

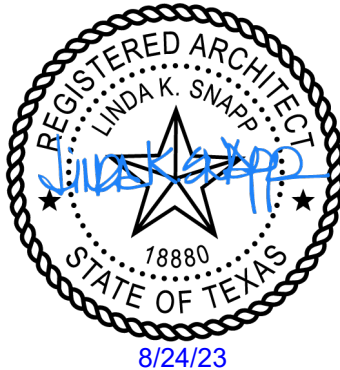
A NEW RETAIL STORE FOR

DOLLAR TREE

IN

CROSS ROADS, TX

CGL PROJECT # 2105-39



SEPTEMBER, 2023

ARCHITECT/ENGINEER

CLARK, GEER, LATHAM & ASSOCIATES, INC.

3901 SPRING HILL AVENUE

MOBILE, ALABAMA

TEL 251-344-7073 FAX 251-343-9179

A NEW RETAIL STORE
FOR DOLLAR TREE
BEL INVESTMENTS, LLC.
CROSS ROADS, TX

TABLE OF CONTENTS

PART 1
INDEX TO CONTRACT DOCUMENTS

INVITATION FOR BIDS	B1
INSTRUCTIONS TO BIDDERS	IB-1
LIEN WAIVER FORM (Spreadsheet)	Submitted Electronically

PART 2
INDEX TO TECHNICAL SPECIFICATIONS

DIVISION 1 – GENERAL REQUIREMENTS

00110	DEFINITION OF TERMS	1 Pages
00130	SUPPLEMENTAL GENERAL CONDITIONS	2 Pages
00140	SPECIAL CONDITIONS	19 Pages
01450	CONSTRUCTION QUALITY CONTROL	1 Page
	DOLLAR TREE FURNISHED MATERIALS & EQUIPMENT	2 Pages

DIVISION 2 - SITEWORK

02220	SITE DEMOLITION	1 Pages
02230	SITE CLEARING	3 Pages
02310	GRADING	2 Pages
02315	EXCAVATION & FILL	3 Pages
02335	SUBGRADE	1 Page
02360	SOIL TREATMENT	2 Pages
02630	STORM DRAINAGE	4 Pages
02700	BASES, BALLASTS, PAVEMENTS, & APPURTENANCE	1 Pages
02810	IRRIGATION SYSTEM	1 Page
02870	LITTER RECEPTACLES	1 Page
02871	JOBSITE CONSTRUCTION CAMERAS	1 Page
02890	TEMPORARY SITE SIGNAGE	1 Page
02900	PLANTING	2 Pages
	GEOTECHNICAL REPORT	

DIVISION 3 - CONCRETE

03050	BASIC CONCRETE MATERIALS & METHODS	3 Pages
03210	REINFORCING STEEL	1 Page
03310	STRUCTURAL CONCRETE	4 Pages
03313	FOUNDATIONS	1 Page
03316	PLACING CONCRETE	2 Pages
03317	CONSTRUCTION JOINTS	1 Page

03318	BONDING	1 Page
03319	REMOVAL OF FORMS	1 Page
03350	FINISHING	1 Page
03390	CURING	1 Page
03910	CLEANING	1 Page

DIVISION 4 - MASONRY

04220	CONCRETE MASONRY UNIT	5 Pages
-------	-----------------------	---------

DIVISION 5 - METALS

05100	STRUCTURAL METAL FRAMING	7 Pages
05210	STEEL JOISTS	3 Pages
05310	STEEL ROOF DECK	2 Pages
05500	METAL FABRICATIONS	3 Pages
05510	METAL LADDER	1 Page

DIVISION 7 – THERMAL & MOISTURE PROTECTION

07210	PARTITION INSULATION	1 Page
07214	FOAMED-IN-PLACE MASONRY WALL INSULATION	2 Pages
07240	EIF SYSTEM	6 Pages
07500	SINGLE PLY MEMBRANE ROOF	9 Pages
07600	FLASHING & SHEET METAL	1 Page
07720	ROOF HATCH	4 Pages
07900	CAULKING & SEALANTS	2 Pages

DIVISION 8 – DOORS & WINDOWS

08110	STEEL DOORS & FRAMES	1 Page
08210	WOOD DOORS	1 Page
08410	ALUMINUM STOREFRONT DOORS & FRAMES	3 Pages
08710	DOOR HARDWARE	3 Pages
08800	GLAZING	2 Pages

DIVISION 9 - FINISHES

09250	GYPSUM BOARD	5 Pages
09260	GYPSUM BOARD ASSEMBLIES	1 Pages
09510	ACOUSTICAL CEILING	2 Pages
09660	RESILIENT BASE	1 Page
09900	PAINT	9 Pages

DIVISION 10 - SPECIALTIES

10280	TOILET ACCESSORIES	1 Page
10440	INTERIOR SIGNAGE	1 Page
10500	LOCKERS	1 Page
10530	METAL DECK CANOPY	2 Pages

DIVISION 15 – MECHANICAL
(ON DRAWINGS)

DIVISION 16 - ELECTRICAL
(ON DRAWINGS)

PART 3
INDEX TO DRAWINGS

G-1.0	COVER SHEET
G-2.0	GENERAL NOTES
G-3.0	BUILDING CODE SUMMARY
G-4.0	DUMPSTER ENCLOSURE PLAN & SECTIONS
G-5.0	METAL DECK CANOPY ELEVATIONS & DETAILS
	ALTA/ACSM LAND TITLE SURVEY
C1.00	COVER SHEET
1 OF 2	REPLAT
2 OF 2	REPLAT
C1.01	SITE PLAN
C2.00	GENERAL NOTES
C3.00	EROSION CONTROL PLAN
C3.01	EROSION CONTROL DETAILS
C4.00	DEMOLITION PLAN
C5.00	DIMENSION CONTROL AND PAVING PLAN
C5.01	STRIPING AND SIGNAGE PLAN
C6.00	GRADING PLAN
C6.01	EXISTING OVERALL DRAINAGE AREA MAP
C6.02	EXISTING DRAINAGE AREA MAP
C6.03	PROPOSED DRAINAGE AREA MAP
C6.04	STORM PLAN
C6.05	STORM CALCULATIONS
C7.00	UTILITY PLAN & PROFILE
C8.00	CONSTRUCTION DETAILS
C9.00 – C9.05	MUSTANG SPECIAL UTILITY DISTRICT DETAILS
LP1.00	OVERALL LANDSCAPE PLAN
LP1.01	LANDSCAPE PLAN
LP1.02	LANDSCAPE PLAN
LP3.01	LANDSCAPE DETAILS
LP3.02	LANDSCAPE DETAILS
LP3.03	LANDSCAPE SPECIFICATIONS
LI1.01	IRRIGATION PLAN
LI1.02	IRRIGATION PLAN
LI3.01	IRRIGATION DETAILS
LI3.02	IRRIGATION SPECIFICATIONS

S-1.0	FOUNDATION PLAN
S-1.1	FOUNDATION SECTIONS & DETAILS
S-1.2	FOUNDATION SECTIONS & DETAILS
S-2.0	ROOF FRAMING PLAN
S-2.1	FRAMING SECTIONS & DETAILS
S-3.0	FRAMING ELEVATIONS & DETAILS
A-1.0	FLOOR PLAN
A-1.1	INTERIOR FLOOR PLAN & WALL CONSTRUCTION TYPES
A-1.2	REFLECTED CEILING PLAN
A-1.3	FIXTURE/EGRESS PLAN
A-1.4	ENLARGED PLANS
A-2.0	EXTERIOR ELEVATIONS
A-2.1	EIFS DETAILS
A-2.2	INTERIOR ELEVATIONS
A-2.3	OFFICE DETAILS & ELEVATIONS
A-2.4	TOILET ROOM DETAILS & ELEVATIONS
A-2.5	EMPLOYEE AREA DETAILS & ELEVATIONS
A-2.6	MISCELLANEOUS DETAILS & ELEVATIONS
A-3.0	STOREFRONT ELEVATIONS & DETAILS
A-3.1	INTERIOR DOOR & FINISH SCHEDULE & DETAILS
A-4.0	WALL SECTIONS
A-4.1	WALL SECTIONS
A-4.2	WALL SECTIONS
A-5.0	ROOF PLAN & SECTION DETAILS
F-1.0	FIRE ALARM PLAN
F-2.0	FIRE ALARM NOTES, CALCULATIONS AND MATRIX
F-3.0	FIRE ALARM DETAIL
F-4.0	FIRE ALARM CONTROL PANEL LAYOUT
F-5.0	FIRE ALARM SPECIFICATIONS
MP-1.1	HVAC PLAN, KEYED NOTES, & LEGEND
MP-1.2	PLUMBING PLAN & RISERS
MP-2.1	HVAC & PLUMBING SCHEDULES
MP-3.1	HVAC & PLUMBING DETAILS
MP-4.1	SPECIFICATIONS
MP-4.2	SPECIFICATIONS
ES-1.1	SITE LIGHTING PLAN
ES-1.2	SITE LIGHTING & PHOTOMETRICS PLAN
ES-1.3	SITE LIGHTING CUT SHEETS
E-1.1	POWER PLAN
E-2.1	LIGHTING PLAN
E-3.1	SCHEDULES, NOTES, & DETAILS
E-4.1	ELECTRICAL SPECIFICATIONS
DS-1	REACH-IN DETAILS AND SPECIFICATIONS
DS-2	WALK-IN DETAILS AND SPECIFICATIONS

DS-3	WALK-IN SPECIFICATIONS
EM-1	ENERGY MANAGEMENT PLAN
EM-2	ENERGY MANAGEMENT PLAN
EM-3	ENERGY MANAGEMENT PLAN
EM-4	ENERGY MANAGEMENT PLAN

INVITATION FOR BIDS (Revised 6-5-23)

Bids shall be submitted through Dollar Tree's SLM website from invited bidders for furnishing all labor and materials and performing all work for the construction of a new retail store or for Dollar Tree in Cross Roads, Texas.

Bids must be submitted not later than 4:00 pm eastern time, September 29, 2023, on the documentation provided by Dollar Tree in the Invitation to Bid.

The right is reserved, as the interest of the Owner may require, to reject any and all bids and to waive any informality in bids received.

No bid will be accepted from anyone except a qualified Contractor, licensed by the State of Texas. Contractor's State License Number shall be noted in the documentation containing the bid.

Plans and specifications will be available online at Dollar Tree's SLM website. All cost of reproduction of the plans and specifications are on the Contractor. Clark, Geer, Latham & Associates, Inc. will not provide copies of plans or specifications but will issue addenda as appropriate.

Bid Bond shall not be required.

Payment and Performance Bonds shall not be required.

Time for completion shall be "Substantially Completed" 135 calendar days after the commencement date, or as agreed to by the Owner.

Liquidated damages will be assessed at \$1,000.00 per day for delays after the "Substantially Complete" date for agreed date. Rain days will not be allowed as an extension of time.

The preferred sequence of construction is to direct initial construction efforts in stabilizing the site and installing all infrastructure prior to construction of the building and its foundations.

Each bidder shall list the appropriate subcontractor that will be utilized in the construction of the project. The Owner reserves the right to either accept or reject the subcontractor prior to the issuance of the contract. If the Owner rejects the subcontractor, the successful bidder shall then resubmit a new subcontractor with the adjusted bid price for the Owner's approval. Upon Owner's approval of the subcontractors, the General Contractor may not alter the approved subcontractor list without approval from the Owner.

INSTRUCTIONS TO BIDDERS

I. PROPOSALS

- A. All proposals shall be submitted through Dollar Tree's SLM website as dictated in the Invitation to Bid

II. REQUESTS FOR INFORMATION (RFIs)

- A. Any RFIs needed shall be emailed in writing to the attention of the project architect. Responses will be issued via addendum or written RFI response as appropriate. Project architect email: lsnapp@cglengineers.com

III. ALTERNATES & ALLOWANCES

ALTERNATE # 1 - UNIT PRICE – In the event unforeseen soil conditions exist, Contractor shall excavate and dispose of unsuitable on-site material and install structural fill, compacted in place.

_____ \$_____ per CYIP

ALTERNATE # 2 – CONCRETE PAVING – This alternate consists of the contractor designing, furnishing and installing a minimum 6" thick reinforced concrete with all expansion and control joints as required (or as specified by the geotechnical engineer) in all locations where asphalt is shown on the drawings. The contractor shall provide stamped engineering drawings for approval if the alternate bid is selected. The cost of engineering shall be included.

_____ \$_____

DIVISION 1 GENERAL REQUIREMENTS

00110 DEFINITION OF TERMS

- A. Owner – DT Retail Properties, LLC.
- B. Developer/Owner's Representative – BEL Investments, LLC., 3601 Spring Hill Business Park, Suite 201, Mobile, AL 36608.

Whenever in Contract Documents the term Owner is used, it shall mean the Owner, DT Retail Properties, LLC and/or the Owner's Developer, BEL Investments, LLC. All contract requirements shall apply to each and both.

- C. Engineer – Clark, Geer, Latham & Associates, Inc.
- D. Engineer's Office - Whenever in Contract Documents the term "Engineer" is used, it shall mean the office established and located at 3901 Springhill Avenue, Mobile, Alabama 36608.
- E. Architect – Clark, Geer, Latham & Associates, Inc.
- F. Architect's Office – Whenever in Contract Documents the term "Architect" is used, it shall mean the office established and located at 3901 Spring Hill Avenue, Mobile, AL 36608.
- G. Contractor - Contractor shall be a General Contractor who shall be responsible for the fabrication, installation, management coordination, and completion of all phases of the Work within the completion date. The terms, "Vendor", "General Contractor", "Prime Contractor", "This Contractor", or "Contractor", where used in this Contract shall refer to the General Contractor or any of his sub-contractors.

The settlement of any questions of a jurisdictional nature regarding the division of the work between the various trades, particularly in connection with, but not limited to the unloading, handling and installing of any equipment or materials, shall be the General Contractors' sole responsibility and any such settlement shall not become a basis for any claim for additional remuneration under this contract.

- H. Work - As used in the Contract Documents, the "Work" shall mean the work to be done by Contractor as described in the Specifications, and anything called for by said Specifications but not shown on the Drawings, shall be as if called for and described in both these ways, and also anything not shown on either said Specifications or Drawings which conditions or circumstances require to be done or provided in order to complete the work in accordance with the general plan and intent thereof, except work to be done or furnished by Owner or other contractors as set forth in the Specifications.

The work includes furnishing all plant, labor, materials and incidentals to complete the construction of a new retail store for Dollar Tree in Cross Roads, TX.

00130 SUPPLEMENTAL GENERAL CONDITIONS

Article 11 - Insurance & Bonds shall be amended to include the following coverages:

1. General - The Contractor shall provide, at his own expense, insurance in accordance with the following paragraphs.
2. Contractor Coverage - The Contractor shall not commence work under the Contract until he has obtained all insurance required under the following paragraphs and until such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until all similar insurance required of the subcontractor has been obtained and approved. If any subcontractor fails to take out insurance in its own name the contractor shall provide the required insurance coverage on the subcontractor in the form of a rider on each of the appropriate policies of the Contractor in the name of the subcontractor.
3. Public Liability - The Contractor shall provide broad form (commonly termed Comprehensive) Public Liability Insurance for not less than \$1,000,000 in any one incident and not less than \$1,000,000 for damage to property for one incident, with a total limit of \$2,000,000 for damages to property arising during the course of the construction and/or during the policy period. Such comprehensive policy shall include:
 - a. All liability of the Contractor, the Owner and the Architect for the Contractor's direct operations.
 - b. Subcontractor's operations.
 - c. Completed Operations Coverage, thereby meaning thereby any such loss which shall occur after the contract has been completed, but which can be traced back to the contract.
 - d. The Contractor shall indemnify and save harmless the Architect/Engineer and the Owner against all loss, cost or damage on account of injuries to persons or property occurring in the performance of the Contract, including all reasonable attorney's fees incurred by the Owner or the Architect/Engineer, on account thereof.
 - e. The Owner and the Architect/Engineer will be protected by an endorsement adding the Owner's and the Architect/Engineer names as additional insureds on the Contractor's policy, or by the issuance of a separate Owner's Protective Insurance in the names of the Owner and the Architect/Engineer, but such shall not relieve the underwriters of their responsibility to indemnify Contractor's liabilities to Owner.

- f. Broad Form Property Damage Coverage, including Completed Operations Coverage.
 - g. Waiver of all rights of subrogation against the Owner and the Architect/Engineer.
- 4. The Contractor shall carry for himself, and shall require from all subcontractors and all owners of automobiles or trucks rented or hired on the contract, until the contract is completed, automobile and truck Comprehensive Automobile Liability and Bodily Injury and Property Damage Liability Insurance for not less than \$1,000,000. The Contractor also shall carry for himself, insurance for non-owned and hired automobiles and truck coverage to at least the limits prescribed above.
- 5. Workmen's Compensation - The Contractor shall provide Workmen's Compensation Insurance for the Statutory limits required by State or any Federal statutes plus Employer's Liability limit of \$100,000.00. Insurance shall include longshoreman and harbor workers and Jones Act Coverages if appropriate for the work of the contract.
 - a. The Owner and the Engineer will be protected by an endorsement adding the Owner's and the Architect/Engineer names as additional insureds on the Contractor's policy, or by the issuance of a separate Owner's Protective Insurance policy in the names of the Owner and the Architect/Engineer.
 - b. All Workmen's Compensation Insurance policies will include provisions forfeiting all rights of subrogation against the Owner and the Architect/Engineer.
- 6. Insurance and Bonds - All insurance and bonds in connection with the work to be performed under the contract shall be countersigned by a licensed agent, resident in the State that the project is located. All coverage and bonds shall be provided by companies acceptable to the Owner and Architect/Engineer.
- 7. Transmittal of Bond and Proof of Carriage of Insurance - All bonds and all Proof of Insurance, as called for by the Contract Documents shall be delivered by the Contractor in triplicate to the Owner with a letter of transmittal, giving date of delivery. A copy of this letter shall be delivered to the Architect/Engineer with copies of the bonds and insurance certificates.
- 8. Builder's Risk
Builder's Risk Insurance, naming the Owner and developer as additional insureds shall be provided by the Contractor.

00140 SPECIAL CONDITIONS

These Special Conditions to the Contract shall modify and/or clarify the Drawings, Specifications, Contract, General Conditions, Supplemental General Conditions and other Contract Documents.

A. Form of Contract

The form of the Contract shall be the "DT Retail Properties, LLC Stipulated Sum Contract."

B. Examination of Site:

The Contractor shall examine the site of the work to determine differing site conditions or visible obstructions, barriers, impediments, etc. to perform work, the quantity of work and time of completion, and satisfy itself that the work can be completed as set forth in the Plans and Specifications.

Dimensions for existing structures are shown to relative scale on the Contract Documents for bidding purposes only, and the Contractor shall be responsible for correct dimensions of equipment, clearances, structures, and walls. The Contractor shall verify all dimensions shown for existing structures and equipment in the field. All dimensions shown on submittal data and final drawings shall be in feet and inches. The Contractor shall be responsible for uncovering existing utilities, marking all existing utilities and hand digging if required to find existing damage to any and all existing utilities shall be at Contractor's cost.

C. Safety, Health and Environmental Regulations

The Contractor shall comply with all Federal, State and local safety, health and environmental laws and regulations, and shall hold the Owner, Developer and the Architect/Engineer harmless from the consequences of any violations by the Contractor of these laws and regulations.

D. Permits and Licenses

Contractor shall obtain **all** permits. Dollar Tree will be responsible for payment of all fees associated with permits. The Contractor will be responsible for all licenses and associated fees, and any fee that includes manual labor, and materials, etc. and shall give all notices, pay all fees, and comply with all laws, ordinances, rules and regulations bearing on the work. If Contractor shall do any work contrary to such laws, ordinances, rules and regulations without the written consent of Architect/Engineer, Developer or Owner, Contractor shall bear all costs and expenses arising therefrom. The Owner shall pay for all application fees and permanent service connection fees that do not include direct work by the

Contractor. Temporary utility fees and service connection fees shall be paid for by the Contractor.

E. Shop Drawings and Equipment/Material Data

Submittal Log: The contractor shall submit a Submittal Log in digital (MS Excel) format within ten (10) days of the contract date. The Submittal Log shall be simply a list of each individual submittal required by the contract documents in chronological order for review and approval. Contractor shall plan for required time for review by the construction manager, architect, and consultants, as well as re-submittal, ordering, manufacturing, fabrication, & delivery when establishing dates.

Shop Drawings / Submittals: Prior to the purchase or installation of any item of equipment or material, the Contractor shall submit to the Architect/Engineer for review electronic shop drawings and data. The drawings/data shall consist of dimensioned layouts and materials list for all materials, manufacturer's descriptive data, diagrams specifications and performance data for all specialty items of equipment and other items specified.

If a product is identical to that specified in the drawings and/or as stated in the specifications and does not require review of dimensions (i.e. structural steel or cast stone), then the Contractor may order the product without prior approval. However, shop drawings will still be required for record purposes.

Required Shop Drawing / Submittal Items:

Division 3: Concrete Submittals / Shop Drawings

1. Concrete Mix Design
2. Curing Compound
3. Concrete Reinforcing
4. Vapor Barrier

Division 4: Masonry Submittals / Shop Drawings

1. Masonry Block
2. Masonry Block Fill Mix Design
3. Masonry Wall Reinforcing

Division 5: Metals Submittals / Shop Drawings

1. Structural Steel
2. Steel Joist
3. Steel Roof Deck
4. Exterior Metal Stud Framing

Division 7: Thermal & Moisture Protection Submittals / Shop Drawings

1. XPS Insulation
2. Foamed-in-Place Insulation
3. EIF System
4. Single-Ply Membrane Roof

Division 8: Doors & Windows Submittals / Shop Drawings

1. Aluminum Storefront Doors & Frames
2. Glazing

Division 10: Specialties Submittals / Shop Drawings

1. Metal Deck Canopies

Other Items

1. Fire Alarm
2. HVAC (Curbs, Air Devices, & Fans)
3. Plumbing (Piping & Specialties)

Shop drawings shall be reviewed by the Contractor and stamped with his approval stamp before being submitted to the Architect/Engineer. Shop drawings shall be reviewed by the Architect/Engineer and returned to the Contractor prior to fabrication and/or placement of any items into the job.

All required drawings/submittals are to be submitted within four (4) weeks of the notice of intent. The Contractor shall allow ten (10) working days for the review and return of all shop drawings/submittals submitted during this time period. The Architect/Engineer will not be responsible for any delays related to shop drawings/submittals that are not submitted within four (4) weeks of the contract date.

Review by the Architect/Engineer of shop drawings for any material, apparatus, devices, and layouts shall only be for compliance with the “Design” requirements of the Contract Documents and shall not relieve the Contractor from the responsibility of furnishing same of proper dimension, size, quantity, quality and all performance characteristics to efficiently perform the requirements and intent of the contract documents.

Shop drawing review by the Architect/Engineer shall not relieve the Contractor from responsibility for errors of any sort on the shop drawings. If the shop drawings deviate from the Contract Documents, the Contractor shall advise the Engineer of such deviations in writing, accompanying the shop drawings, including the reasons for the deviation.

No payment shall be made to the Contractor for materials, equipment and/or specialties which do not comply with the requirements and intent of the Contract Documents.

F. General Guarantee

The Contractor shall guarantee for a period of not less than one (1) year all work and materials, and he shall promptly repair and replace any and all defects and damage which occur as a result of defective materials or workmanship, at no additional cost to the Owner. Additional guarantees are required in specific Divisions of the specifications.

G. Special Controls

1. Workmen who may, because of improper conduct, become objectionable, will be promptly removed by the Contractor at the request of the Owner.
2. No burning of trash or rubbish shall be allowed on site.

H. Protection of Property

The Contractor shall protect all facilities and ground at all times and any damage occurring to such properties shall immediately be repaired at the Contractor's expense. Owner is under no obligation to provide security.

I. Contractor's Responsibility for Work

Until the final acceptance of the work by the Owner is evidenced in writing, it shall be in the custody and under the charge and care of the Contractor and he shall take every necessary precaution against injury or damage to any part thereof or any existing structures or property, whether arising from the execution of, or from the non-execution of the work unless otherwise provided elsewhere in the Contract Documents. The Contractor shall rebuild, repair, restore and make good at his own expense all injuries or damages to any portion of the work or any existing structures or property before its completion and acceptance and shall bear the expense thereof.

J. Definitions

Wherever, in the specifications, or upon the drawings the words directed, required, ordered, designated, prescribed or words of like import are used, it shall be understood that the direction, requirements, permission, order, designation or prescription of the Architect/Engineer is intended; and similarly, the words, "no exception taken", "acceptable", "satisfactory" or words of like import shall mean acceptable to, or satisfactory to, the Owner and the Architect/Engineer, unless otherwise expressly stated.

K. Manufacturer's Names and Catalog Numbers:

In instances where specific references have been made to one or more manufacturer's names and model or catalog numbers, it should be noted that such use does not indicate that the equipment specified is necessarily an "off the shelf" item; variances may be due to special requirements or modifications. The Contractor shall ascertain that such requirements and/or modifications are fully considered before proposing substitutions. Substitution of equipment and materials of all types shall meet the requirements of the project.

L. Surveys and Controls

The Contractor shall have on the job, a skilled instrument man and other personnel as required to accurately lay out his work.

M. Code Requirements:

The Contractor shall be responsible for all Contractor furnished items conforming to the latest revisions of all applicable codes promulgated by Federal, State, local or other regulating bodies applicable to the specified equipment including all codes referenced on the drawings. These codes include but are not limited to the following:

1. The National Electrical Code, 2020 Edition.
2. International Building Code, 2021 Edition.
3. International Plumbing Code, 2021 Edition.
4. International Mechanical Code, 2021 Edition.
5. International Fire Code, 2021 Edition.
6. International Energy Conservation Code, 2018 Edition
7. 2012 (TAS) Texas Accessibility Standards
8. National Fire Protection Association.
9. American Society for Testing & Materials.
10. U.S. Department of Labor & other Government Agencies.
11. Texas Department of Transportation Standard Specification for Highway Construction, latest edition.

N. Procedures and Methods

Notwithstanding any general clauses, wording, paragraphs or other references contained in the Plans or Specifications, the Engineer/Architect is not charged with the responsibility of directing the actual procedures and detailed methods of construction to be used by the Contractor in accomplishing the work contained in the Contract between the Owner and the Contractor, nor is the Architect/Engineer responsible to act as superintendent, foreman or safety engineer for the Contractor, for the safety of the Contractor's personnel or for personnel who may be within the work area. Neither Owner, Developer nor Architect/Engineer have any control of Contractor's employees, sub-contractors, agents, servants, etc., and all such are within the exclusive control of the Contractor.

The preferred sequence of construction is to direct initial construction efforts in stabilizing the site and installing all infrastructure prior to construction of the building and its foundations.

O. Project Clean-Up

Clean-up shall be performed continuously by the Contractor to keep the work area and any part of the Owner's premises disturbed by the Contractor free from accumulation of waste materials and rubbish and to comply with all laws and regulations regarding safe workplaces. At the completion of the work, the Contractor shall remove all waste, rubbish and unused surplus materials from and about the Owner's premises and leave the work area clean. Just prior to inspection, the Contractor shall remove all dust, dirt and stains from finished surfaces and leave the work area ready for the Owner's occupancy and use.

All removal and disposal of materials and wastes associated with the work of this Contract shall be conducted by the Contractor in strict accordance with all applicable local, State and Federal laws and regulations.

P. Project Meetings

1. Preconstruction Conference - The Owner shall arrange for a conference on the job site between representatives of the Owner, Developer, the Architect/Engineer, the sub-contractors, superintendent for the project and the Contractor prior to any construction work. The purpose of conference shall be to review and affirm the construction sequence, time schedule and the limits of use of the areas surrounding the project.
2. Construction Conference - Contractor shall arrange for a meeting at the job site between the above parties on a monthly basis. The purpose of conference shall be to review the progress of the work and to discuss any proposed changes in construction sequence or schedule and safety. A formal

scheduling procedure, suitable to the needs of the project, shall be utilized by the Contractor to provide weekly schedule updates.

Q. Temporary Facilities and Controls

Contractor shall furnish and maintain sanitary temporary toilets for the workmen on the job, subject to any and all sanitary codes having a jurisdiction thereon. The toilets shall be fully enclosed and weatherproof, and kept in sanitary conditions at all time. Location shall be approved by the Owner.

R. Temporary & Permanent Utilities

1. The Contractor shall install, at his expense, all required temporary utility service connections.
2. All temporary utility service connections shall be removed by the Contractor, at his expense, upon completion of the work.
3. The Contractor shall be responsible for setting up and activating all permanent utility accounts to include water, sewer, electric, gas and telephone service. These accounts shall be set up in the General Contractor's name and shall be transferred to the Owner upon completion of the project.

S. Barriers and Security

1. Protective devices such as signs, lights, signals and barriers shall be utilized at all times for safety of the public, the Contractor's employees, and the Owner's employees. The Contractor shall submit his plan to control traffic and provide safety for the adjacent properties.
2. The Owner, Developer or Architect/Engineer will not be responsible for the protection and/or safety of the Contractor's work, materials, or equipment; nor for the protection and/or safety of the materials or equipment of others used by the Contractor.
3. The Contractor may, at his own expense, provide security guards at his discretion.

T. Guarantees, Bonds, Affidavits, and Close Out Documents:

Prior to or concurrent with submission of the final request for payment, the Contractor shall submit to the Architect/Engineer, for transmittal to the Owner, the following:

1. Certification that all work, including that of all subcontractors, has been

completed in accordance with the requirements of the Contract Documents.

2. Invoices for all items for which allowances are specified, if any.
3. Copies of all warranties, guarantees and bond required by the Contract Document.
4. The Contractor's one (1) year written guarantee that all defects in materials and workmanship will be promptly remedied by the Contractor without additional cost to the Owner, including all extended warranties required under the contract.
5. The Contractor's final payment affidavit and final releases of lien for the Contractor and all suppliers and subcontractors on a form approved by the Owner including all final release of liens of subcontractors and materialmen for any value over twenty-five hundred dollars
6. Consent of Surety for release of final payment to the Contractor, if bonded.
7. Advertisement of Notice of Completion as required.
8. Certificate of occupancy from the local governing authority.
9. As-built drawings.
10. The above closeout documents shall be submitted to the developer and/or architect within 60 days of Dollar Tree opening for business. If all closeout documents are not received with the stated 60 days, then the developer will charge the contractor all costs after the 60 days for administration services necessary to extend the project completion. Administration service costs will include the developer's time, the Architect/Engineer's time, administration assistant's time and all reimbursable expenses expended after the 60 days. All costs will be billed at \$100.00 per hour. The total cost to extend the project's closeout time will be submitted to the contractor as a change order to the project's contract and shall be paid prior to release of final payment, or the cost can be deducted from the Contractor's retainage.

U. Operation/Maintenance Data and Spare Parts/Material

Operation and maintenance instructions, as well as spare parts lists for all equipment and specialties included in this project shall be submitted to the Architect/Engineer for approval and transmittal to the Owner, prior to final payment.

All spare parts, replacement tiles and other material stores required to be provided by the Contractor to the Owner under the provisions of other parts of the

specifications shall be submitted to the Architect/Engineer for approval and transmittal to the Owner, prior to final payment.

V. Quality Control

1. Mill certificates for reinforcing and structural steel, and required Underwriter's Laboratories labels and certificates for fire rated doors, shall be provided by the Contractor.
2. All manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer, unless herein specified otherwise.
3. Furnish copies of all printed directions with the materials.

W. Cost Breakdown

Prior to start of construction, the Contractor shall provide the Architect/Engineer, Developer and the Owner, a cost breakdown of the project, showing the various divisions of work to be performed and the dollar amount of the contract price designated for each division of the work. The schedule of values shall be in accordance with the bid form provided by Dollar Tree. The purpose of this schedule of values shall be to provide a basis for the approval of monthly progress payments to the Contractor. Contractor shall also provide the breakdown in accordance with the Owner's SLM schedule of values.

X. As-Built Drawings:

During construction, a set of drawings shall be maintained at the site by the Contractor with all changes and deviations legibly marked thereon in red. Prior to acceptance of the installation by the Owner, the marked-up drawings shall be delivered to the Architect/Engineer, for transmittal to the Owner. As-built drawings for all underground utilities must be verified, marked up, which includes actual routing and depths of all such utilities. Final payment will not be issued until as-built drawings are received by the Architect/Engineer.

Y. Intent of Plans and Specifications:

Any detail which may be incomplete or lacking in the Plans or Specifications shall not constitute claim for extra compensation. Such detail, if requested by the Contractor, shall be supplied by the Architect/Engineer and submitted to the Contractor in advance of its requirement on the job. The true intent of the Plans and Specifications is to produce a complete working facility and incomplete detail will not abrogate this intent.

Z. Superintendence by the Contractor

At all times during the performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work and shall assign and have on the job a competent superintendent who is satisfactory to the Owner and who has the authority to act for the Contractor. The superintendent shall have a minimum of ten (10) years experience in construction of new freestanding retail stores of similar size and the Contractor shall submit evidence of such experience. The superintendent shall be on the project full time and not share his time among other projects. The contractor may not change the approved superintendent without approval of the Owner and Architect.

AA. Project Work Hours

Subject to the normal course of business of those entities, the Contractor may work as the City of Cross Roads allows, and is expected to work adequate hours to meet the required project schedule. No payment, above the contract amount, will be allowed for overtime or any other extended work conditions of the Contractor.

BB. Payment

Monthly payments will be made to the Contractor based on estimates for each month, submitted by the Contractor and approved by the Architect/Engineer, with 10% of each month's payment retained until final acceptance of the entire work, unless otherwise required by law.

On or before the 25th day of each month, the Contractor shall submit to the Architect/Engineer an Application for Payment, dated the 25th day of the previous month, filled out and signed by the Contractor, covering the work completed as of the end of the previous month, and accompanied by such supporting documentation as is required by the Contract Documents. The Application for Payment shall be based on the schedule of values referenced in paragraph W of these Special Conditions, above.

If payment is requested for materials and/or equipment not yet incorporated into the work of the Contract, but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by the supporting documents.

The Architect/Engineer shall review the Contractor's Application for Payment and the extent of completion reflected therein and shall, within ten (10) business days of receipt of pay request, either approve or forward it to the Owner with a recommendation for payment; or return it to the Contractor for adjustment and resubmission.

Application for Payment, that have been recommended for payment and

forwarded to the Developer, Owner by the Architect/Engineer, will be paid to the Contractor on the date which is nearest to 30 days from the date of the Application for Payment; or, in the case of Applications for Payment that were returned to the Contractor for adjustment and resubmission, either on the date which is nearest the 30 days from the Application for Payment or on the date which is twenty one (21) days after receipt by the Owner of the Application bearing the Engineer's/Architect recommendation for payment, whichever is later.

In addition, Application of Payment shall be itemized as required by the Owner in its format and itemization.

CC. Drug and Alcohol Testing

The Contractor is encouraged to require present proof that his employees, and the employees of his subcontractors, who are assigned to work on this project have passed drug and alcohol screening tests, prior to those employees being allowed to enter the property of the Owner.

DD. General Operation

1. The Contractor shall schedule and coordinate his work to minimize interference with the adjacent business. If certain critical operations of the Contractor or of the Owner can only be accomplished by a deviation on the part of the other party, such deviation must be fully coordinated and agreed to well in advance.
2. Prior to commencing any excavation work, the Contractor shall contact the appropriate utility companies and determine the location of any know underground utility systems that could be affected by such excavation. Contractor shall present proof of evidence that the appropriate utility line locations have performed their work at the site.
3. All work shall be phased and accomplished in the order depicted by the Drawings and/or specifications (if any).
4. The Contractor shall control drainage of the project area as required to avoid restriction of waters from upstream of the project, to protect the work in progress, to properly drain the project area, and to protect areas downstream of the project from the harmful effects of altered flow patterns and/or contaminants.

EE. Disposal of Materials

Contractor shall observe all laws and regulations which prescribe handling, use, and disposal of certain materials and substances -- ALL DISPOSAL OF MATERIALS, BY-PRODUCTS, WASTES, AND SPENT EXPENDABLES

AND IMPLEMENTS SHALL BE OFF OF OWNER'S PROPERTY in accordance with prevailing laws.

FF. Work Progress Schedule

Contractor shall furnish in a bar chart form satisfactory to Architect/Engineer a Work Progress Schedule showing proposed dates for starting and completing the work as specified by Owner. This schedule shall be furnished within one (1) week after the date of notice to proceed and before the first monthly partial payment is applied for and shall be brought up to date and resubmitted showing cumulative progress, on every Thursday during the course of the project.

GG. Copies of Drawings and Specifications

Contractor shall keep in good order on the job site, one copy of the Specifications and one copy of each drawing, and Architect/Engineer, Developer and Owner's representative shall have free access to such copies.

HH. Figures to Govern

In no case shall measurements from the drawings be scaled for purposes of construction. Figured construction must be followed, and large scale drawings shall take precedence over those of small scale. All dimensions shall be based on "work points" shown in Drawings.

II. Ownership of Drawings

The Drawings and Specifications furnished by Architect/Engineer shall be used for this work only. As instruments of service they are the property of Architect/Engineer and shall be returned to the Architect/Engineer upon completion of the work.

JJ. Layout of Work - Lines and Levels

The Contractor shall be responsible for establishing the work points and base lines as necessary. These points and lines shall be established by the Contractor who shall certify to the Architect/Engineer their correctness and tolerances. Contractor shall lay out all work and assume full responsibility as to the correctness of the relative location of all parts of the work, both horizontally and vertically, as shown on the Drawings and described in the Specifications. All measurements shall be verified on the site by the Contractor. In no case will any allowance be made for errors arising through scaling of drawings.

KK. Inspection of Work

Owner shall at all times have access to the work wherever it is in preparation or progress, and Contractor shall provide facilities for such access and for inspection.

Testing and inspection services are to be contracted for and paid by the Owner, but coordinated by the Contractor, with copies of all testing and inspection reports supplied to the Owner and Architect/Engineer. Should the Contractor fail to coordinate these services, then the cost of completing these tests post construction will be the responsibility of the General Contractor. Any and all re-inspection fees shall be passed on to the Contractor.

If the Specifications, instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, Contractor shall give timely notice of its readiness for inspection. If any such work should be covered up without approval or consent, it must, if required, be uncovered for examination at Contractor's expense.

LL. Removal of Rejected Material

During performance of the work and prior to substantial completion and acceptance as defined herein, Contractor shall promptly remove from the premises all materials, whether worked or unworked, and take down and remove all portions of work condemned by Architect/Engineer, Developer and/or Owner as failing to conform to this contract; Contractor shall promptly replace such materials and reexecute such work in accordance with the requirements of this contract and without expense to Owner, and shall bear the expense of making good, to the Owner approved, the work destroyed or damaged by such removal or replacement to include all required additional manpower and/or overtime to meet the original schedule.

MM. Approval of Sub-contractors and Materials

Contractor recognizes that the ability and reputation of the party to whom any part of the work may be sublet is a matter of importance to Owner. Therefore, Contractor shall not let any subcontract without first obtaining Owner's written approval of the party to whom Contractor proposes to sublet.

Contractor shall furnish a complete list of subcontractors, together with a list of the major items of materials or equipment which he and the sub-contractor will be furnishing. Requests for approval of a different article or material from that specified shall be in writing and shall be accompanied by samples, records of performance, certified copies of tests by impartial and recognized laboratories, and such other information as Owner may request. Samples and data shall be furnished sufficiently in advance to allow time for investigation before a decision must be made. When Owner approves a substitution, it is with the understanding that Contractor guarantees the substituted article or material to be equal to or

better than the one specified.

In addition, at least one week prior to ordering any finish materials, Contractor shall provide color samples for all finishes including the split faced masonry block, pre-finished metal trim, cap flashing, gutters and downspouts, EIFS, and paint finishes (interior and exterior).

Should any sub-contractor or supplier fail to supply material, or to perform the work undertaken by him in a satisfactory manner, the employment of said sub-contractor or supplier shall be summarily terminated by Contractor on receiving a written order from Architect/Engineer.

Notwithstanding Owner's approval or disapproval of any sub-contractor, shall under any circumstances relieve Contractor of any part of his liabilities or obligations under this contract.

NN. Safety and Health Regulations

The Contractor shall comply with all local, state and federal laws and regulations pertaining to health and safety of employees, and hold harmless the Owner and Architect/Engineer regarding such actions.

To this end, the Contractor shall comply with all of safety policies and procedures prior to commencing work.

OO. Protection of Work and Property

Contractor shall provide and maintain adequate protection of all his said equipment from damage and from loss, and shall protect Owner's and adjacent properties from any and all damage or injury arising in connection with said work. Contractor shall make good any such damage or injury so occurring without any expense whatsoever to Owner.

All work hereunder shall be performed by Contractor as an independent contractor, maintaining complete control over Contractor's personnel and method of operation, and not as agent or employee of Owner. All work shall be performed entirely at the risk of Contractor, and Contractor shall defend, indemnify, and hold harmless Owner, Developer and Architect/Engineer from and against any and all loss, liability, damage, claims demands, action and/or proceedings (and all expenses connected with any thereof, including attorney's fees which Contractor agrees to pay), of whatever nature, on account of any and all damage to, or loss or destruction of any property (including property of Owner not in the care, custody or control of Contractor), or injury to, or death of, any person (including employees of Owner, Developer, Architect/Engineer), arising directly or indirectly out of, or in connection with, the performance by Contractor of the work.

Contractor shall provide and maintain all passageways, walks, fences, lights, and other facilities needed for the protection of workmen and the public.

Contractor agrees to comply with and abide by all safety standards or regulations and all legal requirements of the United States and of the State of Texas and any political subdivision thereof in which the work is done.

PP. Guarantee

Contractor guarantees that he will, at his own expense, rectify, repair and replace any and all defects arising from defective or improper materials or workmanship furnished by him or those employed by him including subcontractors which may appear within one year after the acceptance of the work. See Specific Specification Divisions for other required guarantees.

QQ. Liens and Lien Waivers

Contractor shall pay or cause to be paid promptly when due, all claims, debts and charges against Contractor or subcontractors employed by Contractor which might become a lien upon Owner's property or the premises upon which the work is located arising out of the work performed or materials furnished by Contractor or any subcontractors under this contract, and shall not suffer or permit any lien or encumbrance of any kind to be filed against or upon said property or premises, regardless of whether the basis of such lien is a claim against contractor or against a subcontractor employed by contractor. In case any lien is threatened or filed against such property or premises, or any lienable charge is not paid promptly when due, or in case Owner shall be charged with any item of cost, tax, contribution or other obligation to be borne by Contractor under this contract, a sufficient amount of money payable or to become payable hereunder or upon any other account from Owner to Contractor may be retained by Owner to cover and offset the lien, cost, tax, contribution or other obligation until the same shall be settled or discharged without cost or liability to Owner, or, after ten (10) days prior written notice to Contractor, said money may be applied by Owner directly to the discharge thereof.

The following are contract requirements and documentation to be received by the Developer during the course of construction through final completion of the project. The Contractor shall submit to Developer for approval, prior to start of construction, Contractor's lien waiver forms, both for the General Contractor and Subcontractors.

During Construction

General Contractor shall:

1. Provide conditional lien waiver for full amount for each pay request.

2. Provide each subcontractor's conditional and/or unconditional lien waiver on all subcontracts over \$2,500.00 for the full amount.
3. Provide a complete list of vendors regardless of the amount.
4. Provide an unconditional lien waiver for the full amount of all payments after receipt of payment and prior to next pay request.
5. Provide cancelled checks to all subcontractors and materialmen.
6. Provide conditional and/or unconditional lien waivers for materialmen that provide a "Preliminary Notice."

Subcontractors shall:

1. Provide conditional lien waiver for the full amount of all payments to GC for each pay request.
2. Provide a complete list of all vendors and materialmen to GC.
3. Provide an unconditional lien waiver for the full amount of all payments upon receipt of payment and prior to next pay request.

Upon Completion of Construction

General Contractor shall:

1. Provide an unconditional final waiver of lien of the full amount of contract and any change orders.
2. Provide a conditional waiver of lien from subcontractors plus an unconditional final waiver of lien for full amount of subcontract.
3. Provide a list of all vendors paid and amount due, if any.
4. Provide cancelled checks to all subcontractors and materialmen.

Lien Waiver Forms are included in these specifications.

RR. Extra Work and Alterations

Owner and Developer, without invalidating this contract, may order extra work or make changes by altering, adding to, or deducting from the work, the contract sum being adjusted accordingly. All such work shall be executed under the conditions of this contract except that any claim for extension of time caused thereby shall be adjusted at the time of ordering such change.

In giving instructions, Architect/Engineer shall have authority to make minor changes in the work not involving extra costs and not inconsistent with the purposes of the construction, and such changes shall not be considered as extra work, but in any case, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written change order, signed by Owner and no claim for an addition to the Contract Sum shall be valid unless the work is covered by such an order. **There will be no verbal change orders for any amount. All Change Orders are to be in writing and approved prior to the commencement of the work. No verbal Change Orders or Change Orders after the fact will be approved or paid. NO**

EXCEPTIONS.

Dollar Tree allows 6% Profit and Overhead on Change Orders.

The price to be paid or deducted for each such extra or deducted work or change shall be determined in one of the following ways, it being understood that if no agreement is reached between the parties under sub-paragraphs (a) or (b) below, the price for such extra or deducted work will be determined under sub-paragraph (c) below.

- a. By estimate and acceptance in a lump sum.
- b. By unit prices named in this contract or subsequently agreed upon.
- c. By a written cost-plus agreement agreed to prior to commencement of the work.

Contractor, provided he receives an order as above, shall proceed with the work. In the event, the price is to be determined under sub-paragraph (c) above, he shall keep and present in such form as Architect/Engineer may direct, a correct account of the net cost of labor and materials relative to each item of extra work or each change, together with vouchers, and Contractor shall submit to Architect/Engineer weekly, a detailed statement of the number of men employed, wage rates, and the time spent during each day on each item of extra work.

SS. Explanations and Interpretations:

Should any bidder observe any ambiguity, discrepancy, omission, or error in the Drawings and Specifications, or in any other Contract Document, or be in doubt as to the intention and meaning thereof, he should at once report such to the Architect/Engineer and request clarification, in writing.

Clarification will be made only by written Addenda sent to all prospective bidders. Neither the Architect/Engineer, Developer nor Owner will be responsible in any manner for verbal answers regarding intent or meaning of the Contract Documents, or for any verbal instructions, by whomsoever made, prior to the award of the Contract.

Should conflict occur in or between Drawings and Specifications, a bidder will be deemed to have estimated on the more expensive way of doing the work involved unless he shall have asked for and obtained the written decision of the Architect/Engineer before submission of his proposal, as to method, materials, or equipment which will be required.

TT. Contractor Requested Changes and Errors:

After the contract has been executed, if the Contractor requests changes and/or substitutions to the plans and specifications, he shall formally request subject changes and/or substitutions in writing to the Owner, Developer and Architect/Engineer. By making requests for changes and/or substitutions, the contractor:

1. Represents that the Contractor has personally investigated the proposed change and/or substitution product and determined that it is equal or superior in all respects to that specified.
2. Represents that the Contractor will provide the same warranty for the change and/or substitutions that the contract would for that specified.
3. Certifies that the cost data presented is complete and includes all related cost with this contract but excludes costs under separate contract, and excludes the Engineer's and/or Architect's evaluation, redesign cost and all associated costs thereof, and waives all claims for additional costs related to the change and/or substitutions which may subsequently become approved, and will coordinate the installation of the accepted change or substitution, making such changes as may be required for the work to be completed in all aspects.
4. Acknowledges that the Contractor will be responsible for all engineering and architectural fees associated with each requested change and/or substitutions and accepts such fees by the Engineer and/or Architect will be deducted by the Owner from the Contractor's contract whether such request is accepted or rejected.
5. **There will be no verbal change orders for any amount. All Change Orders are to be in writing and approved prior to the commencement of the work. No verbal Change Orders or Change Orders after the fact will be approved or paid. NO EXCEPTIONS.**

If errors in construction occur as a result of the Contractor's or any of his subcontractor's misinterpretation of plans, negligence, omission, requirements of building codes, or any other cause and causes additional Engineering and Architectural Services either through inspections and/or redesign, Contractor acknowledges that the cost of said Engineer and Architectural Services to rectify such errors may be deducted from the Contractor price as a deducted change order if elected by the Owner.

UU. Owner Specific Requirements and Clarifications

GENERAL

1. Construction is expected to commence on June 17, 2023, and be fully completed no later than 135 calendar days after the commencement date,

with penalties for late delivery. It is the owner's preference to deliver the building as soon as possible. If the General Contractor feels you can complete the building sooner than 135 calendar days after the commencement date, please indicate how many days from Notice to Proceed you will need.

2. The General Contractor's proposal shall include a detailed divisional breakdown of costs as requested by Dollar Tree.
3. All plans are available online on Dollar Tree's SLM website.

CONTRACT

4. The General Contractor shall provide Builder's Risk Insurance, naming the owner, Developer as additional insured in your proposal.
5. Dollar Tree will be responsible for all fees associated with permits. However, the Contractor is responsible for all licenses & fees associated with. Any bonds posted by the Owner prior to commencement of work are to be transferred to the General Contractor.
6. The Owner is responsible for all utility application and connection fees.
7. Retainage will be 10% through completion of the job and reduced to 5% upon receipt of Certificate of Substantial Completion issued by the Architect and Engineer and agreement that uncompleted or deficient items do not exceed the amount of the retainage. All retainage will be released upon sign-off by the Architect and Engineer, closeout of punch list, release of construction bonds and a Certificate of Occupancy issued by the City of Cross Roads.
8. There will be no verbal change orders for any amount. All Change Orders are to be in writing and approved prior to the commencement of the work. No verbal Change Orders or Change Orders after the fact will be approved or paid. NO EXCEPTIONS.
9. Provide a one (1) year warranty on all materials and labor for all work including all pavement and concrete surfaces and landscaping. In addition, the roof is to have a twenty (20) year warranty for Labor and Materials.

GENERAL CONDITIONS

10. Testing & Inspection services are to be contracted for and paid by the Owner, but coordinated by the General Contractor, with copies of all testing and inspection reports supplied to the Owner, General Contractor, and Architect/Engineer. Should the General Contractor fail to coordinate these services, then the cost of completing these tests post construction will be the responsibility of the General Contractor. Any re-inspection fees shall be passed on to the General Contractor.

SITE

11. The General Contractor shall be responsible for setting up and activating all the utility accounts to include water, sewer, electric, gas, and telephone service. These accounts shall be set up in the General Contractor's name and shall be transferred to the Owner upon completion of the project.

12. Provide irrigation and timer controls & circuitry for all landscaped areas, including any required back flow preventers (BFP). The irrigation system will need to be operational and tested, and detailed irrigation plans are to be provided to the owner prior to building turn over. All BFPs will need to be covered and/or enclosed in an owner-approved vandal proof lockable box if not located inside the building. The irrigation timer controls and circuitry needs to be located inside the building in a lockable box. Ensure that 2" conduit is installed in the appropriate locations (change to as shown on site plan if we can) prior to the paving upgrades for the use of the irrigation subcontract to pull his lines. The irrigation shall be connected to city water only. No well water.
13. All disturbed areas are to be solid sodded unless approved by the owner prior to bidding.
14. The location of the water meter is only an approximate. The General Contractor will need to verify the exact location of the existing meter box in the field, and coordinate any necessary repairs of the meter box with the county at no cost to Owner.
15. Contractor shall provide an on-site job construction camera per section 02871 as soon as possible. If temporary power is not available, then the Contractor shall provide a generator for day time operation.
16. One day prior to the store opening the General Contractor shall have all paved areas (concrete and asphalt) pressure washed.
17. General Contractor shall determine the exact tie in points prior to starting construction, including soft digging if necessary, to verify utility elevations.

BUILDING

18. Provide coordination for a security system. Ensure front door is suitable for a magnetic locking device.
19. Ensure that the irrigation system and all exterior (wall pack and pole) lights are connected to the panel and in good working order prior to building turn over.
20. The Owner will furnish certain materials and equipment per the following Dollar Tree Furnished Materials & Equipment list. The Contractor shall coordinate delivery of these materials and equipment with the Owner and shall be responsible for his activities in the installation of all items.

01450 CONSTRUCTION QUALITY CONTROL**SCHEDULE OF INSPECTIONS:**

MINIMUM INSPECTION REQUIREMENTS ARE REQUIRED AS LISTED IN TABLE BELOW. CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING ENGINEER/TESTING AGENT FOR ALL REQUIRED TEST AT APPROPRIATE TIME TO ALLOW FOR PROPER INSPECTION OF ALL RELATED ITEMS. ADDITIONAL SPECIAL INSPECTIONS NOT INCLUDED IN THIS TABLE ARE THOSE REQUIRED BY CITY OR STATE.

MATERIAL / ACTIVITY		REQUIREMENT CONDITIONS
A. INSPECTION OF SITEWORK - DIVISION 2		
1.	PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	REQUIRED
2.	PERFORM CLASSIFICATION AND TESTING OF COMPACTED MATERIALS AS REQUIRED BY GEOTECHNICAL REPORT AND SPECIFICATIONS.	REQUIRED
3.	VERIFY EXCAVATIONS ARE EXTENDED TO THE PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	REQUIRED
4.	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	REQUIRED
5.	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY PRIOR TO CONCRETE PLACING.	REQUIRED
6.	INSPECTION OF WATER AND SEWER SYSTEMS.	IF REQUIRED BY CITY OR STATE
7.	INSPECTION OF STORM DRAINS.	IF REQUIRED BY CITY OR STATE
B. INSPECTION OF CONCRETE - DIVISION 3		
1.	INSPECTION OF CONCRETE REINFORCING AS PER CONSTRUCTION DOCUMENTS.	REQUIRED
2.	INSPECTION OF LOCATIONS, EMBEDMENTS AND PROJECTIONS OF ANCHORS INSTALLED IN HARDENED CONCRETE.	REQUIRED
3.	VERIFYING USE OF REQUIRED DESIGN MIX.	REQUIRED
4.	AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	REQUIRED
5.	SLAB FLATNESS & LEVELNESS TESTING.	REQUIRED
C. INSPECTION OF MASONRY - DIVISION 4		
1.	DURING CONSTRUCTION THE INSPECTION PROGRAM SHALL VERIFY:	
A.	SIZE AND LOCATION OF STRUCTURAL ELEMENTS.	REQUIRED
B.	TYPE, SIZE AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION.	REQUIRED
C.	SPECIFIED SIZE, GRADE AND TYPE OF REINFORCEMENT, ANCHOR BOLTS, AND ANCHORAGE PLATES.	REQUIRED
2.	PRIOR TO GROUTING, THE FOLLOWING SHALL BE VERIFIED TO ENSURE COMPLIANCE:	REQUIRED
A.	GROUT SPACE IS CLEAN.	REQUIRED
B.	PLACEMENT OF REINFORCEMENT AND CONNECTORS AND ANCHORAGES.	REQUIRED
C.	PROPORTIONS OF SITE-PREPARED GROUT.	REQUIRED
D.	CONSTRUCTION OF MORTAR JOINTS.	REQUIRED
3.	GROUT SPECIMENS, MORTAR SPECIMENS AND/OR PRISMS SHALL BE OBSERVED/TESTED.	REQUIRED
D. INSPECTION OF STRUCTURAL STEEL - DIVISION 5		
1.	PRETENSION TESTING OF HIGH-STRENGTH BOLTED CONNECTIONS.	REQUIRED
2.	VISUAL INSPECTION OF WELDED CONNECTIONS.	REQUIRED
3.	INSPECTION OF DECK FASTENING.	REQUIRED
4.	INSPECTION OF METAL DECK CANOPY BOLTS PER SHEET G-5.0.	REQUIRED
5.	INSPECTION OF STEEL FRAME JOINT DETAILS FOR COMPLIANCE WITH APPROVED SHOP DRAWINGS / CONSTRUCTION DOCUMENTS:	REQUIRED
A.	DETAILS SUCH AS BRACING AND STIFFENING.	REQUIRED
B.	MEMBER LOCATIONS.	REQUIRED
C.	APPLICATION OF JOINT DETAILS AT EACH CONNECTION.	REQUIRED
E. INSPECTION OF EIFS - DIVISION 7		
1.	INSPECTION OF EIFS SYSTEM	IF REQUIRED BY CITY OR STATE

Dollar Tree Furnished Materials & Equipment

Project: Dollar Tree 2105-39

Cross Roads, TX

As of: April 2, 2020

ITEMS	VENDOR	NOTES	PAID FOR & ORDERED BY		RECEIVED/ UNLOADED BY		INSTALLED BY	
			DT	GC	DT's Vndr	GC	DT's Vndr	GC
HVAC UNITS	Carrier Corp.		X			X		X
ELECTRICAL PANELS, TRANSFORMER, DISCONNECTS, INTERIOR LIGHTS, OCCUPANCY SENSORS	National Energy Lighting		X			X		X
SITE LIGHTING, POLES & EXT. WALL PACKS	National Energy Lighting		X			X		X
ENERGY MANAGEMENT SYSTEM	Cylon Teletrol		X			X		X
PLUMBING FIXTURES & ACCESSORIES	Haines, Jones, & Cadbury		X			X		X
STEEL / WOOD DOORS & DOOR HARDWARE	Cook & Boardman		X			X		X
STOREFRONT DOOR CLOSERS & DROP PLATES	Cook & Boardman		X			X		X
CARPET TILES & WALKOFF	Interface Surfaces		X			X		X
CHECKOUTS	Lyons		X			X		X
STORE GRAPHICS PACKAGE	Clarity & DGS		X			X		X
GONDOLA FIXTURES - FLOOR & WALL	Lozier		X			X		X
SLATWALL	Leggett & Platt or LA Darling		X			X		X
LOCK CYLINDERS - ALL EXT. DOORS	Locknet		X			X		X
SHELF BRACKETS FOR OFFICE SHELVES	Grand & Benedicts		X			X		X
INDUSTRIAL STOCKROOM SHELVING	CAP & Associates		X			X		X
CHECKOUT CANDY MERCHANDISERS	CAP & Associates		X			X		X
LITTER RECEPTACLES	3PL		X			X		X
AIR CURTAIN	Powered Aire	GC to install disconnect & make final connection	X			X		X
SECURITY DOMES & PANELS, SDT SAFE, CORKBOARD, BROOM / MOP RACK, FIRE EXTINGUISHER, EMPLOYEE ONLY SIGN, T-SHIRT BAG RACKS, OFFICE FILE CABINET, OFFICE PHONE, CHECKOUTS, FLEX ROLLERS TEMP SITE SIGN, HELIUM STORAGE RACK	Dollar Tree Distribution Center		X			X		X
OFFICE MIRROPPANE GLASS, LOCKERS CART GAURDS, JANITOR SUPPLY CABINET, INT & EXT CART CORRAL, COAT RACK	3PL		X			X		X

- CONTINUED -

ITEMS	VENDOR	NOTES	PAID FOR & ORDERED BY		RECEIVED/ UNLOADED BY		INSTALLED BY	
			DT	GC	DT's Vndr	GC	DT's Vndr	GC
FREEZERS / COOLERS	HillPhoenix or Hussmann		X		X		X	
EXTERIOR BUILDING SIGNAGE	Allen Industries		X		X		X	
PYLON / MONUMENT SIGN & FOUNDATION	Allen Industries		X		X		X	
METAL DECK CANOPIES	Allen Industries	GC to install hardware	X		X		X	
CART RETENTION SYSTEM	Gatekeepers		X		X		X	
LVT FLOORING	3PL	Installed by Origin	X		X		X	
CONCRETE FLOOR POLISHING/ FINISHING	Origin Group		X		X		X	
BURGLAR ALARM SYSTEM	Vector Security		X		X		X	
VACUUM, HAND TRUCK, PALLET JACK, REFRIGERATOR, MICROWAVE, CLIPBOARD, OPEN ENDED BASKETS, SHOPPING CARTS, STOCKROOM PALLETS / DUNNAGE RACKS, TABLE & CHAIRS FOR EMPLOYEE AREA, & INTERIOR WALK OFF MATS	Various		X			X	X	
FIRE ALARM MONITORING	Vector Security	See Note on F-1.0	X		X		X	
FIRE ALARM	GC			X		X		X
ROOF CURBS / ROOF CUTS	GC			X		X		X
STOREFRONT, GLASS, DOORS & FRAMES	GC			X		X		X

**ANY AND ALL MATERIALS NOT LISTED ABOVE
TO BE ORDERED, RECEIVED, UNLOADED, & INSTALLED BY GC PER PLANS & SPECIFICATIONS**

DIVISION 2 SITWORK

02220 SITE DEMOLITION

A. Scope of Work

Complete all demolition and disposal of demolished material for all items of work indicated on drawings, specified herein or as required for construction of the project. Contractor shall inspect the site and review construction drawings to determine level of work and details of pertinent information that would affect demolition work to be completed. Demolition work includes but is not limited to:

1. Demolish all existing concrete walks and existing asphalt paving where shown and/or as required and haul off site to an approved disposal area.
2. Contact all utility companies to disconnect any services prior to demolition.
3. Demolish all utilities after receiving necessary permits and haul off-site to an approved disposal area.
4. Contact necessary authorities for permits, pay and secure permits for all work to be demolished in the R.O.W. Demolish all items as shown on drawings and/or as required for new work and haul off site to an approved disposal area.
5. Install all safety barriers as required by City or as necessary to protect public.
6. Install all erosion and sedimentation control measures as shown on drawings.
7. Install all tree protection barrier prior to starting work.
8. Install all traffic control and/or construction signage as required by the City and/or TXDOT.
9. Contractor shall use demolition methods that shall not damage adjacent structures, road and utilities.
10. Contractor shall wet down or use other dust control measures to keep airborne debris, resulting from demolition work, from adjacent Owners and R.O.W.
11. Contractor shall work times as approved by the Owner or as required by City.

02230 SITE CLEARING

A. General

1. Perform all clearing, grubbing, filling and related items necessary to complete work shown on the drawings and specified herein. The subsurface exploration and evaluation are included in this Division and shall be followed in the execution of this work, except as noted on plans.

B. Clearing and Grubbing

1. This contractor shall perform all of the required clearing and grubbing for this project. Work shall include but shall not be limited to the following.
 - a. Complete all necessary clearing and grubbing.
 - b. Properly dispose of all existing debris off-site and all debris generated by this contractor. This includes all soils, roots, and other debris. Excess soils not used in the project shall be removed from site.
 - c. This entire site, within clearing and grubbing limits, shall be cleared of miscellaneous deleterious materials such as glass, metal, plastics, underbrush, stumps, roots, stones larger than 3 inches, roots larger than ½ inch, wood, brick batts, paving materials and other debris. This clean up shall be accomplished and approved prior to beginning of stripping of top soil and rough grading. All such deleterious materials shall be disposed of off-site in an approved manner.
 - d. All trees shall be completely removed including roots, to a depth not less than 2 feet below existing grade and also not less than 4 feet below finished building floor elevation.
 - e. All trees under traffic and parking areas shall be completely removed including roots to a depth not less than 2 feet below existing grade and also not less than 3 feet below final finish pavement grade.
 - f. Existing trees to remain shall be protected from damage by construction activities with suitable barriers (plastic orange barrier fence).

- g. All trees to be saved shall be marked with tape ID. Trunk and roots of these trees shall be protected by a suitable “barrier” which extends to the tree drip line.
- h. All debris from clearing and grubbing operations shall be disposed of off-site by this contractor.
- i. Burning of debris on-site will not be allowed.

STRIPPING

- A. All areas under buildings extending 5’ five feet in all direction beyond the limits of these facilities shall be “stripped” of top soil, organics and other deleterious material. This stripping operation shall extend a minimum depth of 5’ below existing grades unless noted otherwise in the Geotechnical report. After stripping, moisture condition the existing soils per the Geotechnical Report.

Walkways, roadways and parking areas and extending 5’ in all directions beyond the limits of these facilities shall be stripped of top soil, organics and other deleterious materials per the Geotechnical Report.

- B. Handling of Stripped Materials

- 1. Top soil from stripping operation shall be stored on site for use in grassing operations. All materials not used in the project shall be hauled to the approved off-site location.
- 2. Organics, roots and other deleterious materials removed by the stripping operations shall be disposed of off-site by the contractor in an approved manner.
- 3. Contractor shall provide all cost necessary to remove ground water including dewatering systems if necessary.

- C. Approval of Stripping

- 1. After the completion of stripping operation, the site shall be inspected by the geotechnical consultant to observe any areas of “unsuitable materials” which may remain in place after the stripping operation. If areas of “unsuitable materials” are encountered, these areas shall be excavated an additional 12 twelve inches and these “unsuitable materials” shall be properly disposed of by the contractor. All areas of “unsuitable materials” removed shall be measured for payment as “in place” measurements.

2. All areas of under- cut shall be backfilled with suitable “general fill” material provided from on-site and/or off-site by the contractor as approved by the Geotechnical Engineer.
3. After stripping and under cutting is completed the entire stripped area shall be compacted until the soils at a depth of 12" achieve the requirements as listed in the Soils Report by the Geotechnical Consultant. This operation shall be observed by the geotechnical consultant and approved before the beginning of “rough grading” operation.

02310 GRADING

- A. Rough grading includes the movement of suitable on-site material (cut and fill) within the limits of buildings, walkways, roadways, and parking areas and yard areas to obtain appropriate subgrade levels as required for these areas.

B. TXDOT Specifications

All references in these technical specifications and on drawings refer to Texas Department of Transportation Specifications as described in the Soils Report by Geotechnical Consultant.

C. Placement of Material

The operators of mechanical equipment shall be observed by a qualified geotechnical technician. It is intended that subgrade soils shall have a net bearing capacity of not less than 2000 psf, at 2 foot or more below final grade and below bottom of foundation. This value shall be confirmed with a penetrometer.

If these values are not obtained, undercutting shall be performed as directed by and as defined by the Geotechnical Consultant. (Refer to Paragraph E, which follows.)

D. Undercut & Backfill

Undercut & Backfill of some “soft spots” may be required during the grading of on-site soils during the rough grading operations.

Undercut of “unsuitable materials”, where authorized shall extend to a depth of eighteen inches (18”). Unsuitable material shall be disposed of off-site. Undercut areas shall be measured for payment. Undercut area shall be backfilled with any of the following as approved by the Geotechnical Engineer.

1. Suitable On-Site Soil.
2. Suitable “General Fill”.
3. Suitable “Select Structural Fill”.

This backfill shall be placed the same day as the excavation and shall be compacted to not less than 98% of Standard Proctor Density.

Payment for the work shall include the following: Payment shall be “in place” measurements. Backfill shall be “in place” compacted measurements and includes the following in the cubic yard in place cost.

1. Excavation.
2. Disposal of Unsuitable Material.
3. Furnishing and Placing Backfill to Grade.

E. Protection against erosion and standing water.

All grading operations shall be performed in such manner that erosion will be prevented and accumulation of standing water will be prevented.

F. Unsuitable or excess earth shall be disposed of on-site.

G. Restore to original grades and conditions all properties damaged by any activity related to the work and take adequate precautions to avoid settlement or cave-in of properties higher than site and silting, eroding or other damage to properties lower than site.

H. In-place soils may be highly sensitive to moisture. Never allow water to stand or become trapped on a foundation subgrade area. Provide positive drainage to any excavated areas at all times. If subgrade becomes saturated after undercutting, an additional amount of soil, to be determined by the Engineer, shall be removed at no cost to the Owner.

02315 EXCAVATION & FILL

A. General

Work under this paragraph shall include furnishing and placing of borrow fill material to bring the site, building area and roadway areas to the required subgrade elevation.

B. TXDOT Specifications

All references in these technical specifications and on drawings refer to Texas Department of Transportation Specifications as specified in the Soils Report by the Geotechnical Consultant.

C. Materials

1. “General fill” may be used in yard areas not under building or roadway areas. This general fill shall be friable granular soil including little or no organic matter and which can be spread and compacted by conventional earth moving equipment. This material shall generally meet the requirements of TXDOT Standard Specification. Additional requirement of this “general fill” shall be per the Geotechnical Report.
2. “Select structural fill” shall be used for all areas under buildings and all roadway areas to bring elevations up to required subgrade elevation. This select structural fill shall be clean fine sand with less than 5% fines.

D. Placement of Borrow Fill Material

Placement of borrow fill shall be accomplished with standard earth moving equipment and shall be spread in layers not exceeding 8 inches of thickness and compacted to not less than 95 percent of the soils Standard Proctor Density, ASTM D698.

E. Protection Against Erosion and Standing Water

It shall be required that grading operations be performed in a manner to prevent the erosion of soils and to prevent the accumulation of standing water in any graded areas. Do all pumping as required to prevent the accumulation of standing water.

F. Compaction of Soils

All compaction of soils shall be in accordance with Section 02335 of these

specifications and in accordance with the Geotechnical Report, which is included as part of this specification.

G. Placement of Soils

1. Loosen existing soil for a depth of two inches (2") just before filling.
2. Do not place fill on frozen or frosty areas; or over debris, wood, or foreign material.
3. Place all fills and backfill in layers not over eight inches (8") thick and compacted per Section 02335.
4. Fill shall be compacted by approved equipment.
5. Soil moisture shall be maintained within 3 percentage points of the laboratory optimum moisture content during construction.
6. Positive surface drainage shall be maintained during earthwork operations. Do all pumping as required to maintain dry conditions.
7. All soil compactors shall be in accordance with Section 02335 of these specifications and with the soils reports of the Geotechnical Consultants.

EXCAVATION AND BACKFILL

- A. Furnish all labor, material and equipment necessary to complete all excavating and backfilling as indicated on the drawings and specified herein.
- B. The items of work to be performed include, but are not limited to:

Excavation and backfill for

1. Footings and other structures
2. Site utilities
3. Site drainage
4. Walls
5. Concrete Paving

C. Excavation

Excavate to lines and elevations as necessary for the demolition and for removal down to and inclusive of foundations. Equipment and methods shall be suitable for the work at hand. Work shall conform to the

following unless indicated otherwise on the drawings.

1. Excavated material suitable for filling shall be separated from unsuitable materials.
2. Excavated material unsuitable for filling shall be removed from the construction site promptly and disposed of.
3. Backfill to line and elevation, as necessary for proper construction of the work. Equipment and method shall be suitable for the work at hand. Work shall conform to the following, unless otherwise indicated on the drawings.
 - a. Loosen existing soil for a depth of 2" just before filling.
 - b. Do not place backfill in water, on muddy, frozen or frosty areas, or over debris, wood or foreign material.

D. Backfill

Backfill shall be placed in layers not exceeding eight inches (8") in thickness (loose) and compacted to not less than 95% Modified Proctor Density.

Backfill shall be "Select Structural Fill" conforming to TXDOT Standard Specifications with the additional requirement of the recommendations in the Soils Report.

02335 SUBGRADE

A. Scope of Work

Furnish all labor, materials and equipment necessary to perform soil compaction as indicated on the drawings and specified herein.

B. Minimum Densities

1. The following minimum direction of compacting soils in this project shall be as follows:
 - a. Yard Area - 92%.
 - b. Subgrade under buildings and traffic area - 95%.
 - c. Structural fill and base course under building and foundations - 95%.
2. All densities shall conform to Standard Proctor Density/ASTM D698.
3. Compaction of soils shall be performed in accordance with the report of the Geotechnical Consultant which is included as part of these specifications.

C. Field Test

Field density tests to check compaction compliance shall be conducted in all fill areas at a frequency of one per 2500 square feet of fill per lift. Testing will be the responsibility of the Contractor to coordinate with the Geotechnical Consultant. The cost of testing shall be paid by the Owner.

GEOTECHNICAL REPORT

A comprehensive Geotechnical Investigation has been performed by the Owner's Geotechnical Consultant.

This investigation was performed by ECS Southwest, LLP.

The report of this investigation is included in its entirety herein, as part of these Contract Documents, at the end of Division 2.

02360 SOIL TREATMENT

A. Scope

1. Qualifications: Treatment shall be performed by an experienced pest control operator registered and licensed in accordance with the regulations of the State of Texas.
2. Guarantee:
 - a. The Owner shall receive a written subterranean Termite Protection Contract with an effective date commencing on the date of Substantial Completion.
 - b. This Protection Contract shall be in full force for 12 months from Substantial Completion and is guaranteed in accordance with the terms of the Contract, renewable annually, at Owner's option, for the lifetime of the new structure (non-cancellable except by Owner).
 - c. The Termite Protection Contract shall provide for regular preventative inspections and any subsequent treatment needed. Any new subterranean termite damage done to the new structure or contents after the effective date of this Protection Contract shall be corrected at no additional cost to the Owner (except the annual renewal fee) up to \$50,000.00.
 - d. The Pest Control Operator shall provide the General Contractor proof that there are adequate financial resources to fulfill the above contract terms.

B. Materials

Chemicals in Current Use, approved by E. P. A. shall be submitted for approval with proper application information prior to starting work.

C. Application for Sand/Clay Material

1. General: The following rates and location of application may be adjusted for job conditions to provide the cited guarantee. If application adjustment is indicated, advise the Contractor and the Engineer/Architect. Application of chemical shall not be in conflict with procedures indicated on the product label or the EPA.
2. Do not begin soil poisoning work until all soil preparations for slab

placement and backfill have been completed. Do not apply soil poison when surface water is present.

3. Under New Slabs: Treat fill under all new concrete floor slabs at the rate of 1-gallon per 10 square feet of area.
4. New Foundation Walls: Treat each uniformly on both sides of all exterior and interior foundation walls with the solution in a one foot wide strip at the rate of 2-gallons per linear feet of walls. Treat voids in unit masonry at the rate of 1-gallon per linear feet with treatment made at or near the footings.
5. Below Slab at expansion and control joints, conduit, pipes, etc., apply 2 gal./5lf.
6. Under Footings: Treat under all foundation footing, side walls of footing trench (both sides of trench) at the rate of 1-gallon per square foot of footing trench.

02630 STORM DRAINAGE

A. Scope of Work

Furnish all labor, material and equipment necessary to complete all new drainage piping, drainage structures and curbs as shown on the plans or specified herein. Type of drainage pipe shall be as shown on drawings.

B. Permits and Codes

All new work shall comply with all applicable codes and regulations including the requirements of the City of Cross Roads & TXDOT.

C. Materials

1. Drainage Castings

Castings shall be of gray iron conforming to requirements of ASTM C-48, Class 30, unless specified elsewhere. All frames and covers shall be "heavy duty", "traffic bearing" type. (H-20 Loading).

2. Drainage Stone

Shall be #57 washed concrete gravel with less than 5% passing a #200 sieve.

C. HDPE Pipe

High Density Polyethylene (HDPE)

Storm sewer pipe shall be ADS N-12 or approved equal. The prescribed sized of pipe or nominal inside diameters. Pipe sizes shall be of the size and length as shown on the plans.

The product supplied under this specifications shall be high density polyethylene pipe with a corrugated exterior and smooth interior for 12" to 36" diameters meeting AASHTO M294-96 (Type S).

All material shall meet ASTM D3350 resin cell classification 335420C. Flow calculations shall be based on Mannings n value of 0.012.

Joints shall consist of a bell and spigot type joint with an O-ring rubber gasket meeting ASTM F477 place on the spigot end. At least two (2) corrugations of the spigot end must insert into the bell end. Pipe fittings shall conform to AASHTO M294 or as designed

by the Engineer.

4. Concrete Pipe

All concrete drainage pipe shall be reinforced concrete pipe, Class III, conforming to TXDOT Specifications. Joints for storm drainage piping shall be factory made compression joints, conforming to ASTM Specification C-443.

5. PVC Pipe -

Ribbed PVC Drainage Pipe

ULTRARIB PVC Gravity Storm Drain Pipe shall meet the requirements of ASTM F794, and shall be as manufactured by UPONOR ETI Co., or an approved equal.

Pipe shall have a smooth interior and manning flow coefficient of not less than 0.012.

Pipe shall have an Aimpact resistance@ and a Astiffness@ not less than required by AASHTO M304.

Joints for ULTRARIB PVC shall be slip on type with a rubber gasket meeting the requirements of ASTM F477.

Fittings as manufactured by the UPONOR ETI Co. Shall be used for correcting sections of piping system.

6. Concrete - See Division 3.

D. Trench Excavation, Bedding and Backfill for Drains

1. Trenching - Trenches for drain piping shall proceed along the lines and grades shown on the drawings. Width of trenches at any point below the centerline of the pipe shall not be greater than twelve inches (12"), plus the outside diameter of the pipe. Trench shall be sloped, braced, or sheeted sufficiently to prevent caving in of trench walls. Care shall be taken not to undercut desired bottom of pipe trench. In the event undercutting of the trench occurs, the Contractor shall provide structural backfill to bring trench bottom to its proper grade. Provide all pumping necessary for keeping trenches in a dry condition.
2. Removal of Unstable Materials - Where wet or otherwise unstable soil, incapable of properly supporting pipe is encountered, such

material shall be removed to depth required and replaced to the proper grade with structural fill material, and compacted as provided herein.

3. Bedding - The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe. The pipe shall be bedded carefully in a soil foundation shaped to match the outside diameter of the pipe for a minimum of 25% of the height of the pipe laid flat. All pipe bedding shall be tamped. Bell holes and depressions for joint shall be only of such length, depth and width as required for properly making the particular type of joint.
4. Backfilling - After pipe has been placed in bedding and the pipe joints have been completed, selected material from excavation or borrow shall be placed along both sides of the pipe in layers not to exceed six inches (6") in depth. The Backfill shall be brought up evenly on both sides of the pipe for its full length, and shall be thoroughly compacted with hand or mechanical tampers. The Backfill and compaction effort shall be repeated to a minimum cover of twelve inches (12") lifts and compacting by hand or mechanical tampers. Trench Backfill shall be compacted to not less than 95% Standard Proctor Density (ASTM D-698).

E. Pipe Laying

1. Drain Piping shall be carefully laid to lines and grades indicated. Any pipe which is not true in alignment or which shows settlement after laying, shall be taken up and relaid at Contractor's Expense. Interior of pipes shall be kept clear of debris as work progresses. No pipe shall be laid which is cracked, checked, spalled or otherwise damaged or which in any way fails to meet requirements of these specifications and all such rejected pipe shall be immediately and permanently removed from the site. Laying of drain pipe shall be started at outlet ends and proceed upgrade.
2. When a section of drain pipe is installed and prior to backfilling, pipes shall be visually inspected internally by "flashing" with mirrors or by strong spotlight. Any evidence of poor alignment, settlement or leakage shall be corrected by Contractor.
3. Trench Excavation, Bedding and Backfill:

Trench excavation, bedding and backfill shall be in accordance with paragraph 2.4.

F. RCP and HDPE Installation

In addition to installing the pipes per the manufacturer=s specifications, each pipe joint shall be completely wrapped externally with a non-woven filter fabric. The fabric shall be tightly laid against the pipe and shall extend 2' on either side of joint. The fabric shall be overlapped a minimum of 12", with the seam located at the top of the pipe. The overlapped fabric shall be securely attached to each other by stitching the fabric or epoxy the fabric together. The fabric shall be AMOCO 4506 or approved equal.

02700 BASES, BALLASTS, PAVEMENTS & APPURTENANCE

A. Scope of Work:

The Contractor shall perform all necessary items of work to complete Paving and Surfacing as shown on the plans and specified herein. Contractor shall meet all requirements per Geotechnical Report prepared by ECS Southwest, LLP.

B. Materials

1. Subgrade material shall be compacted "Select Structural Fill". Where existing subgrade is found to be "unsuitable" such material shall be removed to a depth of not less than one foot (1') and replaced with soils equal to "Select Structural Fill".
2. Base Course - Asphalt paved areas shall receive a base course of "Lime Rock" with a minimum LBR of 100% in accordance with TXDOT Standard Specification. Base courses shall be placed and compacted to a minimum thickness as indicated on the contract documents. These base courses shall be placed on a prepared subgrade.
3. Concrete paving, curbs and sidewalks shall be as indicated on the drawings and in accordance with Division 3 Concrete.
4. Paint Striping and marking shall be paint (Class I) Reflective (Type A) materials. Traffic marking materials shall meet the material requirements of TXDOT Standard Specification. Construction requirements for the striping and markings shall be in accordance with TXDOT Standard Specification entitled "Traffic Stripe" and "Traffic Control Markings and Legends", respectively.

C. Construction Requirements

Construction requirements, including placement methods and compaction shall conform to the requirements of TXDOT Standard Specification.

02810 IRRIGATION SYSTEM

- A. The Contractor shall design, furnish and install a complete irrigation system and controls.
- B. This Contractor shall furnish and install the irrigation tap, meter and all PVC, Schedule 40, sleeves under walkways and roadways, where shown on the plans. Sleeves shall extend 3 feet beyond pavement.
- C. Materials for sleeves shall be Schedule 40 PVC, Glue Joint Pipe & Couplings. Sleeves shall be 4 inch diameter. All sleeves shall have removable plugs at each end for removal by Owner.
- D. Irrigation sleeves shall have 18 inches to 24 inches of cover to finish grade.
- E. Sleeves shall be installed in the same manner as specified for storm drain piping.
- F. The Control System shall be located inside the building at the main electrical panel and shall be housed in a lockable assembly.

02870 LITTER RECEPTACLES

A. SCOPE OF WORK

Includes installing 2 Litter Receptacles to be provided by Dollar Tree as specified. See plans for exact location of installation.

B. MATERIALS

All materials will be ordered by Dollar Tree for contractor installation.

C. INSTALLATION

Receptacles shall be anchored into the sidewalk with 3/4" anchor bolts. Anchor bolts shall be set in epoxy with 3" minimum embed into concrete.

02871 **JOBSITE CONSTRUCTION CAMERAS**

A. **SCOPE OF WORK**

Includes ordering & installing 12-megapixel jobsite construction camera & solar power kit from OxBlue as described below. The contractor shall include in his bid a Prepaid Lease of \$4,096 for a 4 month lease with optional \$1,024/month extension as required to complete the job.

1. UPON AWARD OF THE PROJECT:

- a. Submit project information at www.oxblue.com/order
- b. Contractor will use an OxBlue provided 12 Hour Solar Power Kit to power the camera prior to commencing construction. OxBlue to provide cellular data connectivity.
- c. Procure camera by signing an OxBlue quote and agree to give full image access to Dollar Tree Stores.

2. PRIOR TO COMMENCING CONSTRUCTION:

- a. Order camera a minimum of 10 days prior to commencing construction. Orders submitted less than 10 days prior to construction shall require a \$250 expediting fee.
- b. Camera shall be installed, tested and fully functional prior to commencing construction. Contractor shall maintain power to the camera and ensure the camera is functional for the entire duration of the project.
- c. Install camera a minimum of 12' above finished floor elevation (higher preferred) and in a location which provides an unobstructed view of the site.

3. AFTER COMPLETION OF CONSTRUCTION:

- a. Return camera and all accessories to OxBlue within 7 days of completing project. Shipment must use original OxBlue packaging materials. Insure package for \$4,000.
- b. **NOTE: THE CAMERA SHALL NOT BE REMOVED UNTIL THE LAST DAY THE GC IS ON SITE WORKING.**

B. **SUPPLIER**

Requirements & pricing is subject to change. Contact OxBlue with any questions.

OxBlue Corporation
1777 Ellsworth Industrial Blvd NW
Atlanta, GA 30318
(888) 849-2583
(404) 917-0200
jpschaaf@oxblue.com

02890 TEMPORARY SITE SIGNAGE

A. SCOPE OF WORK

Includes constructing & installing 6' high construction fencing. Fencing location will be provided by the Developer. Sign will be provided by Dollar Tree for contractor installation.

B. MATERIALS

Fencing shall be temporary fence panels, fuse binded chain link, extended bonded chain link, galvanized chain link, or aluminized as selected by contractor.

C. INSTALLATION

Sign shall be installed on frame by contractor. Sign & frame shall be maintained in good condition for the duration of construction and set in a location that maximizes visibility. Sign & frame shall be removed at completion of project and upon store opening at store manager's approval.

02900 PLANTING

A. Scope of Work

The work covered by this section includes furnishing all labor, material and equipment and incidentals necessary for grassing and soil preparation within the limits shown on the drawings. All disturbed areas shall be solid sod. Temporary stabilization may be seeded and mulched.

B. Material

1. Topsoil - The Contractor shall place topsoil over the area to be grassed or landscaped. Topsoil shall be the best available soils from the stockpile on the project site. Material shall be free from roots or other materials which may be harmful to plant growth. The areas to receive topsoil shall first be brought to approximate grade and line and shall be approved prior to commencement of the top soiling operations. Where insufficient topsoil is not available provide an approved topsoil from off-site. Topsoil shall be 2 inch minimum thickness.

2. Solid Sod

Provide strongly rooted sod, inspected and found free of diseases, not less than two (2) years old and free of weeds and undesirable native grasses.

- a. Provide only sod capable of growth and development when planted (viable, not dormant).
- b. Sod shall be machine cut at a uniform minimum soil thickness of 5/8" at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Thatch shall be a maximum of 1/2", uncompressed.
- c. Individual pieces of sod shall be cut to the supplier's standard width and length. Broken pads, torn pads, or pads with uneven ends shall not be acceptable.

3. Seed - All seed used shall be labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act in effect on the date of Invitation for Bids. All seed shall be furnished in sealed standard containers, unless exception is granted in writing by the Engineer/Architect. Seed which have become wet, moldy, or otherwise damaged in transit or in storage will not be acceptable. Seed shall conform to the requirements of Federal Specification JJJ-S-181. Type of seed shall be Common to the area at a rate of 30 lbs. per acre, unhulled.

4. Lime - Lime shall be ground agricultural lime-stone containing not less than 85% of total carbonates and shall be ground to such fineness that at least 50% will pass through a 100-mesh sieve and at least 90% will pass through a 20-mesh sieve. Coarser material will be acceptable provided the specified rate of application are increased proportionately, on the basis of quantities passing the 100-mesh sieve, but no additional payment will be made for the increased quantity. Apply loose at the rate of 2000 lbs. per acre.
5. Water - Water shall be free from oil, acid, alkali, salt and other substances harmful to growth of grass. The source shall be subject to the approval of the Engineer prior to use.
6. Fertilizer - Initial Application of fertilizer shall be 8-8-8, uniform in composition, free-flowing and suitable for application with approved equipment, delivered to the site in bags or other convenient containers, each fully labeled, conforming to the applicable State Fertilizer Laws, and bearing the name, trade name or trademark, and warranty of the producer. Apply fertilizer at the rate of 1,000 lbs. per acre.
7. Mulch - Mulch shall be hay, straw, or approved biodegradable netting.
8. Water and maintain sod and seed areas until completion of the project.



ECS Southwest, LLP

Geotechnical Engineering Report

Dollar Tree

NEQ of US-380 and Walmart Drive

Cross Roads, Texas

ECS Project Number 19:8994

March 23, 2023





ECS SOUTHWEST, LLP

Geotechnical • Construction Materials • Environmental • Facilities

"Setting the Standard for Service"

TX Registered Engineering Firm F-8461

March 23, 2023

Thomas E. Latham, P.E.
Clark, Geer, Latham & Associates, Inc.
3901 Springhill Ave, Floor 10
Mobile, Alabama 36608

ECS Project No. 19:8994

Reference: Geotechnical Engineering Report
Dollar Tree
NEQ of US-380 and Walmart Drive
Cross Roads, Texas

ECS Southwest (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering analyses for the referenced project. This report presents our understanding of the geotechnical aspects of the project along with the results of the field exploration and laboratory testing conducted. The report also contains our findings and recommendations for design and construction.

It has been our pleasure to be of service to you during the design phase of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase, and we would like to provide our services during construction phase operations as well to verify the assumptions of subsurface conditions made for this report. Should you have any questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

ECS Southwest, LLP

Milton E. Perez
Project Coordinator
MEPerez@ecslimited.com



Michael Batuna, P.E.
Principal Engineer
mbatuna@ecslimited.com

The electronic seal on this document was authorized by Michael P. Batuna No. 92147, on March 23, 2023

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1.0 INTRODUCTION	2
2.0 PROJECT INFORMATION	3
2.1 PROJECT LOCATION/CURRENT SITE USE	3
2.2 PROPOSED CONSTRUCTION	3
3.0 FIELD EXPLORATION AND LABORATORY TESTING	4
3.1 SUBSURFACE CHARACTERIZATION	4
3.2 GROUNDWATER OBSERVATIONS	4
3.3 LABORATORY TESTING	5
4.0 DESIGN RECOMMENDATIONS	6
4.1 POTENTIAL VERTICAL MOVEMENTS	6
4.2 SUBGRADE IMPROVEMENTS	6
4.3 FOUNDATION DESIGN	7
4.3.1 Shallow Footings – Design Parameters	7
4.3.2 Shallow Footings - Construction Considerations	7
4.3.3 Monolithic Slab-On-Grade (BRAB)	8
4.5 BUILDING PERIMETER CONDITIONS	9
4.6 SEISMIC DESIGN CONSIDERATIONS	9
4.7 PAVEMENT SECTIONS – PRIVATE DRIVES AND PARKING	10
4.8 RETAINING WALL DESIGN CONSIDERATIONS	12
5.0 SITE CONSTRUCTION RECOMMENDATIONS	14
5.1 SUBGRADE PREPARATION	14
5.1.1 Stripping and Grubbing	14
5.1.2 Proofrolling (Soil Subgrades)	14
5.1.3 Site Temporary Dewatering	15
5.2 EARTHWORK OPERATIONS	15
5.2.1 Fill Placement	15
5.2.2 Utility Installation	15
5.2.3 Earthwork Testing	16
5.3 MATERIAL SPECIFICATIONS	16
5.3.1 Moisture Conditioning	16
5.3.2 Select Fill	16
5.3.3 Flexible Base	17
5.3.4 Lime Stabilized Material	17
5.4 CONSTRUCTION GROUNDWATER CONTROL	17
5.5 FOUNDATION AND SLAB OBSERVATIONS	18
5.6 UTILITY INSTALLATIONS	18
6.0 CLOSING	19

APPENDICES

Appendix A – Drawings & Reports

- Site Location Diagram
- Boring Location Diagram
- Subsurface Soil Profile
- Geologic Survey Map

Appendix B – Field Operations

- Reference Notes for Boring Logs
- Subsurface Exploration Procedures
- Boring Logs

Appendix C – Laboratory Testing

- Laboratory Testing Summary

Appendix D – Supplemental Report Documents

- Drawings/Details

EXECUTIVE SUMMARY

This Executive Summary is intended as a very brief overview of the primary geotechnical conditions that are expected to affect design and construction. The following summarizes the main findings of the exploration, particularly those that may have a cost impact on the planned development. Further, our principal foundation recommendations are summarized. Information gleaned from the executive summary should not be utilized in lieu of reading the entire geotechnical report.

- The geotechnical exploration performed for this study consisted of a total of nine (9) borings drilled to depths of approximately 5 to 20 feet below the existing site grades.
- The borings encountered mostly Fat Clay (CH) soils to depths of about 5 to 20 feet below existing site grades, with the exception on boring B-02 where Clayey Sand (SC) soil was encountered at the depths of about 5 to 10 feet below existing grades. Borings B-04 and P-04 encountered Lean Clay (CL) soil at depths of 0 to 4 feet below existing grades. These soils were interspersed with sandy soil layers extending to termination depths.
- Groundwater seepage was not observed in the borings during our drilling operations and is indicated on the boring logs as “dry”.
- The planned Dollar Tree building may be supported by on shallow foundations consisting of conventional spread footings or a BRAB slab bearing on improved subgrades.
- The potential vertical movement (PVM) of soils in the site is estimated to be about 3 to 5 inches. Moisture conditioning is recommended to reduce the potential for vertical movements. Specific details on addressing these high plasticity and expansive clay soils are presented in the body of the report.
- It is recommended that ECS conduct a geotechnical review of the project plans (prior to issuance for construction) to check to see that ECS’ geotechnical recommendations have been properly interpreted and implemented.
- To prevent misinterpretation of ECS recommendations, ECS should be retained to perform quality control testing and documentation during construction of the earthwork and foundations for the project.

1.0 INTRODUCTION

The purpose of this study was to provide geotechnical information for earthwork and the design and construction of the foundation, floor slab, site retaining walls, and pavements for the planned commercial development to be located on the northeast quadrant of US-380 and Walmart Drive in Cross Roads, Texas. The recommendations developed for this report are based on project information provided by the client.

Our services were provided in accordance with ECS Proposal No. 19:12859-GPRev, dated October 31, 2022, and authorized by the client by providing the signed contract on November 02, 2022, which includes Clark, Geer, Latham & Associates, Inc. Subconsultant Agreement.

This report contains the procedures and results of our subsurface exploration and laboratory testing programs, review of existing site conditions, engineering analyses, and recommendations for the design and construction of the project.

The report includes the following items.

- A brief review and description of our field and laboratory test procedures and the results of testing conducted.
- A review of surface topographical features and site conditions.
- A review of area and site geologic conditions.
- A review of subsurface soil stratigraphy with pertinent available physical properties.
- A final copy of our soil test borings.
- General recommendations for building pad preparation to reduce active clay soil movements.
- Geotechnical design recommendations for suitable foundation systems.
- General recommendations for site preparation and construction of compacted fills, including an evaluation of on-site soils for use as compacted fills.
- General recommendations for site retaining walls.
- General recommendations for pavement design.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION/CURRENT SITE USE

The project site is located northeast quadrant of US-380 and Walmart Drive in Cross Roads, Texas. The project site is a vacant undeveloped lot covered with grass with sparse shrubs at the north side of the property, and a ditch on the west side of the property extending along Walmart Drive.

The site relatively flat that slopes down from west to east with maximum and minimum elevations of approximately EL +598 feet and EL +592 feet, respectively. The overall topographic relief is about 6 feet. The ground surface elevations noted in this report were obtained from NCTCOG (www.dfwmaps.com), which provided elevation contours in 2-foot intervals. The location is depicted in figure below and on the Site Location Diagram in Appendix A.



Figure 2.1.1. Site Location

2.2 PROPOSED CONSTRUCTION

The following information explains our understanding of the planned development including the proposed buildings and related infrastructure.

SUBJECT	DESIGN INFORMATION / ASSUMPTIONS
Development Area	1.55 acres
Usage	Dollar Tree building (1-story CMU 9,997 sf)
Foundation Loads	Assumed to be less than 200 kips
Lowest Finish Floor Elevation	Assumed to be within 2 feet of existing grade

If ECS' understanding of the project is not correct, especially if the structural loads are different, please contact ECS so that we may review these changes and revise our recommendations, as appropriate.

3.0 FIELD EXPLORATION AND LABORATORY TESTING

Our exploration procedures are explained in greater detail in Appendix B in the insert titled Subsurface Exploration Procedures. Our scope of work included drilling a total of nine (9) soil borings of approximately 5 to 20 feet below existing grades. The boring locations were selected by ECS, approved by the client, and identified in the field by ECS using the site plan provided. The approximate as-drilled boring locations are shown on the Boring Location Diagram in Appendix A.

3.1 SUBSURFACE CHARACTERIZATION

The regional parent geologic mapping indicates that the site is underlain by the Woodbine (Kwb) geologic formation. The residual soil of the Woodbine Formation can show nonhomogeneous stratigraphy. The primary components include sandy clay, fat clay, and clayey sand. The clays are typically not very thick but have very high shrink and swell potential. Sand and silts can also occur in the soil profile. Very hard Sandstones, in the form of boulders and discontinuous lenses (shelf rock) can also be encountered. The location of the site on the geologic map is provided in Appendix A of the report.

The subsurface conditions encountered were generally consistent with published geological mapping. The following sections provide generalized characterizations of the soil and rock strata. Please refer to the boring logs in Appendix B.

Table 3.1.1 Subsurface Stratigraphy

Approximate Depth to Bottom of Strata (ft)	Elevation of Bottom of Strata ⁽¹⁾ (ft)	Stratum	Description	Consistency/Condition
5 to 13	EL. +579 to +591	I	(CH) FAT CLAY/SANDY FAT CLAY, brown, yellowish brown, reddish brown, with sand seams	Very Stiff to Hard
10 ⁽²⁾	EL. +586	II	(SC) CLAYEY SAND, yellowish brown, reddish brown	Dense
20 ⁽³⁾	EL. +572 to +574	III	(CL) LEAN CLAY/SANDY LEAN, yellowish brown, reddish brown, dark brown, with sand seams	Very Stiff to Hard

Notes:

- (1) Please note that the ground surface elevations were obtained from NCTCOG (www.dfwmaps.com).
- (2) Encountered in B-02 only.
- (3) Borings B-01 through B-05 were terminated in this stratum at a depth of 20 feet.

A graphical presentation of the subsurface conditions is shown on the Generalized Subsurface Soil Profile, Section Line 1 included in Appendix A.

3.2 GROUNDWATER OBSERVATIONS

Groundwater level observations were made in the borings during drilling operations. In auger drilling operations, water is not introduced into the borehole and the groundwater position can often be determined by observing water flowing into and out of the excavation. Furthermore, visual observation of soil samples retrieved can often be used in evaluating the groundwater conditions.

Groundwater seepage was not observed in the borings during our drilling operations and is indicated on the boring logs as “dry”.

Any water observed in borings within this geologic setting is generally referred to as a partially perched condition. Specifically, rainfall that enters the site, either directly from overland flow or from adjacent properties, begins to percolate through surficial soils and within the sand seams and clay fissures and travels along that interface. This ground water remains trapped, or flow continues downhill with the water table occasionally surfacing to form wet springs and intermittent streams. Only in the low lying areas and adjacent to existing creeks, shallow groundwater table is present in a continuous condition.

The highest groundwater observations are normally observed in the late winter and early spring. Fluctuation in the location of the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff and other factors not immediately apparent at the time of this exploration. Therefore, the groundwater conditions at this site could be different at the time of construction. The possibility of groundwater level fluctuation should be considered when developing the design and construction plans for the project.

3.3 LABORATORY TESTING

The laboratory testing consisted of selected tests performed on samples obtained during our field exploration operations. Classification and index property tests were performed on representative soil samples. Testing performed include moisture content, Atterberg Limits, percent passing No. 200 sieve tests, and one-dimensional swell tests.

Each sample was visually classified on the basis of texture and plasticity in accordance with ASTM D2488 Standard Practice for Description and Identification of Soils (Visual-Manual Procedures) and including USCS classification symbols, and ASTM D2487 Standard Practice for Classification for Engineering Purposes (Unified Soil Classification System (USCS)). After classification, the samples were grouped in the major zones noted on the boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses along with the soil descriptions. The stratification lines between strata on the logs are approximate; in situ, the transitions may be gradual.

The soil samples will be retained in our laboratory for a period of 60 days, after which, they will be discarded unless other instructions are received as to their disposition.

4.0 DESIGN RECOMMENDATIONS

The following recommendations have been developed on the basis of the previously described project characteristics and subsurface conditions. If there are any changes to the project characteristics or if different subsurface conditions are encountered during construction, ECS should be consulted so that the recommendations of this report can be reviewed. Since site grading information was not available at the time of preparing this report; we have assumed that the proposed building will have a finished floor elevation within 2 feet of the existing site grade. If the finished floor elevation deviates from this assumed grade, the recommendations provided below should be evaluated by our office.

4.1 POTENTIAL VERTICAL MOVEMENTS

The soils encountered in the borings are highly expansive. These soils are susceptible to shrink swell tendencies, occurring seasonally, throughout the life of the structures with the changes in moisture content.

Based on test method TEX-124-E in the Texas Department of Transportation (TxDOT) Manual of Testing Procedures, laboratory swell tests and our experience with similar soils, we estimate potential vertical soil movements (PVM) of about 3 to 5 inches based on dry soil conditions. The actual movements could be greater if poor drainage, ponded water, and/or other unusual sources of moisture are allowed to saturate the soils beneath the structure after construction.

4.2 SUBGRADE IMPROVEMENTS

We are assuming that any imported fill soils will be similar to on-site soils. Higher PI soils or select fill soils, if imported, could impact the recommendations below. The total depth of improved zone should be considered from the finished floor elevation. In order to achieve a uniform PVM and minimize the risk associated with future movements, we recommend the subgrade under the proposed buildings be improved to reduce the PVM to 1.0 inch or less. Improvements to the soil subgrade can be achieved by reworking on-site soils with proper moisture/density control.

Subgrade Improvements			
Depth of Non-Expansive Fill ¹ (Inches)	Depth of Moisture Conditioning (feet)	Total Depth of Improved Zone (feet)	PVM (in)
12	9	10	1.0

¹ Select Fill or Flexible base material can be used as non-expansive fill cap. 8 inches of lime stabilized material can be used in lieu of select fill or flexible base material.

The subgrade improvements should extend at least 5 feet beyond the edge of the building pad and include any flatwork sensitive to movements such as sidewalks or pavements. Select fill should not be used outside of the building pad limits. Exterior grade beam backfill should consist of onsite moisture conditioned clay. For additional improvements to the long-term performance of the subgrades, a poly sheet may be placed over the moisture conditioned clay soils prior to the placement of the non-expansive fill material.

These design parameters assume that positive drainage will be provided away from the structures and with moderate irrigation of surrounding lawn and planter areas with no excessive wetting or drying of soils adjacent to the foundations. Greater potential movements could occur with extreme wetting or

drying of the soils due to ponding of water, plumbing leaks, or lack of irrigation. Recommendations for earthwork operations are found in the "Site Construction Recommendations" portion of this report.

4.3 FOUNDATION DESIGN

Based on the conditions encountered in the borings and planned structure type, we recommend the planned commercial buildings be supported on shallow foundations consisting of conventional spread footings or a BRAB slab bearing on improved subgrades.

The following sections provide recommendations for foundation design, pavements, slabs, seismic design parameters and retaining walls.

4.3.1 Shallow Footings – Design Parameters

The planned structures can be supported on a shallow footing foundation system if some movement can be tolerated in the foundation system, provided the subgrade soils are prepared as recommended to reduce the potential vertical movement (PVM) as discussed in **Section 4.2 Subgrade Improvements**. The design parameters for shallow footings are presented in the following table.

Shallow Footing Design Parameters

Design Parameter	Spread Footing	Continuous Footing
Net Allowable Bearing Pressure ⁽¹⁾	2,500 psf	2,000 psf
Acceptable Bearing Soil Material	Improved Clay Subgrade	Improved Clay Subgrade
Minimum Width	36 inches	24 inches
Minimum Footing Embedment Depth	2 feet below lowest adjacent final grade	
Ultimate passive pressure (triangular distribution) ^(2, 3)	245 psf/ft	245 psf/ft
Ultimate coefficient of sliding ⁽³⁾	0.36	0.36
Estimated Total Settlement	Less than 1- inch	Less than 1- inch
Estimated Differential Settlement	Less than ½ to ¾ inches between footings	Less than ½ to ¾ inches over 40 feet length

Notes:

- (1) The net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. No footing should be founded within a 45-degree plane from the base of the adjacent footing or excavation.
- (2) The side of the excavation for footings must be nearly vertical and concrete should be placed against these vertical faces. The upper 1-foot of the passive earth pressure should be neglected. In addition, the passive pressure should be ignored if the material in front of the wall will be excavated at any time in the future.
- (3) A minimum factor of safety of 1.5 is recommended against sliding.

4.3.2 Shallow Footings - Construction Considerations

Footing excavations should be protected from standing water or desiccation. The base of all foundation excavations should be free of water and loose soil and rock prior to placing concrete. Complete construction of a spread footing or a section of wall footing, including excavation, placement of steel and concrete, and backfilling should be completed in a reasonably continuous manner, preferably within 72 hours of excavation to reduce the disturbance to foundation bearing

material. A seal slab of footing strength concrete should be provided at the bottom of any footing which will remain open for more than 72 hours or if rain events are expected before footings are constructed.

Backfilling of footings should be accomplished using excavated material for footings and as soon as possible to reduce disturbance of foundation soils. Backfill should be placed at a minimum of 5 percentage points above optimum moisture content and compacted to at least 93% of the Maximum Dry Density as obtained using the Standard Proctor Method (ASTM D-698). Construction of footings should be inspected by a qualified geotechnical engineer to verify the bearing materials and to perform related observations and testing.

4.3.3 Monolithic Slab-On-Grade (BRAB)

As an alternative, provided that the subgrades are improved to a PVM of 1 inch or less, a monolithic slab-on-grade/grade beam foundation system may be used with a modulus of subgrade reaction (ks) of 100 pci for foundation at retail and restaurant buildings. This system may be designed with conventional reinforcing in accordance with WRI/CRSI "Design Slab-On-Ground Foundations" as follows:

BRAB Slab Parameters

Design Parameter	Design Values
Allowable Bearing Capacity	2,500
Design PI	42
Climatic Rating (Cw)	20
Unconfined Compressive Strength (tsf)	2.0
Soil-Climate Support Index (1-C)	0.32

A net allowable soil bearing pressure of 2,500 psf can be used to design grade beams founded on the reworked existing soils as described in the section titled "Earthwork Operations". Beams should have a minimum width of 24 inches to reduce the possibility of foundation bearing failure and excessive settlement due to local shear or "punching" failures. Additionally, the beams should extend at least 24 inches below final adjacent grade to utilize this bearing pressure.

These design parameters assume that positive drainage will be provided away from the structure and with moderate irrigation of surrounding lawn and planter areas with no excessive wetting or drying of soils adjacent to the foundations. Greater potential movements could occur with extreme wetting or drying of the soils due to ponding of water, plumbing leaks, or lack of irrigation.

The settlement of a structure is a function of the compressibility of the bearing materials, bearing pressure, actual structural loads, fill depths, and the bearing elevation of footings with respect to the final ground surface elevation. Estimates of settlement for foundations bearing on engineered or non-engineered fills are strongly dependent on the quality of fill placed. Factors that may affect the quality of fill include maximum loose lift thickness of the fills placed and the amount of compactive effort placed on each lift. We anticipate settlement on the order of 1 inch or less provided the recommendations of this report are followed.

If floor treatments that are sensitive to moisture will be used, a vapor barrier of polyethylene sheeting or similar material should be placed beneath the slab to minimize moisture migration through the slab. If a vapor barrier is considered to provide moisture protection, special attention should be given to the surface curing of the slabs to minimize uneven drying of the slabs and associated cracking and/or slab curling. The use of a blotter or cushion layer above the vapor barrier can also be considered for project specific reasons. Please refer to ACI 302.1R96 Guide for Concrete Floor and Slab Construction and ASTM E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs for additional guidance on this issue.

4.5 BUILDING PERIMETER CONDITIONS

Soils placed along the exterior of the structures should be on-site clay soils placed and compacted to at least 93% of the Maximum Dry Density at a minimum of 5 percentage points above optimum moisture content as obtained using the Standard Proctor Method (ASTM D698). The purpose of this clay backfill is to reduce the opportunity for surface or subsurface water infiltration beneath the structure. Additionally, where penetrations into the structure occur, a clay plug (or suitable synthetic alternative) should be placed at the building line to reduce the opportunity for infiltrating water, regardless of the backfill material. A typical clay plug detail is provided in Appendix D of the report.

Positive drainage away from the structures should also be provided. Additionally, irrigation of lawn and landscaped areas should be moderate, with no excessive wetting or drying of soils around the perimeter of the structures allowed. Trees and bushes/shrubs planted near the perimeter of the structure can withdraw large amounts of water from the soils and should be planted at least their anticipated mature height away from the building.

Where flatwork is placed against or near the structure, a positive seal must be installed and adequately maintained to minimize water intrusion. Down spouts and gutters should be used to collect and distribute water at least 10 feet away from the structure. Routine maintenance is required to ensure that the recommendations contained in this report are followed and maintained. Greater potential movements could occur with extreme wetting or drying of the soils due to poor drainage, ponding of water, plumbing leaks, lack of irrigation, and/or lack of routine maintenance, etc.

4.6 SEISMIC DESIGN CONSIDERATIONS

Seismic Site Classification: The International Building Code (IBC) 2018 requires site classification for seismic design based on the upper 100 feet of a soil profile. At least two methods are utilized in classifying sites, namely the shear wave velocity (v_s) method and the Standard Penetration Resistance (N-value) method. The Standard Penetration Resistance (N-value) method was used in classifying this site.

SEISMIC SITE CLASSIFICATION			
Site Class	Soil Profile Name	Shear Wave Velocity, V_s , (ft./s)	N value (bpf)
A	Hard Rock	$V_s > 5,000$ fps	N/A
B	Rock	$2,500 < V_s \leq 5,000$ fps	N/A
C	Very dense soil and soft rock	$1,200 < V_s \leq 2,500$ fps	>50

SEISMIC SITE CLASSIFICATION			
Site Class	Soil Profile Name	Shear Wave Velocity, V_s , (ft./s)	N value (bpf)
D	Stiff Soil Profile	$600 \leq V_s \leq 1,200$ fps	15 to 60
E	Soft Soil Profile	$V_s < 600$ fps	<15

Based upon our interpretation of the subsurface conditions, the appropriate Seismic Site Classification is "D" as shown in the preceding table.

Ground Motion Parameters: In addition to the seismic site classification, ECS has determined the design spectral response acceleration parameters following the IBC methodology. The Mapped Responses were estimated from the USGS website. The design responses for the short (0.2 sec, S_{DS}) and 1-second period (S_{D1}) are noted in bold at the far right end of the following table.

GROUND MOTION PARAMETERS [IBC 2015 Method]							
Period (sec)	Mapped Spectral Response Accelerations (g)		Values of Site Coefficient for Site Class		Maximum Spectral Response Acceleration Adjusted for Site Class (g)		Design Spectral Response Acceleration (g)
Reference	Figures 1613.3.1 (1) & (2)		Tables 1613.3.3 (1) & (2)		Eqs. 16-37 & 16-38		Eqs. 16-39 & 16-40
0.2	S_s	0.113	F_a	0.8	$S_{MS}=F_a S_s$	0.091	$S_{DS}=2/3 S_{MS}$ 0.06
1.0	S_1	0.055	F_v	0.8	$S_{M1}=F_v S_1$	0.044	$S_{D1}=2/3 S_{M1}$ 0.03

The Site Class definition should not be confused with the Seismic Design Category designation which the Structural Engineer typically assesses. If a higher site classification is beneficial to the project, we can provide additional testing methods that may yield more favorable results.

4.7 PAVEMENT SECTIONS – PRIVATE DRIVES AND PARKING

As previously noted, the PVM of this site is estimated to be on the order of 3 to 5 inches. Should these movements be unacceptable for the pavements, the recommendations included in this report to achieve more desirable future movements should be followed.

Both asphalt pavement and Portland cement concrete pavement can be used for parking lots and drives. Typical pavement sections are provided below. The Standard Duty and Medium Duty asphalt pavements with lime stabilization are suitable for design life of 50,000 and 100,000 ESAL, respectively. The Standard Duty and Medium Duty concrete pavements with lime stabilization are suitable for design life of 80,000 and 200,000 ESAL, respectively.

Please note that the recommended pavement sections provided below are considered the minimum necessary to provide satisfactory performance. In some cases, jurisdictional minimum standards for pavement section construction may exceed those provided below.

Pavement Sections

Material Description	Asphaltic Concrete Pavement		Portland Cement Concrete (PCC) Pavement		
	Standard Duty	Medium Duty	Standard Duty	Medium Duty	Dumpster Area
Asphalt Surface Course	2 inches	2 inches	--	--	--
Asphalt Binder Course ¹	3 inches	4 inches	--	--	--
Portland Cement Concrete	--	--	5 inches	6 inches	7 inches
Subgrade ²	6 inches lime stabilized	6 inches Lime stabilized	6 inches compacted soil	6 inches lime stabilized	6 inches lime stabilized
Notes: <ol style="list-style-type: none"> 1. Flexible base material may be substituted for the asphalt binder using a substitute ratio of three inches of flexible base for each inch of asphalt binder. 2. Flexible base materials may be substituted with the lime stabilization at an equivalent thickness substitution. 3. In lieu of lime stabilization, pavement concrete thickness can be increased by one (1) inch. 					

Please note, the recommended pavement sections provided above are considered the minimum necessary to provide satisfactory performance based on the provided traffic loading. In some cases, jurisdictional minimum standards for pavement section construction may exceed those provided above.

For the design and construction of pavement, the subgrade should be prepared in accordance with the recommendations in the "Earthwork Operations" section of the original report. An important consideration with the design and construction of pavements is surface and subsurface drainage. Where standing water develops, either on the pavement surface or within the base course layer, softening of the subgrade and other problems related to the deterioration of the pavement can be expected. Furthermore, good drainage should reduce the possibility of the subgrade materials becoming saturated during the normal service period of the pavement.

A preliminary lime application rate of 8% hydrated lime by dry weight of clay should be used for budgeting purposes. The lime stabilized clay should be thoroughly mixed and appropriately mellowed for at least 48 hours and tested for gradation and lime solubility (pH) prior to final placement and compaction. Prior to using lime, sulfate testing should be performed to determine the amount of sulfates and whether or not lime is suitable for use or if additional mixing or mellowing is required.

Once appropriately mixed and mellowed, this material may then be placed and compacted, in 8 inch loose lifts, at workable moisture contents 3 percentage points above the optimum moisture content and compacted to at least 95% of the Maximum Dry Density as obtain using the Standard Proctor Method (ASTM D-698). Lime treatment should extend at least 1 foot beyond exposed pavement edges to reduce the effects of shrinkage and associated loss of subgrade support. Density tests should be performed at a frequency of 1 test per 5,000 square feet of pavement. The actual amount of lime required should be confirmed by additional laboratory tests (lime series) during the construction phase.

All proposed paved areas should be proof rolled with heavy compaction equipment to attempt to locate any soft or undesirable soils so they can be removed and replaced with properly placed and compacted soils.

Pavement should be specified, constructed, and tested to meet the following requirements:

1. Reinforcing steel may consist of #3 reinforcing steel bars placed at 18 inches on center each way. The reinforcing steel should be placed at mid-point of the pavement section.
2. Hot Mix Asphaltic Concrete: Item 340 of the TxDOT Standard Specifications, Type A or B Base Course (binder), Type D Surface Course. The coarse aggregate in the surface course should be crushed limestone rather than gravel.
3. Portland cement Concrete: Minimum compressive strength of 3,600 psi (28 Days). Concrete should be designed with 3 to 6 percent entrained air.
4. Flexible Base Material: Item 247 of the TxDOT Standard Specifications, Type D, Grade 1 or 2. The material should be compacted to a minimum 95 percent of standard Proctor maximum dry density (ASTM D 698) and within three percentage points of the material's optimum moisture content.

Proper joint placement and design is critical to pavement performance. Load transfer at all joints and maintenance of watertight joints should be accomplished by use of proper joint seals and dowels. Control joints in new pavement should be sawed as soon as practical and preferably within 5 to 12 hours after placing concrete in order to control the location of cracks which form as the concrete cures. Longitudinal and transverse control joints should be sawed at about 15-foot spacing. Joints should be properly cleaned and sealed as soon as possible to avoid infiltration of water, small gravel, etc.

4.8 RETAINING WALL DESIGN CONSIDERATIONS

Typically, site retaining walls are free to rotate at the top (not restrained). For these walls, the "Active" (k_a) soil condition should be used along with a triangular distribution of earth pressures. In addition, site retaining walls should be designed to withstand lateral earth pressures exerted by the backfill and any surcharge loads within the "Critical Soil Zone". The Critical Zone is defined as the area between the back of the retaining wall footing and an imaginary line projected upward and rearward at a 45-degree angle (see figure below).

The lateral earth pressures developed behind site retaining walls are a function of the backfill soil type, backfill slope angle, and any surcharge loads. For the design of site retaining walls, we recommend the soil parameters provided below.

RETAINING WALL BACKFILL IN THE CRITICAL SOIL ZONE		
Soil Parameter	Estimated Value	Estimated Value
Soil Classification	Select Fill	On-Site Soils
Coefficient of Active Earth Pressure (K_a)	0.29	0.59
Retained Soil Moist Unit Weight (γ)	125 pcf	120 pcf
Cohesion (C) psf	--	100 psf

RETAINING WALL BACKFILL IN THE CRITICAL SOIL ZONE		
Soil Parameter	Estimated Value	Estimated Value
Angle of Internal Friction (ϕ)	32°	18°
Active Equivalent Fluid Density (pcf)	40	70

FOUNDATION SOILS	
Soil Parameter	Estimated value
Allowable Soil Bearing Pressure	2,000 psf
Minimum Wall Embedment Below Grade	24 inches
Coefficient of Passive Earth Pressure (K_p)	1.9
Soil Moist Unit Weight (γ)	120 pcf
Cohesion (C)	100 psf
Interface Friction Angle [Concrete on Soil] (ϕ_i)	18°
Sliding Friction Coefficient [Concrete on Soil] (μ)	0.32
Passive Equivalent Fluid Pressure	228H (psf)

It is critical that the soils used for backfilling of the retaining walls meet the soil parameters recommended above. If the soils available do not meet those parameters, then ECS should be contacted to provide revised values, and to confirm that only suitable soils will be used for wall backfill.

Care should be used to avoid the operation of heavy equipment to compact the wall backfill since it may overload and damage the wall. In addition, such loads are not typically considered in the design of site retaining walls and are not provided for in our recommendations.

Wall Drainage: Retaining walls should be provided with a wall and foundation drainage system to relieve hydrostatic pressures which may develop behind the walls. This system should consist of weepholes through the wall and/or a 4-inch perforated, closed joint drain line located along the backside of the walls above the top of the footing. The drain line should be surrounded by a minimum of 6 inches of AASHTO #57 Stone wrapped with an approved non-woven geotextile, such as Mirafi 140-N or equivalent. Wall drains can consist of a 12-inch wide zone of free draining gravel, such as AASHTO #57 Stone, employed directly behind the wall and separated from the soils beyond with a non-woven geotextile. Alternatively, the wall drain can consist of a suitable geocomposite drainage board material. The wall drain should be hydraulically connected to the foundation drain.

5.0 SITE CONSTRUCTION RECOMMENDATIONS

5.1 SUBGRADE PREPARATION

In a dry and undisturbed state, the upper 1-foot of the majority of the soil at the site should provide good subgrade support for fill placement and construction operations. However, when wet, this soil will degrade quickly with disturbance from contractor operations. Therefore, good site drainage should be maintained during earthwork operations, which should help maintain the integrity of the soil.

The surface of the site should be kept properly graded in order to enhance drainage of the surface water away from the proposed structures during the construction phase. We recommend that an attempt be made to enhance the natural drainage without interrupting its pattern, where possible. The soils at the site are moisture and disturbance sensitive and contain fines which are considered moderately erodible.

Therefore, the contractor should carefully plan his operation to limit exposure of the subgrade to weather and construction equipment traffic and provide and maintain good site drainage during earthwork operations. All erosion and sedimentation shall be controlled in accordance with sound engineering practice and current jurisdictional requirements.

5.1.1 Stripping and Grubbing

The subgrade preparation should consist of stripping all existing vegetation, topsoil, loose, poorly compacted, or deleterious existing soils, existing fill (as defined in this report), and any soft or unsuitable materials from the 5-foot expanded building area, and any areas receiving new fill. Deeper topsoil or organic laden soils may be present in wet, low-lying, and poorly drained areas. ECS should be retained to verify that topsoil and unsuitable surficial materials have been removed prior to the placement of structural fill or construction of structures.

5.1.2 Proofrolling (Soil Subgrades)

Prior to fill placement or other construction on subgrades, the subgrades should be evaluated by an ECS field technician. The exposed subgrade should be thoroughly proofrolled with construction equipment having a minimum axle load of 10 tons [e.g. fully loaded tandem-axle dump truck]. Proofrolling should be traversed in two perpendicular directions with overlapping passes of the vehicle under the observation of an ECS technician. This procedure is intended to assist in identifying any localized yielding materials.

Where proofrolling identifies areas that are unstable or “pumping” subgrade those areas should be repaired prior to the placement of any subsequent Structural Fill or other construction materials. Methods of stabilization include undercutting, moisture conditioning, or chemical stabilization. The situation should be discussed with ECS to determine the appropriate procedure. Test pits may be excavated to explore the shallow subsurface materials to help in determining the cause of the observed unstable materials, and to assist in the evaluation of appropriate remedial actions to stabilize the subgrade.

5.1.3 Site Temporary Dewatering

Based upon our subsurface exploration at this site, we believe construction dewatering at this site will be mainly limited to removing accumulated rainwater from low lying areas and some minor seepage.

Temporary sump pits can be used and established at an elevation below the bottom of the excavation subgrade. A perforated 55 gallon drum or other temporary structure could be used to house the pump.

Details of a typical French drainage installation are included in Appendix D. A typical French drain consists of an 18 to 24-inch wide by 18 to 24-inch deep bed of AASHTO #57 stone wrapped in a medium duty, non-woven geotextile. Actual dimensions should be as determined necessary during construction. After the installation has been completed, the geotextile should be wrapped over the top of the gravel followed by placement of backfill.

5.2 EARTHWORK OPERATIONS

The following sections describe soil reusability, and requirements for fill placement and utility installation.

5.2.1 Fill Placement

Prior to placement of any new fill or other construction material, subgrade soils should be scarified to a minimum depth of 8 inches, moisture conditioned to a workable moisture content at or above the optimum value and compacted to at least 95% of Maximum Dry Density as obtained by the Standard Proctor Method (ASTM D-698).

Fill material in the building pad areas should not have a Plasticity Index (PI) of greater than the material encountered onsite and should be approved by ECS prior to its use. Details regarding select fill and moisture conditioning are presented in the "Materials Specifications" section of this report.

Soil moisture levels should be preserved (by various methods that can include covering with plastic, watering, etc.) until new fill, pavements, or slabs are placed. Fill soils should be placed in maximum 8 inch loose lifts for mass grading operations and maximum 4 inches for trench type excavations where walk behind or "jumping jack" compaction equipment is used.

Upon completion of the filling operations, care should be taken to maintain the soil moisture content prior to construction of floor slabs and/or pavements. If the soil becomes desiccated, the affected material should be removed and replaced, or these materials should be scarified, moisture conditioned and recompacted.

5.2.2 Utility Installation

Utility cuts should not be left open for more than 24 hours or during times when precipitation is anticipated and should be properly backfilled. Backfilling should be accomplished with properly compacted on-site soils, rather than granular materials. If granular materials are used, a utility trench cut-off at the building line is recommended to help prevent water from migrating through the utility trench backfill to beneath the proposed structure.

5.2.3 Earthwork Testing

Field density and moisture tests should be performed by ECS on each lift as necessary to verify that adequate compaction is achieved. One test per 2,500 square feet per lift and 5,000 square feet per lift is recommended in the future building and private paving areas, respectively (two tests minimum per lift). Utility trench backfill should be tested at a rate of one test per lift per each 150 linear feet of trench (two tests minimum per lift). Certain jurisdictional requirements may require testing in addition to that noted previously. Therefore, these recommendations should be reviewed, and the more stringent specifications should be followed.

5.3 MATERIAL SPECIFICATIONS

The recommendations provided in the "Subgrade Improvements" portion of this report outline the subgrade improvement options required in order to achieve the desired PVM. This section is intended to outline the material requirements of those recommendations.

5.3.1 Moisture Conditioning

Within the planned pads and flatwork sensitive to movements, moisture conditioning should be performed as outlined in this report. Reworking of the existing clays, and new clayey fill, is performed to increase the moisture of the clays to a level that reduces their ability to absorb additional water that could result in post-construction heave in these soils.

The moisture conditioning should consist of undercutting, scarifying and/or reworking, as required to achieve the required subgrade improvement. During this process, the clay should receive adequate amounts of water to attain an even moisture content of at least +5% or higher above the optimum moisture content. During the addition of water, the soils should be adequately mixed, and re-mixed, to achieve an even distribution of the moisture throughout the soil mass. Once appropriately mixed, the material should be compacted to at least 93% of the Maximum Dry Density as obtained using the Standard Proctor Method (ASTM D-698).

Outside of the moisture conditioned zone and where clay is used to establish site grades, we recommend that this material be placed and compacted to at least 95% of the Maximum Dry Density as obtained using the Standard Proctor Method (ASTM D-698). These soils should be free of deleterious materials and be reworked to achieve an even distribution of water in order to achieve a moisture content of +2% of the material optimum moisture content. Care should be taken to verify and preserve the specified moisture levels in the reworked clays.

5.3.2 Select Fill

For the purposes of this report, select fill may consist of on site or imported material that is free of debris and organic matter and has a Plasticity Index (PI) less than 15, and contain 40 to 70 percent passing the No. 200 sieve.

Crushed limestone, or crushed concrete, may be used for this purpose. The crushed material used for this process should have a minimum Dry Density of 115 pcf. The PI of this material should be evaluated by ECS at the time of construction and may largely be based on the granularity of the material, rather than the PI. The crushed material should have a maximum dimension of 2 inches.

This material should be placed and compacted at workable moisture contents above the optimum moisture content and compacted to at least 95% of the Maximum Dry Density as obtain using the Standard Proctor Method (ASTM D-698).

5.3.3 Flexible Base

Flexible base should meet the requirements of TxDOT Item 247, Type D, Grade 1 or 2. Recycled concrete meeting the gradation requirements of flexible base is also acceptable for use. The flexible base and recycled concrete should be compacted to 95% of maximum dry density at or above the optimum moisture content as obtained using the Standard Proctor Method (ASTM D-698).

5.3.4 Lime Stabilized Material

In lieu of importing select fill or flexible base, as defined above, the on-site clay soils may be lime stabilized. The advantage to lime stabilization over untreated fill is the nearly "weatherproof" nature of the soil and once placed and compacted the material essentially retains the virtually impermeable nature of the parent clay, limiting water infiltration beneath the building.

A preliminary lime application rate of 8% hydrated lime by dry weight of clay should be used for budgeting purposes. The lime stabilized clay should be carefully mixed and appropriately mellowed for at least 48 hours and tested for gradation and lime reactivity (pH) prior to final placement and compaction. Prior to using lime, sulfate testing should be performed to determine the amount of sulfates and whether or not lime is suitable for use or if additional mixing or mellowing is required.

Once appropriately mixed and mellowed, this material may then be placed and compacted at workable moisture contents at least +3% above the optimum moisture content and compacted to at least 95% of the Maximum Dry Density as obtain using the Standard Proctor Method (ASTM D-698).

5.4 CONSTRUCTION GROUNDWATER CONTROL

Excavations performed at this site, especially those in the relatively low areas of the site, may encounter water. These conditions should be anticipated and can be handled through the use of trenching and pumping. One of the more cost effective techniques that can be utilized is through the prudent utilization of spot drains, and in planning utility installations. For example, any utility installation that requires a gravity feed can be effectively converted into a drainage line to help assist in groundwater control during construction.

As a minimum, the gravel bedding of utility lines can be converted into French Drains by encapsulating the gravel bedding stone in an appropriate filter fabric. In this manner, the blasting and/or trenching operations required to install the utility help intercept near surface perched water and canalize the flow. Naturally, these changes in the utility installation should be coordinated with the appropriate jurisdictional authorities. Furthermore, it is important that final outlet conditions for these drainage systems be considered in design. That is, if the entire utility installation is converted to a French Drain, for example, the end of run can have severe wetness and water problems. Therefore, intercepting French Drains may be required to "bleed off" the water flow and redirect it into storm water drain lines, or surface impoundments.

5.5 FOUNDATION AND SLAB OBSERVATIONS

Protection of Foundation Excavations: Exposure to the environment may weaken the soils in foundations if the foundation excavations remain open for too long a time. Therefore, foundation concrete should be placed immediately after the excavation has been completed, cleaned, and observed. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation immediately prior to placement of concrete.

5.6 UTILITY INSTALLATIONS

Utility Subgrades: The soils encountered in our exploration are expected to be generally acceptable for support of utility pipes. The pipe subgrades should be observed and probed for stability by ECS. Any loose or yielding materials encountered should be removed and replaced with acceptable material.

Utility Backfilling: The granular bedding material (often AASHTO #57 stone) should be at least 4 inches thick, but not less than that specified by the civil engineer's project drawings and specifications. We recommend that the bedding materials be placed up to the spring line of the pipe. Fill placed for support of the utilities, as well as backfill over the utilities, should satisfy the project requirements.

Excavation Safety: All excavations and slopes should be constructed and maintained in accordance with OSHA excavation safety standards. The contractor is solely responsible for designing, constructing, and maintaining stable temporary excavations and slopes. The contractor's responsible person, as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations. ECS is providing this information solely as a service to our client. ECS is not assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

6.0 CLOSING

ECS has prepared this report of findings, evaluations, and recommendations to guide geotechnical-related design and construction aspects of the project. In fulfilling our obligations and responsibilities, as listed in the proposal, we performed these services in accordance with the standard of care expected of professionals in the industry performing similar services on projects of like size and complexity at this time in the region. No other representation expressed or implied, and no warranty or guarantee is included or intended in this report. ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

The description of the proposed project is based on information provided to ECS by the project design team. If any of this information is inaccurate, either due to our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted so that we can review the report in light of the changes and provide additional or alternate recommendations as may be required.

We recommend that ECS review the project's plans and specifications so that we may evaluate those plans/specifications with the intent of the geotechnical report.

Field observations, monitoring, and quality assurance testing during earthwork and foundation installation are an extension of and integral to the geotechnical design recommendations. We recommend that the Owner retain ECS throughout construction.

ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

APPENDIX A – Diagrams & Reports

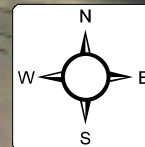
Site Location Diagram
Boring Location Diagram
Subsurface Soil Profile
Geologic Survey Map



SITE LOCATION DIAGRAM DOLLAR TREE

NEQ US-380 AND WALMART DRIVE, CROSS ROADS, TEXAS
CLARK, GEER, LATHAM & ASSOCIATES, INC.

ENGINEER MPB1
SCALE AS NOTED
PROJECT NO. 19:8994
FIGURE 1 OF 1
DATE 11/10/2022



Legend



Approximate Boring Location - Building



Approximate Boring Location - Pavement



BORING LOCATION DIAGRAM DOLLAR TREE

NEQ US-380 AND WALMART DRIVE, CROSS ROADS,
CLARK, GEER, LATHAM & ASSOCIATES, INC.

ENGINEER
MPB1

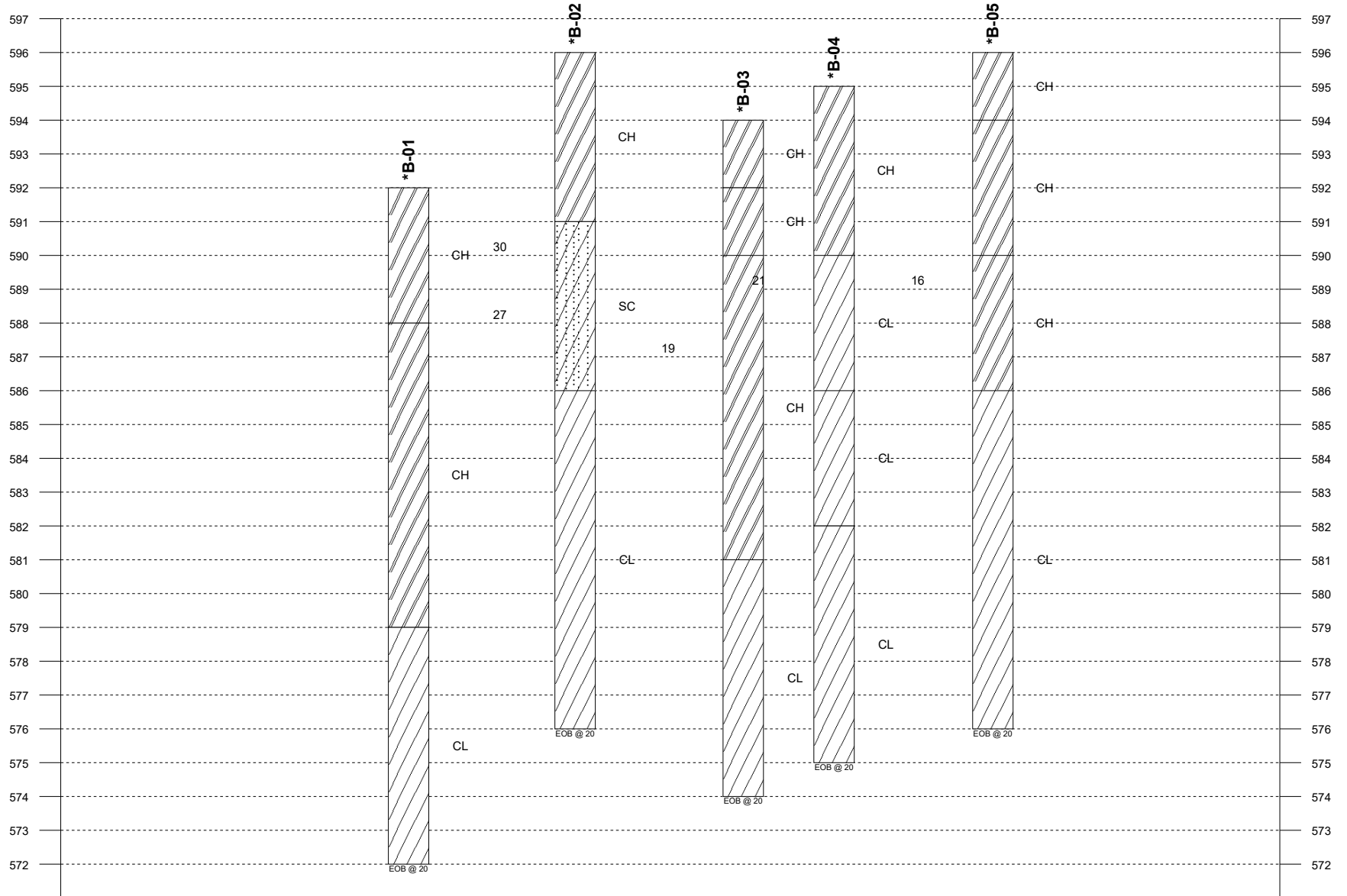
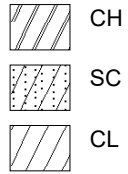
SCALE
AS NOTED

PROJECT NO.
19:8994

FIGURE
1 OF 1


DATE
11/10/2022

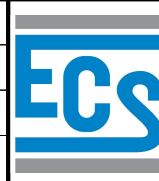
Legend Key



Notes:

1- EOB: END OF BORING AR: AUGER REFUSAL SR: SAMPLER REFUSAL
 2- THE NUMBER BELOW THE STRIPS IS THE DISTANCE ALONG THE BASELINE.
 3- SEE INDIVIDUAL BORING LOG AND GEOTECHNICAL INFORMATION.
 4- STANDARD PENETRATION TEST RESISTANCE (LEFT OF BORING) IN BLOWS PER FOOT (ASTM D1586).

Plastic Limit X	Water Content ●	Liquid Limit Δ	∇ WL (First Encountered)		Fill
[FINES CONTENT %]			▼ WL (Completion)		Possible Fill
 BOTTOM OF CASING			∇ WL (Seasonal High Water)		Probable Fill
 LOSS OF CIRCULATION			∇ WL (Stabilized)		Rock



GENERALIZED SUBSURFACE SOIL PROFILE Section line 1	
Dollar Tree	
Clark, Geer, Latham & Associates, Inc.	
NEQ US-380 and Walmart Drive, Cross Roads, Texas, 76227	
Project No:	19-8994
Date:	03/23/2023



GEOLOGIC SURVEY MAP DOLLAR TREE

NEQ US-380 AND WALMART DRIVE, CROSS ROADS, TEXAS
CLARK, GEER, LATHAM & ASSOCIATES, INC.

ENGINEER MPB1
SCALE AS NOTED
PROJECT NO. 19:8994
FIGURE 1 OF 1
DATE 11/10/2022

APPENDIX B – Field Operations

Reference Notes for Boring Logs
Subsurface Exploration Procedures
Boring Logs



REFERENCE NOTES FOR BORING LOGS

MATERIAL^{1,2}

	ASPHALT
	CONCRETE
	GRAVEL
	TOPSOIL
	VOID
	BRICK
	AGGREGATE BASE COURSE
	GW WELL-GRADED GRAVEL gravel-sand mixtures, little or no fines
	GP POORLY-GRADED GRAVEL gravel-sand mixtures, little or no fines
	GM SILTY GRAVEL gravel-sand-silt mixtures
	GC CLAYEY GRAVEL gravel-sand-clay mixtures
	SW WELL-GRADED SAND gravelly sand, little or no fines
	SP POORLY-GRADED SAND gravelly sand, little or no fines
	SM SILTY SAND sand-silt mixtures
	SC CLAYEY SAND sand-clay mixtures
	ML SILT non-plastic to medium plasticity
	MH ELASTIC SILT high plasticity
	CL LEAN CLAY low to medium plasticity
	CH FAT CLAY high plasticity
	OL ORGANIC SILT or CLAY non-plastic to low plasticity
	OH ORGANIC SILT or CLAY high plasticity
	PT PEAT highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS

SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION

DESIGNATION	PARTICLE SIZES
Boulders	12 inches (300 mm) or larger
Cobbles	3 inches to 12 inches (75 mm to 300 mm)
Gravel: Coarse	¾ inch to 3 inches (19 mm to 75 mm)
Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand: Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")	<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS

UNCONFINED COMPRESSIVE STRENGTH, QP ⁴	SPT ⁵ (BPF)	CONSISTENCY ⁷ (COHESIVE)
<0.25	<2	Very Soft
0.25 - <0.50	2 - 4	Soft
0.50 - <1.00	5 - 8	Firm
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

RELATIVE AMOUNT ⁷	COARSE GRAINED (%) ⁸	FINE GRAINED (%) ⁸
Trace	≤5	≤5
With	10 - 20	10 - 25
Adjective (ex: "Silty")	25 - 45	30 - 45

GRAVELS, SANDS & NON-COHESIVE SILTS

SPT ⁵	DENSITY
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

WATER LEVELS⁶

	WL (First Encountered)
	WL (Completion)
	WL (Seasonal High Water)
	WL (Stabilized)

FILL AND ROCK

FILL	POSSIBLE FILL	PROBABLE FILL	ROCK

¹Classifications and symbols per ASTM D 2488-17 (Visual-Manual Procedure) unless noted otherwise.

²To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.

³Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-FILL)].

⁴Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).

⁵Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf). SPT correlations per 7.4.2 Method B and need to be corrected if using an auto hammer.

⁶The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.

⁷Minor deviation from ASTM D 2488-17 Note 14.

⁸Percentages are estimated to the nearest 5% per ASTM D 2488-17.

SUBSURFACE EXPLORATION PROCEDURE




The field exploration was planned with the objective of characterizing the project site in general geotechnical and geological terms and to evaluate subsequent field and laboratory data to assist in the determination of geotechnical recommendations.

The subsurface conditions were explored by drilling a total of nine (9) borings. Five (5) borings for proposed Dollar Tree building (B-01 through B-05) were drilled to depths of 20 feet below the existing grade. Four (4) borings for the pavement (B-06 and B-09) were drilled to a depth of 5 feet below the existing grade. A truck-mounted drill rig with continuous flight augers was utilized to drill the borings.

The boring locations were determined by and identified in the field by ECS personnel using the supplied diagram. The approximate as-drilled boring locations are shown on the Boring Location Diagram in Appendix A. The ground surface elevations noted in this report were obtained from NCTCOG (www.dfwmaps.com), which provided elevation contours in 2-foot intervals.

Representative soil samples were obtained by means of the split-barrel and Shelby tube sampling procedures in accordance with ASTM Specifications D-1586 and D-1587, respectively. In the split-barrel sampling procedures, a 2-inch O.D., and split-barrel sampler is driven into the soil a distance of 18 inches by means of a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler through 12-inch intervals is termed the Standard Penetration Test (SPT) value and is indicated for each sample on the boring log. In the Shelby tube sampling procedure, a thin walled, steel, seamless tube with sharp cutting edges is pushed hydraulically into the soil, and a relatively undisturbed sample is obtained.




Field log of the soils encountered in the boring was maintained by the drill crew. After recovery, each geotechnical soil sample was removed from the sampler and visually classified. Representative portions of each soil sample were then wrapped in plastic and transported to our laboratory for further visual examination and laboratory testing. After completion of the drilling operations, the borehole was backfilled with auger cuttings to the existing ground surface.









CLIENT: Clark, Geer, Latham & Associates, Inc.				PROJECT NO.: 19:8994		BORING NO.: B-01		SHEET: 1 of 1				
PROJECT NAME: Dollar Tree				DRILLER/CONTRACTOR: Total Depth								
SITE LOCATION: NEQ US-380 and Walmart Drive, Cross Roads, Texas, 76227								LOSS OF CIRCULATION 				
NORTHING: 7132895.2		EASTING: 2432572.0		STATION:		SURFACE ELEVATION: 592.00		BOTTOM OF CASING 				
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT		LIQUID LIMIT PLASTIC LIMIT	
									ROCK QUALITY DESIGNATION & RECOVERY		CALIBRATED PENETROMETER TSF	
									20 40 60 80 100		1 2 3 4 5	
	S-1	ST	24	24	(CH) FAT CLAY, brown, reddish brown moist, hard, with sand seams							
	S-2	ST	24	24								
5	S-3	ST	24	24	(CH) SANDY FAT CLAY, yellowish brown, dark brown, moist, hard		587					
	S-4	ST	24	24								
	S-5	ST	24	24			582					
10												
	S-6	ST	24	24	(CL) SANDY LEAN CLAY, yellowish brown, reddish brown, moist, hard		577					
15												
	S-7	ST	24	24			572					
20					END OF BORING AT 20 FT							
25							567					
30							562					
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL												
<input checked="" type="checkbox"/> WL (First Encountered)		Dry		BORING STARTED: Mar 07 2023				CAVE IN DEPTH:				
<input checked="" type="checkbox"/> WL (Completion)		Dry		BORING COMPLETED: Mar 07 2023				HAMMER TYPE: Auto				
<input checked="" type="checkbox"/> WL (Seasonal High Water)				EQUIPMENT: Truck				LOGGED BY: MEP				
<input checked="" type="checkbox"/> WL (Stabilized)								DRILLING METHOD: CFA				
GEOTECHNICAL BOREHOLE LOG												









CLIENT: Clark, Geer, Latham & Associates, Inc.						PROJECT NO.: 19:8994		BORING NO.: B-02		SHEET: 1 of 1	
PROJECT NAME: Dollar Tree						DRILLER/CONTRACTOR: Total Depth					
SITE LOCATION: NEQ US-380 and Walmart Drive, Cross Roads, Texas, 76227										LOSS OF CIRCULATION 	
NORTHING: 7132881.4			EASTING: 2432640.6			STATION:		SURFACE ELEVATION: 596.00		BOTTOM OF CASING 	
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	⊗ STANDARD PENETRATION BLOWS/FT		△ LIQUID LIMIT
									ROCK QUALITY DESIGNATION & RECOVERY		×
									20 40 60 80 100	○ CALIBRATED PENETROMETER TSP	1 2 3 4 5
										— RQD	● WATER CONTENT % [FINES CONTENT] %
										— REC	10 20 30 40 50
	S-1	ST	24	24	(CH) FAT CLAY, brown, yellowish brown, moist, very stiff to hard, with sand seams						○ 2.00
	S-2	ST	24	24							○ 4.50
5	S-3	ST	12	12			591	26-16-14 (30)	⊗ 30		○ 4.50
	S-4	SS	18	18	(SC) CLAYEY SAND, yellowish brown, reddish brown, moist, dense			10-11-16 (27)	⊗ 27		○ 4.50
	S-5	SS	18	18							● 11.3 [34.1%]
10	S-6	ST	12	12			586				○ 4.50
					(CL) SANDY LEAN CLAY, yellowish brown, light gray, moist, hard, with sand with sand seams						○ 4.50
15	S-7	ST	24	24			581				○ 4.50
											○ 4.50
20	S-8	ST	24	24			576				○ 4.50
					END OF BORING AT 20 FT						
25							571				
30							566				
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL											
WL (First Encountered)		Dry	BORING STARTED: Mar 07 2023				CAVE IN DEPTH:				
WL (Completion)		Dry	BORING COMPLETED: Mar 07 2023				HAMMER TYPE: Auto				
WL (Seasonal High Water)			EQUIPMENT: Truck				LOGGED BY: MEP		DRILLING METHOD: CFA		
WL (Stabilized)											
GEOTECHNICAL BOREHOLE LOG											

CLIENT: Clark, Geer, Latham & Associates, Inc.						PROJECT NO.: 19-8994		BORING NO.: B-03		SHEET: 1 of 1		
PROJECT NAME: Dollar Tree						DRILLER/CONTRACTOR: Total Depth						
SITE LOCATION: NEQ US-380 and Walmart Drive, Cross Roads, Texas, 76227								LOSS OF CIRCULATION <div></div>		<div>100'</div>		
NORTHING: 7132823.7			EASTING: 2432594.2			STATION:		SURFACE ELEVATION: 594.00		BOTTOM OF CASING <div></div>		
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	⊗ STANDARD PENETRATION BLOWS/FT		△ LIQUID LIMIT × PLASTIC LIMIT	
									ROCK QUALITY DESIGNATION & RECOVERY — RQD — REC		○ CALIBRATED PENETROMETER TSP 1 2 3 4 5 ● WATER CONTENT % [FINES CONTENT] % 10 20 30 40 50	
5	S-1	ST	24	24	(CH) SANDY FAT CLAY, brown, moist, hard		589	15-11-8 (19)	⊗ 19		25 ×	○ 4.50 ○ 4.50 ○ 4.50 ○ 7.2 [71.3%] ● 15.8 ○ 3.50 ○ 3.00 ○ 4.00 ○ 4.50
	S-2	ST	24	24	(CH) FAT CLAY, yellowish brown, light gray, moist, hard, with sand seams							
	S-3	ST	24	24	(CH) FAT CLAY WITH SAND, reddish brown, dark brown, moist, very stiff to hard							
	S-4	SS	18	18								
	S-5	ST	12	12								
	S-6	ST	12	12								
15	S-7	ST	24	24	(CH) SANDY LEAN CLAY, yellowish brown, reddish brown, moist, hard		579					
20	S-8	ST	24	24			574					
25	END OF BORING AT 20 FT						569					
30							564					
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL												
☒ WL (First Encountered)		Dry		BORING STARTED: Mar 07 2023				CAVE IN DEPTH:				
▼ WL (Completion)		Dry		BORING COMPLETED: Mar 07 2023				HAMMER TYPE: Auto				
▼ WL (Seasonal High Water)				EQUIPMENT: Truck				LOGGED BY: MEP		DRILLING METHOD: CFA		
☑ WL (Stabilized)												
GEOTECHNICAL BOREHOLE LOG												

CLIENT: Clark, Geer, Latham & Associates, Inc.						PROJECT NO.: 19:8994		BORING NO.: B-04		SHEET: 1 of 1																																																																																																																																																																																																																																																								
PROJECT NAME: Dollar Tree						DRILLER/CONTRACTOR: Total Depth																																																																																																																																																																																																																																																												
SITE LOCATION: NEQ US-380 and Walmart Drive, Cross Roads, Texas, 76227										LOSS OF CIRCULATION 																																																																																																																																																																																																																																																								
NORTHING: 7132787.0				EASTING: 2432554.5		STATION:		SURFACE ELEVATION: 595.00		BOTTOM OF CASING 																																																																																																																																																																																																																																																								
<table border="1"><thead><tr><th rowspan="2">DEPTH (FT)</th><th rowspan="2">SAMPLE NUMBER</th><th rowspan="2">SAMPLE TYPE</th><th rowspan="2">SAMPLE DIST. (IN)</th><th rowspan="2">RECOVERY (IN)</th><th rowspan="2">DESCRIPTION OF MATERIAL</th><th rowspan="2">WATER LEVELS</th><th rowspan="2">ELEVATION (FT)</th><th rowspan="2">BLOWS/6"</th><th colspan="2">STANDARD PENETRATION BLOWS/FT</th><th colspan="2">CALIBRATED PENETROMETER TSF</th></tr><tr><th colspan="2">ROCK QUALITY DESIGNATION & RECOVERY</th><th colspan="2"></th></tr><tr><th colspan="9"></th><th>⊗</th><th>○</th><th>△</th><th>×</th></tr><tr><th colspan="9"></th><th>20 40 60 80 100</th><th colspan="2">1 2 3 4 5</th><th colspan="2"></th></tr><tr><th colspan="9"></th><th>RQD</th><th colspan="2">WATER CONTENT % [FINES CONTENT] %</th><th colspan="2"></th></tr><tr><th colspan="9"></th><th>— REC</th><th colspan="2">●</th><th colspan="2"></th></tr><tr><th colspan="9"></th><th></th><th colspan="2">10 20 30 40 50</th><th colspan="2"></th></tr></thead><tbody><tr><td rowspan="3">5</td><td>S-1</td><td>ST</td><td>24</td><td>24</td><td>(CH) FAT CLAY, yellowish brown, brown, moist, hard</td><td rowspan="3"></td><td rowspan="3">590</td><td rowspan="3">17-13-8 (21)</td><td rowspan="3">⊗ 21</td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3">4.50</td></tr><tr><td>S-2</td><td>ST</td><td>24</td><td>24</td><td></td><td>15.5</td><td>23</td><td>4.50</td></tr><tr><td>S-3</td><td>ST</td><td>12</td><td>12</td><td></td><td>8</td><td>4</td><td>4.50</td></tr><tr><td rowspan="2">10</td><td>S-4</td><td>SS</td><td>18</td><td>18</td><td>(CL) LEAN CLAY, dark brown, reddish brown, moist, hard</td><td></td><td></td><td></td><td></td><td></td><td>11.7</td><td>18</td><td>42</td><td>4.50</td></tr><tr><td>S-5</td><td>ST</td><td>24</td><td>24</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>4.50</td></tr><tr><td rowspan="2">15</td><td>S-6</td><td>ST</td><td>12</td><td>12</td><td>(CL) SANDY LEAN CLAY, yellowish brown, reddish brown, moist, hard, with sand seams</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>4.50</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="2">20</td><td>S-7</td><td>ST</td><td>24</td><td>24</td><td>(CL) SANDY LEAN CLAY, yellowish brown, light gray, moist, very stiff to hard, with sand seams</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>3.50</td></tr><tr><td>S-8</td><td>ST</td><td>24</td><td>24</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>4.00</td></tr><tr><td>20</td><td colspan="4"></td><td>END OF BORING AT 20 FT</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>25</td><td colspan="4"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>30</td><td colspan="4"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>												DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT		CALIBRATED PENETROMETER TSF		ROCK QUALITY DESIGNATION & RECOVERY													⊗	○	△	×										20 40 60 80 100	1 2 3 4 5													RQD	WATER CONTENT % [FINES CONTENT] %													— REC	●														10 20 30 40 50				5	S-1	ST	24	24	(CH) FAT CLAY, yellowish brown, brown, moist, hard		590	17-13-8 (21)	⊗ 21			4.50	S-2	ST	24	24		15.5	23	4.50	S-3	ST	12	12		8	4	4.50	10	S-4	SS	18	18	(CL) LEAN CLAY, dark brown, reddish brown, moist, hard						11.7	18	42	4.50	S-5	ST	24	24										4.50	15	S-6	ST	12	12	(CL) SANDY LEAN CLAY, yellowish brown, reddish brown, moist, hard, with sand seams									4.50															20	S-7	ST	24	24	(CL) SANDY LEAN CLAY, yellowish brown, light gray, moist, very stiff to hard, with sand seams									3.50	S-8	ST	24	24										4.00	20					END OF BORING AT 20 FT										25															30														
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT		CALIBRATED PENETROMETER TSF																																																																																																																																																																																																																																																							
									ROCK QUALITY DESIGNATION & RECOVERY																																																																																																																																																																																																																																																									
									⊗	○	△	×																																																																																																																																																																																																																																																						
									20 40 60 80 100	1 2 3 4 5																																																																																																																																																																																																																																																								
									RQD	WATER CONTENT % [FINES CONTENT] %																																																																																																																																																																																																																																																								
									— REC	●																																																																																																																																																																																																																																																								
										10 20 30 40 50																																																																																																																																																																																																																																																								
5	S-1	ST	24	24	(CH) FAT CLAY, yellowish brown, brown, moist, hard		590	17-13-8 (21)	⊗ 21			4.50																																																																																																																																																																																																																																																						
	S-2	ST	24	24									15.5	23	4.50																																																																																																																																																																																																																																																			
	S-3	ST	12	12									8	4	4.50																																																																																																																																																																																																																																																			
10	S-4	SS	18	18	(CL) LEAN CLAY, dark brown, reddish brown, moist, hard						11.7	18	42	4.50																																																																																																																																																																																																																																																				
	S-5	ST	24	24										4.50																																																																																																																																																																																																																																																				
15	S-6	ST	12	12	(CL) SANDY LEAN CLAY, yellowish brown, reddish brown, moist, hard, with sand seams									4.50																																																																																																																																																																																																																																																				
20	S-7	ST	24	24	(CL) SANDY LEAN CLAY, yellowish brown, light gray, moist, very stiff to hard, with sand seams									3.50																																																																																																																																																																																																																																																				
	S-8	ST	24	24										4.00																																																																																																																																																																																																																																																				
20					END OF BORING AT 20 FT																																																																																																																																																																																																																																																													
25																																																																																																																																																																																																																																																																		
30																																																																																																																																																																																																																																																																		
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL																																																																																																																																																																																																																																																																		
WL (First Encountered) Dry						BORING STARTED: Mar 07 2023			CAVE IN DEPTH:																																																																																																																																																																																																																																																									
WL (Completion) Dry						BORING COMPLETED: Mar 07 2023			HAMMER TYPE: Auto																																																																																																																																																																																																																																																									
WL (Seasonal High Water)						EQUIPMENT: Truck		LOGGED BY: MEP		DRILLING METHOD: CFA																																																																																																																																																																																																																																																								
WL (Stabilized)																																																																																																																																																																																																																																																																		
GEOTECHNICAL BOREHOLE LOG																																																																																																																																																																																																																																																																		

CLIENT: Clark, Geer, Latham & Associates, Inc.				PROJECT NO.: 19:8994		BORING NO.: B-05		SHEET: 1 of 1			
PROJECT NAME: Dollar Tree				DRILLER/CONTRACTOR: Total Depth							
SITE LOCATION: NEQ US-380 and Walmart Drive, Cross Roads, Texas, 76227								LOSS OF CIRCULATION 			
NORTHING: 7132773.8		EASTING: 2432619.8		STATION:		SURFACE ELEVATION: 596.00		BOTTOM OF CASING 			
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT		CALIBRATED PENETROMETER TSF
									ROCK QUALITY DESIGNATION & RECOVERY		
									20 40 60 80 100		1 2 3 4 5
										— RQD	● WATER CONTENT %
										— REC	○ PLASTIC LIMIT
											10 20 30 40 50
5	S-1	ST	24	24	(CH) FAT CLAY, brown, yellowish brown, moist, hard, with sand seams						○ 4.50
	S-2	ST	24	24	(CH) FAT CLAY, reddish brown, dark brown, moist, very stiff to hard, with sand seams						○ 4.50
	S-3	ST	24	24			591				○ 4.50
	S-4	SS	18	18	(CH) SANDY FAT CLAY, yellowish brown, brown, moist, hard			13-10-6 (16)	⊗ 16		● 13.5
10	S-5	ST	24	24			586				○ 4.50
					(CL) SANDY LEAN CLAY, yellowish brown, light gray, moist, very stiff to hard						○ 52 [59.8%]
15	S-6	ST	24	24			581				○ 3.50
20	S-7	ST	24	24			576				○ 4.50
					END OF BORING AT 20 FT						
25							571				
30							566				
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL											
☒ WL (First Encountered)		Dry		BORING STARTED: Mar 07 2023				CAVE IN DEPTH:			
☒ WL (Completion)		Dry		BORING COMPLETED: Mar 07 2023				HAMMER TYPE: Auto			
☒ WL (Seasonal High Water)				EQUIPMENT: Truck		LOGGED BY: MEP		DRILLING METHOD: CFA			
☒ WL (Stabilized)											
GEOTECHNICAL BOREHOLE LOG											

CLIENT: Clark, Geer, Latham & Associates, Inc.				PROJECT NO.: 19:8994		BORING NO.: P-01		SHEET: 1 of 1				
PROJECT NAME: Dollar Tree				DRILLER/CONTRACTOR: Total Depth								
SITE LOCATION: NEQ US-380 and Walmart Drive, Cross Roads, Texas, 76227								LOSS OF CIRCULATION 				
NORTHING: 7133002.5		EASTING: 2432633.5		STATION:		SURFACE ELEVATION: 598.00		BOTTOM OF CASING 				
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT		LIQUID LIMIT PLASTIC LIMIT	
									ROCK QUALITY DESIGNATION & RECOVERY		CALIBRATED PENETROMETER TSF	
									20 40 60 80 100		1 2 3 4 5	
									RQD REC		WATER CONTENT % [FINES CONTENT] %	
5	S-1	ST	24	24	(CH) FAT CLAY, yellowish brown, reddish brown, moist, very stiff to hard, with sand seams		593				22 25.2 2.00 23.3 4.00 59 4.50	
	S-2	ST	24	24								
	S-3	ST	12	12								
	END OF BORING AT 5 FT											
10							588					
15							583					
20							578					
25							573					
30							568					
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL												
 WL (First Encountered)		Dry		BORING STARTED: Mar 07 2023				CAVE IN DEPTH:				
 WL (Completion)		Dry		BORING COMPLETED: Mar 07 2023				HAMMER TYPE: Auto				
 WL (Seasonal High Water)				EQUIPMENT: Truck				LOGGED BY: MEP				
 WL (Stabilized)								DRILLING METHOD: CFA				
GEOTECHNICAL BOREHOLE LOG												

CLIENT: Clark, Geer, Latham & Associates, Inc.				PROJECT NO.: 19:8994		BORING NO.: P-02		SHEET: 1 of 1					
PROJECT NAME: Dollar Tree				DRILLER/CONTRACTOR: Total Depth									
SITE LOCATION: NEQ US-380 and Walmart Drive, Cross Roads, Texas, 76227								LOSS OF CIRCULATION 					
NORTHING: 7132925.6		EASTING: 2432618.7		STATION:		SURFACE ELEVATION: 596.00		BOTTOM OF CASING 					
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT		LIQUID LIMIT PLASTIC LIMIT		
									ROCK QUALITY DESIGNATION & RECOVERY		CALIBRATED PENETROMETER TSF		
									20 40 60 80 100		1 2 3 4 5		
	S-1	ST	24	24	(CH) FAT CLAY, reddish brown, yellowish brown, moist, stiff to hard, with sand seams								
	S-2	ST	24	24									
	S-3	ST	12	12									
5					END OF BORING AT 5 FT		591					1.00	
												23.1	
												15.9	
												4.50	
												4.50	
10							586						
15							581						
20							576						
25							571						
30							566						
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL													
 WL (First Encountered)		Dry		BORING STARTED: Mar 07 2023				CAVE IN DEPTH:					
 WL (Completion)		Dry		BORING COMPLETED: Mar 07 2023				HAMMER TYPE: Auto					
 WL (Seasonal High Water)				EQUIPMENT: Truck		LOGGED BY: MEP		DRILLING METHOD: CFA					
 WL (Stabilized)													
GEOTECHNICAL BOREHOLE LOG													

CLIENT: Clark, Geer, Latham & Associates, Inc.				PROJECT NO.: 19:8994		BORING NO.: P-03		SHEET: 1 of 1				
PROJECT NAME: Dollar Tree				DRILLER/CONTRACTOR: Total Depth								
SITE LOCATION: NEQ US-380 and Walmart Drive, Cross Roads, Texas, 76227								LOSS OF CIRCULATION 				
NORTHING: 7132723.3		EASTING: 2432581.5		STATION:		SURFACE ELEVATION: 598.00		BOTTOM OF CASING 				
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT		LIQUID LIMIT PLASTIC LIMIT	
									ROCK QUALITY DESIGNATION & RECOVERY		CALIBRATED PENETROMETER TSF	
									20 40 60 80 100		1 2 3 4 5	
									RQD REC		WATER CONTENT % [FINES CONTENT] %	
5	S-1	ST	24	24	(CH) FAT CLAY, brown, yellowish brown, moist, very stiff to hard, with sand seams						3.50	
	S-2	ST	24	24	(CH) FAT CLAY, reddish brown, yellowish brown, moist, hard, with sand seams						4.50	
	S-3	ST	12	12							4.50	
	END OF BORING AT 5 FT						593					
10							588					
15							583					
20							578					
25							573					
30							568					
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL												
<input checked="" type="checkbox"/> WL (First Encountered)		Dry		BORING STARTED: Mar 07 2023				CAVE IN DEPTH:				
<input checked="" type="checkbox"/> WL (Completion)		Dry		BORING COMPLETED: Mar 07 2023				HAMMER TYPE: Auto				
<input checked="" type="checkbox"/> WL (Seasonal High Water)				EQUIPMENT: Truck		LOGGED BY: MEP		DRILLING METHOD: CFA				
<input checked="" type="checkbox"/> WL (Stabilized)												
GEOTECHNICAL BOREHOLE LOG												

CLIENT: Clark, Geer, Latham & Associates, Inc.				PROJECT NO.: 19:8994		BORING NO.: P-04		SHEET: 1 of 1				
PROJECT NAME: Dollar Tree				DRILLER/CONTRACTOR: Total Depth								
SITE LOCATION: NEQ US-380 and Walmart Drive, Cross Roads, Texas, 76227								LOSS OF CIRCULATION 				
NORTHING: 7132641.3		EASTING: 2432567.0		STATION:		SURFACE ELEVATION: 598.00		BOTTOM OF CASING 				
DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT		LIQUID LIMIT PLASTIC LIMIT	
									ROCK QUALITY DESIGNATION & RECOVERY		CALIBRATED PENETROMETER TSF	
									20 40 60 80 100	1 2 3 4 5	WATER CONTENT % [FINES CONTENT] %	
									RQD REC		10 20 30 40 50	
5	S-1	ST	24	24	(CL) LEAN CLAY, brown, yellowish brown, moist, very stiff to hard, with sand seams		593					3.50 4.50
	S-2	ST	24	24								
	S-3	ST	12	12								
	END OF BORING AT 5 FT											
10							588					
15							583					
20							578					
25							573					
30							568					
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL												
WL (First Encountered)		Dry		BORING STARTED: Mar 07 2023				CAVE IN DEPTH:				
WL (Completion)		Dry		BORING COMPLETED: Mar 07 2023				HAMMER TYPE: Auto				
WL (Seasonal High Water)				EQUIPMENT: Truck				LOGGED BY: MEP				
WL (Stabilized)								DRILLING METHOD: CFA				
GEOTECHNICAL BOREHOLE LOG												

APPENDIX C – Laboratory Testing

Laboratory Test Results Summary



ECS Southwest, LLP
Carrollton, Texas
Laboratory Testing Summary

Date: 3/20/2023

Project Number: 19:8994

Project Name: Dollar Tree (Cross Roads, TX)

Project Engineer: MEP

Principal Engineer: MB

Summary By: MEP

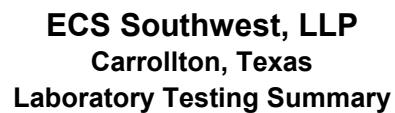
Boring Number	Sample Number	Depth (feet)	MC ¹ (%)	Soil Type ²	Atterberg Limits ³			Percent Passing No. 200 Sieve ⁵	Dry Unit Weight (pcf)	One-Dimensional Swell ⁶			Soluble Sulfate (ppm)
					LL	PL	PI			Final Moisture (%)	Overburden (psf)	Swell (%)	
B-01													
	S-2	2 - 4	13.9										
	S-4	6 - 8	17.3	CH	67	24	43	61.6	109.5	20.6	860	3.5	
B-02													
	S-2	2 - 4	20.3	CH	56	22	34						
	S-5	7 - 8.5	11.3					34.1					
B-03													
	S-3	4 - 6	16.9	CH	71	25	47	71.3	108.4	24.2	620	8.0	
	S-5	7 - 8	15.8										
B-04													
	S-2	2 - 4	15.5	CH	60	23	37	92.3					
	S-3	4 - 5	8.4										
	S-5	7 - 9	11.7	CL	42	18	24						
B-05													
	S-3	4 - 6	13.5										
	S-5	8 - 10	16.2	CH	52	21	31	59.8	110.9	19.1	110.9	1.5	
P-01													
	S-1	0 - 2	25.2	CH	59	22	37						
	S-2	2 - 4	23.3										

Notes:

1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 7260, 5. ASTM D 1140, 6. ASTM D 4546

Definitions:

MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, NP: Non Plastic



Project Number: 19:8994

Project Name: Dollar Tree (Cross Roads, TX)

Project Engineer: MEP

Principal Engineer: MB

Summary By: MEP

Notes:

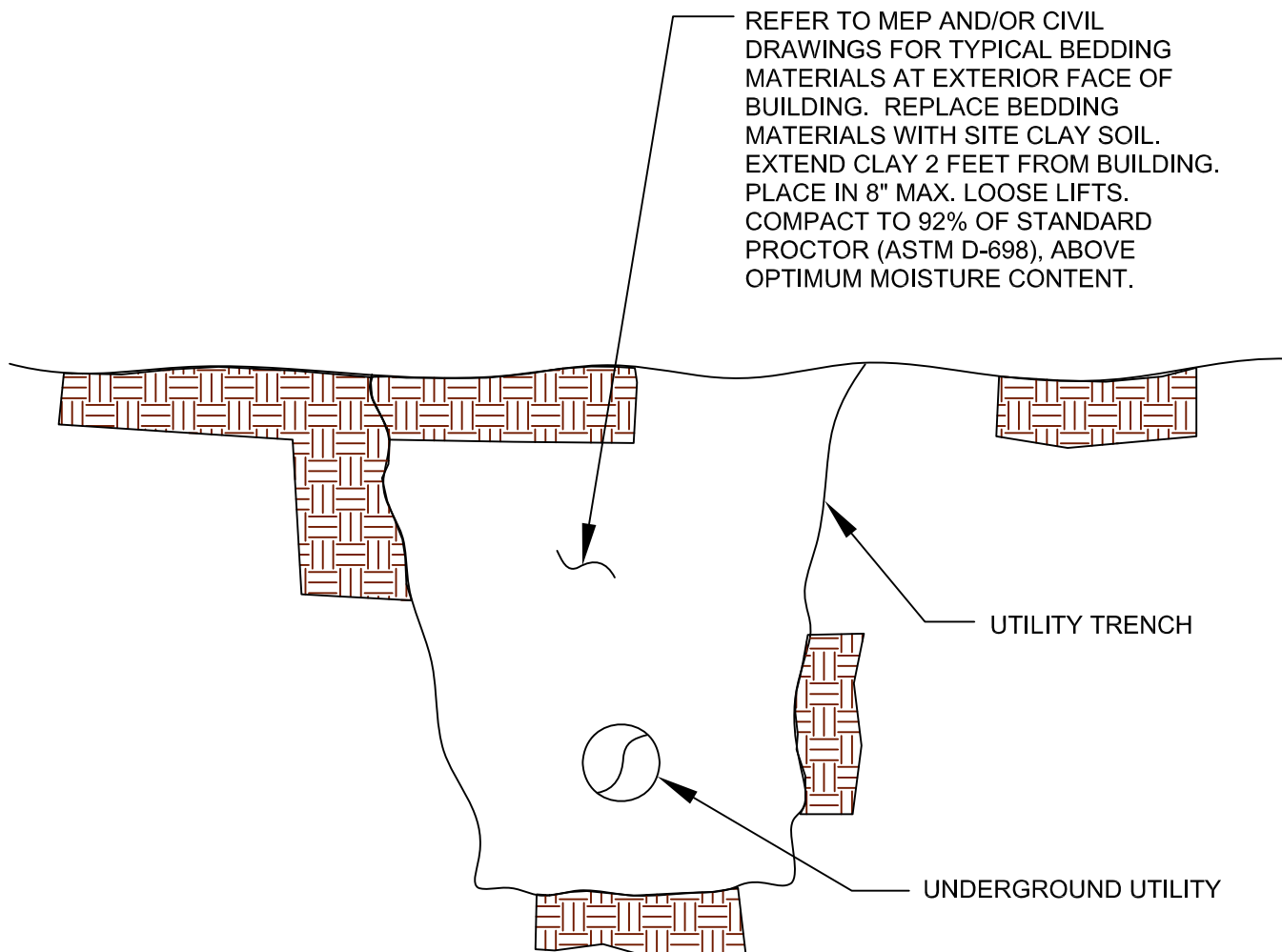
1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 7260, 5. ASTM D 1140, 6. ASTM D 4546

Definitions:

MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, NP: Non Plastic

APPENDIX D – Supplemental Report Documents

Drawings/Details



**TYPICAL DETAIL
DIAGRAM**



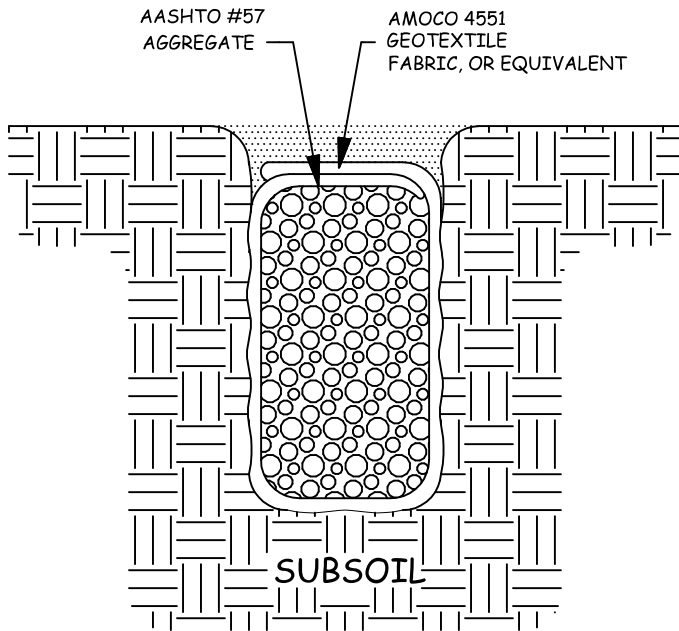
**CLAY PLUG AT
UTILITY TRENCH**

ENGINEER	SCALE
	NTS
DRAFTSMAN CLL	PROJECT NO.
REVISIONS	SHEET
	1 OF 1
	DATE
	1/25/2021

FRENCH DRAIN INSTALLATION PROCEDURE

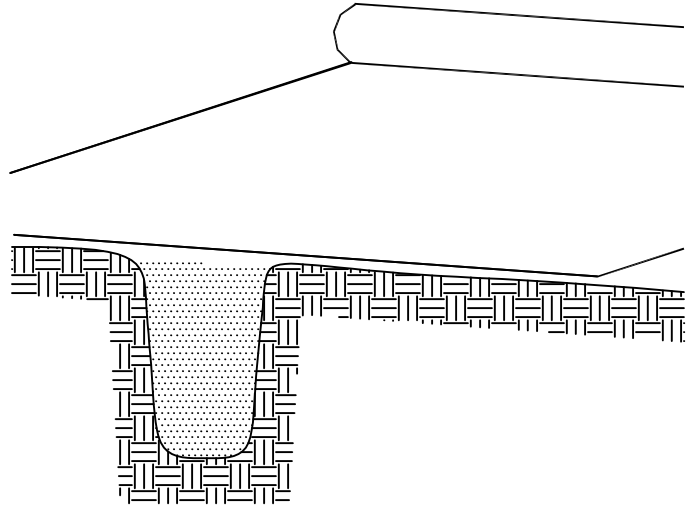
NOT TO SCALE

FINAL CONFIGURATION



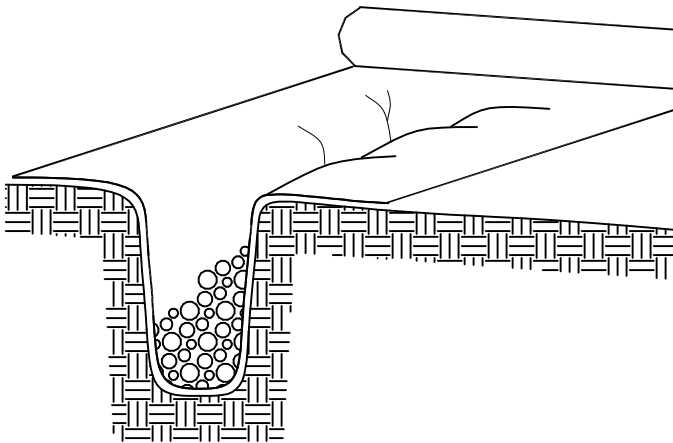
SUBDRAIN USING FILTER FABRIC

STEP 1



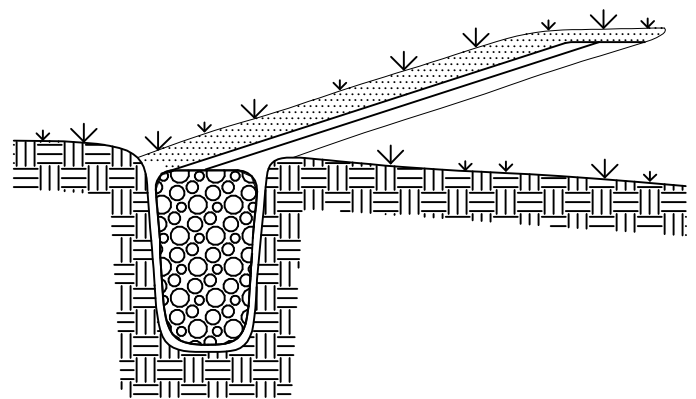
FABRIC IS UNROLLED DIRECTLY OVER TRENCH

STEP 2



THE TRENCH IS FILLED WITH AGGREGATE

STEP 3



THE FABRIC IS LAPPED CLOSED AND
COVERED WITH BASE STONE

DIVISION 3 CONCRETE

03050 BASIC CONCRETE MATERIALS & METHODS

1.1 Scope of Work:

The work under this section shall include furnishing all labor, materials, equipment and incidentals necessary to do concrete and cement finish work shown on the plans or as specified.

1.2 Materials:

- A. Portland Cement - All cement used shall conform to the latest ASTM Specification C-150, Type I. Only one (1) brand of Portland Cement shall be used in any one structure.
- B. Concrete Aggregates - Concrete aggregates shall be sand and gravel, conforming to "Standard Specifications for Concrete Aggregates", ASTM Serial Designation C-33, latest edition.

The gradation from any one source shall be reasonably uniform and not subject to extreme percentages of gradation specified. For the purpose of determining the degree of uniformity, a Fineness Modulus determination shall be made upon representative samples submitted from such sources as is proposed to be used. Fine aggregates having a variation in Fineness Modulus greater than 0.20 either way from the Fineness Modulus of the representative sample submitted, may be rejected or may be accepted subject to such changes in proportions used as may be directed.

The mortar strength under Paragraph 4, of ASTM C-33 shall be 100%. The gradation of coarse aggregates shall be as shown in Table 11, ASTM C-33. Coarse aggregates shall be graded in accordance with Table II of ASTM C-33 and the following:

- 1. Class "A" Concrete - Size No. 57 (1" to No. 4)
Class "B" Concrete - 5/8" to No. 4
- 2. The Contractor shall submit, for approval, gradations and other physical characteristics of aggregates to show conformity with the above requirements.

C. Admixtures -

- 1. Air Entraining Admixtures shall meet the requirements of ASTM C-260

2. Water Reducing Admixtures, if used, shall be Pozzoloth Type 200N, or an approved equal, meeting the requirements of ASTM C494M.
 3. Set Retarding Agent, if used, shall be Pozzoloth Type 100R, or an approved equal, meeting the requirements of ASTM C494M.
 4. Flyash, if used, shall be Type C, meeting ASTM C618.
- D. Reinforcing Steel shall conform to ASTM Specification A-615, Grade 60 or better.

Field inspection for section, rust, shape and dimensions will be required.

- E. Welded Wire Reinforcement - Wire reinforcement shall conform to ASTM Specification A-1064. Field inspection for dimensions, spacing, size of wire and rust will be required. Welded wire reinforcement shall be sheet type (rolled wire reinforcement is not acceptable).
- F. Tie Wire for securing steel reinforcement shall be #18 black annealed.
- G. Forms -

1. Unexposed Surfaces shall have forms of #2 common (or better) lumber.
2. Exposed Surfaces designated as a smooth finish shall have plywood forms or form lining of #1 common, dressed, matched boards, uniform in thickness and of such quality as to produce good surfaces or such steel forms as may be approved.
 - a. Plywood Forms shall be at least 5/8 inch thick, not less than 5-ply.
 - b. Form Lining may be either of the following:

Fiber Board, Federal Specification LLL-H-35, Type I, Class 3, 3/15 inch thick, no less, or exterior plywood, 3-ply, 1/4 inch thick, not less.

- H. Water shall be clean, fresh and free from alkali, acids, vegetable, sewage, organic or other deleterious matter.
- I. Form Oil shall be a non-staining mineral oil.
- J. Waterproof Building Paper, Federal Specification UU-B-790.
- K. Form Lacquer shall be of a type specially prepared for the purpose and shall not stain or injure the concrete.
- L. Premolded Expansion Joint Material shall conform to ASTM Specification for "Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction", ASTM Designation D-1751, latest edition.
- M. Control Joint Sealant shall be a traffic bearing, (pour grade), one component, self leveling sealant, Fed. Spec. TT-S-00230C. Class A, Type I. Install in all interior horizontal control joints. Submit sample for approval.
- N. Waterstop shall be polyvinylchloride (PVC) serrated 6" wide center bulb type, ASTM D-638, D-792, D-747 & D-624. Waterstops shall be welded at joints for profile continuity and not overlapped. Splices at corners shall be factory made.
- O. Vapor Barrier
 - 1. Material - Vapor barrier shall be 10 mil Stego Wrap by Stego Industries or equal.
 - 2. Application - Sheeting shall be placed under all interior slabs on ground. Sheeting shall be lapped 6" minimum. All punctures and joints (laps) shall be taped. All sheeting shall be new, (not previously used).

03210 REINFORCING STEEL

- 1.1 Placing and shop detail drawings for reinforcing shall be furnished for approval. Reinforcement of size and shape shown shall be placed accurately where indicated on drawings or required to carry out intent of drawings and specifications. Reinforcement steel shall mean rebar and wire reinforcement.
- 1.2 Bars and wire reinforcing shall be cleaned of loose rust, scale or coatings. Steel shall not be bent or straightened in an injurious manner. Bars with kinks or bends, not shown, shall be discarded. Bars shall be ASTM A-615, deformed bars, Grade 60. Wire reinforcement shall be ASTM A 1064, sheet type (rolled wire reinforcement is not acceptable).
- 1.3 Reinforcement shall be spliced where shown on plans. Splices in adjacent bars shall be staggered. Provide Class "B" Lap splices for all reinforcement as required by ACI 318 and all cases, splices shall be sufficient to transfer stress by bond. No lap shall be less than twelve inches (12"). Provide corner bars at all corners. Wire reinforcement shall be lapped a minimum of six inches (6").
- 1.4 Reinforcement bars shall be securely tied at intersections with #18 annealed wire and be carried on spacers or chairs of sufficient weight and number to properly support same. Wire reinforcement shall be securely tied at laps/intersection with #18 annealed wire and supported on spacers or chairs of sufficient size and number to adequately maintain reinforcement wire in slab center. Welding of reinforcing steel shall not be permitted. Heating of bars for field bending shall not be permitted.
- 1.5 Concrete covering over steel shall be in accordance with Paragraph 7.7.1 of ACI 318, unless otherwise shown.
- 1.6 As an alternative, footing rebar tied securely may be supported on precast concrete blocks. Clay bricks will not be allowed. Horizontal reinforcement in masonry units shall be supported with wire ties. Provide corner bars with proper laps.
- 1.7 Manufactured spacers and chairs shall be made of plastics and/or steel. Exposed steel shall be protected with plastic or coatings such that exposed steel does not come in contact with supporting elements.
- 1.8 Spacers shall be used for vertical rebars in CMU construction.

03310 STRUCTURAL CONCRETE

PART 1 - MATERIALS

1.1 Measurement:

All materials shall be measured by weighing and the apparatus for determining weights shall be suitably designed and constructed for the purpose. Fine aggregate, coarse aggregate and cement shall be weighed separately, except sack cement shall be considered one (1) cubic foot per sack (94#) and need not be weighted. Weighing devices shall be accurate to within one-half of one percent. Water may be measured by weight or volume and measuring device shall be accurate to within one (1) quart.

1.2 Properties of Concrete:

All concrete placed under this contract shall meet all of the requirements hereinafter specified.

Class	Maximum Water Per Bag Cement (Gallons)	Min. Cement Per Cu. Yd. (bags)	Min. Compressive Strength in 28 Days (PSI)	Range in Slump
A	5.5	5.5	3,000	3"-5"
B	7.5	6.0	3,000	5"-7"

Class "A" Concrete shall be used for foundation work and all other concrete in this project.

Class "B" Concrete shall be used in CMU filled cells.

1.3 Admixtures:

- A. All Class "A" Concrete shall not be air-entrained concrete. Total natural air content shall not exceed 3.0 percent, plus or minus 0.5 percent. Air entraining admixtures shall not be used.
- B. All Class "B" Concrete shall have a set retardant added. If a set retardant is added to the mix, water reducing agent shall not be added.
- C. Water reducing admixtures as specified may be used at the Contractors option. Application rates shall be in accordance with the manufacturer's written recommendations, but shall not be greater than eight (8) ounces per sack of cement. Water reducing admixtures shall not replace any of the specific minimum cement content.

- D. Class C Flyash may be used to replace not more than fifteen percent (15%) of the specified cement content except as noted below.

1.4 Ready Mixed Concrete

- A. Ready mixed concrete shall be used in lieu of concrete mixed at the job. Ready mixed concrete shall be in conformance with the latest ASTM Specification C-94.
- B. All mixing requirements herein specified for concrete mixed at the site shall be in force, and the Engineer shall have free access to the mixing plant at all times.
- C. Concrete shall not be transported or used in any case after addition of cement, if elapse time exceeds the following:

Class "A" Concrete - 1.5 hours
Class "B" Concrete - 1.5 hours
- D. The organization supplying ready mixed concrete shall have a plant of sufficient capacity and transportation facilities to assure continuous delivery at the rate required.

PART 2 – QUALITY CONTROL & TESTING

- 2.1 A testing laboratory shall be selected and paid for by the Owner to design the mixes of concrete to be used on the project, and to test and control the project concrete during the placement. Copies of all mix designs and the results of all test shall be furnished in triplicate to the Engineer.
- 2.2 The Contractor shall furnish to the designated testing laboratory samples of the materials to be used on the project, in quantities of at least one cubic foot each, to determine mix design. The laboratory shall be approved by the Owner.
- 2.3 The following shall be the minimum requirements of operations to be performed by the Testing Laboratory:
 - A. Check the mix; submit reports of design mixes.
 - B. Check ready mix plant for compliance with design mix and material requirements.

- C. Perform at least two (2) slump tests and prepare at least one (1) set of four (4) compression cylinders from each days pour and for each 50 cu. yd. or increment thereof during days operations. All above operations shall be performed in accordance with the applicable ASTM Specifications C-31 and C-39.
- D. Cylinders shall be broken as follows:
 - 1. One (1) at seven (7) days age.
 - 2. Two (2) at twenty-eight (28) days age.
 - 3. If the 28 day breaks are good, the fourth cylinder may be discarded. If the 28 day breaks are deficient the fourth cylinder shall be broken as instructed.
- E. Reports of all tests and control measures shall be submitted to the Engineer in duplicate. Reports shall show the in-place location of the concrete.

2.4 If cylinder breaks show concrete to be of deficient strength, one or more of the following shall be performed:

- A. Impact (Swiss) hammer tests.
- B. Take in place cores and test as per ASTM C-24.
- C. Load test actual structure as per ACI 318.
- D. Remove portion(s) of structure in question and reconstruct in accordance with plans and specifications.

2.5 Application References

The following Specification Standards and Publications form a part of this Division and shall be applicable where those specifications do not provide specific direction.

- A. ACI STANDARD 318 - "Building Code Requirements for Reinforced Concrete".
- B. ACI STANDARD 301 - "Specifications for Structural Concrete for Building".
- E. ACI STANDARD 302 - "Guide for Concrete Flood and Slab Construction".

- F. ACI STANDARD 224 - “ Joints with Concrete Construction”.
- G. ACI STANDARD 305 – “Hot Weather Concreting”.
- H. ACI STANDARD 306 - “ Cold Weather Concreting”.

03313 FOUNDATIONS

1.1 General

The bottom of excavations shall be properly compacted as specified and leveled before receiving concrete. Footings and/or floors shall be poured monolithically, unless otherwise shown.

1.2 Footings - All footings shall be placed on soil which is properly leveled, compacted and wetted as specified. All footings shall be poured monolithically, unless otherwise shown or specified.

1.3 Slabs - All slabs on grade shall be placed on vapor barrier over compacted soil as indicated on the drawings or specified. The ground surface shall be properly graded.

1.4 Removal of Water

Water shall be removed from excavations before concrete is deposited. Any flow of water shall be diverted through proper side drains to a sump or be removed by other approved methods which will avoid washing freshly deposited concrete. Temporary drains shall be filled by grouting or otherwise.

1.5 Inspection

All excavations, forms and reinforcements shall be inspected and approved before concrete is placed and if found unsatisfactory, the work will not proceed until all defects have been remedied. Approval will in no way relieve the Contractor his obligation to produce the finished concrete required by the drawings and specifications.

03316 PLACING CONCRETE

- 1.1 Concrete shall be handled from mixer to place of final deposit in a continuous manner, as rapidly as practicable, by methods which will prevent the separation or loss of ingredients. Under no circumstances shall concrete that has partly hardened be deposited in the work.
- 1.2 Care shall be exercised to prevent splashing forms or reinforcement. Any hardened or partially hardened concrete already in place must be removed before the work proceeds.
- 1.3 Concrete shall not be placed on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within the section.
- 1.4 Concrete shall not be carried or conveyed in or through any aluminum items.
- 1.5 Concrete, as soon as deposited, shall be spaded and worked into corners and around reinforcements. It shall be deposited in the forms as nearly as practicable in its final position to avoid rehandling. High frequency vibrators shall be used inside the form to properly consolidate the mix at the time of placing. Vibrators of an approved type shall be used, and care shall be exercised by the Contractor to prevent any displacement of forms or reinforcing. The concrete mixture shall be worked into all corners and around all reinforcement and inserts. Tapping or external vibration of forms will not be permitted. Satisfactory runways or other means must be provided to convey the concrete to the place of deposit in order not to disturb forms or reinforcement. Runways shall not be supported on reinforcement. Running wheelbarrows directly over reinforcement will not be permitted.

A. Placing in Cold Weather:

Concrete shall only be mixed and placed when temperature is at least 40 degrees and rising.

Suitable means shall be provided for maintaining concrete at an temperature of at least 50 F. for a period of seven (7) days after placing. The method of heating materials and protecting concrete shall be subject to approval. Salt, chemicals or other foreign materials shall not be mixed with the concrete for the purpose of preventing freezing.

B. Placing by Chute:

When concrete is conveyed by chutes, the plant and equipment shall be of such size and design as to insure a practically continuous flow in the chute. The chute shall be of metal or metal lined, and the different portions shall have approximately the same slope. The slope shall not be less than one vertical to three horizontal and not more than one vertical to two horizontal, and shall be such as to prevent the segregation of the ingredients of the concrete.

The discharge end of the chute shall be provided with a baffle plate to prevent segregation. If the height of discharge end of the chute is more than three (3) times the thickness of the layer being deposited, but not more than five feet (5') above the surface of the concrete in the forms, a spout shall be used, and the lower end maintained as near the surface of deposit as practicable. When the operation is intermittent, the chute shall discharge into a hopper. The chute shall be thoroughly cleaned before and after each run and the debris and any water shall be discharged outside the forms.

C. Placing by Pumping:

Where concrete is indicated as being placed by pumping, the plant, equipment and mix shall be approved by the Engineer. The pumping operation shall be such that a continuous stream of concrete without separation of ingredients and without air pockets is being produced. Concrete shall not be handled or pumped in or through any aluminum containers or conduits.

03317 CONSTRUCTION JOINTS

- 1.1 Concrete shall be placed continuously so that each unit will be monolithic in construction. At least 24 hours shall elapse between the pouring of adjoining units unless otherwise specified.
- 1.2 Joints not shown or specified shall be so located as to least impair the strength and appearance of the work.
- 1.3 Concrete slabs shall be poured in a continuous manner and saw-cut to the depth and pattern as shown on the plans within 12 hours of placement.

03318 BONDING

Before depositing new concrete on or against concrete which has set, existing surfaces shall be thoroughly roughened and cleaned of all foreign matter and laitance. Forms shall be retightened and existing surface flushed with a neat coat of bonding agent. New concrete shall be placed before bonding agent has attained initial set. Work shall be performed in a manner assuring complete bonding of new and existing work. Contractor shall submit bonding agent for approval.

Bonding steel reinforcing anchor dowel shall be installed in accordance with manufactures recommendations and requirements. Minimum depth embedment shall be fifteen (15) bar diameters. Bonding adhesive shall be CONCRESEIVE 1490 by Degussa/Master Builders or an approved equal.

03319 REMOVAL OF FORMS

- 1.1 Forms shall not be disturbed until concrete has adequately hardened. Shoring shall not be removed until supported members have acquired sufficient strength to safely support their weight and the imposed load.
- 1.2 Care shall be exercised to avoid spalling concrete surfaces.
- 1.3 Under normal conditions, the minimum period elapsing before forms may be stripped shall be governed by the following schedule, but its use shall not operate to relieve the Contractor of responsibility for safety of structure.
 - A.

Side Forms	Footings & Beams	1 Day
Side Forms	Piers, Columns & Walls	3 Days
 - B. Wood forms shall be completely removed in order that no material will be left for termite infestation.
 - C. NOTE: When temperature below 40 F occurs, supports shall remain in place an additional time equal to period structure has been exposed to low temperatures.

03350 FINISHING

The type of finish for the various parts of the work, unless otherwise noted on the drawings, shall be as follows:

- A. Curbs: Rubbed Finish.
- B. Walks: Broom Finish.
 - 1. Exterior concrete walks and slabs shall be given a light to medium broomed finish to provide a slip resistant surface. Ramps shall receive a rough texture finish. Submit actual samples for approval, 12" x 12" size or larger.
- C. Interior Floor Slabs:
 - 1. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
 - 2. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighen until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings. Apply a machine trowel finish to surfaces to be polished.
 - a. Specified overall values of flatness, F(F) 40; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 17; for slabs-on-grade.
 - b. Troweling of floor receiving polish finish shall be done using plastic
- D. Imperfect or Damaged Work
 - 1. Imperfect or damaged work, or any material damaged before final acceptance, shall be satisfactorily replaced by the Contractor in accordance with requirements of the drawings and specifications.
 - 2. Removal and/or replacement of concrete work shall be done in such manner that strength will not be impaired.

03390 CURING

- 1.1 Curing shall be accomplished by preventing loss of moisture, rapid temperature change and mechanical injury or injury from rain or flowing water, for a period of seven (7) days. Curing shall be started as soon as free water has disappeared from the surface of the concrete after placing and finishing. Curing may be accomplished by any of the following method:

- 1.2 Moist Curing:

Unformed surfaces shall be covered with burlap, cotton or other approved fabric mats kept in intimate contact with the surface or with sand, and shall be kept continually wet. Where formed surfaces are cured in the forms, the forms shall be kept continually wet. If the forms are removed before the end of the curing period, curing shall be continued as on unformed surfaces, using suitable materials. Burlap shall be in two (2) layers.

- 1.3. Membrane Forming Curing: Curing compound shall conform to ATM C-309 and shall be applied by power spraying equipment using a spray nozzle equipped with a wind guard. The compound shall be applied in a two-coat continuous operation at coverage of not more than 200 square feet per gallon for each coat. Second coat shall be applied transverse to the original first coat. The compound shall form uniform, continuous, adherent film and shall not check, crack, or peel and shall be free from pinholes or other imperfections. Surfaces subjected to heavy rainfall within three (3) hours after compound has been applied, or surfaces damaged by subsequent construction operations within the curing period shall be re-sprayed at the rate specified above. Where membrane forming compounds are permitted, permanently exposed surfaces shall be cured by use of a clear-type membrane forming curing compound containing a fugitive dye. Surfaces coated with curing compound shall be kept free of foot and vehicular traffic and other sources of abrasion during the curing period unless curing compound is protected from abrasion.
- 1.4. Polyethylene Sheeting and Polyethylene Coated-Waterproof Paper and Burlap: Surfaces shall be completely covered. Where a single sheet does not cover the entire surface, the ends and edges shall lapped not less than four inches (4”), and sealed with adhesive tape conforming to the Federal Specification PPP-T-60; Type III, Class I. Edges shall be securely attached to form and/or secured to prevent movement due to winds.

03910 CLEANING

1.1 Upon completion of work, forms, equipment, protective covering and rubbish resulting therefrom shall be removed from premises.

1.2 Finished concrete surfaces shall be left in a clean condition.

Finished concrete curbs and drainage structures shall be swept with an ordinary broom to remove loose dirt and left to a satisfactory manner.

DIVISION 4 MASONRY

04220 CONCRETE MASONRY UNIT

A. Scope of Work:

The work covered by this division of these specifications includes furnishing all plant, labor, equipment, materials and incidentals to complete the masonry work as shown on the drawings or specified herein. In addition to certificates required in Paragraph C, submit samples of masonry units, anchors, reinforcing, control joints and reglets.

B. Materials:

1. Concrete Masonry Units (CMU) shall conform to the requirements of ASTM 90 Standard Specification for Loadbearing Concrete Masonry Units, medium weight block.

Minimum Compressive Strength shall be $f'_m = 2,000$ psi.

2. Masonry Cement: ASTM C-91, furnished in bags containing one (1) cubic foot each, marked with weight and shall be products of Holnam, Atlas, Longview, or approved equal.
3. Mortar shall conform to the requirements of ASTM C-270, be freshly prepared and uniformly mixed and shall meet the requirements for Type "M" mortar per the International Building Code for CMU.
4. Vertical Reinforcing Steel shall be deformed bars conforming to ASTM Designation A-615, Grade 60.
5. Horizontal Reinforcement shall be Dur-O-Wall truss reinforcement for single wythe walls with #9 side rods and #9 gage truss wires. Reinforcement shall be galvanized and conform to requirements of ASTM Designation A-153.

Equal manufacturers include Wire-Bond, Hohmann & Barnard.
6. Column Anchors shall be fabricated bar type as detailed on the plans and shall be galvanized in accordance with ASTM Designation A-153. Refer to drawings for other types.
7. Refer to drawings for other anchor devices. All anchors shall be galvanized, ASTM A-153.
8. Control Joints (where shown on plans) for masonry units shall be Hohmann & Barnard RS-Standard rubber control joint.

C. Certification:

1. Prior to delivery of masonry units to the job site, the Contractor shall provide to the Owner, a letter from the manufacturer of the masonry units that all such items are within the requirements of these specifications.
2. Certification shall show results of tests made not more than twelve (12) months prior to delivery of concrete masonry units to the job site, shall show compliance with the specified ratings and values, and shall certify that the mix design, yield per batch, and curing procedures for the units delivered to the job site are equal to those submitted for the test.

D. Storage and Handling:

Concrete masonry units shall be stored in a location off the ground covered at all times and protected from the weather. Concrete masonry units shall be so stacked to allow free circulation of air to all units. Concrete masonry units shall be laid in wall as soon as possible.

E. Installation:

1. Cold-Weather Installation - No frozen work shall be built upon. If the Contractor chooses to erect masonry during temperatures below 40 degrees F, he shall submit a written statement for approval of methods he proposes to utilize to heat masonry materials and to prevent freezing of freshly placed masonry prior to laying units.
2. Laying Concrete Masonry Units - Masonry units shall be set to line, level, plumb and true. Ends of units shall be full buttered with mortar and shall be fully bedded in the mortar. Masonry units shall be laid in running bond pattern having a minimum joint thickness of 3/8 inch. Lintel bond beams and tie columns shall be filled with concrete and required reinforcement and located as shown on the plans. Tool all joints concave. Joints shall be laid in "running" bond except as otherwise noted. Reinforcement shall be wire tied to hold rods in correct positions. Note that all split face block exposed surfaces shall be split faces. Special order blocks or cut blocks in field to obtain smooth face surface where storefront glass or doors abut split face block.
3. Control Joints shall be installed where shown with masonry reinforcement interrupted but reinforcing horizontal rods shall be continuous thru the joint.

4. Use only sound masonry units free from cracks, chipped edges and corners and other defects. Exposed units shall have even textured faces without slicks or other surface imperfections.
5. Masonry Reinforcement -
 - A. Horizontal masonry reinforcement shall be placed at the first masonry joint and be placed every other course therefrom. In shear walls, reinforcement shall be at 8" o.c. Fill shear walls with concrete. Reinforcement shall be continuous, with side bars being lapped a minimum of six (6") inches. Corner reinforcement sections shall be provided for intersections of and at change of direction of walls.
 - B. Column Anchors - When concrete masonry passes a structural steel column, install column anchors in same course as the horizontal reinforcement for the full height of wall welded to columns.
6. Pointing and Cleaning - Mortar splashes and daubs shall be removed from all exposed masonry units. All defective joints shall be raked out as necessary and re-filled with mortar to match adjacent joints. Masonry surfaces shall not be cleaned until mortar joints have hardened, but shall be dry brushed after each day's operations to remove excess mortar. Metal tools or brushes shall not be used for cleaning. Masonry surfaces shall be left clean, neatly pointed, free of scum and debris, with tight joints throughout. Do not clean masonry with high pressure driven power machines.
7. Other Materials - The Contractor shall set and build in all materials furnished under other headings, such as miscellaneous metals, anchors and other accessories required to complete the work. He shall build around steel and concrete work, doors, frames and take care to see that all such are left in good condition.
8. Head and Bed Joints shall be of such thickness as required to give even joints maintaining the number of courses shown on the plans. In no case shall any bed joint, in either be more than one-half inch. All head joints to be 3/8" unless otherwise shown. All head joints must be full with no "bugholes
9. After mortar is "thumb print" hard, finish CMU joints with concave (unless shown otherwise) pointing tool, using sufficient

pressure to compact mortar and provide smoothly concave finished joint with mortar in positive contact with brick.

10. MASONRY WORK SHALL BE REJECTED IF WALLS ARE NOT PLUMB OR ALL BED JOINTS, HEAD JOINTS, AND ALL OTHER JOINTS ARE NOT COMPLETELY FILLED WITH MORTAR, IF HEAD JOINTS ARE OUT OF VERTICAL ALIGNMENT.
11. Use dry saw blade to cut CMU.
12. Unfinished Work shall be stepped back for joining with new work; do no toothing unless specifically approved. Remove loose mortar, clean exposed joints before laying new work.
13. Protection: Protect masonry surfaces at all times while not being worked on; when rain or snow is imminent and/or work is discontinued cover tops of exposed masonry work with a strong waterproof membrane, secured in place. Consult portion of this section devoted to frost and freezing weather. Take precautions to protect against staining or discoloration of finished work.
14. Guarantee masonry work against leakage due to mortar shrinkage or pointing workmanship for a period of two (2) years. This guarantee shall run concurrently with the standard one (1) year guarantee.
15. Block Sealer – All exterior walls are to be treated with a sealer.
 - a. Block sealer shall not be applied until the wall had dried out a minimum of 72 hours without rain and there is no visible sign of efflorescence on the wall.
 - b. Exterior block walls shall be sealed only with Prime-A-Pell 200 Clear Sealer as manufactured by Chemprode of Garland, TX. Apply materials in accordance with manufactures printed instructions.
 - c. Apply a second coat of sealer of masonry surfaces that are pourous.
 - d. All windows must be covered and all cars removed before spraying as glass and finished metal can be damaged. Sealers are extremely hard if not impossible to remove from glass.

F. Cleaning

CMU's must be cleaned properly including mortar droppings, mortar splatters and efflorescence. Improper cleaning materials and/or methods

will also harm water repellency.

1. DO NOT USE WATER PRESSURE OVER 50 PSI – Using high pressure will most likely cause efflorescence, streaking and color variation.
2. Use “Prosoco’s Custom Masonry Cleaner” or equal to clean CMUs.
3. Consistent application of water and cleaner on the wall system will ensure consistent color after completion of cleaning – inconsistent application will cause color variation.

DIVISION 5 METALS

05100 STRUCTURAL METAL FRAMING

1.1 Scope of Work:

The work required consists of all structural steel, steel erection and related items necessary to complete the work shown on the drawings and/or specified herein.

1.2 Shop Drawings:

- A. Shop Drawings for all work included in this section shall be prepared by the steel fabricators and four (4) copies submitted to the Engineer. Drawings shall be submitted and processed in accordance with requirements of Division 1 of these specifications. Approval of drawings shall be obtained prior to fabricating any material or proceeding with the work.
- B. Shop Drawings shall include all information necessary for the fabrication of the component parts of the structure. They shall indicate size and weight of members, type and location of shop and field connections, the type, size and extent of all welds, and the welding sequence when required. The welding symbols used on the shop drawings shall be as adopted by the American Welding Society.
- C. The Review of Shop Drawings by the Engineer will be for size and arrangement of principal and auxiliary members and for "design" requirements of the Contract Documents. Any errors in dimensions, quantities and/or details shown on shop drawings shall be the responsibility of the Contractor. The Contractor shall check and approve/disapprove shop drawings prior to submitting them to the Engineer. The shop drawings/data shall consist of dimensioned layouts and materials list for all reinforcing steel and structural steel; manufacturer's descriptive data, diagrams, specifications and performance data for all specialty items of equipment and other items specified. Shop drawings shall be reviewed by the Contractor before being submitted to the Engineer. Shop drawings shall be reviewed by the Engineer and returned to the Contractor prior to fabrication and/or placement of any items into the job. Review by the Engineer of shop drawings for any material, apparatus, devices, and layouts shall only be for compliance with the "Design" requirements of the Contract Documents and shall not relieve the Contractor from the responsibility of furnishing same of proper dimension, size quantity, quality and all

performance characteristics to efficiently perform the requirements and intent of the Contract Documents. Shop drawings review by the Engineer shall not relieve the Contractor from responsibility for errors of any sort on the shop drawings.

1.3 Design:

- A. For structural steel, the rules and practices set forth in the latest edition of AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" shall govern this work. Welding shall be in accordance with the requirements of the AWS Standard Code for Arc and Gas Welding in Building Construction (Latest Edition).
- B. The design of members and connections for any portions of the structure not indicated on the design plans shall be completed by the fabricator. Such design shall conform to the requirements of the current issue of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" of the AISC. Shop drawings showing such design shall be submitted to the Engineer for approval before fabrication. No changes or modifications of the design will be permitted without approval.
- C. Members and connections designed by the Fabricator shall have the full strength of the strongest element of the joint(s) or member(s) involved.

1.4 Materials:

All materials shall be new and shall conform to the following:

- A. Heavy Structural Steel - ASTM Designation A-992.
- B. High Strength Steel Bolts (HSB) - ASTM Designation A-325. Special anchor bolts are shown on drawings, tolerance shall be 1/16". All bolts shall be of American manufacturers.
- C. Mild Steel Bolts (MB) - ASTM Designation A-307. All bolts shall be of American manufacturers.
- D. Filler Metal for Welding - Welding electrodes for manual shielded metal arc welding shall conform to ASTM Specifications A-233-64T, E70 series.
- E. Steel Pipe (Sch 40) - ASTM Designation A-53 and structural tubing ASTM Designation A500B, ($F_y=46\text{KSI}$).

- F. Galvanized Steel Shapes, Plates, Bars and Strips - All steel shapes, plates, bars and strips shall be hot-dip galvanized after fabrication in complete accordance with ASTM A-123, (where shown or where listed herein).
- G. Galvanized Steel Hardware (Bolts, Nuts and Washers) - All steel hardware to be galvanized shall be hot dip galvanized in complete accordance with ASTM A-153. Zinc coating shall be Class "C" (minimum). All of American Manufacturers.

Galvanized items shall be as shown on the drawings and as listed herein. The required galvanized items are:

- 1. All anchor bolts, channels, plates, angles and plates embedded in concrete or masonry. All bolts and washers joining galvanized members.
 - 2. Miscellaneous steel framing at exterior doors and door openings including embedded items, lintels and plates.
 - 3. Refer to drawings for additional items.
- H. Evidence of Conformity - Certified test reports of structural steel, cast steel, steel forgings and rivet steel shall constitute sufficient evidence of conformity with the specifications. The manufacturer's certification for bolts and nuts and filler metal for welding shall constitute evidence of compliance.
- I. All steel not galvanized shall be shop finished as follows:

All structural framing members shall be cleaned of all foreign matter and loose scale and shall be given one (1) complete coat of red oxide metal primer, which shall have a DFT of not less than 2.0 mils.

After erection, the field connections and all abraded places shall be repaired with a touch-up coat of the same primer.
- J. Grout for setting anchor plates shall be Sono-grout by Sonneborn Building Products or other approved equals.
- K. Welding electrodes shall conform to the American Welding Society Specifications Class E-70.

1.5 Structural Framing:

All framing members except where noted shall be hot-rolled structural shapes, cold-formed shapes or built-up shapes of welded plate construction. All metals shall comply with applicable ASTM Designations and the manufacturer shall designate the submittal of Design Notes, the applicable ASTM Designation for the various type members used. The minimum thickness of all hot-rolled or built-up structural steel shall be 0.188" thickness.

1.6 Workmanship and Details of Construction:

A. Connections shall be as shown on the plans; or when not shown on the drawings, shall conform to the requirements of the AISC and the AWS for welded and bolted connections.

1. Shop Connections shall be welded unless otherwise shown.
2. Field Connections on all major structural members shall be made with high strength bolts (A-325) as shown on contract drawings, except where welded connections are detailed. Connection not detailed on drawings shall be approved by the Engineer.

Minor connections may utilize mild steel bolts ASTM-307.

B. Formation of Holes shall be as follows:

1. Burning - Holes shall not be made or enlarged by burning. The burning of unfair holes in the field or shop will not be permitted.
2. Holes shall be provided in the structural steel as shown or required to permit connecting the work of other templates and other information as required. Holes may be drilled or punched, except that holes in base or bearing plates shall be drilled.

C. Nuts shall be of an approved self-locking type, or the bolt threads shall be upset to prevent backing-off of the nuts.

D. Bolting Except High Strength Bolting - Bolts shall be driven accurately into the hole without damaging the thread. Bolt heads shall be protected from damage during driving. Bolt heads and nuts shall rest squarely against the metal. Where bolts are to be used on beveled surfaces having slopes greater than 1 in 20 with a

plane normal to the bolt axis, beveled washers shall be provided to give full bearing to the head or nut. Where self-locking nuts are not furnished, bolt thread shall be upset to prevent the nuts from backing off. Bolts shall be of the length that will extend entirely through, but no more than 1/4 inch beyond the nuts. Bolt heads and nuts shall be drawn tight against the work with a suitable wrench not less than fifteen (15") inches long. Bolt heads shall be tapped with a hammer while the nut is being tightened, nuts shall be locked. Bolts shall be tightened to attain a stress of not less than 10,000 psi in the body of the bolt for A-36 or A-307 material.

High Strength Bolting shall comply with the requirements of AISC Specifications for Structural Steel Joints, using ASTM A-325.

1.7 Erection:

- A. The rules and practices set forth in "Code of Standard Practice for Steel Buildings and Bridges" and "AISC Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction (AISC) shall govern heavy structural steel work. Welding shall be in accordance with the Standard Code for Arc and Gas Welding in Building Construction of the American Welding Society (AWS).

All applicable codes shall be those in effect at the time of Contract award.

- B. Work under this heading shall be properly coordinated with the work of all other trades. The Contractor shall verify that work of other trades which is related to or will be incorporated with this work is properly placed, inspected and approved before proceeding with this installation.
- C. No material shall be fabricated or delivered to the site until after approval of shop drawings.
- D. Substitution of sections and details may be made only when approved by the Engineer. In case structural sections shown on plans cannot be readily obtained, substitution of sections of equal strength which conform to the requirements of the design may be approved for use.
- E. Fabrication assembling and erection shall conform to the approved shop drawings. Structural material shall be fabricated and assembled in the shop to the greatest extent possible. Shearing, flame cutting, and chipping shall be done carefully and accurately.

Assembled pieces shall be taken apart, if necessary, for the removal of burrs and shavings produced by the fabricating operations.

1.8 Responsibility for Errors:

- A. The Contractor shall be responsible for all errors of fabrication and for the proper fitting of the various members shown on the shop drawings. Errors in the shop fabrication of deformation resulting from handling and transporting that prevent the proper assembly and fitting of parts shall be reported immediately to the Engineer and approval of the method of correction shall be obtained. Approved connections shall be made at no additional cost to the Owner.

1.9 Assembly and Fitting:

- A. Driftpins - driftpins may be used only to bring together the several parts and shall not be used in such manner as to distort or damage the metal.
- B. Gas-Cutting - The use of a gas-cutting torch in the field for correcting fabrication errors will not be permitted on any major member in the structural framing. The use of a gas cutting torch will be permitted only on minor members, when the member is not under stress, and then only after the approval of the Engineer has been obtained.
- C. All work done and materials furnished shall be of first class quality to the satisfaction of the Engineer. The work of erection shall be at all times, subject to the inspection and acceptance of the Engineer or his representative on the ground.

1.10 Welding

- A. Welding, where permitted or specified, shall be electrical arc method in accordance with the American Welding Society Specifications for Welding in Building Construction.
- B. Welds shall be made only by operators who are currently qualified by tests, as prescribed by the American Welding Society "Standard Qualification Procedure", to perform the type of work required, except that this provision need not apply to tack welds not later incorporated into finishing welds carrying calculated stress.

- C. All arc welding electrodes shall conform to the requirements of the American Welding Society Specifications for Iron and Steel Arc Welding Electrodes, latest edition.

05210 STEEL JOISTS

1.1 Scope of Work:

The work required under this section consists of all open-web steel joists, joist girders, accessories and related items necessary to complete the work shown on the drawings and/or as herein specified.

1.2 Shop Drawings:

Shop drawings and erection diagrams of steel joists shall be submitted in triplicate to the Engineer for approval. Drawings shall be submitted and processed in accordance with the requirements described in Division 1 General Requirements and 05100-5.2. Approval of Shop drawings shall be obtained prior to proceeding with manufacturing. Shop drawings shall indicate joists type, number, sizes, spacings, bridging, connections, headers, anchoring, bearing plates and all other details of erection.

1.3 Compliance with Standard & Industry Specifications:

- A. All material and fabrication shall comply with one or more of the following ASTM Specifications: A-36, A-242, A-529, A-572, A-588, A-606.
- B. An affidavit, if requested, shall be furnished by the Contractor from the manufacturer, certifying that the materials or products delivered to the job meets the requirements specified, however, such certification shall not relieve the Contractor from the responsibility of complying with any added requirements specified herein.

1.4 Joist-Type, Fabrication and Erection:

Open-Web Joists and Joist Girders shall be provided where shown on the drawings. The joists shall be designed, fabricated and erected in accordance with the Standard Specifications and Load Tables for Open-web Steel Joists, as adopted by the American Institute of Steel Construction, Inc., and the Steel Joist Institute, the latest edition, the applicable building code and with modifications as shown on the drawings and as herein specified. Provide bottom chord extensions where shown.

1.5 General Requirements

- A. Painting - Joists, bridging, anchors and other accessories shall be

cleaned of all foreign matter and loose scale by hand or power tool (SSPC-SP15) and given one (1) shop coat of zinc chromate primer, joist manufacturer's standard metal primer, 2.0 mils DFT.

1. After erection, the field connections and all abraded places shall be repaired with a touch-up coat of the same primer.
2. Refer to Division 9 for final joist painting.

B. Open Web Joist Loading - Additional loads applied to top chord and seat shall be as follows and as shown on the contract documents. All of these additional loads shall be transferred through the bar joist structure and through the seat of the bar joist into the structural system below. These loads are actual loads and are not to be factored for wind.

1. 1,500 pounds axial load tension or compression in top chord due to wind. This applies to all bar joist in the roof system except where larger specific loadings are required by contract documents.
2. 650 lb. horizontal (perpendicular to joist) load applied to top chord at seat due to wind.

C. Open Web Joist Loading – Additional loads applied to top chord from roof top units and condensers shall be additive to the joint uniform loads.

Open Web Joist shall be designed as shown on plans and with unsymmetrical panel point loading.

D. Joist Girder Loading – Additional loads applied to top chord from roof top units and condensers shall be additive to the joist girder designation panel point loads.

Joist girders shall be designed as shown on plans with unsymmetrical panel point loading.

1.6 Erection - Joists shall be set to spacing shown with minimum bearings in accordance with Specifications of the Steel Joist Institute. Headers, trimmers and bearing plates shall be provided as shown.

A. Each joist resting on steel supports shall be welded to each support with two (2) welds, as shown on the drawings. Touch-up paint immediately after welding.

- B. Joists shall be bridged with diagonal or continuous horizontal bridging. Bridging shall be spaced at intervals shown and in accordance with the Steel Joist Institute.
- C. The joists shall be permanently fastened to supports and all bridging and anchors completely installed before any construction loads, other than workmen, are placed on the joists.
- D. Welding shall be executed in accordance with the "Code for Arc and Gas Welding in Building Construction" of the American Welding Society as amended to date, and only by welding operators who are currently qualified to perform the type of work required.
- E. Open web joists shall have uplift bridging/bracing at the first bottom chord panel point. Joist girders shall be struted at the ends of the bottom chord for uplift stability. Design joists for uplift pressures as shown on drawings.

05310 STEEL ROOF DECK

1.1 Scope of Work

The work required consists of furnishing and installing all metal deck, accessories and related items necessary to complete the construction as shown on the drawings or specified herein.

1.2 Materials & Erection

- A. Steel Roof Deck shall be Vulcraft, Fy=33KSI, 22 gage, galvanized G-90. Deck shall be 1-1/2" deep. Submit shop drawings and fastener data. Equal product manufacturer include Bowman, Epic, Wheeling.
- B. Steel Roof Deck shall be attached to supporting members by means of galvanized steel, No. 12, Hex head, self drilling screws, in accordance with the following:
 - 1. End parts shall have a four inch (4") thick lap and shall occur at supports. Fastening shall be done from the top side. Fastening of roof deck to supports shall be spaced as a minimum not more than 6" c.c. at edges and end termination. Interior fastening of roof deck shall be 12" c.c. at supports.
 - 2. Attachment shall comply with FM-I-90 or as shown on plans.
 - 3. Diaphragm shear strength screw pattern shall develop a minimum of 400 lbs/lf in plane, screw down application.
 - 4. Steel for decks shall conform to the requirements of ASTM A568 and/or A-651, Grade A, or equal, having a minimum yield strength of 33,000 psi as noted above.
 - 5. Accessories such as ridge and valley plates shall be supplied with the deck.

1.3 Structural Requirements:

- A. Gravity load requirements: Submit manufacturer's certification establishing the load carrying capacity of the specified integral roof deck assembly to include steel deck sheet and insulation; sealed by a licensed structural engineer registered to practice in the state in which the project is located. Individual component

performance or certification is not acceptable.

- B. Diaphragm load requirements: Submit manufacturer's certification establishing the shear strength and shear stiffness of the specified integral roof deck assembly to include steel deck sheet and insulation; sealed by a licensed structural engineer registered to practice in the state in which the project is located. Individual component performance or certification is not acceptable.
- C. Wind uplift requirements: Submit manufacturer's certification establishing the wind uplift performance of the specified integral roof deck assembly to include steel deck sheet and insulation; sealed by a licensed structural engineer registered to practice in the state in which the project is located. Individual component performance or certification is not acceptable.

05500 METAL FABRICATIONS

1.1 Scope of Work

- A. The work required consists of all metal fabrication items. All items shall be free of defects impairing strength, durability and appearance.
- B. Submit shop drawings on all items to the Engineer prior to fabrication.
- C. Verify dimensions and job conditions prior to fabrication.
- D. AWS "Structural Welding Code" of the American Welding Society shall govern. All exposed welds shall be ground smooth.

1.2 Materials

- A. Structural Steel shapes shall conform to ASTM A-992 and A-36. Loose lintels shall be hot dipped galvanized for all masonry, (ASTM A-123) Light gage metal shall be G90 galvanized.
- B. Miscellaneous Steel shall be mild steel unless otherwise specified and painted as per Section 0990 Painting.
- C. Cast Iron shall be of the best quality soft, tough gray castings obtainable conforming to ASTM A-48-74.
- D. Steel Pipes shall conform to ASTM A-53.
- E. Bolts, nuts, screws, plugs, washers, shall conform to ASTM A-307, hot dip galvanized to ASTM A-153.
- F. Mild Steel Arc-Welding Rods shall conform to ASTM A-233.
- G. Aluminum: Aluminum Alloy 6061-T6 Clear Anodized Finish.
- H. Fabricated Items
 - 1. General: Provide Fabricated Metal items as shown on the drawings or otherwise required to complete the work even though each item may not be specifically mentioned herein.

The following items shall include all required parts, supports, anchorage, fittings and accessories. This list is for convenience only, and in no way relieves the Contractor from furnishing items indicated elsewhere or otherwise required.

2. Miscellaneous Steel Bracing: Provide and install all miscellaneous steel shapes, angles, channels, etc., for securing of and bracing door frames or other fabricated equipment to masonry or concrete as shown on the drawings or as necessary to insure proper stability and support. All items shall be galvanized.
3. Provide rough bucks as detailed or otherwise required, (galvanized).
4. Provide anchor bolts for miscellaneous items where not provide by trades furnishing the equipment. Wedge anchors shall generally be used, (galvanized).

1.3 Fabrication and Installation

A. General

1. Miscellaneous Items: Furnish and install fastening devices, anchor bolts, hangers, sleeves, angle frames, etc., as shown on the drawings, or otherwise required in the completion of the work. Even though every item is not herein specifically mentioned. Do not omit or duplicate required materials.
 2. Provide all connecting members and attaching devices for properly securing fabricated items. Scribe and fit items as necessary for installation. Attachment with wood or fiber plugs in masonry is not permitted. Use galvanized steel wedge anchors on exterior and ferrous anchors on the interior.
- B. Anchor bolts, nuts and heads shall be standard; provide proper washers where required. Attaching devices to be covered with masonry shall be installed as far as practicable as the work progresses, to avoid cutting or drilling. Masonry cutting shall be provided under the masonry contract. .
- C. All work shall be laid out, cut and assembled by mechanics skilled in metal fabricating so that the work will present a neat, satisfactory appearance in the building. Measurements shall be accurate, cutting true to line, joints tight and secure, all in accordance with the best, current practice.
- D. Required holes shall be accurately drilled or punched; do not cut with torch. Holes not matching shall be reamed and not drifted.

- E. Welding: Electrodes shall conform to the American Welding Society Specifications Class E-70. Grind and remove scale from welded joints in metal burned or cut with torch; chip back to bright metal before welding. Welded joints to be exposed to view shall have the welds so formed that the joint can be ground smooth with adjacent surfaces.
- F. Shop assemble and fit work for installation, if possible.
- G. Construct and erect work plumb, square, straight and true to line, with tight joints at intersections.
- H. Castings: Cast work shall be secured with bolts or tap screws where practicable; all screws and bolt heads shall be concealed or countersunk if necessary to expose on finished exterior faces.
- I. Protective Coatings
 - 1. Galvanizing: All ferrous metal items, structural shapes, closures, fittings, anchoring devices, etc., used in conjunction with exterior work shall be hot-dipped galvanized even if specified to be painted. (ASTM A-123) unless otherwise indicated. Galvanize after fabrication.
 - 2. All material shall be thoroughly cleaned of all loose mill scale, rust, splatter, sag and flux deposit, oil, dirt and other foreign matter before applying finished coating.
 - 3. Painting shall be applied only to dry surfaces and be allowed to dry before using.
 - 4. Painting shall not be done in wet or freezing weather.
 - 5. Bitumastic paint shall be of approved kind and quality. No thinning will be permitted. Apply heavy coat to contact area of dissimilar metals in contact with one another.
 - 6. Refer to Division 9 for additional painting requirements.

05510 METAL LADDER

PART 1 - GENERAL

A. SCOPE OF WORK:

1. Furnish, construct and install a roof access ladder at the location shown on the plans.
2. Ladder shall be stick built and conform to OSHA specifications.

PART 2 - PRODUCTS

A. METAL LADDER

1. Fabrication: Ladder shall be fabricated from stick steel consisting of the following members. Field verify height of ladder.
 - a. 2" x 3/8" flat bar rails spaced 18" apart.
 - b. 3/4" diameter smooth bar rungs @ 14" O.C. max. capable of withstanding 300-pound load.
 - c. Top rung shall be 2" below underside of roof deck.
 - d. Rails shall extend 6" above top rung.
 - e. Toe spacing shall not be less than 6".

PART 3 - EXECUTION

A. PREPARATION

1. Provide wall blocking as necessary.

B. INSTALLATION

1. Ladder to be anchored at top, bottom, & 2 locations in between.
2. Paint SW6215 Rocky River (see division 9)

DIVISION 7 THERMAL & MOISTURE PROTECTION

07210 PARTITION INSULATION

A. Scope of Work

Include furnishing and installation of insulation in interior and exterior partitions as indicated on drawings. Submit manufacturer's data for approval.

B. Materials

1. Batts shall be flame resistant Owens Corning Sonobatts without paper facing (or equal), glass fiber batts. Insulation thickness, R-value, and location to be shown on the drawings.
2. Extruded Polystyrene Board Insulation: Rigid cellular polystyrene thermal insulation with closed cells and integral high density skin, formed by the exposition of polystyrene base resin in an extrusion process to comply with ASTM C 578, Type IV; 5-year aged r-value of 5 Btu/ (hr x sf x degree F) at 75 degree F in manufacturer's standard lengths and widths. Compressive strength shall be 25 PSI. Flame spread rating shall be not more than 25 w/ smoke-developed index of not more than 450. Thickness shown on drawings.
 - a. Manufacturers: The following manufacturers' products have been used to establish minimum standards for materials, workmanship & function. Equal products of other manufacturers may be used in the work, provided such products have been approved by the Architect.

“Styrofoam Scoreboard”; Dow Chemical USA.
“Foamular 250”; Owens Corning.
“Certifoam”, Minnesota Diversified Products, Inc.
“GreenGuard”; Type IV 25 PSI
 - b. Adhesive: Type recommended by insulation board manufacturer for application indicated.

C. Installation

Install in accordance with details on drawings and manufacturers instructions.

07214 **FOAMED-IN-PLACE MASONRY WALL INSULATION**

A. Scope of Work:

Include furnishing and installation of insulation as indicated on drawings for thermal & sound attenuation purposes. Submit manufacturer's data for approval.

B. Quality Assurance:

1. Insulation shall be installed as per manufacturer's recommendation and must come from the manufacturer pre-mixed to ensure consistency. A one year product and installation warranty will be issued by both the manufacturer and installer.
2. Engage an experienced dealer/applicator who has been trained and licensed by the product manufacturer and which has not less than three years direct experience in the installation of the product used.
3. At the Architect's request, the Installer will provide infrared scanned images of the work prepared by a "Block Wall Scan IR" trained IR technician to confirm that empty core cells are filled with foam insulation. Insulation voids shall be foamed at no added cost to the Owner.

C. Acceptable Manufacturers:

1. **"Core-Fill 500"** as manufactured by
Tailored Chemical Products
P.O. Drawer 4186
Hickory, NC 28603
(800) 627-1687
2. **"Core Foam Insulation"** as manufactured by
cfiFOAM, Inc. Southern Foam Insulation, Inc
P.O. Box 10393
Knoxville, TN 37939
(800) 656-3626

There will be no prequalification of subcontractors, however, any contractor who intends to submit a bid using a manufacturer other than the approved manufacturers listed must submit all required documentation for approval during the shop drawing process. Any contractor who fails to submit all information as requested will be subject to rejection.

D. Minimum Product Performance Standards:

1. Fire-Resistance Ratings: Foam shall neither add to nor detract from fire-resistance ratings of insulated fire-resistance rated CMU walls per prevailing building codes.

2. Surface Burning Characteristics: Class A per ASTM E84; Flame spread index shall be not more than 25 w/smoke-developed index of not more than 450.
3. Thermal Values: R-4.6/inch @ 75°F per either ASTM C518 or ASTM C177.
4. Sound Abatement: Minimum Sound Transmission Class ("STC") rating of 53 and a minimum Outdoor Indoor Transmission Class ("OITC") rating of 44 for 8" wall assembly ASTM E90-90).
5. Potential Heat: < 8000 Btu/lb when tested per NFPA 259.

E. Installation Guidelines:

Fill all open cells and voids in hollow concrete masonry walls where shown on drawings. The foam insulation shall be pressure injected through a series of 5/8" to 7/8" holes drilled into every unreinforced vertical column of block cells beginning at an approximate height of four (4) feet from finished floor level.

Drill all holes on the inside face of the wall. Repeat this procedure at an approximate height of ten (10) feet above the first horizontal row of holes (or as needed) until the void is completely filled. Patch holes with mortar and score to resemble existing surface. Insulation shall not be injected into wet walls.

07240 EIF SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

- A. Materials and installation of Air and Moisture Barrier Drainable EIF System as indicated on the drawings.

1.02 DESIGN REQUIREMENTS

A. Moisture Control

- 1. Prevent the accumulation of water behind the EIF system, either by condensation or leakage through the wall construction, in the design & detailing of the wall assembly.
 - a. Provide flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, and at the base of the wall.
 - b. Air Leakage Prevention—provide continuity of air barrier system at foundation, roof, windows, doors, and other penetrations through the system with connecting and compatible air barrier components to minimize condensation and leakage caused by air movement.

B. Color Selection & Submittals

- 1. There will be no prequalification of subcontractors, however, any contractor who intends to submit a bid using a manufacturer other than the approved manufacturers listed must submit all required documentation for approval during the shop drawing process. Product data must be submitted along with color samples made to match those specified on the drawings. Any contractor who fails to submit the product data & samples as requested will be subject to rejection. Color samples must be submitted along with shop drawings regardless of the manufacturer chosen.
 - a. STO Colors: See drawings for STO colors.
 - b. Dryvit Colors:
 - i. EIFS-1: DOTR011022 Sandstone (STO93860) w/ Sandpebble Fine Finish
 - ii. EIFS-2: DOTR021022 Smoked Putty (STO93240) w/ Sandpebble Fine Finish
 - iii. EIFS-G: DOTR031030 Envy (SW6925) w/ Sandblast Finish
 - c. BASF Colors:
 - i. EIFS-1: Z 112554319-3 Sandstone w/ Fine Finish

- ii. EIFS-2: Z 112554319-2 Smoked Putty w/ Fine Finish
- iii. EIFS-G: Z 112554319-1 Green Envy w/ Fine Finish

C. Joints

1. Provide minimum 1/2 inch wide expansion joints in the EIFS at the locations shown on the drawings.
2. Provide minimum 1/2 inch wide sealant joints at all penetrations through the EIFS (windows, doors, etc.).
3. Install compatible backer rod and sealant that has been evaluated in accordance with ASTM C 1382, "Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish System (EIFS) Joints," and that meets minimum 50% elongation after conditioning.
4. Provide joints so that Air Barrier continuity is maintained across the joint and drain joints to the exterior.

D. Trim, Projecting Architectural Features and Reveals

1. All trim and projecting architectural features must have a minimum 1:2 [27°] slope along their top surface. All horizontal reveals must have a minimum 1:2 [27°] slope along their bottom surface. Where trim/feature or bottom surface of reveal projects more than 2 inches from the face of the EIFS wall plane, protect the top surface with waterproof base coat.

E. Insulation Thickness

1. Minimum EPS insulation thickness is 1 inch. See drawings for EPS thickness.
2. Maximum EPS insulation thickness is 12 inches when installed in accordance with ESR 1748 (including architectural features).

1.03 QUALITY ASSURANCE

A. Manufacturer requirements

1. Member in good standing of the EIFS Industry Members Association (EIMA).
2. System manufacturer for a minimum of twenty (25) years.
3. Manufacturing facilities ISO 9001-2000 certified Quality System.

B. Contractor requirements

1. Engaged in application of EIFS for a minimum of three (3) years.
2. Knowledgeable in the proper use and handling of Sto materials and possessing certificate of completion of Sto on-line application test.
3. Employ skilled mechanics who are experienced and knowledgeable in EIFS application, and familiar with the requirements of the specified work.
4. Successful completion of minimum of three (3) projects of similar size and complexity to the specified project.
5. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with Sto's published specifications and details and the project plans and specifications.

C. Insulation board manufacturer requirements

1. Recognized by Sto as capable of producing insulation board to meet system requirements, and hold a valid certification with Sto.
2. Listed by an approved agency.
3. Label insulation board with information required by Sto, the approved listing agency and the applicable building code.

D. Inspections

1. Provide independent third party inspection where required by code or contract documents.

1.04 DELIVERY, STORAGE, & HANDLING

- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.
- B. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32° C). Store away from direct sunlight.
- C. Protect Portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

1.05 PROJECT / SITE CONDITIONS

- A. Maintain ambient and surface temperatures above 40°F (4°C) during application and drying period, minimum 24 hours after application of Air/Moisture barrier and EIFS.

- B. Provide supplementary heat for installation in temperatures less than 40°F (4°C).
- C. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.06 COORDINATION SCHEDULING

- A. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors, and other penetrations to provide a continuous Air and Moisture Barrier.
- B. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall and provide sill flashing.
- C. Coordinate installation of windows and doors so Air and Moisture Barrier components are connected to them to provide a continuous Air and Moisture Barrier.
- D. Install window and door head flashing immediately after windows and doors are installed.
- E. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior.
- F. Install copings and sealant immediately after installation of the EIFS system and when EIFS coatings are dry.
- G. Attach penetrations through EIFS to structural support and provide water tight seal at penetrations.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Provide EIFS System, Air/Moisture Barrier and accessories from single source manufacturer or approved supplier.
- B. The following are approved manufacturers:
 - 1. Sto Corp.— EIFS System: StoTherm Essence ci – 10-year warranty
 - 2. Dryvit – Outsulation Plus MD EIFS w/ Drainage. – 10-year warranty
 - 3. BASF Finestone – Pebbletex DCA Design – 10-year warranty

There will be no prequalification of subcontractors, however, any contractor who intends to submit a bid using a manufacturer other than the approved manufacturers listed must submit all required documentation for approval during the shop drawing process. Product data must be submitted along with color samples made to match those specified on the drawings. Any contractor who fails to submit the product data & samples as requested will be subject to rejection.

2.02 AIR/MOISTURE BARRIER

A. StoGuard™

1. Joint Compound: Sto Gold Fill with StoGuard Mesh—ready mixed flexible joint compound for rough opening protection and joint treatment of wall sheathing used in combination with StoGuard Mesh (not required for concrete/masonry surfaces)
Note: Contractor has option of using Sto Gold Coat® over standard mesh.
2. Waterproof Barrier: Sto Gold Coat®—ready mixed waterproof coating for wall substrates and sheathings.
3. Elastomeric Rough Opening Treatment (if shown on drawings): StoGuard Rapid Seal™ : moisture cure elastomeric waterproof air barrier material.

2.03 ADHESIVE

- ### A. Sto Primer/Adhesive-B---one-component polymer modified cement based, factory blend adhesive with less than 33 percent Portland cement content by weight.

2.04 EXPANDED POLYSTYRENE BOARD INSULATION

- ### A. Nominal 1.0 lb/ft³ (16 kg/m³) Expanded Polystyrene (EPS) Insulation Board in compliance with ASTM C 578 Type I requirements, and EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board. See drawings for thickness. (Must be Miami-Dade listed per NOA requirements if NOA# is specified)

2.05 BASE COAT

- ### A. Sto Primer/Adhesive-B---one-component polymer modified cement based, factory blend adhesive with less than 33 percent Portland cement content by weight.

2.06 MESH

- ### A. Standard Mesh: nominal 4.5 oz./yd², symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with Sto materials.
- ### B. Detail Mesh: nominal 4.2 oz./yd², flexible, symmetrical, interlaced glass fiber fabric, with alkaline resistant coating for compatibility with Sto materials (*used for standard EIFS backwrapping, aesthetic detailing, and reinforcement of sheathing joints and protection of rough openings with air/ moisture barrier*).

- C. High Impact Mesh - Sto Armor Mat--nominal 15 oz./yd², ultra-high impact, double strand, interwoven, open-weave glass fiber fabric with alkaline resistant coating for compatibility with Sto materials *(required to height of 4'-0" above finish floor. Achieves Ultra-High Impact Classification when applied beneath Sto Mesh)*

2.07 PRIMER

- A. Sto Primer Smooth – acrylic based tinted primer for spray application, tinted to the color of the finish

2.08 FINISH COAT

- A. Sto 310 Essence Finish: Acrylic based textured wall coating with graded marble aggregate. Texture: Fine Sand #310, tinted to colors as indicated on drawings.
- B. Stolit 130D: Acrylic based textured wall coating specially formulated for tinting to dark, vibrant colors. (Use only where STO SW 'Envy' SW 6925 is used)

2.09 SELF-ADHERING WATERPROOF AIR-BARRIER TAPE

- A. 6" Sto Guard Tape: (80269) Self adhering waterproof air-barrier material composed of spun bond polyester fabric laminated to rubberized asphalt adhesive.

2.10 JOB MIXED INGREDIENTS

- A. Water--Clean and potable.
- B. Portland cement – ASTM C 150, Type I, Type II, Type I-II

2.11 GYPSUM SHEATHING

- A. Provide 5/8" glass-mat faced gypsum sheathing fastened per manufacturer's recommendations, not to exceed 8" O.C. vertically.

2.12 (2) LAYERS 1/2" FRT STRUCTURAL GRADE PLYWOOD SHEATHING

- A. (2) Layers 1/2" FRT Structural Grade Plywood sheathing fastened w/ #12 TEK screws @ 6" o.c. along studs & system perimeter.

PART 3 – EXECUTION

Refer to long form specification E100G for detailed information on substrates, performance data, mixing and installation instructions

3.01 INSTALLATION

- A. Install Air/Moisture Barrier and EIFS in compliance with drawings & manufacturer's published instructions.

3.02 PROTECTION

- A. Provide protection of installed materials from water infiltration into or behind them.
- B. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry.

07500 SINGLE PLY MEMBRANE ROOF

PART 1 GENERAL

1.01 DESCRIPTION

- A. The project consists of installing Carlisle's Sure-Weld TPO 60-mil membrane adhered Roofing System as outlined below. Roof membrane color shall be white, membrane on back of all parapets shall be tan. Apply the Sure-Weld Adhered Roofing System in conjunction with two layers of Carlisle HP-H Polyiso with total R-value of no less than that which is listed on the drawings over metal roof deck.

1.02 EXTENT OF WORK

- A. Provide all labor, material, tools, equipment, and supervision necessary to complete the installation of the Sure-Weld 60-mil thick white & tan reinforced TPO (Thermoplastic Polyolefin) reinforced membrane Adhered Roofing System including flashings and insulation as specified herein and as indicated on the drawings in accordance with the manufacturer's most current specifications and details.
- B. The roofing contractor shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of all job site conditions that will affect their work.
- C. The roofing contractor shall confirm all given information and advise the building owner, prior to bid, of any conflicts that will affect their cost proposal.
- D. There will be no prequalification of subcontractors, however, any contractor who intends to submit a bid using a manufacturer other than the approved manufacturers listed must submit all required documentation for approval during the shop drawing process. Any contractor who fails to submit the product data as requested will be subject to rejection.

1.03 SUBMITTALS

- A. Prior to starting work, the roofing contractor must submit the following:
 - 1. Shop drawings showing layout, details of construction and identification of materials.
 - 2. Sample of the manufacturer's Membrane System Warranty.
 - 3. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.
 - 4. Certification from the membrane manufacturer indicating the membrane thickness over the reinforcing scrim (top ply membrane thickness) is nominal 15 mil or thicker.

5. Certification of the manufacturer's warranty reserve.
- B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption.
- B. Comply with the manufacturer's written instructions for proper material storage.
 1. Store Sure-Weld membrane in the original undisturbed plastic wrap in a cool, shaded area. Sure-Weld membrane that has been exposed to the elements for approximately 7 days must be prepared with Carlisle Weathered Membrane Cleaner prior to hot air welding.
 2. Store curable materials (adhesives and sealants) between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.
 3. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.
- C. Insulation must be on pallets, off the ground and tightly covered with waterproof materials.
- D. Any materials which are found to be damaged shall be removed and replaced at the applicator's expense.

1.05 WORK SEQUENCE

- A. Schedule and execute work to prevent leaks and excessive traffic on completed roof sections. Care should be exercised to provide protection for the interior of the building and to ensure water does not flow beneath any completed sections of the membrane system.
- B. Do not disrupt activities in occupied spaces.

1.06 USE OF THE PREMISES

- A. Before beginning work, the roofing contractor must secure approval from the building owner's representative for the following:
 1. Areas permitted for personnel parking.

2. Access to the site.
 3. Areas permitted for storage of materials and debris.
 4. Areas permitted for the location of cranes, hoists and chutes for loading and unloading materials to and from the roof.
- B. Interior stairs or elevators may not be used for removing debris or delivering materials, except as authorized by the building superintendent.

1.07 EXISTING CONDITIONS

If discrepancies are discovered between the existing conditions and those noted on the drawings, immediately notify the owner's representative by phone and solicit the manufacturer's approval prior to commencing with the work. Necessary steps shall be taken to make the building watertight until the discrepancies are resolved.

1.08 SAFETY

The roofing contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state and federal requirements that are safety related.

Safety shall be the responsibility of the roofing contractor. All related personnel shall be instructed daily to be mindful of the full time requirement to maintain a safe environment for the facility's occupants including staff, visitors, customers and the occurrence of the general public on or near the site.

1.09 WORKMANSHIP

- A. Applicators installing new roof, flashing and related work shall be factory trained and approved by the manufacturer they are representing.
- B. All work shall be of highest quality and in strict accordance with the manufacturer's published specifications and to the building owner's satisfaction.
- C. There shall be a supervisor on the job site at all times while work is in progress.

1.10 QUALITY ASSURANCE

- A. The Sure-Weld Membrane Roofing System must achieve a UL Class A.
- B. The specified roofing assembly must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated according to American Society of Civil Engineers (ASCE 7) and ANSI/SPRI WD-1 "Wind Design Standard Practice for Roofing Assemblies."
- C. The membrane must be manufactured by the material supplier. Manufacturer's supplying membrane made by others are not acceptable.

- D. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.
- E. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least five (5) years successful experience installing single-ply TPO roofing systems and having installed at least one (1) roofing application or several similar systems of equal or greater size within one year.
- F. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.
- G. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the specifier. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the specifier's consideration.
- H. The Sure-Weld TPO White membrane meets CRRC (Cool Roof Rating Council) for reflectance and emittance. When tested in accordance with ASTM C1549, the Sure-Weld White material has an initial solar reflectance of 0.79 and a 3-year aged reflectance of 0.70. The material has also been tested for emittance in accordance with ASTM C1371; an initial emittance of .90 and a 3-year aged emittance of 0.86 were achieved.
- I. The Sure-Weld White TPO membrane meets the emittance requirements set forth by the USGBC (U. S. Green Building Council) for their LEED (Leadership in Energy and Environmental Design) Program. The Sure-Weld White TPO material has an emittance of 0.95 (when tested in accordance with ASTM E408) and an SRI (solar reflectance index) of 110 (calculated using ASTM E 1980).
- J. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the building owner seventy-two (72) hours prior to the manufacturer's final inspection.

1.11 JOB CONDITIONS, CAUTIONS AND WARNINGS

Refer to Carlisle's Sure-Weld Roofing System specification for General Job Site Considerations.

- A. Material Safety Data Sheets (MSDS) must be on location at all times during the transportation, storage and application of materials.
- B. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.

- C. When loading materials onto the roof, the Carlisle Authorized Roofing Applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.
- D. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
- E. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
- F. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
- G. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
- H. New roofing shall be complete and weather tight at the end of the work day.
- I. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

1.12 WARRANTY

- A. Provide manufacturer's 20 year Total System Warranty covering both labor and material with no dollar limitation. The warranty shall not be prorated or require the owner's signature, and shall be transferrable. The maximum wind speed coverage shall be peak gusts of 80 mph measured at 10 meters above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.
- B. A Reflectivity Warranty Amendment is available indicating the membrane will meet the Energy Star program reflectivity guidelines for both new and aged membrane for a period of 10 years.
- C. Pro-rated System Warranties shall not be accepted.
- D. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the specifier's approval.

PART 2 PRODUCTS

2.01 GENERAL

- A. All components of the specified roofing system shall be products of an approved

manufacturer. There is no prequalification of subcontractors, however, any contractor who intends to submit a bid using a manufacturer other than the approved manufacturers listed must submit all required documentation for approval during the shop drawing process. Any contractor who fails to submit the product data as requested will be subject to rejection.

a. Approved Manufacturerers:

Carlisle Syntec (as specified)
Firestone (Ultra Ply TPO)
Versico (VersiWeld)
Mulehide (TPO-c Standard)

- B. All products (including insulation, fasteners, fastening plates, prefabricated accessories and edgings) must be **manufactured and/or supplied** by the roofing system manufacturer and covered by the warranty.
- C. Carlisle Roofing Systems (www.carlisle-syntec.com)
Representative: Mark McBryde 205-942-9538 (office) 205-288-2646 (cell)

2.02 MEMBRANE

Furnish Sure-Weld 60-mil thick white & tan reinforced TPO (Thermoplastic Polyolefin) membrane as needed to complete the roofing system. Membrane thickness over the reinforcing scrim (top-ply thickness) shall be nominal 15 mil thick or greater. Membrane sheets in rolls 12', 10' or 8' wide by 100' long.

2.03 INSULATION BOARD

- A. When applicable, insulation shall be installed in multiple layers. The first and second layers of insulation shall be mechanically fastened to the substrate in accordance with the manufacturer's published specifications.
- B. Insulation shall be **Carlisle Insulbase Polyiso** as supplied by Carlisle SynTec. Minimum R-value required is listed on the drawings, to be applied in two layers.
1. **Carlisle Insulbase Polyiso** – A foam core insulation board covered on both sides with a medium weight fiber-reinforced felt facer meeting ASTM C 1289-06, Type II, Class 1, Grade 3 (25 psi). The product is available in 4' x 8' standard size with a thickness from 1 to 4 inches. 4' x 4' tapered panels are also available.

2.04 ADHESIVES AND CLEANERS

All products shall be furnished by Carlisle and specifically formulated for the intended purpose.

- A. **Sure-Weld Bonding Adhesive:** A high-strength, synthetic rubber adhesive used for bonding Sure-Weld membrane to various surfaces. The adhesive is applied to both the membrane and the substrate at a coverage rate of approximately 60 square feet per gallon per finished surface (includes coverage on both surfaces).

- B. **Low VOC Bonding Adhesive for TPO:** This product meets the <250 gpl VOC (volatile organic compound) content requirements of the OTC Model Rule for Single-Ply Roofing Adhesives. A high strength, solvent-based contact adhesive that allows bonding of TPO membrane to various porous and non-porous substrates. Apply at a rate of 60 ft² per gallon finished surface. Available in 5 gallon pails. This product does not comply with southern California counties with additional restrictions on solvents. See Carlisle's Product Data Sheet for a listing of the counties involved.
- C. **Low VOC Bonding Adhesive 1168:** This product meets the <250 gpl VOC (volatile organic compound) content requirements of the OTC Model Rule for Single Ply Roofing Adhesives. A high strength, solvent-based contact adhesive the allows bonding of TPO membrane to various porous and non-porous substrates. Apply at a rate of 60 ft² per gallon finished surface. Available in 5-gallon cans. This product complies with southern California counties with additional restrictions on solvents. See Carlisle's Product Data Sheet for a listing of the counties involved.
- D. **Cut-Edge Sealant:** A white or clear colored sealant used to seal cut edges of reinforced Sure-Weld membrane. Color of sealant shall be tan or clear where adjacent to tan membrane. A coverage rate of approximately 225 - 275 linear feet per squeeze bottle can be achieved when a 1/8" diameter bead is applied.
- E. **Water Cut-Off Mastic:** Used as a mastic to prevent moisture migration at drains, compression terminations and beneath conventional metal edging (at a coverage rate of approximately 10' per tube or 100' per gallon).
- F. **Universal Single-Ply Sealant:** A 100% solids, solvent free, voc free, one part polyether sealant that provides a weather tight seal to a variety of building materials. It is white (tan on parapet walls) in color and is used for general caulking such as above termination bars and metal counter flashings and at scuppers.
- G. **Thermoplastic One-Part Pourable Sealer:** A one-part, moisture curing, elastomeric polyether sealant used to fill TPO Molded Pourable Sealant Pockets. Packaged in 4, 2-liter foil pouches inside a reusable plastic bucket. 1 pouch will fill 2 TPO Molded Pourable Sealant Pockets.
- H. **Weathered Membrane Cleaner:** Used to prepare membrane for heat welding that has been exposed to the elements or to remove general construction dirt at an approximate coverage rate of 400 square feet per gallon (one surface).
- I. **TPO Primer:** A solvent-based primer used to prepare the surface of Sure-Weld Membrane prior to application of Pressure-Sensitive Coverstrip and TPO Pressure-Sensitive RUSS.
- J. **TPO Low VOC Primer::** A solvent-based, low solids primer used to prepare the surface of Sure-Weld Membrane prior to application of Pressure-Sensitive Coverstrip and TPO Pressure-Sensitive RUSS. This low VOC product is ideal for use in states where environmental issues are a concern.

2.05 FASTENERS AND PLATES

To be used for mechanical attachment of insulation and membrane securement:

- A. **HP-X Fasteners:** A heavy duty #15 threaded fastener with a #3 phillips drive used for membrane or insulation securement into steel, wood plank or minimum 15/32 inch thick plywood when increased pullout resistance is desired.
- B. **Insulation Fastening Plates:** a nominal 3 inch diameter plastic or metal plate used for insulation attachment.

2.06 MEMBRANE TERMINATIONS

- A. **Metal Termination Bar:** (If shown on drawings) a 1" wide and .098" thick extruded aluminum bar pre-punched 6" on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

PART 3 EXECUTION

3.01 GENERAL

- A. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, job site considerations and weather restrictions.
- B. Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.

3.02 INSULATION BOARD PLACEMENT

- A. Do not install more insulation board than can be covered with membrane in the same day. Install insulation or membrane underlayment over the substrate with boards butted together. Gaps greater than 1/4" are not acceptable. Stagger joints both horizontally and vertically if multiple layers are provided.
- B. Secure insulation to the substrate with the required mechanical fasteners in accordance with the manufacturer's specifications.

3.03 MEMBRANE PLACEMENT AND ATTACHMENT

- A. Position Sure-Weld membrane over the acceptable substrate. Fold membrane sheet back onto itself so half the underside of the membrane is exposed.
- B. Apply Bonding Adhesive in accordance with the manufacturer's published instructions, to the exposed underside of the membrane and the corresponding substrate area. Do not apply Bonding Adhesive along the splice edge of the membrane to be hot air welded over the adjoining sheet. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.

1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded section of the membrane sheet immediately after rolling the membrane into the adhesive with a soft bristle push broom to achieve maximum contact.
 2. Fold back the unbonded half of the sheet and repeat the bonding procedures.
- C. Position adjoining sheets to allow a minimum overlap of 2 inches to provide a minimum 1-1/2" hot air weld.
- D. Continue to install adjoining membrane sheets in the same manner, overlapping edges a minimum of 2 inches and complete the bonding procedures as stated previously.

3.04 MEMBRANE HOT AIR WELDING PROCEDURES

- A. Hot air weld the Sure-Weld membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's specifications. At all splice intersections, roll the seam with a silicone roller immediately after welder crossed the membrane step-off to ensure a continuous hot air welded seam.

Note: All splice intersections shall be overlaid with Sure-Weld T-joint covers or non-reinforced flashing.

- B. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).
- C. Repair all seam deficiencies the same day they are discovered.
- D. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete. Cut Edge Sealant is not required on vertical splices.

3.05 FLASHING

- A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using Sure-Weld reinforced membrane. Sure-Weld non-reinforced membrane can be used for flashing pipe penetrations, Sealant Pockets, and scuppers, as well as inside and outside corners, when the use of prefabricated accessories is not feasible.
- B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.06 DAILY SEAL

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
- B. Complete an acceptable membrane seal in accordance with the manufacturer's

requirements.

3.07 CLEAN UP

- A.** Perform daily clean up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
- B.** Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

07600 FLASHING & SHEET METAL

A. Scope

1. All materials passing through or mounted on the roof shall be flashed.
2. Include all flashing at windows, doors and finished openings.

B. Materials

1. Downspouts (and scupper, conductor head and gutters, if shown on the drawings) shall be 24 gauge galvanized metal & painted.
2. Metal parapet cap shall be galvanized steel & painted. See drawings for gauge.
3. Plastic bituminous cement shall comply with Fed. Spec. SS-C.153, Type 1 or ASTM D2822.
4. Fasteners and nails shall be stainless steel except where otherwise shown.
5. Sealants shall comply with Section 07900 Caulking & Sealants.

C. Fabrication - Installation

1. All work shall be water-tight. Fabrication and installation shall be consistent with standards of good workmanship and the requirements of the roofing work. All materials passing through or mounted on the roof shall be flashed. Proper allowance shall be made for expansion.
2. Clean all new metal work at the completion of the project.
3. Metals which join or abut dissimilar materials or other metals shall be isolated or insulated to prevent electrolysis.
4. Flashing and sheet metal work shall be set in true alignment without "oil canning" or distortion.

D. Clean-up

Remove all empty containers, flashing materials, tools, etc., and clean stains from surfaces to be exposed.

07720 ROOF HATCH

PART 1 - GENERAL

1.01 SUMMARY

- A. Work included: Furnishing and installing factory fabricated roof hatches.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM), 100 Bar Harbor Drive, West Conshocken, PA 19428-2959; (610) 832-9585, fax (610) 832-9555.
 - 1. ASTM A 36-93a: Standard Specification for Structural Steel
- B. Miami-Dade Building Code Compliance Office, 140 W Flagler Street, Suite 1603, Miami, FL 33130-1563 phone (305) 375-2901, fax (305) 375-2908
 - 1. N.O.A. 19-1029.10 High velocity hurricane zone, large and small missile impact
- C. Florida Building Commission, 1940 North Monroe Street, Tallahassee FL 32399, phone: 850-487-1824
 - 1. Florida Product Approval number FL13501 High velocity hurricane zone, large and small missile impact.
- D. International Organization for Standardization (ISO), ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, phone +41 22 749 01 11, fax +41 22 733 34 30
 - 1. ISO 9001:2008 Certified

1.03 SUBMITTALS

- A. Shop Drawings: Provide manufacturer's product data for all materials in this specification
- B. Contract Closeout: Roof hatch manufacturer shall provide the manufacturer's Warranty prior to the contract closeout.

1.04 PRODUCT HANDLING

- A. All materials shall be delivered in manufacturer's original packaging.
- B. Store materials in a dry, protected, well-vented area. The contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.
- C. Remove any protective wrapping immediately after installation.

1.05 JOB CONDITIONS

- A. Verify that other trades with related work are complete before installing roof hatch.

- B. Mounting surfaces shall be straight and secure; substrates shall be of proper width.
- C. Refer to the construction documents, shop drawings, and manufacturer's installation instructions.
- D. Coordinate installation with roof membrane and roof insulation manufacturer's instructions before starting.
- E. Observe all appropriate OSHA safety guidelines for this work.

1.06 WARRANTY

- A. Manufacturer's standard warranty: Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge. Electrical motors, special finishes, and other special equipment (if applicable) shall be warranted separately by the manufacturers of those products.
- B. Manufacturer's Quality System: Registered to ISO 9001:2008 Quality Standards including in-house engineering for product design activities.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. The BILCO Company, P.O. Box 1203, New Haven, CT 06505, 1-203-934-6363, Fax: 1-203-933-8478, Web: www.bilco.com
- B. There will be no prequalification of manufacturers, however, any contractor who intends to submit a bid using a manufacturer other than the approved manufacturers listed above must submit all required documentation for approval during the shop drawing process. Product data must be submitted to match that specified on the drawings. Any contractor who fails to submit the product data as requested will be subject to rejection.

2.02 ROOF HATCH

- A. Furnish and install where indicated on plans metal roof hatch Type S, size width: 3'0" x length: 2'6". Length denotes hinge side. The roof hatch shall be single leaf. The roof hatch shall be pre-assembled from the manufacturer.
- B. Performance characteristics:
 - 1. Cover shall be reinforced to support a minimum live load of 40 psf (195kg/m²) with a maximum deflection of 1/150th of the span or a maximum design pressure of + or - 70 psf (342kg/m²) with a factor of safety of 2.

2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
 3. Operation of the cover shall not be affected by temperature.
 4. Entire hatch shall be weathertight with fully welded corner joints on cover and curb.
- C. Cover: Shall be 14 gauge paint bond G-90 galvanized steel with a 3" beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.
- D. Cover insulation: Shall be fiberglass of 1" thickness, fully covered and protected by a 22 gauge paint bond G-90 galvanized steel liner.
- E. Curb: Shall be 12" in height and of 14 gauge paint bond G-90 galvanized steel. The curb shall be formed with a 3-1/2" flange with 7/16" holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip® flashing system, including stamped tabs, 6" on center, to be bent inward to hold single ply roofing membrane securely in place.
- F. Curb insulation: Shall be rigid, high-density fiberboard of 1" thickness on outside of curb.
- G. Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe through bolted to the curb assembly.
- H. Hardware:
1. Heavy pintle hinges shall be provided.
 2. Cover shall be equipped with a spring latch with interior and exterior turn handles.
 3. Roof hatch shall be equipped with interior and exterior padlock hasps.
 4. The latch strike shall be a stamped component bolted to the curb assembly.
 5. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1" diameter red vinyl grip handle to permit easy release for closing.
 6. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed.
 7. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.
- I. Finishes: Factory finish shall be alkyd based red oxide primed steel.

- J. Models S-20 (galvanized steel cover and curb) and S-50 (aluminum cover and curb) shall be Miami-Dade Product Control approved, NOA # 19-1029.10 (Exp. 12/2/24) meeting large and small missile impact requirements. Florida Product Approval #FL15110.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify that roof hatch installation will not disrupt other trades. Verify that the substrate is dry, clean, and free of foreign matter. Report and correct defects prior to any installation.

3.02 INSTALLATION

- A. The installer shall check as-built conditions and verify the manufacturer's roof hatch details for accuracy to fit the application prior to fabrication. The installer shall comply with the roof hatch Manufacturer's installation instructions.
- B. The installer shall furnish mechanical fasteners consistent with the roof requirements.

07900 CAULKING & SEALANTS

A. SCOPE OF WORK:

Includes caulking, sealing, pointing and other related items necessary to complete project indicated by drawings. Sealants shall be installed by the trade installing the material.

1. Inside and outside face of all vertical wall joints, around door and window frames and at mechanical openings shall receive sealant.
 - a. Sealant - Use on exterior or interior where joint is subject to movement. Cyclic movement capacity is 12 to 25 percent.
 - b. Caulk - Use on interior only where joint is not subject to movement. Cyclic movement is 5 to 10 percent.

B. PRODUCTS:

1. Sealant - Tremco "Dymeric", Pecora NR-200 or Sonneborn "Sonolastic NP-2" or an approved equal, with 20-year minimum life expectancy and installed in strict accordance with the manufacturer's recommendations. Provide backer rods compatible with sealant used.
2. Caulk - Resinous, gun grade, non-staining plastic compound with shrinkage factor not exceeding 15 percent. TREMCO MONO, Sonneborn "Sonolac" or Pecora AC-20 or an approved equal, (interior use).
3. Joint Backing - Elastic close cell synthetic material, non-reactive with caulking materials and non-oily, approved by sealant manufacturer min. density 3.24 lbs per cubic foot. Use no asphalt or bitumen-impregnated materials with sealants.

C. INSTALLATION:

1. Thoroughly clean all joints, blow loose particles from joint. Material to be contacted by sealant shall be dry, fully cured and free from agents to prevent a good bond. Prime joint as recommended by sealant manufacturer. Mineral spirits, kerosene or paint solvents shall not be used to surface clean.
2. Install backing material in joints so that joint depth is 50% joint width, but a minimum of 1/4" deep. Backing shall be an approved closed cell rod.
3. Apply sealant in joints using pressure gun with nozzle cut to fit joint width, deposited in uniform continuous beads without gaps or air pockets.
4. Tool joints to required configuration within ten (10) minutes of sealant

application. If masking materials are used, remove as soon as tooling is complete. Sags, runs and smears are not permitted.

5. Color shall match adjoining surface or as selected by Architect.

DIVISION 8 DOORS & WINDOWS

08110 STEEL DOORS & FRAMES

A. SCOPE OF WORK

Includes installation of Dollar Tree ordered steel doors & frames as indicated on the drawings and specified herein.

B. MATERIALS

All materials will be ordered by Dollar Tree for contractor installation.

C. INSTALLATION

1. Installation of steel doors & frames shall be in accordance with manufacturers written instructions.
2. Follow door manufacturer's written instructions for all installation work. Replace doors that are hinge bound or damaged during installation.
3. Bottom of door frames shall be flush with the top of the floor.
4. All steel doors & frames shall be painted where called for on drawings per division 9 paint specs (color shown on drawings).

08210 WOOD DOORS

A. SCOPE OF WORK

Includes installation of Dollar Tree ordered wood doors as indicated on the drawings and specified herein.

B. MATERIALS

All materials will be ordered by Dollar Tree for contractor installation.

C. INSTALLATION

1. Fitting

- a. Fit doors with width by planeing and for height by sawing. Undercut for carpets.

- I. 1/2" from bottom.
 - II. 1/8" maximum from top.
 - III. Bevel lock and hinge edges.
 - IV. Undercut for carpet.

- b. Seal all job site cut surfaces with two (2) coats of clear sealer before final door hanging.

- 2. Installation of Doors - Install in accordance with door manufacturer's written instruction. Undercut as required.

- 3. All wood doors shall be painted where called for on drawings per division 9 paint specs (color shown on drawings).

D. ADJUST & CLEAN

Replace or rehang doors which are hinge bound and do not swing or operate freely. Refinish or replace doors damaged during installation.

08410 ALUMINUM STOREFRONT DOORS & FRAMES

A. SCOPE

1. Includes labor, materials and equipment for the installation of aluminum doors, frames and windows as indicated on the drawings and specified herein.
2. Consult drawings for sizes, design and construction details.

B. MATERIALS

1. Aluminum doors and frames shall be products of an approved manufacturer. There will be no prequalification of subcontractors, however, any contractor who intends to submit a bid using a manufacturer other than the approved manufacturers listed must submit all required documentation for approval during the shop drawing process. Any contractor who fails to submit the product data as requested will be subject to rejection.

a. Approved Manufactuerers:

The Kawneer Company (as specified)

Manko Window Systems Inc. (135 Series & 2450 Series unless NOA is noted. When noted, system must be equal to that shown on drawings)

YKK AP America Inc. (equal to that specified)

2. Doors, Frames and Glazing Members

- a. Extruded aluminum not less than .125 inches in thickness, except that door glazing moldings may be .050 inches thick. Aluminum alloy shall be 6063-T5.
- b. Fastenings shall be of aluminum alloy or stainless steel.
- c. Doors shall be of mechanical fastening and electric arc Sigma welded. Welding shall be at unexposed junction of rails and stiles. The welds shall have deep penetration without creating blemishes on exposed surfaces.
- d. Hardware shall be furnished and installed by door manufacturer. Doors are to be single acting.

Hardware is to be as follows:

- | | |
|----------------|---|
| 1) Glass Stops | Square for 9/16" infill, interior screw applied glass stop with silicone seal |
|----------------|---|

- | | | |
|----|--------------|--|
| 2) | Push-Pulls | Architects Classic Hardware
“CO-9 Pull and CP-II Push Bar” |
| 3) | Door Closers | <p><u>If specifications include the “Dollar Tree Furnished Materials & Equipment” spreadsheet at the end of Division 1:</u> Installation of Yale 2721 Stop Arm Closer & Yale 3148 Drop Plate provided by Dollar Tree.</p> <p><u>If specifications DO NOT include the “Dollar Tree Furnished Materials & Equipment” spreadsheet at the end of Division 1:</u> Yale 2721 Stop Arm Closer & Yale 3148 Drop Plate.</p> |
| 4) | Hinging | KawneerTop, Bottom and Intermediate (4-1/2”x 4”) Butt Hinge |
| 5) | Locking | <p>MS 1850 Deadbolt on active leaf w/ Kawneer Controller Locking System on inactive leaf.</p> <p><u>Note:</u> Where impact glazing is specified provide MS1850 3-point lock w/thumb turn on inside & key cylinder on outside & top & bottom flush bolts on inactive leaf.</p> |
| 6) | Thresholds | Kawneer Standard Threshold (1/2” x 4”) clear anodized aluminum finish |
| 7) | Weathering | Sealair bulb polymeric weathering in Door frames, adjustable bottom rail sweep with EPDM blade and adjustable astragal utilizing pile weathering with polymeric fin at meeting stiles. |
- e. Glazing stops shall be snap-in extruded aluminum type with neoprene bulb-type glazing, without exposed screws. Exterior sides shall be lock-in tamper proof type.
- f. Door stops shall be applied to the frame with concealed fastenings with vinyl insert for weather proofing and door silencing.
3. Finish of Aluminum shall be clear anodized. Thresholds shall be clear anodized.

4. Fabrication: Assemble members as detailed employing concealed anchoring devices, brackets, reinforcing for hardware, etc., to provide mechanical hairline water-tight joints.
5. Weatherstripping shall be provided on three sides of all doors with metal-backed pile cloth installed in the door and/or frame.
6. Aluminum Doors shall be Kawneer 350 Entrances or equal unless shown otherwise on drawings. Storefront Frames shall be Kawneer TRIFAB 451T framing system or equal unless shown otherwise on drawings.

C. INSTALLATION

Aluminum work shall be made water-tight and secured in place, plumb and in true alignment by the use of concealed fastening devices in accordance with details as shown on the drawings. Where components are jointed, they shall be accurately cut and fitted in a tightly closed joint. Caulking shall be installed where required in order to secure a water-tight condition. Thresholds shall be set in grout. Anchor frames with 3/8" diameter stainless steel wedge anchors spaced 18" o.c.

D. CLEANING

Remove protective coatings and wash all aluminum in strict accordance with manufacturer's recommended practice. Do not use abrasive or caustic cleaning agent.

08710 DOOR HARDWARE

PART 1 – GENERAL

A. SCOPE OF WORK

Includes installation of Dollar Tree ordered door hardware, thresholds, & weatherstripping as indicated on the drawings and specified herein.

B. RELATED SECTIONS

1. Section 08110 – Steel Doors & Frames.
2. Section 08210 – Wood Doors.
3. Section 08410 – Aluminum Storefront Doors & Frames.

C. QUALITY ASSURANCE

1. Manufacturers and model numbers listed in the hardware sets portion of this specification are for the purpose of establishing a standard of quality. Similar products by approved manufacturers that are equal in design, function and quality will be acceptable.
2. The hardware manufacturer shall be a recognized firm regularly engaged in the manufacturer and sale of finished hardware items.
3. Provide hardware for fire rated openings that complies with the requirements of NFPA 80 and authorities having jurisdiction. Provide only items of door hardware that have been tested and listed by UL, FM, Warnock-Hersey or other testing organizations acceptable to the authorities having jurisdiction.
4. All hardware shall be the requirements set forth in the American with Disabilities Act (ADA) and state and local handicapped codes.

D. DELIVERY, STORAGE, AND PROTECTION

1. Package each item individually. Label and clearly identify each package with item nomenclature and door opening. Correlate all making and opening numbers to match the hardware schedule.
2. The General Contractor is to provide a secure, locked storage area for all items delivered to the jobsite.

3. The General Contractor shall inventory all items delivered to the jobsite within forty-eight hours and advise the supplier immediately of any shortages.

E. WARRANTY

- A. All hardware items are to be warranted for a period of one (1) year from date of substantial project completion. Door closers are to be warranted for five (5) years.
- B. Warranty is to cover failure due to manufacturing defects or material failure only. It shall not cover abuse, vandalism, improper installation or maintenance. Defective materials are to be replaced at no cost to owner.

PART 2 – PRODUCTS

A. MANUFACTURERS

1. All materials will be ordered by Dollar Tree for contractor installation.

PART 3 – EXECUTION

A. INSTALLATION

1. Mount hardware units at heights indicated in following application publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
 - a. “Recommended Locations for Builders Hardware for Standard Steel Doors and Frames” by the DOOR AND HARDWARE INSTITUTE
 - b. WDMA Industry Standard I.S 1.A97, “Hardware Locations for Wood Flush Doors”.
2. Install each hardware item in compliance with the manufacturer’s instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9. Do not install surface-mounted items until finishes have been completed on the substrates involved.
3. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
4. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

5. Set thresholds in sealant complying with requirements specified in Section 07900 – Caulking & Sealants.
6. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

B. ADJUSTING & CLEANING

1. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
2. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware item in such space or area. Clean operating items as necessary to restore proper functions and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
3. Clean adjacent surfaces soiled by hardware application.

08800 GLAZING

A. SCOPE OF WORK

Includes labor, materials, and equipment for the installation of all glass and glazing as indicated on the drawings and specified herein. Glazing shall meet the ANSI Glazing Code. All glazing shall be dry glazed. Submit samples for approval.

B. QUALITY ASSURANCE

Acceptable Products (as listed below)	Vitro Solarban 70XL Vitro Solarban 60 Viracon (Spandrel Coating if applicable)
--	--

There will be no prequalification of subcontractors, however, any contractor who intends to submit a bid using a manufacturer other than the approved manufacturers listed must submit all required documentation for approval during the shop drawing process. Any contractor who fails to submit the product data & samples as requested will be subject to rejection.

C. STORAGE

Store in original packing, in a cool, dry area on supportive frames or platforms.

D. MATERIALS

1. Clear Low-E Insulated Glass

- Outdoor Lite: ¼” clear float glass, pyrolytic coated on 2nd surface (2)
- Gas Cavity: ½” air gas fill
- Indoor Lite: ¼” clear float glass
- Low-E (Pyrolytic) Coating: Solarban 70XL by Vitro Architectural Glass, Inc. located on second surface (2).
- Performance Values:

Visible Light Transmittance	U-Value Winter	U-Value Summer	SHGC	Shading Coefficient	Exterior Visible Light Reflectance
64%	.28	.26	.27	.31	12%

2. Clear Low-E Insulated Glass (Storefront Door)

- Outdoor Lite: ¼” clear float glass, pyrolytic coated on 2nd surface (2)
- Gas Cavity: ½” air gas fill
- Indoor Lite: ¼” clear float glass
- Low-E (Pyrolytic) Coating: Solarban 60 by Vitro Architectural Glass, Inc. located on second surface (2).
- Performance Values:

Visible Light Transmittance	U-Value	U-Value	SHGC	Shading Coefficient	Exterior Visible
-----------------------------	---------	---------	------	---------------------	------------------

	Winter	Summer			Light Reflectance
70%	.29	.27	.39	.45	11%

3. Spandrel Low-E Insulated Glass (if called for on drawings)
 - a. Outdoor Lite: 1/4" clear glass
 - b. Gas Cavity: 1/2" air gas fill
 - c. Indoor Lite: 1/4" float glass w/ Viracon V903 Subdued Gray spandrel coating.
4. Setting Blocks
 - a. 1/4" thick neoprene.
 - b. 1/4" lead plugs.

E. INSTALLATION

1. Install all glass in accordance with manufacturer's printed recommendations, and as detailed on the drawings. At completion of work, leave all glass in clean condition to satisfaction of the owner.
2. Furnish protection for material after it is in place. Remove broken, chipped or substandard material and replace at no cost to the owner.
3. Any leaks or defective work shall be immediately corrected by the manufacturer, this sub-contractor or the General Contractor, at no expense to the owner.

DIVISION 9 FINISHES

09250 GYPSUM BOARD

A. Product Delivery, Storage & Handling:

1. Delivery & Handling - Deliver materials to the project site with manufacturer's labels intact and legible, handle materials with care to prevent damage. Deliver fire-rated materials bearing testing agency label and required fire classification numbers.

2. Storage - Store materials inside cover, stack flat, off floor, in dry area. Stack wallboard so that long lengths are not over short lengths.

B. Job Conditions:

1. Environmental Conditions -

a. Temperature - During cold weather, in areas receiving wallboard installation, maintain temperature range between 55°F to 70°F for 24 hours before, during and after gypsum wallboard and joint treatment application.

b. Ventilation - Provide ventilation during and following adhesives and joint treatment application. Use temporary air circulators in enclosed areas lacking natural ventilation. Protect installed materials from drafts during hot, dry weather.

2. Protection - Protect adjacent surfaces against damage and stains.

C. Materials: (See Div. 7 for insulation)

1. Gypsum Wallboard -

a. Fire-rated Board, ASTM C-36, Type X, shall be 5/8" thick as indicated on drawings. Edges shall be tapered (SW). All board shall be fire-rated where used in fire walls and standard board in other walls.

b. Water-resistant Board, 5/8" W/R, as indicated on drawings and for toilets.

2. Fasteners - Screws shall be self-drilling, self-tapping, bugle head, for use with power driven tool. Type S shall be used for wallboard to sheetmetal application and Type G, for wallboard to wallboard application. Length for single layer or base layer application, Type S, shall be one inch (1") face layer of two-layer application, Type S shall be 1-7/8". Length for wood cabinets through single layer panels to steel studs shall be 1-5/8" type S, oval head.

3. Joint Treatment Materials (where required) -

a. Joint Tape - ASTM C-475, perforated tape.
b. Joint Compound - ASTM C-475, all purpose joint compound.

4. Laminating Adhesive - Manufacturer's recommendation for laminating wallboard, ASTM C-557.

5. Caulking - Non-hardening, permanently resistant synthetic rubber based acoustical sealant.

6. Metal Accessories - Corner beads shall be 1-1/8" x 1-1/8" for crimping to any wallboard corner. Casing bead and trim shall be galvanized steel. Fascia sill molding shall be MM Corp. No. FSMD 58-50, FSMD-58-12 as required.

7. Wall Studs - galvanized, corrosion-resistant, studs to extend from floor to bottom of floor slab above. Use gauges called out on drawings. Provide runners at bottom and top, use continuous studs without splices. Studs manufactured by U. S. Gypsum or equal. Walls with studs going from floor slab to structure above unless noted otherwise. Walls shall be rotary hammered in place and anchored with lead drive pins. Studs shall be screwed off at top and bottom - not crimped.

D. Installation

1. Metal Stud Frame System

a. Metal studs and runners shall be of size shown on the plans or as specified herein. Align all partitions accurately so that frame systems are true to line and plumb.
b. Where applicable, metal runners shall be securely attached as follows:

- 1) Where structural studs attach to concrete use 1/2" expansion anchors with 3" min. embedment between each stud (for all exterior walls). Shot-in anchors are only acceptable at interior walls.
 - 2) Where exterior furring studs attach to concrete use tapcons @ spacing matching stud centers on plans.
 - 3) At steel framing use No. 12 Tek screws @ spacing matching stud centers on plans.
 - 4) Unless noted otherwise on drawings: At Cast Stone over Block Masonry use 1/2" expansion anchors with 3" min. embedment into block. An anchor shall be placed between each stud. Cast stone shall have predrilled holes to allow the expansion anchor to be installed into the block.
- c. Cut studs accurately to rest on bottom track and fully engaged ceiling track. Attach studs to runners with two (2) 3/8" pan head screws through one stud flange and runner flange at top and bottom of stud. End splices shall be provided by nesting one stud into another to a depth of at least 9". One flange of each stud must be in between two flanges of mating stud so that studs interlock. Fasten together with two 3/8" pan head screws in each flange. Locate each screw not more than 1" from ends of splice. Studs shall be accurately spaced and set plumb.
- d. Studs shall be placed no more than 3" from abutting partitions, partition corners, and existing construction elements.
- e. Double studs shall be placed in direct contact with door frame jambs and securely anchored to the jamb anchor clips with screw attachments. A horizontally cut-to-length runner with a web-flange bend at each end shall be placed in direct contact with the door frame studs with one positive attachment per flange, and securely anchored to the head anchor clip with screw attachment. At least one vertical stud shall be placed between the runner section over the door and ceiling runner, with the vertical stud(s) equally spaced across the door opening width.
- f. When necessary to splice a stud, a lap of 8 inches shall be made in the stud and one positive attachment made in each

flange. All studs shall be anchored to runner flanges with Type S pan head screws or other fasteners. This is not intended to direct the splicing of studs in walls in order to extend the allowable height of the stud.

- g. Openings in partitions for windows, louvers, etc., shall have studs and runners positioned around these openings in the same way as for door openings, unless indicated otherwise on the design drawings.

E. Inspection:

1. Check framing for accurate spacing and alignment.
2. Verify that spacing of installed framing does not exceed maximum allowable for thickness of wallboard to be used.
3. Verify that frames are set for thickness of wallboard to be used.
4. Do not proceed with installation of wallboard until deficiencies are corrected and surfaces to receive wallboard are acceptable.
5. Protrusions of framing, twisted framing members, or unaligned members must be repaired before installation of wallboard is started.

F. Installation:

1. Installing Wallboard - Use wallboard of maximum lengths to minimize end joints. Stagger end joints when they occur. Abut wallboard without forcing. Neatly fit ends and edges of wallboard. Do not place butt ends against tapered edges. Support ends and edges of wallboard panels and where ends are back blocked and floated.
 - a. Single-Layer Wallboard shall be applied face out with long dimensions horizontal. All abutting ends and edges shall occur over stud flanges. Joints on opposite side of a partition shall occur on different studs. Screws shall be spaced 12" o.c. in the field of the board and 8" o.c. staggered along the vertical abutting edges.
 - b. Double Layer Wallboard shall be applied to base layer of gypsum wallboard with adhesive in accordance

with manufacturer's instructions. Stagger joints of face layer and base layer a minimum of 10" apart. During application, maintain a uniform temperature between 55 degrees F and 70 degrees F, until completely dry. Provide adequate ventilation.

c. Mechanical Fasteners - Attach single layer of wallboard to framing with Type "G" screws. Minimum edge clearance from mechanical fasteners: 3/8". Stagger mechanical fasteners opposite each other on adjacent ends or edges. Sand abutting ends or edges over support surface. Space screws 12" o.c. along ends or edges and field of wallboard at walls. Drive screws with positive clutch electric screwdriver.

d. Install ceiling access panels where shown on the drawings.

e. Expansion joints shall be provided as recommended by the Gypsum Panel Manufacturer.

f. All board shall be finished per 09260.

09260 GYPSUM BOARD ASSEMBLIES

A. Scope

1. Consult Drawings for extent of work; see Finish Schedule.
2. All finishes shall be as defined by Gypsum Association GA-214.

C. Execution

1. All gypsum board surfaces shall have a level 5 finish as described below.
2. Level 5 Finish: All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin consistent coating of joint compound over all joints and interior angles. Two separate coats of joint compound shall be applied over all flat joints and one separate coat of joint compound shall be applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. A thin skim coat of joint compound or a material manufactured especially for this purpose shall be applied to the entire surface. The surface shall be free of tool marks and ridges. Where glass mat and/or fiber-reinforced gypsum panels are installed, refer to the gypsum manufacturer for specific finishing recommendations.

C. Clean-Up

Protect adjacent finishes over-spray, spatters, etc., and remove mis-applied materials from floors and other surfaces scheduled to receive other finishes. Leave area broom clean.

09510 ACOUSTICAL CEILING

A. SCOPE OF WORK:

Includes all suspended acoustical ceilings, ceiling suspension systems and acoustical ceiling tiles. Refer to reflected ceiling plan.

B. QUALITY ASSURANCE:

1. Acceptable Manufacturer:

- a. Suspension System - Armstrong Prelude. 15/16" face exposed "T", Intermediate Duty. White.

Note: If plans call for a seismic ceiling provide: Seismic Suspension System - Armstrong Prelude. 15/16" face exposed "T", Heavy Duty #7301. White.

- b. Acoustical Ceiling
Armstrong "Cortega"
#769A – 24" x 48"
Color - White

2. Ceilings:

- a. Fire Hazard Classification: Flame Spread Index of 25 or less per ASTM E-84.
- b. All ceiling tile shall have a limited 10-year warranty against visible sag. This warranty shall be based on a maximum of 120 Degrees F.

C. SUBMITTALS:

- 1. Maintenance Material - Provide 5% replacement allowance for each type of tile for maintenance purposes.
- 2. Samples - submit full size samples to illustrate range of appearance.

D. PRODUCT DELIVERY & STORAGE:

Deliver materials in original, unopened, protective packaging, with manufacturer's labels, indicating brand name, pattern, size and thickness. Store cartons open at each end.

E. MATERIALS:

- 1. Suspension Systems - White, lay-in 24" x 48", 15/16" exposed tee grid system, conforming to requirements of Intermediate Duty, to fit the specified ceiling units.
- 2. Main Tees, Cross Tees, Edge Molding and Concealed Members - Double

web design, cold-rolled steel, Hot dipped galvanized coated and factory painted low sheen satin white.

3. Rough Suspension - Wire ties shall be 12-gauge, galvanized annealed steel wire. Hanger clips shall be prefabricated metal clamps for fastening to steel joists. Carrying channels shall be 16 gage, 1-1/2", cold-rolled steel.

F. INSTALLATION:

1. Suspension Systems - ASTM C636.
2. Rough Suspension -
 - a. Hangers - Hanger clips shall be installed as recommended by manufacturer. Space hanger wires 4' o.c., each direction. Install additional hangers at ends of each suspension member at light fixtures, 6" from vertical surfaces. Do not splay wires more than 5" in a 4' vertical drop. Wrap wire a minimum of three (3) times horizontally turning ends upward.
 - b. Carrying Channels - Install with leveling clips to main structure for indirect hung suspension system.
 - c. Main and Cross Runners - Space main runners at 48" o.c., at right angle to carrying channel. Space cross runners at 2' o.c., depending on system used.
 - d. Wall Molding - Install wall molding at intersection of suspended ceiling and vertical surfaces where suspension grid is exposed. Miter corners where wall moldings intersect or install corner caps. Attach to vertical surface with mechanical fasteners.
3. Acoustical Units - Install in level plane, except where shown, in straight line courses. Place materials to bear all around on suspension members. Minimum width of border tiles shall be one-half (1/2) unit dimension. Do not checkerboard patterns. Refer to reflected ceiling plan shown on Drawings.

G. CLEANING:

Clean soiled or discolored unit surfaces after installation. Touch-up scratches, abrasions, voids and other defects in painted surfaces. Remove and replace damaged or improperly installed units.

09660 RESILIENT BASE

A. Scope of Work:

Furnish all labor, materials, services and equipment for a complete installation of floor and base as indicated on drawings, schedule of finishes and as specified herein.

B. Materials:

1. Base - Vinyl Wall base (see plans for height). Color to be black.
2. Sheet Vinyl Base (if called for on plans) - Armstrong Connection Classic Corlon Series with by Intregal or approved equal, 3/8" Radius, 6" high.
3. Adhesives - Water resistant type, as recommended by flooring manufacturer. Clean existing slab. Test for adhesion.
4. Accessories – Aluminum Cap Trim, Black vinyl reducer strips, as required.
5. Corners – Outside corners to be manufactured corners. Cut outside corners or base creased around outside corners will not be accepted.

C. Installation:

1. Remove grease, dirt and other substances from slab. Do not proceed with installation until surfaces are smooth, all holes and cracks filled. Use fillers in all areas to fill cracks and voids.
2. Apply waterproof adhesive and set base in accordance with manufacturer's specifications. Make joints and seams as inconspicuous as possible. Test samples for adherence to existing surfaces shall be conducted. Clean existing surfaces, as required. Do not checkerboard tile.
 - a. Set base straight and true in cement. Outside corners factory furnished and inside corners neatly formed at job.
3. Immediately before building is ready for acceptance, clean base, and accessories. All material shall be rolled until a firm bond has been obtained. Wax floors (1 coat) with commercial grade non-slip wax and power buff.
4. Turnover to Owner upon completion of the resilient flooring, an additional 5% of the material in its original unopened boxes.

09900 PAINT

PART 1 - GENERAL

A. SCOPE OF WORK:

1. Interior and exterior painting and all related clean-up and preparation as shown on the drawings and called out in this specification.

B. REFERENCES:

1. Steel Structures Painting Council (SSPC):
 - a. SSPC-SP 1 - Solvent Cleaning.
 - b. SSPC-SP 2 - Hand Tool Cleaning.
 - c. SSPC-SP 3 - Power Tool Cleaning
 - d. SSPC-SP5/NACE No. 1, White Metal Blast Cleaning.
 - e. SSPC-SP6/NACE No. 3, Commercial Blast Cleaning.
 - f. SSPC-SP7/NACE No. 4, Brush-Off Blast Cleaning.
 - g. SSPC-SP10/NACE No. 2, Near-White Blast Cleaning.
 - h. SSPC-SP11, Power Tool Cleaning to Bare Metal.
 - i. SSPC-SP12/NACE No. 5, Surface Preparation and Cleaning of metals by Waterjetting Prior to Recoating.
 - j. SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete.

C. COLORS & SAMPLES:

1. All colors shall be as shown on drawings.

D. QUALITY ASSURANCE:

1. All paint is to be delivered to the site in manufacturer's labeled & sealed containers.
2. Paint exposed surfaces. If a color of finish, or a surface is not specifically mentioned, Architect will select from standard products, colors and sheens available
3. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels unless indicated.

E. DELIVERY, STORAGE, & HANDLING:

1. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information
 - a. Product name, and type (description).
 - b. Application and use instructions.
 - c. Surface preparation

- d. VOC content
 - e. Environmental issues
 - f. Batch date
 - g. Color number
- 2. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
 - 3. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.
 - 4. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

F. PROJECT CONDITIONS:

- 1. 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.

G. EXTRA MATERIALS:

- 1. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
- 2. Furnish Owner with an additional one percent of each material and color, but not less than 1 gal or 1 case, as appropriate.

PART 2 - PRODUCTS

A. MANUFACTURER:

- 1. Sherwin Williams or approved equal.

B. MATERIALS:

- 1. Paints and Coatings: Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- 2. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- 3. Coating Application Accessories: Provide all primers, sealers, cleaning

agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

4. Color: Refer to plans for paint colors.

C. INTERIOR PAINT SYSTEMS:

1. Columns below 12'-0" A.F.F. & Hollow Metal Doors & Frames

Latex System:

Sherwin Williams Semi-Gloss Finish (Low Odor – Zero VOC Finish):

- a. 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (5-10 mils wet, 2-4 mils dry).
- b. 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series.
- c. 3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series (4 mils wet, 1.7 mils dry per coat).

Benjamin Moore Semi-Gloss Finish (Low Odor – Zero VOC Finish):

- a. 1st Coat: Ultra Spec® 500 Interior Latex Primer #N534 (MPI listed Product, Categories 50, 50-X, 149, 149-X)
- b. 2nd Coat: Ultra Spec® 500 Interior Semi-Gloss Finish N539 (MPI Listed Product Categories 52, 52-X Green)
- c. 3rd Coat: Ultra Spec® 500 Interior Semi-Gloss Finish N539 (MPI Listed Product Categories 52, 52-X Green)

2. Roof Ladder

Sherwin Williams Semi-Gloss Finish (Low Odor – Zero VOC Finish):

- a. 1st Coat: Pro-Industrial Acrylic Semi-Gloss B66W651
- b. 2nd Coat: Pro-Industrial Acrylic Semi-Gloss B66W651

3. Wood Doors

Latex System:

Semi-Gloss Finish (Low Odor – Zero VOC Finish):

- a. 1st Coat: S-W Premium Wall and Wood Primer, B28W8111 (4 mils wet, 1.8 mils dry).
- b. 2nd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series.
- c. 3rd Coat: S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series (4 mils wet, 1.7 mils dry per coat).

4. MDO Employee Area Walls

Latex System:

Sherwin Williams Eggshell Finish (Low Odor – Zero VOC Finish):

- a. 1st Coat: S-W Premium Wall and Wood Primer, B28W8111 (4 mils wet, 1.8 mils dry).
- b. 2nd Coat: S-W ProMar 200 Zero VOC Latex Eggshell, B20-2600 Series.
- c. 3rd Coat: S-W ProMar 200 Zero VOC Latex Eggshell, B20-2600 Series (4 mils wet, 1.7 mils dry per coat).

Benjamin Moore Eggshell Finish (Low Odor – Zero VOC Finish):

- a. 1st Coat: Ultra Spec® 500 Interior Latex Primer #N534 (MPI listed Product, Categories 50, 50-X, 149, 149-X)
- b. 2nd Coat: Ultra Spec® 500 Interior Eggshell Finish N538 (MPI Listed Product Categories 52, 52-X Green)
- c. 3rd Coat: Ultra Spec® 500 Interior Eggshell Finish N538 (MPI Listed Product Categories 52, 52-X Green)

5. Drywall

Latex System:

Sherwin Williams Eggshell Finish (Low Odor – Zero VOC Finish):

- a. 1st Coat: S-W ProMar200 Zero VOC Interior Latex Primer, B28W2600 (4 mils wet, 1.5 mils dry).
- b. 2nd Coat: S-W ProMar 200 Zero VOC Latex Eggshell, B20-2600 Series.
- c. 3rd Coat: S-W ProMar 200 Zero VOC Latex Eggshell, B20-2600 Series (4 mils wet, 1.7 mils dry per coat).

Benjamin Moore Eggshell Finish (Low Odor – Zero VOC Finish):

- a. 1st Coat: Ultra Spec® 500 Interior Latex Primer #N534 (MPI listed Product, Categories 50, 50-X, 149, 149-X)
- b. 2nd Coat: Ultra Spec® 500 Interior Eggshell Finish N538 (MPI Listed Product Categories 52, 52-X Green)
- c. 3rd Coat: Ultra Spec® 500 Interior Eggshell Finish N538 (MPI Listed Product Categories 52, 52-X Green)

D. EXTERIOR PAINT SYSTEMS:

1. CMU/Brick & Exposed Foundation & Light Pole Bases

(Note: Color of exposed foundation (if applicable) shall match above color unless otherwise stated on the exterior elevations).

Elastomeric System:

Flat Finish:

- a. 1st Coat: S-W Loxon BlockSurfacer, A24W200 (50-100 sq ft/gal).
- b. 2nd Coat: S-W ConFlex XL Elastomeric High Build Coating, A5-400 Series.
- c. 3rd Coat: S-W ConFlex XL Elastomeric High Build Coating, A5-400 Series (16 mils wet, 7.5 mils dry per coat).
- d. 2nd Coat (Where Envy Green is used): S-W Loxon XP Acrylic Coating, A24-1400 (14-18 mils wet 6.4 - 8.3 mils dry / per coat).
- e. 3rd Coat (Where Envy Green is used): S-W Loxon XP Acrylic Coating, A24-1400 (14-18 mils wet 6.4 - 8.3 mils dry / per coat).

3. Downspouts, Gutter, Parapet Caps, & Hollow Metal Doors & Frames & Exposed Clip Angles/Drip Edges over Storefront

Latex System:

Semi-Gloss Finish:

- a. 1st Coat: S-W Pro-Cryl Universal Acrylic Primer, B66W310 Series.

- b. 1st Coat: S-W Metalatex Acrylic Semi-Gloss, B42 Series.
 - c. 2nd Coat: S-W Metalatex Acrylic Semi-Gloss, B42 Series. (4 mils wet, 1.7 mils dry per coat).
- 4. Wood Fence Pickets
Oil-Based System:
 - a. 1st Coat: S-W SuperDeck Exterior Transparent Stain, SD2C00064 Natural.
 - b.
- 5. Steel Lintels over Storefront
Latex System:
Semi-Gloss Finish:
 - a. 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (5-10 mils wet, 2-4 mils dry).
 - b. 2nd Coat: S-W Metalatex Acrylic Semi-Gloss, B42 Series.
 - c. 3rd Coat: S-W Metalatex Acrylic Semi-Gloss, B42 Series. (4 mils wet, 1.7 mils dry per coat).

PART 3 - EXECUTION

A. EXAMINATION

- 1. Do not begin installation until substrates have been properly prepared; notify Architect of unsatisfactory conditions before proceeding. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- 2. Proceed with work only after conditions have been corrected and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.
- 3. Previously Painted Surfaces: Verify that existing painted surfaces do not contain lead based paints, notify Architect immediately if lead based paints are encountered.

B. SURFACE PREPARATION

- 1. General Notes
 - a. Surfaces shall be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
 - b. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry a minimum of 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the

mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

- c. Remove items including but not limited to thermostats, electrical outlets, switch covers and similar items prior to painting. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- d. No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50 degrees F (10 degrees C), unless products are designed specifically for these conditions. On large expanses of metal siding, the air, surface and material temperatures must be 50 degrees F (10 degrees F) or higher to use low temperature products.

2. Block/Brick

- a. Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Concrete and mortar must be cured at least 30 days at 75 degrees F (24 degrees C). The pH of the surface should be between 6 and 9, unless the products are designed to be used in high pH environments. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface. Fill bug holes, air pockets, and other voids with a cement patching compound.

3. Concrete

- a. SSPC-SP13 or NACE 6: This standard gives requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems. The requirements of this standard are applicable to all types of cementitious surfaces including cast-in-place concrete floors and walls, precast slabs, masonry walls, and shotcrete surfaces. An acceptable prepared concrete surface should be free of contaminants, laitance, loosely adhering concrete, and dust, and should provide a sound, uniform substrate suitable for the application of protective coating or lining systems.

4. Galvanized Metal

- a. Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP7 is necessary to remove these treatments.

5. Drywall

- a. Must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with a joint compound.

6. Wood

- a. Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

7. Steel

- a. Should be cleaned by one or more of the surface preparations described below. These methods are used throughout the world for describing methods for cleaning structural steel. Visual standards are available through the Society of Protective Coatings. A brief description of these standards together with numbers by which they can be specified follow.
 - i. Solvent Cleaning, SSPC-SP1: Solvent cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation.
 - ii. Hand Tool Cleaning, SSPC-SP2: Hand Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before hand tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.
 - iii. Power Tool Cleaning, SSPC-SP3: Power Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before power tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.
 - iv. White Metal Blast Cleaning, SSPC-SP5 or NACE 1: A White Metal Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.
 - v. Commercial Blast Cleaning, SSPC-SP6 or NACE 3: A Commercial Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 33 percent of each square inch of surface area and

- may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.
- vi. Brush-Off Blast Cleaning, SSPC-SP7 or NACE 4: A Brush-Off Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust, and loose paint. Tightly adherent mill scale, rust, and paint may remain on the surface. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP 1 or other agreed upon methods.
 - vii. Power Tool Cleaning to Bare Metal, SSPC-SP11: Metallic surfaces that are prepared according to this specification, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide corrosion products, and other foreign matter. Slight residues of rust and paint may be left in the lower portions of pits if the original surface is pitted. Prior to power tool surface preparation, remove visible deposits of oil or grease by any of the methods specified in SSPC-SP1, Solvent Cleaning, or other agreed upon methods.
 - viii. Near-White Blast Cleaning, SSPC-SP10 or NACE 2: A Near White Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 5 percent of each square inch of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.
 - ix. High- and Ultra-High Pressure Water Jetting for Steel and Other Hard Materials: SSPC-SP12 or NACE 5: This standard provides requirements for the use of high- and ultra-high pressure water jetting to achieve various degrees of surface cleanliness. This standard is limited in scope to the use of water only without the addition of solid particles in the stream.
 - x. Water Blasting, SSPC-SP12/NACE No. 5: Removal of oil grease dirt, loose rust, loose mill scale, and loose paint by water at pressures of 2,000 to 2,500 psi at a flow of 4 to 14 gallons per minute.

B. INSTALLATION

1. General: Apply all coatings and materials with manufacture specifications in mind. Mix and thin coatings according to manufacturer's recommendations.
2. Do not apply to wet or damp surfaces. Wait at least 30 days before applying to new concrete or masonry. Or follow manufacturer's procedures to apply appropriate coatings prior to 30 days. Test new concrete for moisture content.
3. Apply coatings using methods recommended by manufacturer.
4. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.
5. Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness.
6. Regardless of number of coats specified, apply as many coats as necessary for complete hide, and uniform appearance.
7. Inspection: The coated surface must be inspected and approved by the Architect just prior to each coat.

C. PROTECTION

1. Protect finished coatings from damage until completion of project.
2. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

10280 TOILET ACCESSORIES

A. SCOPE OF WORK

This work includes installation of Dollar Tree ordered toilet room accessories, required to complete the project as indicated by drawings.

B. MATERIALS

All materials will be ordered by Dollar Tree for contractor installation. Toilet accessories are provided by Hajoca.

C. INSTALLATION

Installation of toilet accessories shall be in accordance with manufacturers written instructions. See drawings for location and quantities.

DIVISION 10 SPECIALTIES

10440 INTERIOR SIGNAGE

A. SCOPE OF WORK

1. Install Dollar Tree ordered ADA Signs per drawings.

B. MATERIALS

1. General: All engraving shall be in accordance with requirements for the physically handicapped.

C. INSTALLATION

1. The exact location of mounting for each sign will be given to the Contractor on the job prior to installation.
2. Signs shall be installed in strict accordance with manufacturer's printed instructions and approved shop drawings. Install with screws.

10500 LOCKERS

A. SCOPE OF WORK

Install lockers ordered by Dollar Tree as required and as shown on the drawings.

B. MATERIALS

All materials will be ordered by Dollar Tree for contractor installation. Lockers are provided by 3PL.

C. INSTALLATION

1. Installation of lockers shall be in accordance with the manufacturer's written instructions.

10530 METAL DECK CANOPY

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. Work in this section includes providing & installing blocking and anchoring hardware only of Dollar Tree ordered extruded aluminum overhead hanger rod style metal deck canopy as indicated on the drawings. Dollar Tree's sign vendor will provide & install the metal deck canopy.

1.02 SUBMITTALS

- A. Contractor shall obtain submittals from Sign Vendor and submit for review. Shop drawings shall show structural component connection locations/positions, material dimensions and locations of all hardware that GC is to provide & install in advance of Metal Deck Canopy installation.
- B. Where required by the local jurisdiction, P.E. stamped calculations are shall be prepared and submitted by the contractor.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Anchor Sign, 2200 Discher Avenue, Charleston, SC 29405
843-576-3259 Ext 241. www.anchorsign.com

2.02 METAL DECK CANOPY

- A. Materials:
 - 1. Decking shall consist of a 2 3/4" Extruded .078" Decking.
 - 2. Intermediate framing members shall be extruded aluminum, alloy 6063-T6.
 - 3. Hanger rods and attachment hardware shall be powder coated.
 - 4. Fascia shall be standard 8" extruded G style.
 - 5. Escutcheon plates shall be diamond.
- B. Finish: Finish type shall be 2-Coat Kynar Finish.
- C. Fabrication:
 - 1. All Metal Deck Canopies are shipped in preassembled sections for ease of installation.
 - 2. All connections shall be mechanically assembled utilizing 3/16 fasteners with a minimum shear stress of 350 lb. Pre-welded or factory-welded connections are not acceptable.

3. Decking shall be designed with interlocking roll-formed aluminum members.
4. Concealed drainage. Water shall drain from covered surfaces into intermediate trough and be directed to Front Scupper.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Manufacturer shall provide shop drawing prior to the delivery of the metal deck canopy. Hardware specified on G-5.0 shall be installed prior to wall finishes being installed to allow for wall finishes to be installed continuously around metal deck canopy hardware without penetrations being made when the metal deck canopy is installed at the end of the job.
- B. See Section 01450 for required inspection of canopy bolts prior to installation of EIFS.
- C. Installation shall be in strict accordance with manufacturer's shop drawings. Particular attention should be given to protecting the finish during handling and erection.
- D. Metal Deck Canopy shall be cleaned after installation.