**

The location and sizes of existing electrical and telephone service facilities are shown based upon a site visit made by the Electrical Engineer. Data shown is offered as an estimating guide without guarantee of accuracy; each bidder shall make complete investigations of the site and shall check and verify all data given. Contractor will be responsible for verifying the exact location of all utility services pertaining to his work.

**MATERIALS AND WORKMANSHIP:**

All materials shall be new, unless otherwise specified, and of quality grade standard manufacture and first class in every respect. All materials of a type for which the Underwriters' Laboratories, National Electrical Manufacturer's Association (NEMA), etc., have established a standard shall be listed by the agency and shall be listed by the agency and shall bear their label.



#### CUTTING AND PATCHING:

Contractor shall be responsible for all cutting and patching required for the proper installation of his own work, and shall obtain permission from Brookshire's before doing any cutting. Cutting shall be done in such a manner that the surrounding work will be restored to its original condition.

All cutting and patching of finished surfaces shall be performed by the General Contractor at the expense of this Contractor. NO STRUCTURAL MEMBER MAY BE CUT WITHOUT APPROVAL OF BROOKSHIRE'S.

CUTTING TORCH is NOT ACCEPTABLE for any use on this project.

Openings cut through the roof or exterior walls shall be provided with a temporary water tight cover during construction or until equipment installation or repair has been made.

Contractor shall be responsible for providing correct sizes and locations of all such chases, slots, etc., on sufficient time that they may be built in as the building construction progresses.

#### CONSTRUCTION REQUIREMENTS:

Refer to EXCAVATING, BACKFILLING AND COMPACTING and all other related Specification Sections for Below Grade Work.

Contractor is responsible for the proper location and size of all slots, holes or openings in the building structure pertaining to his work, and for the correct location of pipe sleeves.

Contractor shall so harmonize his work with that of the several other trades that it may be installed in the most direct and workmanlike manner without hindering or handicapping the other trades. Piping interference shall be handled by giving precedence to pipe lines which require a stated grade for proper operation.

#### DEMOLITION:

Schedule all demolition work to not interfere with Owner's operations of the building.

Report any discrepancies to Architect before disturbing existing installation. Beginning of demolition means installer accepts existing conditions.

Disconnect any electrical systems in walls, floors and ceiling that are to be removed to meet the construction schedule.

Coordinate any utility service outages with Utility Company.

Provide temporary wiring and connections to maintain existing systems in service during construction or indicated as existing to remain at the completion of the project. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

Maintain existing Fire Alarm system in service until new system and modifications to existing system are accepted and approved by Authority Having Jurisdiction. Disable system only to make switchovers and connections. Notify Owner and local fire service at least 72 hours in advance before partially or completely disabling system. Make temporary connections to maintain service in areas adjacent to work area as required.

Remove and properly dispose of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state and local regulations. Materials include but are not limited to:

1. PCB containing electrical equipment, including transformers, capacitors and switches.
2. PCB and DEHP containing lighting ballasts.
3. Mercury containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignition tubes, neon and incandescent.

Remove, relocate and extend existing installations to accommodate new construction. Remove abandoned wiring to source of supply. Remove exposed abandoned conduit, including abandoned circuit above accessible ceiling finishes. Cut conduit flush with walls and floors and patch surfaces.

Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Furnish blank stainless steel cover for abandoned outlets that cannot be removed. Disconnect and remove abandoned panelboards and distribution equipment. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed. Disconnect and remove abandoned luminaires, and remove brackets, stems, hangers and other accessories.

Extend existing installations using materials and methods compatible with existing electrical installations or as specified.

Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

Repair adjacent construction and finishes damaged during demolition and extension work.

#### COORDINATION WITH OTHER TRADES:

This Contractor shall coordinate all electrical work with the complete work including all other contractors. Should this Contractor fail to coordinate the installation/location of electrical work with the specific requirements of work by others, this Contractor shall make all necessary changes without additional cost or delay to Brookshire's.

Where lighting fixtures are shown to conflict with locations of structural members, mechanical or other equipment, this Contractor shall provide adequate support and wiring to clear same.

Each Contractor shall furnish and install all equipment, motors, motor starters, thermostats, shunts/cut-offs, controls, etc. as specified herein and as necessary for the complete installation of his work. Contractor shall pre-set these devices in place and shall coordinated with and furnish necessary wiring diagrams, cut-sheets, instructions, etc. to the Electrical Contractor as appropriate to determine proper wire/circuit sizing and connections. Electrical wiring, conduit, junction boxes, and related devices will be furnished and installed by the Electrical Contractor. Electrical Contractor shall make all "Line Voltage" connections (110 volt and greater). Each respective Contractor shall make connection of all lower voltages to devices furnished within his contract, unless specifically noted otherwise in the Construction Documents.

Refer to Section 15010 for additional coordination information/requirements.

#### REFRIGERATION:

Electrical Contractor shall furnish and install all required refrigeration control wiring. Refrigeration contractor shall make all final connections. Electrical Contractor shall seal all penetrations through equipment, cooler and freezer panels that are associated with their work.

Receptacle for Electric Heater Tape shall be furnished and installed by Electrical Contractor close to the condensate drain wall penetration in all walk-in freezers as high as possible. Receptacle shall be twist lock style to be coordinated with Refrigeration Contractor. Electric Heater Tape and cord cap shall be furnished and installed by Refrigeration Contractor.

#### EQUIPMENT IDENTIFICATION:

All major equipment such as panelboards, transformers, contactors, safety switches, starters, timeclocks, etc., shall be identified by the attachment of nameplates constructed from laminated engraved plastic 3-ply with red surface and white interior core at least 1/16" thick. Engraved lettering shall be condensed gothic at least 1/4" high (1/2" high for panelboards) and properly spaced for easy and legible reading. Plates shall be attached to equipment by the use of a

permanent type double-sided adhesive tape, pop-rivets or chromium plated screws trimmed within 1/8" of inside face of cover.

Identification cards for switches, starters, panels, distribution switchboards, and other devices; shall be neatly typed for assigned circuits, lettered in pencil for "spare", and left blank for spaces. Should card size be of insufficient size for proper identification of circuits, damaged, or lost, the index may be photo-reduced to fit card holder from a properly proportioned larger sheet of paper. All cards shall be in clear plastic holders prior to Final Acceptance of Electrical Work.

#### DEVICE IDENTIFICATION:

Electrical Contractor shall furnish and install label with circuit number on all receptacles and switches. Labels shall be mounted horizontally on the bottom part of the cover plate. Label shall be made with a handheld label maker with 1/4" high "Black" letters in gothic font on clear tape. Tape shall be fade and water resistant.

#### SYMBOLS:

Symbols for the various outlets, lighting and wiring systems are noted on the plans, and shall be strictly adhered to in connection with all work. Should Contractor be in doubt regarding the exact meaning and intent of the various symbols used, he shall confer with Brookshire's for interpretation whose decision shall be final.

#### FOUNDATIONS:

All concrete foundations required by equipment or apparatus furnished under this contract shall be constructed by the General Contractor, see Division 3.

Necessary anchor bolts shall be set in place when the foundation is poured. One inch shall be allowed below equipment bases for alignment and shimming. No grout shall be installed.

#### PAINTING:

All equipment shall be delivered to the job with suitable factory finish. Should the finish be marred in transit or during installation, it shall be finished to present a neat, workmanlike appearance.

Contractor shall leave equipment clean and free from any grease, dirt, rust, etc., in suitable condition for painting.

#### GUARANTEE:

Per Conditions of the Contract and Division 1. These conditions shall not abrogate specific guarantees or warranties issued by manufacturers for greater periods of time.

#### CLEANUP:

Per GENERAL CONDITIONS.

Clean and repair existing materials and equipment that remain or are to be reused.

Clean exposed surfaces of all panelboards and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions at no cost to Brookshire's. Verify any parts to be replaced with Brookshire's prior to any work.

Provide typed circuit directory showing circuiting arrangement for each existing and new panelboard on project.

Each Contractor must be responsible for all equipment, unused material, rubbish and debris of any kind which is generated during the execution of his portion of the work. Keep premises, including the outside area, broom clean and free from unnecessary impediments and debris at all times.

SECTION 16050  
**OVERCURRENT PROTECTIVE DEVICE COORDINATION AND ARC FLASH STUDY**

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes computer-based, fault-current and overcurrent protective device coordination studies, and the setting of these devices.

1.2 SUBMITTALS

- A. Product Data: For computer software program to be used for studies.
- B. Product Certificates: For coordination-study and fault-current-study computer software programs, certifying compliance with IEEE 399. For arc-flash study, computer software programs, certifying compliance with IEEE 1584.
- C. Qualification Data: For coordination-study specialist and arc-flash study specialist.
- D. Other Action Submittals:
  - 1. Coordination-study input data, including completed computer program input data sheets.
  - 2. Coordination-study report.
  - 3. Equipment evaluation report.
  - 4. Setting report.
  - 5. Fault current study.
  - 6. Arc-Flash Protection Study, report and labeling.

1.3 QUALITY ASSURANCE

- A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are not acceptable.
- B. Coordination-Study Specialist Qualifications: An organization experienced in the application of computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
- C. Comply with IEEE 399 for general study procedures.
- D. Comply with IEEE 242 for short-circuit currents and coordination time intervals.
- E. Comply with IEEE 1584 for arc-flash study procedure and labeling, and NFPA-70E for personnel protective equipment recommendations and labeling.

- F. Comply with ANSI Z535 safety standards.

## PART 2 - PRODUCTS

### 2.1 COMPUTER SOFTWARE DEVELOPERS

- A. Available Computer Software Developers: Subject to compliance with requirements, companies offering computer software programs that may be used in the Work include, but are not limited to, the following:
  - 1. CYME International, Inc.
  - 2. EDSA Micro Corporation.
  - 3. Electrical Systems Analysis, Inc. (ESA)
  - 4. SKM Systems Analysis, Inc.

### 2.2 COMPUTER SOFTWARE PROGRAM REQUIREMENTS

- A. Comply with IEEE 399.
- B. Analytical features of fault-current-study computer software program shall include "mandatory," "very desirable," and "desirable" features as listed in IEEE 399, Table 7-4.
- C. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices.
  - 1. Optional Features:
    - a. Arcing faults.
    - b. Simultaneous faults.
    - c. Explicit negative sequence.
    - d. Mutual coupling in zero sequence.
- D. Comply with IEEE 1584.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. Devices to be coordinated are indicated on Drawings.
- B. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices not submitted for approval with coordination study may not be used in study.

### 3.2 FAULT-CURRENT STUDY

- A. Source Impedance: As an infinite bus on primary side of transformer.
- B. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project and use approved computer software program to calculate values. Include studies of system-switching configurations and alternate operations that could result in maximum fault conditions.
- C. Calculate momentary and interrupting duties on the basis of maximum available fault current.
- D. Calculations to verify interrupting ratings of overcurrent protective devices shall comply with the following:
  - 1. Low-Voltage Circuit Breakers: IEEE 1015 and IEEE C37.50.
  - 2. Low-Voltage Fuses: IEEE C37.46.
  - 3. Circuit Breakers: IEEE C37.13.
- E. Study Report: Enter calculated X/R ratios and interrupting (5-cycle) fault currents on electrical distribution system diagram of the report. List other output values from computer analysis, including momentary (1/2-cycle), interrupting (5-cycle), and 30-cycle fault-current values for 3-phase, 2-phase, and phase-to-ground faults.
- F. Equipment Evaluation Report: Prepare a report on the adequacy of overcurrent protective devices and conductors by comparing fault-current ratings of these devices with calculated fault-current momentary and interrupting duties.

### 3.3 COORDINATION STUDY

- A. Gather and tabulate the following input data to support coordination study:
  - 1. Product Data for overcurrent protective devices specified in other Division 16 Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
  - 2. Impedance of utility service entrance.
  - 3. Electrical distribution system diagram showing the following:
    - a. Load current that is the basis for sizing continuous ratings of circuits for cables and equipment.
    - b. Circuit-breaker and fuse-current ratings and types.
    - c. Relays and associated power and current transformer ratings and ratios.
    - d. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.
    - e. Generator kilovolt amperes, size, voltage, and source impedance.
    - f. Cables. Indicate conduit material, sizes of conductors, conductor insulation, and length.
    - g. Motor horsepower and code letter designation according to NEMA MG 1.

4. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram:
  - a. Special load considerations, including starting inrush currents and frequent starting and stopping.
  - b. Magnetic inrush current overload capabilities of transformers.
  - c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
  - d. Ratings, types, and settings of overcurrent protective devices.
  - e. Special overcurrent protective device settings or types stipulated by Owner or A/E.
  - f. Time-current-characteristic curves of devices indicated to be coordinated.
  - g. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
  - h. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
  - i. Panelboards, switchboards, motor-control center ampacity, and interrupting rating in amperes rms symmetrical.
  
- B. Perform coordination study and prepare a written report using the results of fault-current study and approved computer software program. Comply with IEEE 399.
  
- C. Comply with NFPA 70 for overcurrent protection of circuit elements and devices.
  
- D. Comply with IEEE 141 and IEEE 242 recommendations for fault currents and time intervals.
  
- E. Transformer Primary Overcurrent Protective Devices:
  1. Device shall not operate in response to the following:
    - a. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
    - b. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.
  
  2. Device shall protect transformer according to IEEE C57.12.00, for fault currents.
  
- F. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and conductor melting curves in IEEE 242. Verify adequacy of phase conductors at maximum three-phase bolted fault currents, equipment grounding conductors, and grounding electrode conductors at maximum ground-fault currents.
  
- G. Coordination-Study Report: Prepare a written report indicating the following results of coordination study:
  1. Tabular Format of Settings for Overcurrent Protective Devices:

- a. Device tag.
  - b. Relay-current transformer ratios; and tap, time-dial, and instantaneous-pickup values.
  - c. Circuit-breaker sensor rating; and long-time, short-time, and instantaneous settings.
  - d. Fuse-current rating and type.
  - e. Ground-fault relay-pickup and time-delay settings.
2. Coordination Curves: Prepared to determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between series devices, including upstream devices. Show the following specific information:
- a. Device tag.
  - b. Voltage and current ratio for curves.
  - c. Three-phase and single-phase damage points for each transformer.
  - d. No damage, melting, and clearing curves for fuses.
  - e. Cable damage curves.
  - f. Transformer inrush points.
  - g. Maximum fault-current cutoff point.
3. Completed data sheets for setting of overcurrent protective devices.
4. Provide all project files on disk.

### 3.4 OVERCURRENT PROTECTIVE DEVICE SETTING

- A. Manufacturer's Field Service: Engage a factory-authorized service representative, of electrical distribution equipment being set and adjusted, to set overcurrent protective devices within equipment.
- B. Testing: Perform the following device setting and prepare reports:
  - 1. After installing overcurrent protective devices and during energizing process of electrical distribution system, perform the following:
    - a. Verify that overcurrent protective devices meet parameters used in studies.
    - b. Adjust devices to values listed in study results.
  - 2. Adjust devices according to recommendations in Chapter 7, "Inspection and Test Procedures," and Tables 10.7 and 10.8 in NETA ATS.

### 3.5 IDENTIFICATION OF AVAILABLE FAULT CURRENT

- A. Service equipment shall be legibly marked in the field with the maximum available fault current. The field marking(s) shall include the date the fault current calculation was performed and be of sufficient durability to withstand the environment involved in accordance with NEC 110.24, 2014.



### 3.6 ARC-FLASH STUDY

- A. Perform an arc-flash study using approved computer software program. Prepare a written report using results of arc-flash study. Study shall comply with NFPA 70E-2015 Section 130.5 “Arc Flash Risk Assessment”, OSHA 1910.269 and NEC 110-16, 2014.
1. Perform a risk assessment to determine the appropriate safety-related work practices, the arc flash boundary, and the PPE to be used within the arc flash boundary. The risk assessment shall be performed per NFPA-70E Section 130.5.
  2. Provide equipment labels that comply with NFPA-70E 2015 Section 130.5(D). Based on the results, produce and install a warning label (orange < 40 cal/cm<sup>2</sup>) or danger label (red > 40 cal/cm<sup>2</sup>) for each piece of equipment in accordance with ANSI Z535.4-2011. The label must be readable in both indoor and outdoor environments for at least 3 years.
  3. Provide a comprehensive report that includes:
    - Report summary with analysis methodology, findings and recommendations
    - Summary of input data for utility source, equipment and cables
    - Available fault current at each equipment location with comparison to equipment rating
    - Incident energy level (calories/cm<sup>2</sup>) for each equipment location and recommended PPE
    - Complete system single-line diagram for the system analyzed

- END OF SECTION 16050 -

SECTION 16110  
**RACEWAYS AND FITTINGS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all labor, materials, equipment and facilities necessary to furnish and install raceways and fittings as indicated on the Drawings and as described in this section.

**CONDUIT:**

Conduits installed under the conditions listed below shall be as follows:

- Conduit installed underground or under concrete slabs shall be Type II, Schedule 40 rigid polyvinyl chloride (PVC) rated 90° C., and approved for burial without concrete encasement, or galvanized rigid conduit (GRC).
- Underfloor conduit placed inside building slab shall have 12" minimum coverage below finished slab. Coordinate routing with all other trades.
- All feeders from distribution panels to individual panels shall be run underfloor.
- All circuits to sales area equipment shall be run underfloor, unless approved by Brookshire's.
- Underground conduit placed outside building slab shall have 24" minimum coverage below finished grade. Electrical Contractor shall elevate primary and secondary underground conduit on 3" minimum height approved seats above trench floor. Contractor shall furnish and place all concrete required for electrical installation, including conduit encasement, housekeeping and transformer pads, etc.
- Electrical Contractor shall perform all Trenchwork, Backfill and Compaction required in the placement of electrical work, per related specification section(s).
- Overhead Conduit trapeze hangers shall be supported from top chord of roof joists. Hangers shall be galvanized in electrical room, backroom or above ceiling areas and shall be prime coated or galvanized at Sales Area to match roof structure finish.
- Conduit shall be equal to or greater than the minimum as established by the NEC, and no less than 1/2" diameter.
- Where PVC is not permitted by local code use GRC.
- Where soil conditions are extremely corrosive use PVC or PVC coated GRC.
- Where PVC conduit emerges from below grade or slab, transition to GRC shall be made below grade where required.
- Where bends of 45° or greater are required in a run of PVC conduit, PVC conduit ells shall be installed.
- A grounding conductor, properly sized in accordance with Article 250, NEC, shall be installed in all runs of non-metallic conduit.

Galvanized rigid conduit (GRC) or intermediate metal conduit (IMC) shall be installed for the following --

- Conduits above grade enclosing unfused service entrance conductors.
- Conduits emerging from below grade or slab.
- Conduits subject to physical damage.

Conduit installed above grade, concealed or exposed, where not exposed to physical damage or corrosive influences may be electrical metallic tubing (EMT). Conduit shall be run to avoid proximity to steam or hot pipes, keeping a minimum of 3 inches between these pipes and the conduit.

Do not install conduit in concrete slabs. All under slab conduits must be buried a minimum of 12 inches below the bottom of concrete slab.

**CONDUIT FITTINGS:**

All conduit fittings shall be approved for the purpose and shall bear the Underwriter's Laboratory Label.

Conduit bends shall be made with factory elbows or approved bending methods. Where conduits are grouped, bends shall be symmetrical.

PVC conduit fittings and welding solvent shall be of the type recommended by the manufacturer of the conduit with which they are used.

Fittings for rigid conduit and IMC shall be compatible with the material of the conduit and the application.

Fittings for steel conduit shall be of steel or malleable iron properly coated to resist corrosion. Threadless fittings shall not be used below grade.

Fittings for electrical metallic tubing (EMT) shall be of die cast or equal.

All exposed electrical metallic tubing (EMT) on roof conditions shall be of steel or malleable iron, plated to resist corrosion.

Bonding bushings shall be installed on service entrance conduits and elsewhere when required to insure grounding continuity.

#### FLEXIBLE CONDUIT AND FITTINGS:

Flexible metallic conduit shall be constructed from flexible or spiral wound electro-galvanized steel or aluminum terminated with approved grounding fittings.

Liquid tight flexible metallic conduit shall be light gray in color, shall have "Seal-tite" fittings and shall be equal to American Brass "Seal-tite" Type U.A. All flexible metal conduit shall contain a bonding ground wire sized per N.E.C. A section of metallic flexible conduit shall be used to connect each motor, transformer and rotating device for power and control, shall be a minimum of 12" in length, shall be "Seal-tite" construction in all exterior applications, mechanical rooms, and to connect all Store Product Refrigeration Equipment, Coolers, and Freezers. Length of flexible connections shall be no longer than necessary for each installation, and shall be installed in a neat and workmanlike manner.

#### ARMORED CABLE:

The use of Armored Cable, Type AC, BX, or MC is strictly prohibited.

#### OUTLET BOXES:

Outlet boxes shall be standard, stamped galvanized steel boxes except as hereinafter noted. Each box shall be of the proper size to accommodate the device and function for which they are shown.

Boxes for wall devices, such as light switches, convenience outlets, thermostats, telephone outlets, shall be 4" square boxes (1900 4/s) as a minimum. Do not use handy boxes or switch boxes. Boxes shall be multiple gang where required, properly sized to accept the required devices and shall be furnished complete with plaster ring where required.

Boxes for installation in exterior masonry walls shall be special square corner masonry type. All outlet, pull and junction boxes shall be securely fastened to the structure and shall not depend on conduits for support.

Boxes for mounting of lighting fixtures shall be 3" or 4" octagon boxes, equipped with 3/8" "no bolt" fixture studs.

All boxes shall be furnished with proper covers or wall device plates. Boxes unused for any reason shall have blank cover plates. All covers and wall device plates shall be stainless steel unless located on a millwork finish. Verify color at millwork finishes with Brookshire's.

Boxes for installation in wet locations and in exterior walls shall use hot dipped galvanized cast iron, furnished with Intermatic WP1010MXD recessed weatherproof, vertical single gang with in-use cover; Intermatic WP1030MXD recessed weatherproof, vertical double gang with in-use cover; or Intermatic WP1010HMXD recessed weatherproof, horizontal single gang with in-use cover. Horizontal outlets shall be used at all exterior installations. No plastic in-use covers will be allowed.

Boxes for installation in concrete floors, on grade or below grade shall be galvanized cast iron or PVC with threaded conduit entrances, waterproof type, with means of adjusting cover plate to finish floor level. Where these boxes occur in floors above grade, galvanized steel boxes with concrete proof inlets and adjustable tops. Where flush type floor box outlets are indicated, covers shall be polished brass, waterproof type with threaded outlets to receive devices scheduled. Where flush type power outlets are shown, they shall be of the duplex type with captive flip-top covers for each half of the receptacle.

#### WIREWAYS, JUNCTION AND PULL BOXES:

Finish and install all wireways, junction and pull boxes shown on the drawings and required. Fabricate in accordance with NEMA, National Electrical Code Standards and requirements in so far as materials, gauges, dimensions and methods of fastening are concerned.

Wireways, junction and pull boxes shall bear UL label where required by code.

Units not sized on the Drawings shall be sized in accordance with NEC standards.

Manufactured Units shall be furnished in standard gray enamel, sides and backs spot welded in position, and removable screw cover mounted with brass machine screws.

When allowed by Code, Shop fabricated of 24 gauge min. Galvanized Sheet Metal may be used where not exposed to view within Finished Areas and as acceptable to Brookshire's.

#### CONDUIT HANGERS AND SUPPORTS:

Contractor shall furnish all foundations or supports for the work installed. All conduit less than 2" shall have hangers spaced not more than 8' on centers, and all conduit over 2" shall have hangers spaced not more than 10' on centers. Conduits shall be supported within 3' of any bend and every outlet or junction box.

Conduits shall be secured by means of toggle bolts on hollow masonry, expansion shields and machine screws on precast inserts on poured concrete, machine screws and bolts on metal, and wood screws on wood construction.

Perforated strap hangers shall not be accepted for any work. No plastic fasteners may be used in exterior locations.

Where conduit is supported from site poured overhead concrete construction, approved inserts shall be placed in forms before concrete is poured. Inserts shall be Modern Hanger Corp. No. 510 or equal adjustable concrete inserts. No ramset type fasteners shall be used in concrete inserts.

Trapeze hangers shall be used for multiple parallel conduit runs, and shall be Steel City No. B-900, Unistrut No. P-1000 or equal. Each conduit shall be clamped to the trapeze hanger with conduit clamps. Use clamps of *One-Piece Construction*, B-Line B-1000 Series, or approved equal.

All concrete inserts shall be galvanized; all steel bolts, nuts, washers, and screws shall be galvanized or cadmium plated; individual hangers, trapeze hangers, and rods shall be prime coated.

#### DEVICES:

All devices shall be "Ivory" color unless noted otherwise.

All isolated ground receptacle devices shall be "Orange" color unless noted otherwise.

All covers and wall device plates shall be stainless steel unless located on a millwork finish. Verify color at millwork finishes with Brookshire's.

#### INSTALLATION:

All wiring, unless specifically noted to the contrary, shall be installed in metallic raceways. These raceways shall be run concealed in finished areas and where run exposed shall be run square to the building and held as tight as possible to the building construction. Horizontal runs shall be installed to provide a natural drain for condensation.

The Drawings indicate the required size of all raceways, except as hereinafter specified, the points of termination, and a suggested routing. However, it shall be the responsibility of this Contractor to install the conduit in proper coordination with the building structure and the other mechanical trades, furnishing all required bends, fittings, junction boxes, whether or not they are specifically shown on the Drawings, to satisfy all codes and standards of good practice. Where conduits for both branch and feeder circuits are run concealed, they may be run out of square to the building providing the shortest runs possible.

Conduit sizes as shown on the Drawings are minimum. Conduit where sizes are not shown shall be in accordance with National Electric Code, using 1/2" conduit as minimum size above ceilings and 3/4" in or under floor slabs or masonry walls. All conduits shall be of adequate size to allow the installation of conductors without excessive strain or damage.

Ream out ends of all conduit before installation of wire. Keep dry during construction by properly plugging or capping all ends and swab out before wires are pulled in. All bends shall be made with approved bending device, and all crushed, deformed or damaged conduit must be replaced before pulling of wire.

Conduit shall not be installed across expansion joints without written approval. All roof penetrations shall be made in adequate time to the Roofer to make proper flashings.

Where conduit penetrates concrete or steel beam, provide suitable sleeves made of galvanized steel pipe, allowing a minimum gap of 1/4" space between sleeve and conduit.

It shall be the responsibility of this Contractor to determine from the actual determination on the site the exact location of each and every outlet. The outlet locations shall be modified from those shown on the plans to accommodate changes in door swings or to clear other interferences that may arise from job construction details, as well as modification to center within room spaces. These modifications shall be made with no change in contract price and shall be a matter of job coordination at the expense of the Contractor. This Contractor shall check these conditions throughout the entire job and shall notify Brookshire's of discrepancies, as they may occur, before proceeding with the installation of the work to verify the modifications, if any. Wall boxes shall be set in advance of wall construction, shall be blocked in place and secured. All wall boxes shall be set flush with the finish. Install extension sleeves as required to extend boxes to the finished surfaces of special furring or wall finishes.

Unless otherwise noted or directed by Brookshire's to the contrary at the time of installation, outlet boxes shall be placed at the following heights - center of box to finished floor level.

- Wall switches - 46"
- Receptacle - 18"
- Telephone & Intercom boxes - 46"
- Fire alarm signaling devices - 6" below ceiling but not greater than 80" AFF unless specifically noted otherwise on the *Fire Alarm Plans*
- Thermostat mounting height shall be field verified or as noted on the Drawings

- Other outlet boxes shall be located as shown on the Drawings

Brookshire's reserves the right to change location of any outlet a distance of 15' in any direction from plan location, before work is actually roughed-in, at no charge.

*- END OF SECTION 16110 -*

## SECTION 16130 CONDUCTORS

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

### SCOPE:

Provide all labor, materials, equipment and facilities necessary to furnish and install conductors as indicated on the Drawings and as described in this section.

### CONDUCTORS:

All conductors shall be made of soft-drawn annealed copper with a conductivity not less than that of 98% pure copper. All wire shall be stranded conductor type.

All wiring systems shall utilize conductors with insulation rated at 600 volts and insulated with Type THWN/THHN insulation only, no exception. Wire in fixture channels and other special locations shall be as specifically noted for temperature in Article 300 in the National Electrical Code.

Minimum wire sizes shall be as follows: For 20 ampere branch circuits #12 gauge, except that home runs greater than 75' on 120/208 volt shall be #10 gauge systems from the panel to the first outlet of the circuit. Wire size of branch circuits shall be adjusted to compensate for voltage drop based upon actual conduit routing. Contractor shall maintain voltage drop as recommended by the National Electrical Code (not to exceed 3% for feeder or branch circuit individually, not to exceed 5% for both together).

All wire #10 gauge and smaller shall be factory color coded. For all wire #8 Gauge and larger, where factory color is not available, mark conductors on each end with a 1" band of colored, pressure sensitive plastic tape or by the use of brilliant waterproof lacquer properly applied. Colors for each phase and the neutral shall be consistent throughout the system. Color code shall be as follows:

	<u>120/208 Volts</u>
Phase A:	Black
Phase B:	Red
Phase C:	Blue
Neutral:	White
Ground:	Green

The white or gray conductor shall be the neutral at each lighting fixture. Switches shall be installed in "hot" legs. A Grounding Conductor shall be run to every Light Fixture.

Conductors having white, gray, or green covering shall not be used to indicate other than neutral or grounding. This limitation applies to all power lighting and control circuits.

### INSTALLATION:

Installation of conductors shall be made in a neat and workmanlike manner to meet Code requirements and shall be run continuous without weld, splice or joint between boxes unless noted otherwise on the Drawings. Do not install wire in conduit unless the entire system of conduit and outlet boxes is permanently in place. All conductors shall be pulled using a UL approved wire lubricant.

Make connections to terminals using pressure type connectors. Soldered joints will not be permitted. All joints in conductors shall be made by first twisting the conductors and then applying a UL approved insulated, cadmium plated, live steel, spring type connector in all sizes up to the catalog capacity of the connectors.

On sizes larger than catalog capacity of the connectors listed above, joints shall be made with an approved clamp type solderless connector insulate with a UL approved plastic electrical tape with the number of layers required to give an insulating quality equal to that of the conductor itself. Where wire sizes larger than the catalog terminal size must be connected to wiring devices, they shall be connected as follows: Install a short length of the largest size conductor with connectors herein specified. Contact area between the 2 conductors shall be at least twice the cross sectional area of the largest conductor. Provide oversized boxes as required for this installation.

Where outlets only are indicated on the Drawings, allow for 72" lengths of conduits and wiring for connection of Brookshire's furnished equipment. Connection to Brookshire's furnished elements of the work will be coordinated with and made under the supervision of Brookshire's Representative.

All conductors shall be identified with Brady markers at terminals and junction boxes indicating circuit numbers.

*- END OF SECTION 16130 -*



SECTION 16142  
**ELECTRICAL CONNECTIONS FOR EQUIPMENT**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.
- B. Division 16 Basic Electrical Requirements and Basic Electrical Materials and Methods sections apply to work specified in this section.

1.2 SUMMARY

- A. Extent of electrical connections for equipment is indicated by Drawings and schedules. Electrical connections are hereby defined to include connections used for providing electrical power to equipment.
- B. Applications of electrical power connections specified in this section include but are not limited to the following:
  - 1. To resistive heaters such as unit heaters, cabinet heaters, wall heaters, etc.
  - 2. From electrical source to motor starters and/or disconnect switches.
  - 3. From motor starters and/or disconnect switches to motors.
  - 4. To lighting fixtures.
  - 5. To converters, rectifiers, transformers, inverters, rheostats, and similar current adjustment features of equipment.
  - 6. To grounds including earthing connections.
  - 7. To master units of communications, signal, alarm, clock, public address, sound, and video systems.
- C. Electrical connections for equipment, not furnished as integral part of equipment, are specified in Division-15 and other Division-16 sections, and is work of this section.
- D. Refer to Division 15 sections for control system wiring; not work of this section.
- E. Refer to sections of other Divisions for specific individual equipment power requirements, not work of this section.

1.3 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of electrical connectors and terminals, of types and ratings required, and ancillary connection materials, including electrical insulating tape, soldering fluxes, and cable ties, whose products have been in satisfactory use in similar service for not less than 3 years.

- B. Installer's Qualification: Firms with at least 2 years of successful installation experience with projects utilizing electrical connections for equipment similar to that required for this project.
- C. Codes and Standards:
  - 1. NEC Compliance: Comply with applicable requirements of NEC as to type products used and installation of electrical power connections (terminals and splices), for junction boxes, motor starters, and disconnect switches.
  - 2. UL Compliance: Comply with all applicable UL standards and provide electrical connection products and materials which are UL-listed and -labeled.

#### 1.4. DELIVERY, STORAGE, AND HANDLING

- A. Deliver electrical connection products wrapped in proper factory-fabricated type containers.
- B. Store electrical connection products in original cartons and protect from weather, construction traffic and debris.
- C. Handle electrical connection products carefully to prevent breakage, denting, and scoring finish.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products of one of the following (for each type of product):

Adalet.  
AMP.  
Appleton Electric Co.  
Burndy Corporation.  
Hubbell, Inc.  
Ideal Industries, Inc.  
Thomas & Betts.  
3M Company.

#### 2.2 MATERIALS AND COMPONENTS

- A. General: For each electrical connection provide complete assembly of materials, including but not necessarily limited to, pressure connectors, terminals (lugs), electrical insulating tape, heat-shrinkable insulating tubing, cable ties, solderless wire-nuts, and other items and accessories as needed to complete splices and terminations.

- B. Metal Conduit, Tubing and Fittings:
  - 1. General: Provide metal conduit, tubing and fittings of types, grades, sizes and weights (wall thicknesses) required for each type service. Provide proper selection as determined by Installer to fulfill wiring requirements and comply with NEC requirements for raceways. Provide products complying with Section 16110.
  
- C. Wires, Cables, and Connectors:
  - 1. General: Provide wires, cables, and connectors complying with Section 16130.
  - 2. Wires/Cables: Unless otherwise indicated, provide wires/cables (conductors) for electrical connections which match, including sizes and ratings, of wires/cables which are supplying electrical power. Provide copper conductors with conductivity of not less than 98% at 20 deg C (68 deg F).
  - 3. Connectors and Terminals: Provide electrical connectors and terminals which mate and match, including sizes and ratings, with equipment terminals and are recommended by equipment manufacturer for intended applications.
  - 4. Electrical Connection Accessories: Provide electrical insulating tape, heat-shrinkable insulating tubing and boots, wirenuts and cable ties as recommended for use by accessories manufacturers.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine area and conditions under which electrical connections for equipment are to be installed and notify Engineer in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Engineer.

### 3.2 INSTALLATION OF ELECTRICAL CONNECTIONS

- A. Install electrical connections in accordance with equipment manufacturer's written instructions and with recognized industry practices, and complying with applicable requirements of UL, NEC and NECA's "Standard of Installation" to ensure that products fulfill requirements.
- B. Coordinate with other work, including wires/cables, raceway and equipment installation, as necessary to properly interface installation of electrical connections for equipment with other work.
- C. Connect electrical power supply conductors to equipment conductors in accordance with equipment manufacturer's written instructions and wiring diagrams. Mate and match conductors of electrical connections for proper interface between electrical power supplies and installed equipment.
- D. When making connections to screw terminals with #10 or smaller stranded wire, the frayed end shall be taped or enclosed by a piece of the conductor insulation.

- E. Cover splices with electrical insulating material equivalent to, or of greater insulation resistivity rating, than electrical insulation rating of those conductors being spliced.
- F. Prepare wires/cables, by cutting and stripping covering armor, jacket, and insulation properly to ensure uniform and neat appearance where wires/cables are terminated. Exercise care to avoid cutting through tapes which will remain on conductors. Also avoid "ringing" copper conductors while skinning wire.
- G. Trim wires/cables as short as practicable and arrange routing to facilitate inspection, testing and maintenance.
- H. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturers published torque tightening values for equipment connectors. Accomplish tightening by utilizing proper torqueing tools, including torque screwdriver, beam-type torque wrench, and ratchet wrench with adjustable torque settings. Where manufacturer's torqueing requirements are not available, tighten connectors and terminals to comply with torqueing values contained in UL's 486A.
- I. Provide flexible conduit for motor connections, and other electrical and/or mechanical equipment connections, where subject to movement and vibration.
- J. Provide liquid-tight flexible conduits for connection of motors and other electrical and/or mechanical equipment where subject to movement and vibration, and also where connections are subjected to one or more of the following conditions:
  - Exterior location.
  - Moist or humid atmosphere where condensate will accommodate.
  - Corrosive atmosphere.
  - Water spray.
  - Dripping oil, grease, or water.
  - When within 24 inches of floor.

### 3.3 FIELD QUALITY CONTROL

- A. Upon completion of installation of electrical connections, and after circuitry has been energized with rated power source, test connections to demonstrate capability and compliance with requirements. Ensure that direction of rotation of each motor fulfills requirement. Correct malfunctioning units at site, then retest to demonstrate compliance.

- END OF SECTION 16142 -

SECTION 16161  
**ELECTRICAL SERVICE ENTRANCE EQUIPMENT**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all labor, materials, equipment, and facilities necessary to furnish and install electrical equipment as shown on the Drawings and described in this section.

**MAIN SWITCHBOARD:**

Furnish and install all modifications to existing main switchboard as scheduled on the Drawings and as described herein. All new components shall bear UL service entrance label.

Circuit protection devices shall be identified by individual engraved nameplates. Main devices shall be identified as such.

Cable termination space shall be adequate for hydraulically compressed lugs.

Switchboard components shall be Square 'D', GE or Cutler-Hammer. No other substitutes will be considered.

**FUSES:**

Furnish and install current limiting fuses where specifically noted on the Drawings. All fusible switches shall have replacement fuse information attached to the inside of the door.

Fuses 601 amperes and larger shall be Class L time delay Bussman KLU. Fuses 600 amperes and smaller serving circuit breaker panelboards shall be fast acting Class R Bussman KTS-R. Fuses 600 amperes and smaller serving motors and transformers shall be dual element current limiting Class R Bussman LPS-R.

Furnish 3 fuses of each size and type required on job for a spare set. Spare fuses shall be in a Bussman Type SFC fuse cabinet, mounted in the electrical room.

**INSTALLATION:**

Service and feeder conduits shall terminate only in the switchboard section containing the lugs or devices to which they are to be connected.

*- END OF SECTION 16161 -*

SECTION 16261  
**STATIC UNINTERRUPTIBLE POWER SUPPLY (UPS)**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all labor, materials, equipment, and facilities necessary to furnish and install the static uninterruptible power supply (UPS) as shown on the Drawings and described in this section.

The UPS shall provide high quality AC power for sensitive electronic equipment loads with N+1 power and logic capabilities with hot swappable power and battery modules to maintain maximum uptime.

The UPS shall work in conjunction with the building electrical system to protect electronic equipment from power disturbances that may occur with utility power, such as voltage fluctuations, brownouts power surges and sags.

**SHOP DRAWINGS:**

Per SUBMITTALS. Furnish cut-sheets of UPS, all devices and accessories.

**MATERIALS:**

Products of Eaton only are acceptable, no others will be considered.

**SYSTEM DESCRIPTION:**

Standard UPS system will include a minimum of an Enclosure, 3 Power Modules and 3 Battery Modules. For each Power Module in the system, a minimum of 1 Battery Module is required.

*UPS –*

Eaton 9PXM model with 4kVA – 16kVA: 8-slot split-phase 4-wire I/O.

*Power Module –*

Each power module shall be rated at 4kVA, 3.6kW.

*Battery Module –*

Two battery modules per chassis slot equals one battery string which is equivalent to 120VDC. Each battery module has five 9Ah, 12 Volts VRLA batteries to form a 60 Volts battery. Two of these modules fit in one slot of the chassis and are connected in series to form a 120 Volts battery string. Two battery modules per slot can be installed in any slot of the UPS chassis to form multiple parallel strings of 120VDC for extended backup time capability.

*Charger –*

Each Power Module (UPM) can charge up to 5 battery strings.

The UPS shall operate as an on-line, double-conversion UPS in Normal Mode. During the Normal or Double Conversion Mode the rectifier shall derive power as needed from the commercial AC utility or generator source and supply filtered and regulated DC power to the on-line inverter. The inverter shall convert the DC power to highly regulated and filtered AC power for the critical loads.

Components shall be as follows:

- Converter (Rectifier/Booster)
- Inverter
- Valve Regulated Lead Acid (VRLA) Battery Modules
- Battery Charger
- User Interface Panel
- Serial (RS-232 Communication Interface)
- Communication Card Slots (2)

- Remote Emergency Power Off Contacts
- On Generator Contacts
- On Bypass Contacts
- Input Line Cord or Hardwired
- Hardwired Output
- Caster Kit for 8 slot enclosure
- Wall Mounted Maintenance Bypass Cabinet

**CABINET CHARACTERISTICS:**

Actual unit catalog number is Eaton 9PXM8S12K with the following features:

1. Power rating: 4 kVA expandable
2. Input connection: Hardwired
3. Output connection: Hardwired
4. Cabinet dimensions: 25" H x 17 1/2" W x 34 1/2" D
5. Weight: 254.5 lbs.

*Mechanical Construction -*

1. All materials and components making up the UPS shall be new, of current manufacture, and shall not have been in prior service except as required during factory testing. The UPS shall be constructed of replaceable subassemblies. All active electronic devices shall be solid-state.
2. The UPS unit comprised of: input converter, battery charger, inverter, bypass, and battery consisting of the appropriate number of sealed battery modules, shall be housed in a single freestanding enclosure. The UPS cabinet shall be cleaned, primed, and painted with the manufacturer's standard color. Casters and leveling feet shall be provided as needed.

**BATTERY:**

Battery type shall be a Valve Regulated Lead Acid (VRLA) with a minimum 3 year float service life at 25 degrees C.

Each UPS system shall have a Holdover Time (Runtime) consisting of a minimum of one battery string (consisting of two battery modules) for each power module which shall have a minimum holdover time of 6 minutes.

*Battery Recharge Time -*

1. Base UPS System consisting of one battery string (two battery modules) for each power module will have a recharge time of 3 hours to 80% usable capacity at nominal line after a full load discharge.
2. UPS system with more than one battery string (two battery modules) for each power module will have a recharge time calculated by the ampere hour capacity of the total battery system divided by the nominal ampere rating of the battery charger(s) (i.e. 100AH capacity/5 amps of total charge = 20 hours of recharge) after any load discharge. The New Optional 20 Amp Charger can be used with any UPS system to improve recharge times.

*Battery Protection -*

1. Short Circuit Protection: Over-current protection shall protect the batteries from all short circuit and reverse polarity fault conditions.
2. Battery Module Fusing: Internal Battery Module Fusing shall limit each module to 60 amps.

3. Under-voltage Protection:
  - a. Inverter cutoff voltage: Battery operation shall be terminated when the battery voltage drops to the load adaptive low battery set point. At no load the shutdown voltage should be 105VDC. At full load the terminal voltage of the battery should not go below 95VDC while in Battery Mode.
  - b. Protective shutdown voltage: System current draw shall be removed from the battery when the battery voltage drops below 1.33 volts-per-cell typical.
4. Over-voltage Protection: If the UPS systems battery buss voltage exceeds 150VDC for more than 5 seconds the UPS will disable all battery chargers and alarm a high battery condition.

*Battery Management –*

1. Battery Recharge: After recharging batteries to full capacity, the charger will reduce its output to supply internal power supplies only. Continual float (trickle) charging of the battery shall not be allowed. The active battery charger states are Maintenance (no-charge), Constant-Current, and Constant-Voltage (equalize).
2. Battery Runtime Monitoring: UPS shall monitor batteries and provide status to end user of battery runtime via front panel, serial communications, or both. Runtime calculations to be based on load demand and analysis of battery health.
3. Battery Health Monitoring: UPS shall periodically monitor battery health and provide warnings visually, audibly and/or serially when battery capacity falls below 80% of original capacity. Battery testing may also be user initiated via front panel or serial communications.

Each Battery Module shall be User-Replaceable and Hot Swappable. All battery modules shall have a weight of 30lbs or less to insure they are User-Replaceable and Hot Swappable for one person.

USER INTERFACE:

- A. Front Panel Display: The UPS shall include a front panel display consisting of a LCD display that provides the information and access to all settings and control features of the UPS.
  1. Three Languages (English, French and Spanish).
  2. The main status screen shall include all the following information at a single view:
    - a. UPS mode status.
    - b. Load information:
      - i. Load wattage.
      - ii. Load VA.
      - iii. Load percentage.
      - iv. Graphical representation of load percentage.
    - c. Battery condition.
      - i. Battery charge percentage.
      - ii. Estimated runtime.
      - iii. Number of EBM's connected.
      - iv. Graphical representation of battery percentage.
    - d. Alert / alarm conditions.
    - e. Efficiency.



B. User menu:

1. Controls will consist of a 5-button configuration including:
  - a. ESC – Exit menu item / cancel changes.
  - b. UP – Go to previous screen or menu/value selection.
  - c. DOWN – Go to next screen or menu/value selection.
  - d. ENTER – Enter menu or select value.
  - e. On/Off button.
2. Notify end users in the event of a power anomaly via network, E-mail or page.

C. Communication Ports:

1. (2) Internal Communication Card Slots: UPS shall have (2) Internal Communication Card Slots for additional communication capabilities, including SNMP/WEB Communication and Dry (Isolated) contact communication.
2. Serial communications (via RS-232) with manufacturer-supplied Power Management Software package.

OPTIONAL ACCESSORIES:

Bypass Power Module: Eaton BPM125HW

The UPS will include the installation of a compatible external maintenance bypass power module (BPM). The BPM bypass shall provide a means to provide power to the critical load while isolating or removing the UPS for maintenance. The BPM shall act as both a maintenance bypass and a panelboard in the applications it supports. BPM shall be hardwired input and hardwired output standard.

The BPM shall be a rotary type and make-before-break type. There shall be no loss of power to the critical load during transition.

BPM shall be wall mounted adjacent to the UPS.

COMMUNICATIONS:

A. Network Card

UPS shall include two communication slots, allowing for the installation of applicable communication cards as follows:

1. Relay-MS
2. Network-M2
3. Modbus-MS
4. PXG-MS

B. RS232 serial communication

The UPS shall provide a RS232 serial connection. Cable shall provide DB-9 interface.

C. USB

The UPS shall be furnished with a USB connection.

D. REPO (EPO) / ROO (Remote Emergency Power Off (Emergency Power Off) / Remote On/Off)

The UPS will provide both Remote Emergency Power Off and On/Off capability.

1. Remote Emergency Power Off (Emergency Power Off (EPO)) – Allows a remote contact to be used to disconnect power to the UPS and all devices attached. Restarting the UPS requires manual intervention.
2. Remote On/Off – Allows a remote contact to be used to turn the UPS on and off. Resetting the contact to the normal position will automatically return the UPS back to normal state.

#### MANAGEMENT SOFTWARE:

The UPS shall be compatible with manufacturer's designed power management software platforms. These perform the following actions:

- Support redundant UPS configuration
- Lightweight software, not running in JRE
- Performs mass configurations on alarms, alert notifications and shutdown parameters
- Mass update of network card firmware
- Plugs into dashboard of major Virtualization players. Allows for monitor of power equipment through the same dashboard that the Virtualized data center uses.
- Triggers movement of virtual machines to avoid shutdown of the server facing imminent power disruption.

#### INSTALLATION:

Install in accordance with manufacturer's instructions and associated User and Installations Manual.

#### WARRANTY:

The UPS manufacturer shall warrant the UPS module against defects in materials and workmanship for 24 months after initial start-up.

#### CLEAN-UP:

Per General Conditions.

*- END OF SECTION 16261 -*

SECTION 16400  
**ELECTRICAL SERVICES**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all labor, materials, equipment, and facilities necessary to furnish and install electrical services as indicated on the Drawings and as described in this section.

**COORDINATION:**

Electrical service shown on the Drawings reflect information obtained from the electrical utility company. The Contractor shall verify all data with the electrical utility company and shall install facilities in exact compliance with utility company requirements.

**CONDUCTORS:**

Service entrance conductors shall be installed without splice from the power company transformers to the service entrance equipment.

**SERVICE VOLTAGES:**

Electrical service voltage shall be as shown on the Drawings.

**METERING:**

Metering as noted on plans. The Contractor shall provide all equipment required by the power company for metering electrical power usage.

*- END OF SECTION 16400 -*

SECTION 16410  
**LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS & CABLES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Copper building wire rated 600 V or less.
- 2. Aluminum building wire rated 600 V or less.
- 3. Metal-clad cable, Type MC, rated 600 V or less.
- 4. Connectors, splices, and terminations rated 600 V and less.

- B. Related Requirements:

- 1. Section 16700 for twisted pair cabling used for data circuits.

1.3 DEFINITIONS

- A. PV: Photovoltaic.
- B. RoHS: Restriction of Hazardous Substances.
- C. VFC: Variable-frequency controller.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location, and termination locations.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers:

1. Southwire.
2. Alpha Wire Company.
3. General Cable.
4. Cerro Wire LLC.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.

E. Conductor Insulation:

1. Type NM: Comply with UL 83 and UL 719.
2. Type RHH and Type RHW-2: Comply with UL 44.
3. Type USE-2 and Type SE: Comply with UL 854.
4. Type TC-ER: Comply with NEMA WC 70/ICEA S-95-658 and UL 1277.
5. Type THHN and Type THWN-2: Comply with UL 83.
6. Type THW and Type THW-2: Comply with NEMA WC-70/ICEA S-95-658 and UL 83.
7. Type UF: Comply with UL 83 and UL 493.
8. Type XHHW-2: Comply with UL 44.

## 2.2 METAL-CLAD CABLE, TYPE MC

A. THE USE OF MC CABLE IS NOT PERMITTED, EXCEPT FOR LIGHTING FIXTURE WHIPS ABOVE CEILING, 6FT IN LENGTH OR LESS.

B. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.

C. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. Comply with UL 1569.
3. RoHS compliant.
4. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Circuits:

1. Single circuit.

- E. Conductors: Copper, complying with ASTM B 3 for bare annealed copper and with ASTM B 8 for stranded conductors.
- F. Ground Conductor: Insulated.
- G. Conductor Insulation:
  - 1. Type THHN/THWN-2: Comply with UL 83.
- H. Armor: Steel interlocked.

## 2.3 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Manufacturers:
  - 1. 3M
  - 2. AFC Cable Systems, Inc.
  - 3. Hubbell Power Systems, Inc.
  - 4. Ideal Industries, Inc.
  - 5. O-Z/Gedney; an Emerson Industrial Automation business.
  - 6. Square D Co.
  - 7. ILSCO
  - 8. Burndy
  - 9. Thomas & Betts.
- C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.
- D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
  - 1. Material: Copper.
  - 2. Type: Two hole with standard barrels.
  - 3. Termination: Crimp.

## PART 3 - EXECUTION

### 3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

- B. Feeders: Copper for 2" feeders. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- D. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.
- E. VFC Output Circuits Cable: Extra-flexible stranded for all sizes.
- F. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

### 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type XHHW-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway or Type XHHW-2, single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.
- E. Feeders Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway.
- F. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- G. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.
- H. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- I. Branch Circuits Installed below Raised Flooring: Type THHN/THWN-2, single conductors in raceway.
- J. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

- B. Complete raceway installation between conductor and cable termination points according to Section 16110 prior to pulling conductors and cables.
- C. 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.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, which will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- F. Support cables according to Section 16110.

### 3.4 CONNECTIONS

- A. 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-486B.
- B. Conductor Splices: Not permitted unless specifically noted on construction drawings.
- C. Make terminations and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings when compared to the original conductors.
- D. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer.
- E. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
  - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- F. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

### 3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 16130.
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

### 3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 16110.



3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 16010.

*- END OF SECTION 16410 -*

SECTION 16415  
**EMERGENCY RADIO COMMUNICATION ENHANCEMENT SYSTEM**

A. General

1. Provide an in-building radio signal amplification system to provide complete coverage in the building for the public safety agencies as required by the local fire department and other agencies and authorities having jurisdiction. System users shall receive and transmit radio broadcasts from their portable radio units within the building. This shall be accomplished utilizing the following components:
  - a. Bi Directional Amplifiers (Signal Boosters)
  - b. Plenum rated Coaxial Cable
  - c. Antennas
  - d. Cable taps
  - e. Connectors
  - f. Power dividers
  - g. Other components and interconnecting circuitry as required
2. The system shall comply with the requirements of UL2524 1st Edition In-building 2-Way Emergency Radio Communication Enhancement Systems, NFPA 72 2010 Edition, NFPA 1221 2016 Edition and IFC 2018, as referenced.
3. The entire system shall meet with approval of the Fire Department, the Building Department and all other agencies and authorities having jurisdiction (AHJ).
4. The work in this section shall include the responsibility for all fillings with the AHJ. Where fillings require engineer's signature, documents shall be submitted for his review and signature. This responsibility shall include furnishing of required quantities of floor plans, descriptive notes and/or specifications, wiring diagrams, shop drawings and amendment forms.
5. Early completion of the in-building emergency radio communication enhancement system will be required as to permit a Certificate of Occupancy to be obtained in a timely manner.
6. Any permits necessary for the installation of the work shall be obtained prior to the commencement of the work. All permit costs and inspection fees shall be included as the part of the required work.
7. The in-building emergency radio communication enhancement system shall use a UL2524 1<sup>st</sup> Edition, NFPA-72 2010 Edition, NFPA 1221 2016 Edition and IFC 2018 compliant Farenhyt signal booster or approved equal.

B. Design requirements

1. In-building emergency radio communication enhancement systems for emergency responders are an integral component of the life safety equipment of a building or structure. The primary function is to provide reliable emergency responder communications at the required signal strength within the specified areas.

2. Critical Areas such as emergency command center, exit stairs, exit passageways, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations and similar critical areas shall be provided with 100% floor area radio coverage.
3. General building areas shall be provided with 95% radio coverage, or as specified by AHJ.
4. The In-building emergency radio communication enhancement systems must provide the following signal strengths:
  - a. Downlink - Minimum signal strength of -95 dBm throughout the coverage area.
  - b. Uplink - Minimum signal strength of -95 dBm received at the AHJ Radio System.
5. The system shall be complete with all components and wiring required for compliance with all applicable codes and regulations, and for its operations described hereinafter.
6. EC shall sub-contract an approved manufacturer or a qualified and approved vendor to supply, test and determine locations of components which are required for proper operation as well as to supply, deploy, test and certify the performance of the complete system. Vendor qualifications must be acceptable to the AHJ.
7. All tests shall be conducted, documented, and signed by a person in possession of an FCC General Radio Telephone Operators License. All testing personnel shall be certified and authorized by the signal booster manufacturer in the installation and operation of their equipment. Personnel qualifications must be acceptable to the AHJ.
8. The system design shall be based on the Farenhyt line of Public Safety Signal Boosters UL2524 1<sup>st</sup> Edition, NFPA-72 2010 Edition, NFPA 1221 2016 Edition, IFC 2018 Edition and FCC compliant to establish standards of quality for materials and performance. The naming of a specific manufacturer or a catalog number does not waiver any requirement or performance of individual components described in the specifications.
9. Assembly and installation of all components of the Emergency Responder Radio Communication Enhancement System shall comply with all applicable sections of the National Electrical Code.
10. Survivability from attack by fire shall meet NFPA 72, National Fire Alarm and Signaling Code, 2010 edition and NFPA 1221 2016 edition.
11. The system must comply with all applicable sections of the FCC rules. Signal booster shall have FCC certification prior to installation.
12. Antenna isolation shall be maintained between the donor antenna and all inside antennas (D.A.S.) to a minimum of 20dB under all operating conditions.

C. Technical Specifications and Performance Requirements

1. The system specified shall be based upon Farenhyt line of Public Safety UL2524 1<sup>st</sup> Edition, NFPA-72 2010 Edition, NFPA 1221 2016 Edition, IFC 2018 Edition compliant signal boosters.
2. The signal booster shall be a Class B Public Safety type as designated by the FCC and as required by the AHJ.
3. The secondary power supplies, battery chargers and system monitoring shall be fully compliant with NFPA-72, 2010 edition and NFPA 1221,2016 edition. The signal booster shall have both the primary and the secondary power supplies built in a fully sealed NEMA-4 type approved enclosure.
4. All signal boosters and other active system components must have FCC certification prior to installation. The equipment FCC ID must be shown on the product datasheets and technical submittals. The ID must also be displayed on the product as required by the FCC.
5. The signal booster shall be set and tuned by the equipment manufacturer to pass frequencies as specified by the local fire department.
6. To reduce the possibility of unwanted interference affecting the operation of the system, signal boosters shall be band or channel selective type with a maximum 3dB channel bandwidth of 200KHz ( $F_c \pm 100\text{KHz}$ ). Wide-band signal boosters shall not be accepted, unless required to cover multiple channels within the same band.
7. Signal Boosters shall have oscillation prevention circuitry to protect the public safety radio system in case of signal booster malfunction.
8. Signal Booster gain shall be rated at minimum of 80dB and the gain shall be adjustable in a minimum of 25dB range. System gain shall be set and documented at the time of the final system test.
9. Maximum Propagation delay of the signal booster system shall be 14 $\mu\text{s}$  (microseconds) or as specified by AHJ.
10. The signal booster system shall include built-in automatic alarming of malfunctions of the signal booster and battery system as per NFPA 1221 2016 Edition Section 9.6, NFPA 72, 2010 Edition, Sections 24.5.2.6.1, and 24.5.2.6.2. Aftermarket equipment add-ons and modifications to comply with this specification will not be accepted.
11. A dedicated supervised monitoring panel shall be provided within the emergency command center or other location as designated by AHJ to annunciate the status of all signal booster locations. The monitoring panel shall provide visual and labeled indication of the following for each signal booster:
  - a. Normal AC power
  - b. Signal booster trouble

- c. Antenna Failure
  - d. Loss of normal AC power
  - e. Failure of battery charger
  - f. Low battery capacity
12. The signal booster system shall include a built-in Farenhyt addressable monitor module for Farenhyt Fire Alarm Panel connection for monitoring the signal booster.
  13. The vendor shall verify the system monitoring requirements with the AHJ prior to system installation. System monitoring shall be fully compliant with the AHJ requirements.
  14. External filters, attachments or other aftermarket modifications of the original equipment shall not be accepted.
  15. All signal booster components shall be contained in a NEMA4-type approved waterproof cabinet. All enclosures shall be painted red with signage in bright yellow or as required by AHJ.

D. Installation Requirements

1. Assembly and installation of all components of the Emergency Responder Communication Enhancement System shall comply with all applicable sections of the National Electrical Code, NFPA-70 and the National Fire Alarm and Signaling Code, NFPA-72, NFPA 1221 current enforceable editions.
2. At least 2 independent and reliable power supplies shall be provided as specified in sections 2 and 3 below.
3. The primary power source shall be supplied from a dedicated twenty (20) ampere branch circuit and comply with NFPA-70 National Electrical Code, NFPA 72, National Fire Alarm and Signaling Code, 2010 edition and NFPA 1221 2016 edition.
4. The emergency responder radio coverage enhancement system shall be equipped with a secondary source of power. The secondary source of power shall be a battery system with a dedicated battery charger powered by a separate, dedicated twenty (20) ampere branch circuit. The secondary power supply shall supply power automatically when the primary power source is lost. The secondary source of power shall be capable of operating the emergency responder radio coverage enhancement system for a period of at least 24 hours. The battery system shall automatically charge in the presence of external power input. Battery charger and all other electronic components must be fully enclosed in a non-vented NEMA4 Type approved enclosure. Batteries shall be enclosed in a separate, vented NEMA 3R Type approved enclosure.
5. The signal booster shall be designed to allow degraded performance in adverse conditions, such as high temperatures in the event of heat from a nearby fire, voltage fluctuations or other abnormal conditions that may occur during an emergency. Circuits that intentionally disable the signal booster in such situations (i.e. under/over voltage, over/under current, over/under temperature, etc.) are not acceptable. External UPS (Uninterruptable Power Supplies) are not acceptable. It

is the purpose of this specification to assure the maximum possible level of communications to public safety personnel depending upon the signal booster, even to the extent of damaging the signal booster, as long as some communications benefit can be provided during the emergency.

6. System design shall be such that neither the failure of the normal power source, the transfer to an emergency source, nor the re-transfer to the normal source shall cause a change in system status.
  7. The amplifier shall be housed in a 2-hour fire rated room or other suitable space as approved by the Engineer, or where specifically shown on the Drawing.
  8. Radiating cable, if used, shall be run without conduit. All other cable can be run in conduit if required for mechanical protection of the cable, or where specified by the electrical engineer.
  9. RF Coaxial Cable shall be a fire-resistant, low-smoke type, U.L. classified as plenum. The classification shall be clearly marked on the outer surface of the cable regular intervals.
- E. Acceptance and Test Procedures
1. Acceptance testing for an in-building radio system is required upon completion of installation.
  2. The coverage testing shall be done in accordance with NFPA 72, National Fire Alarm and Signaling Code, 2010 edition, NFPA 1221 2016 edition and as required by the local AHJ.
  3. All tests shall be conducted, documented, and signed by a person in possession of a current FCC General Radio Operator License.
  4. All test records along with system diagrams, equipment specifications, user manuals, RF link budget calculations, battery backup calculation and other design data shall be submitted upon completion of the project.

*- END OF SECTION 16415 -*

SECTION 16450  
**GROUNDING SYSTEM**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

All electrical systems (circuits and equipment) shall be properly grounded in accordance with NEC Article 250, applicable local codes, and as herein specified or detailed on the Drawings.

Main switchboard and each distributing panel, and dry-type transformer shall be grounded to an approved copper grounding system and the building structural steel.

Grounding to water piping is NOT ACCEPTABLE.

Connections to structural steel shall be made by means of the Cadweld process of welding. Approved grounding connectors shall be used at grounding rods and at equipment ground lugs. Grounding conductors shall be sized in accordance with NEC Section 250-94 (a) and shall be enclosed in conduit bonded to the conductor at each end.

Each voltage system shall be grounded in accordance with NEC Section 250-26. These NEC requirements are minimum and where requirements are specified or scheduled, the higher requirements shall apply.

Install equipment grounding conductors in all non-metallic raceways, all underfloor ducts, and all raceways.

Interior lighting fixtures shall be grounded with grounding conductor.

Where connections are made to motors or equipment with flexible metal conduit, grounding conductor shall be stranded copper conductor within the conduit and bonded to the equipment. Conductor shall be sized per NEC Table 250-95.

All utilization equipment and devices shall be grounded per most current NEC.

*- END OF SECTION 16450 -*

SECTION 16470  
**ELECTRICAL DISTRIBUTION SYSTEM**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all labor, materials, equipment and facilities necessary to furnish and install the electrical distribution system as shown on the Drawings and described in this section.

**DISTRIBUTION PANELS:**

Shall consist of a box, front, interior and circuit protective devices and shall be manufactured in accordance with NEMA standards and shall bear applicable Under-writer's Laboratories labels.

Box shall be fabricated from code gauge galvanized sheet steel, and shall have a turned edge around the front for rigidity. Fronts shall be fabricated from sheet steel and finished with baked on gray enamel over a rust inhibitor. Panel front cover shall match box installation.

Interiors shall consist of a factory assembled rigid frame, supporting the rectangular bus, the mains for a sequenced phasing throughout.

Bus bars shall be sized so as to limit the temperature rise in accordance with NEMA standards. All contact points shall be silver plated copper. Insulated neutral bar shall be located at the opposite end of the structure from the mains and shall have numbered terminals. Mains shall have either solderless lugs or main circuit protective devices as scheduled. Unit shall be complete with full length ground bus with lugs for each protective device.

Circuit protective devices shall be molded case circuit breakers of the bolt-in thermal magnetic type and shall be operated by means of toggle type mechanism with trip rating of the breakers shall be as scheduled. Short circuit rating shall be as scheduled on the Drawings.

Each device shall have an engraved laminated plastic nameplate identifying the device served. Labels shall correspond to designations on plans. Circuits shall be rearranged as required to maintain the most balanced loads on each phase within each panel.

All distribution equipment shall be Square 'D', GE or Eaton Cutler-Hammer. No other substitutes will be considered.

**LIGHTING AND POWER PANELBOARDS:**

Panelboards, shall consist of a box, front, interior and circuit protective devices and shall be manufactured in accordance with NEMA standards and bear applicable UL labels.

Box shall be fabricated of code gauge galvanized sheet steel in accordance with latest UL standards, and shall have turned edges around the front for rigidity and for clamping on front. Standard knockouts shall be provided. Lighting and Power Panelboards shall have blank endwalls (no knockouts).

Front shall be fabricated from sheet steel and finished with baked on gray enamel over a rust inhibitor. Each front shall have a door mounted on semi-concealed hinges with a cylinder lock, index card and card holder. All panelboards locks shall be master keyed and all index cards shall be properly completed with a computer generated text.

Interiors shall consist of a factory assembled rigid frame supporting the rectangular bus, the mains and the neutral bar.

Bussing shall be arranged for sequence phasing throughout. Bus bar shall be sized so as to limit the temperature rise in accordance with the latest NEMA standards. Insulated neutral bar shall be located at the opposite end of the structure from the mains and shall have numbered terminals.



Mains shall have either solderless lugs or a main circuit protective device as scheduled. Each enclosure shall be provided with grounding lugs and uninsulated equipment grounding terminals. Panelboard main lugs shall be furnished as required to accommodate the size and number of conductors scheduled to serve the panels.

Circuit protective devices shall be molded case circuit breakers of the bolt-in thermal magnetic type and shall be operated by means of toggle type mechanism with trip rating of the breakers shall be as scheduled. The short circuit rating shall be as scheduled on the Drawings.

Where scheduled on the Drawings install contactors as specified in this section within the panelboard enclosures.

All panelboards shall be Square 'D', GE or Cutler-Hammer. No other substitutes will be considered.

#### SAFETY SWITCH:

Safety switches shall be single throw, of proper voltage for the application, fusible or non-fusible as indicated. They shall be horse-power rated, heavy duty, designed for locking in "ON" or "OFF" position, in code gauge steel cabinets.

Switches shall have number of poles required, dependent on phases serving equipment. Where switches are utilized for non-fusible disconnects, they may be "General Duty" Type L.E.

Switches shall be UL approved for duty shown and NEMA 3R where exposed to weather. NEMA 3R switches shall have weatherproof threaded hubs for all conduit entries into switch.

All switches shall be identified, as to equipment served, with engraved laminated plastic plates. White letters on black background shall be minimum of 1/4" high.

Manufacturers same as lighting panelboards.

#### WIRING DEVICES:

Wiring devices as shown in symbol list on the Drawings, and/or specified herein shall be furnished and properly installed in their respective outlets.

All device plates in shall be Type 302 satin stainless steel. Device plates shall be in proper units of gangs as required; sectional plates will not be accepted.

Flush switches shall be as specified. Terminal screws or connectors shall be designed to accommodate and firmly terminate up to No. 10 solid conductors. Switches controlling or disconnecting motor loads in excess of 1/3 HP shall be HP rated and approved for motor control or disconnect service. Switches shall be 120/277 single pole, listed below indicate Hubbell grade and model number.

- Single pole #1221

- 3-way #1223

- 4-way #1224

- Switch with Pilot Light #1201-PL (120V)

- Single pole, double throw, momentary contacts #1557

Receptacle listed below indicate Hubbell grade and model number. Colors as selected by Brookshire's.

- Duplex 20A-125V: #5362

- Outdoor 20A-125V: #GFWRST20

- Clock Outlet #5235

Approved equals: Arrow Hart, Bryant, Sierra, G.E., P&S, shall have nylon face.

#### RELAYS AND CONTACTORS:

Furnish and install relays or contactors of the electrically held type where indicated and as scheduled on the Drawings.

Contactors for equipment other than lighting varies. Contactors installed for equipment for the purpose of energy management should be sized according to the circuit name plate requirements and will be Normally Closed (NC) for 30 amp and smaller or Normally Open (NO) for 40 amp and larger; and to be determined by Lighting Control panel to be installed.

Rating, number of poles and types of enclosure shall be as scheduled on the Drawings.

Approved manufacturers: ABB, ASCO or Square D. No others acceptable.

#### PHOTO-INITIATED LIGHTING CONTROLS:

Furnish and install photocells as shown on the Drawings to control exterior lighting systems.

Photocells shall be 1500 watt, 120V., Intermatic K-1121 LA, relay type with lightning arrestor and 5 year warranty.

#### DATA CABLE RACEWAYS SYSTEM:

Furnish and install a system of conduits and underfloor ducts with pull wires shown on the Drawings, for the installation of data cable.

#### TESTING:

Test all circuits to assure them to be free of grounds. Light and test each lamp. Prove and test energy available at the load side of disconnect switches and the final point of connection to driven equipment. The Contractor shall make all necessary and reasonable test as required by Brookshire's to prove the integrity of his work and shall leave the complete electrical installation in first class condition and ready for operation.

Furnish at the completion of the project or each bona fide portion of the project, a final inspection certificate from the local inspection authority.

#### ELECTRICAL CONNECTIONS TO EQUIPMENT:

Electrical contractor shall make all electrical power and control connections to equipment furnished under other contracts and furnish wiring, conduit, outlet boxes, disconnect switches, etc., as required for same throughout the building. He shall check the General Construction, Plumbing, Heating and Air Conditioning plans and inform himself as to the amount of such wiring that may be required and include same in his bid. Locations, horsepower, voltages, etc., of all such equipment, shall be verified as the job progresses. If an apparent conflicts arises in power wiring, the electrical contractor shall advise Brookshire's immediately for clarification.

Motor controls and pilot devices, such as starters, control switches, thermostats, pushbutton stations, etc., will be furnished by the same Contractor who furnished the equipment; but the electrical contractor shall mount all such and make electrical power and control connections thereto, in accordance with diagrams furnished by the supplier of the equipment.

Electrical contractor shall furnish and install all disconnect switches as shown and where required by national or local codes. In general, all such wiring shall be in conduit, with a short section flexible conduit at each motor, and shall be securely attached at the point of adapting to flexible. If the motor is an integral part of a piece of equipment, the entire piece of equipment shall be isolated with a short section of flexible metal conduit to prevent vibration and/or noise amplification to be transferred to the building structure. If the motor is adjustable, an additional length of flexible metal conduit shall be installed at the motor. A ground wire shall be connected to the motor frame on the inside of flexible conduit. Contractor shall use approved grounding lugs or clamps for the conduit connection.

Connections to all electrically operated equipment throughout the building are included in this contract, whether or not specifically mentioned herein. The electrical contractor shall check on the job; from time to time, for further details on Plumbing, Heating and Air Conditioning equipment. Grounding of all such equipment shall be done in an approved manner by the Electrical Contractor.

Furnish and install all HVAC control wiring and temperature control wiring per A/C plans. Unless otherwise specified or indicated, control conductors shall be #14 THW stranded and shall be installed in conduits.

Major equipment furnished under the mechanical and other sections of the specifications may require different rough-in requirements than indicated on the Drawings due to the "or equal" equipment clause. The electrical contractor shall secure detailed drawings from the Contractor furnishing the equipment, to determine actual rough-in locations and conduit and conductor requirements to assure a proper and workmanlike installation.

*- END OF SECTION 16470 -*

**SECTION 16500**  
**LIGHTING FIXTURES**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Provide all labor, materials, equipment and facilities necessary to install lighting fixtures as shown and scheduled on the Drawings.

**INSTALLATION:**

Contractor shall install a lighting fixture as hereinafter specified and as scheduled on the Drawings on each and every circuit in accordance with the type designation shown on the Drawings. If a type designation is omitted, the fixture shall be of the same type as it is shown for rooms of similar usage. Verify installation.

It shall be the Contractor's responsibility to check the architectural finishes and regardless of the specified or scheduled catalog number, prefixes and suffixes, furnish fixtures with the proper trim, frames, support, hangers and other miscellaneous appurtenances required to properly coordinate with said finishes, in relation to fixture to be supplied by the Contractor.

Immediately before final inspection, this Contractor shall thoroughly clean all fixtures, inside and out, including plastics and glassware, shall adjust all trim to properly fit adjacent surface, replace broken or damaged parts and lamps, and test all fixtures for electrical as well as mechanical operation.

**WARRANTY:**

Manufacturer and installer agree to repair or replace components of luminaires that fall in materials or workmanship within specified warranty period.

All luminaires shall have a warranty that shall be for 5 years from date of Substantial Completion.

**DELIVERY, STORAGE AND HANDLING:**

All light fixtures shall be furnished by Brookshire's F.O.B. Job Site and installed by the Electrical Contractor unless noted otherwise.

Electrical Contractor shall be responsible to verify shipment of all materials upon receipt from courier for any missing, incorrect or broken fixtures or parts. Once shipment has been accepted by the Electrical Contractor then they will be responsible for any costs associated with replacing any missing, incorrect or broken fixtures or parts.

Deliver and store materials in dry, protected areas. Keep free from corrosion or other damage. Replace any damaged materials at no cost to Brookshire's.

All fixtures and lamps brought to the site by the Contractor shall be new and delivered to the job in the original packing cases and sleeves.

**MATERIALS:**

**LED -**

All LED fixtures and lamps shall be furnished and installed as noted on the Drawings. No substitutions for fixtures or lamps will be allowed unless noted otherwise.

**EXAMINATION:**

Contractor shall examine substrates, areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Contractor shall examine rough-in for luminaire to verify actual locations and electrical connections before luminaire installation are as shown on the Drawings.

Starting Work under this Section implies acceptance of surfaces. Proceed with installation only after unsatisfactory conditions have been corrected.

#### INSTALLATION:

All luminaires shall be installed level, plumb and square with ceilings and walls unless noted otherwise and shall comply with NECA 1.

Supports for all luminaires shall be sized and rated for luminaire weight, able to maintain luminaire position after cleaning, and provide support for luminaire without causing deflection of ceiling or wall. Mounting devices shall be capable of supporting a horizontal force of 100% of luminaire weight and a vertical force of 400% of luminaire weight.

- A. Flush Mounted Luminaires.
  - 1. Secured to outlet box.
  - 2. Attached to ceiling structural members at four points equally spaced around circumference of luminaire.
  - 3. Trim ring flush with finished surface.
- B. Wall Mounted Luminaires
  - 1. Attached to structural members in walls or provide extra support as recommended by the light manufacturer.
  - 2. Do not attach luminaires directly to gypsum board.
- C. Suspended Luminaires
  - 1. Two 5/32" diameter adjustable aircraft cable supports adjustable to a minimum of 10 feet in length unless noted otherwise. Furnish oval sleeves to secure cable at final install location.
  - 2. Stem mounted shall be supported with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
  - 3. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.
- D. Ceiling Grid Mounted Luminaires
  - 1. Secure to any required outlet box.
  - 2. Secure luminaire to the luminaire opening using approved fasteners in a minimum of four locations spaced near corners of luminaire.
  - 3. Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of two locations spaced near opposite corners of the luminaire.

#### TESTING:

After installing luminaires switches and accessories, and after electrical circuits have been energized, Contractor shall be required to test all luminaires to confirm proper operation.

To test emergency luminaires, Contractor shall interrupt power supply to demonstrate proper operation and verify transfer from normal power to battery power and then transfer back to normal.

#### STARTUP AND ADJUSTING:

Perform startup service for all battery powered luminaires by charging units and batteries a minimum of 24 hours and conduct a one-hour discharge test.

Contractor shall be required to provide on-site assistance in adjusting the direction of aim of luminaires to suit locations of fixtures upon final location. Make up to two visits to the site as directed by the Owner for this purpose.

- END OF SECTION 16500 -

SECTION 16600  
**STANDBY ELECTRIC GENERATOR**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Install a standby engine driven generator set complete with all specified accessories and all required equipment including an automatic transfer switch, which will be furnished by Brookshire's. Equipment shall be set in place by the General Contractor. Electrical Contractor shall perform all connection requirements. Startup will be performed by Brookshire's only.

**GENERAL:**

Generator and transfer switch shall be furnished by Brookshire's, F.O.B. job site. Electrical Contractor shall coordinate schedule for delivery of generator and transfer switch with Brookshire's. Electrical Contractor shall receive and unload generator and transfer switch.

**PRODUCTS:**

*85 KW Generator –*

Cummins 85GGHG – Spark Ignited Natural Gas, 60 Hz.

Duty Rating – Standby Power

Listing – UL2200

Fuel System – Natural Gas

Enclosure – Steel, Weather Protective with Exhaust System

Voltage – 120/208, 3 Phase, Wye, 4 Wire

Alternator – 60 Hz, 12 Lead, Lower Broad Range, 125c

Set Control – PCC 2100

Exciter/Regulator – Torque Match

Engine Governor – Electronic, Isochronous Only

Interface – Communications Network, FTT-10

Circuit Breaker Mounting – Single Breaker, Left of Control

Circuit Breaker – 250 amp, 3 pole, 240v, Thermo-Magnetic, UL

Engine Cooling – Radiator, 40c Ambient

Coolant Heater – 120 Volt AC, Single Phase

Genset Warranty – 1 Year Base

Battery Rack

Oil Drain Extension

Fuel Strainer – Gaseous – 1" NPT Inlet/Outlet

Flexible Fuel Connection Kit – NGL/LPV – 1"

Annunciator Kit with Enclosure

*85 KW Transfer Switch -*

Cummins BTPC300 Transfer Switch – Bypass, Power Command, 400 Amp

Poles – 3

Application – Utility to Generator

Listing – UL 1008/CSA Certification

Frequency – 60 Hertz

System – 3 Phase, 3 Wire or 4 Wire

Voltage – 208 VAC

Cabinet – NEMA Type 1

Control – Transfer Switch, Level 2

Display – Digital

Interface – Communications Network, FTT-10

Battery Charger – 10 Amp Minimum, 12/24 VDC  
Transfer Switch Warranty – 1 Year Base  
Product Revision - A

**INSTALLATION:**

Install all necessary power and control wiring between generator and automatic transfer switch.

Coordinate battery charger voltage with supplier of generator.

Conform to all City, National and State Codes for installation.

Generator manufacturer's Factory Trained Service personnel will start the unit after the electrical contractor installs the above system to comply with the factory warranty certification.

*- END OF SECTION 16600 -*

SECTION 16700  
**COMMUNICATIONS SYSTEMS**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**TELEPHONE ROUGH-IN:**

Wall telephone outlets shall consist of a 4" x 4" box with raised cover and a one hole stainless steel device plate.

Where telephone "Board" is indicated on Drawings, this Contractor shall furnish and install a 3/4" thick plywood board for installation of telephone equipment. Size as noted on the Drawings.

**VENDOR DOOR BUZZER SYSTEM:**

Contractor shall furnish and install a complete buzzer system including weatherproof pushbuttons, buzzers, transformer, power supply and all interconnecting wiring to be located adjacent to the vendor door as indicated on the Drawings. Push buttons shall be similar to Edwards Catalog No. 852 and buzzer shall be Edwards Flush Buzzer No. 1064G5 mounted in common outlet box with transformer. Provide louvered coverplate.

**INSTALLATION:**

This installation shall employ the same methods and materials as for lighting circuits under these specifications.

Upon completion of rough-in for these systems, install 200 lb., test nylon pull cord for future installation of telephone wiring by others.

*- END OF SECTION 16700 -*



SECTION 16751  
**FIRE ALARM SYSTEM**

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

**SCOPE:**

Furnish and install a complete Fire Alarm system including conduits, wiring, panel, signalization and notification accessories as required for a complete installation. Incorporate and use the existing fire alarm system as much as possible.

Installation services shall be provided by a Fire Alarm Installation Contractor appropriately licensed and permitted in the State in which this project is located.

Indications for the various devices as shown on the Drawings are general in nature and are not represented to be all inclusive of items required for a certified Fire Alarm System. Verify the exact location of all visible devices with Brookshire's prior to installation.

System shall comply with codes and regulations of all governmental authorities, having jurisdiction; and meet the requirements of NFPA 72, and all other applicable Standards.

Fire Alarm system shall not be a proprietary system to any single company.

**REFERENCES:**

NFPA 13 – Installation of Sprinkler Systems.  
NFPA 17A – Wet Chemical Extinguishing Systems.  
NFPA 70 – National Electrical Code (NEC).  
NFPA 90A – Standard for Installation of Air Conditioning and Ventilating Systems.  
NFPA 101 – Life Safety Code.  
UL 268 – Standard for Smoke Detectors for Fire Alarm Signaling Systems.  
UL 864 – Standard for Control Units and Accessories for Fire Alarm Systems.  
UL 1971 – Standard for Signaling Devices for the Hearing Impaired.  
UL 2572 – Standard for Control and Communication Units for Mass Notification Systems.

**SHOP DRAWINGS:**

Per SUBMITTALS. Furnish cut-sheets of central panel, all devices and accessories. Furnish plan with each device location noted, wiring diagram and load calculations.

**MATERIALS:**

Equipment shall be Fire-Lite Alarms, System Sensor, Notifier, Edwards or approved equal. All devices shall be UL Listed and specifically designed for the use intended.

*Central Panel -*

Fire-Lite Alarms MS-9200UD Series with a minimum of 10 zone cards. Battery backup standby power to maintain full operation capability for 24 hours.

System shall be complete with a local control unit which shall contain the necessary transformer, rectifier and relays required for supervision and operation of the system in its respective area. In addition, the panel shall be equipped with individual lamp indicators for "fire", "trouble", and "power-on", plus an audible "trouble" buzzer signal.

Batteries shall be sealed and provided with a self-regulating battery charger to assure that batteries are maintained in a fully charged condition.

Furnish complete with integral dialer for issuing signal to remote monitor station, and connect as required to telephone line furnished by Brookshire's.

Initiating circuits shall be wired as four wire Class A.

Separate Zone connections shall be made to:

- Each Fire Sprinkler Riser Flow Switch
- Each Fire Sprinkler Riser Tamper Switch
- Each Manual Pull Station
- Each Cooking Hood Fire Protection System
- Each Air Conditioning System Smoke Detector
- Fuel Station Kiosk if applicable

Provide relay, either remote or at panel, for electromagnetic lock at each emergency door. Relay to release electromagnetic lock upon fire alarm activation.

*Remote Annunciator -*  
Fire-Lite ANN-80 Series.

*Remote Power Supply -*  
Silent Knight Model 5495 with internal batteries.

*Manual Pull Station -*  
Fire-Lite BG-12LX Series.

*Water Flow Switch -*  
Potter PS10A Series with Cover Tamper Switch or an approved equal. Fire Alarm Contractor to make final connections between switch and alarm system.

*Strobe & Horn -*  
System Sensor "SpectrAlert" Series as applicable for mounting style.

*Smoke Detector -*  
Fire-Lite Alarms SD355(A) Series.

*Smoke Detector for Rooftop Air Conditioning Units -*  
System Sensor D4120 low voltage duct housing with ionization smoke detector head, System Sensor DST Series metal sampling tube, and System Sensor RTS-151KEY remote indicating lamp installed flush mounted at wall close to unit at 48" A.F.F. and to be visible from the primary area served. Verify exact switch location(s) with Brookshire's prior to installation. Furnish in units with air flow capacity in excess of 2,000 cfm unless furnished by unit manufacturer.

Unless furnished by unit manufacturer, install detector inside housing of Rooftop unit at a location acceptable to Brookshire's which will permit easy access for servicing. Detector shall sample air from within the return air stream and prior to the point of introduction of any outside air. Installation shall be per manufacturer's printed instructions, NFPA 72, NFPA 90A, State and Local Fire Marshal.

All wiring shall be type THHN or THWN copper conductors run in EMT.

Coordinate installation and connection of devices related to other trades to insure compatibility of Fire Alarm System furnished.

- END OF SECTION 16751 -