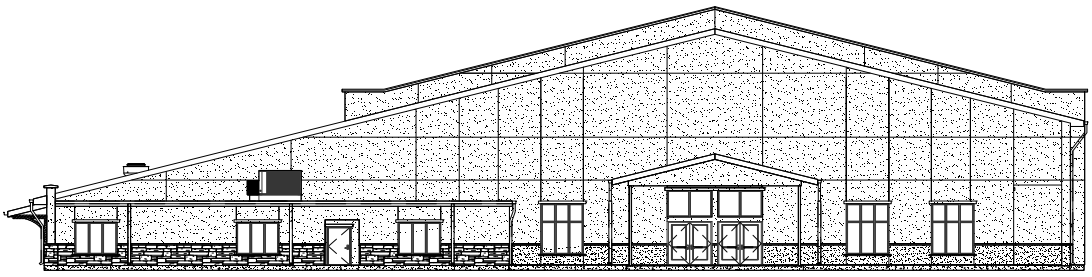
New Braunfels Church of Christ

New Multipurpose Facility

PROJECT MANUAL

State Hwy 46 & FM 1863

New Braunfels, TX 78130



Date of Issue: _____
Set Number: _____

Project Directory:

Owner:	New Braunfels Church of Christ 1665 Business IH 35 S New Braunfels, TX 78130 (830) 625-3520 Fax: (830) 626-9950
Designer/General Contractor:	Timbercon Construction, Inc. 1241 Universal City Blvd. Universal City, Texas 78148 (210) 590-2544 Fax: (830) 590-2352
Civil Engineer:	The Shultz Group, Inc. Consulting Engineers and Land Surveyors 2461 Loop 337 New Braunfels, TX 78160 (830) 606-3913 Fax: (830) 625-2204
Structural Engineer:	J.M. Nunn, P.E. Hill Country Structural 1204 N. Llano, Suite D Fredricksburg, TX 78624 (830) 990-4700 Fax: (830) 990-4718 Contact: J. M. Nunn P.E.
Plumbing Designer:	David Vasquez 7221 Lamb Rd San Antonio, TX 78240 (210) 865-2294
Electrical Designer:	R.E. Hannasch, P.E. Tower Electric 945 SBC Center Parkway San Antonio, TX 78219 (210) 590-7333 Fax: (830) 590-3244
Mechanical Designer:	Tom Chaffe 11950 Shadow Lane New Braunfels, TX 78132 (830) 629-0204

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Section 01010-Summary of Work

PART 1 – GENERAL

I. SUMMARY

A. Description of Work: Unless otherwise specified, the Contractors shall supply all labor, transportation, materials, apparatus, fuel, light, water, scaffolding, and tools necessary for the entire proper and substantial completion of the work, entitled New Braunfels Church of Christ – New Church Building. He must maintain and remove all equipment of construction and other utensils, and be responsible for lawful construction and use of the same. He shall construct, complete, in an excellent and workmanlike manner, ready for occupancy and use, the building and all appurtenances, inclusive of all items incidental thereto, as shown on the drawings, stated in the specifications, or reasonably implied by either, in strict accordance with the contract documents.

B. Permits: Apply for, obtain, and pay for permits required to perform the work. Submit copies to Timbercon Construction, Inc.

C. Codes: Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices and similar communications to Timbercon Construction.

D. Testing: An independent testing firm will be hired to provide structural testing as specified for concrete, structural fill and structural steel. Refer to structural notes for testing schedule. Additional testing required when test results indicate specified structural characteristics have not been attained will be at subcontractor's expense. Coordinate with Timbercon Construction and testing service.

E. Dimensions: Verify dimensions indicated on drawings with actual field dimensions before fabrication or ordering of materials. Do not scale drawings.

F. Existing Conditions: Notify Timbercon in writing of existing conditions differing from those indicated on the drawings prior to any work relating to differing conditions.

G. Definitions for terms used in the specifications:

1. Provide: Furnish and install, complete with all necessary accessories, ready for intended use. Pay for all related costs.

2. Approved: Acceptance of item submitted for approval. Not a limitation or release for compliance with the Contract Documents or regulatory requirements.

H. Intent: Drawings and specifications are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth but which is reasonably implied or necessary for proper performance of the project shall be included. In the event of conflict between the specifications and drawings, the drawings take precedence.

I. Application for payment: the Owner shall make payment for the work monthly. It shall be based on approved request for payment submitted to the Owner by Timbercon Construction on standard A.I.A. form 702 and G 702A. The request shall be for only material and labor properly incorporated in the work and material suitably stored on site. Materials and/or equipment stored off-site shall not be included in any request for payment unless documentation is submitted that verifies the item is insured and is assigned exclusively as property of the Owner. The request shall be submitted on the twenty-fifth day of each month for percentage of work completed up to the twenty-fifth day of the month. A certificate of substantial completion shall be issued to the contractors when the work is sufficiently complete for the Owner to use the facility for its intended purpose. Upon receipt of this certificate, 90% of the contract sum is due less the cost of the items remaining incomplete. The final payment including all retainage progressively withheld through out the term of the project, shall be made thirty (30) days after all work has been completed. This project is tax exempt.

J. Change Orders: Any changes in the work of the contract shall be documented and submitted in writing to Timbercon Construction for approval. Request must be signed by a corporate officer of Timbercon Construction to be valid. No change in work should commence until approval in writing has been received. No payment will be made on any changes or modifications of work that have not been properly approved and signed.

K. Lien waivers, releases, and receipts: The Owner reserves the right to demand and receive clear lien waivers, release of liens, and/or receipted bills from all parties who may have a lienable claim on the involved property of the Owner. If the contractor fails to furnish evidence of payment upon request, the Owner shall have no obligation to make further payments on that part of the work involving the lienable claim until the same is furnished.

PART 2 – PRODUCTS – Not applicable to this section

PART 3 – EXECUTION – Not applicable to this section.

END OF SECTION 01010

Section 01020-Allowances

PART 1 – GENERAL

I. SUMMARY

A. Allowance amounts below are for materials and installation.

B. Coordinate allowances with requirements for related and adjacent work.

C. Notify Owner of date when final decision on allowance items is required to avoid delays in the work.

D. Furnish certification that quantities of products purchased are the actual quantities needed with reasonable allowance for cutting or installation losses, tolerances, mixing waste and similar margins.

PART 2 – PRODUCTS – Not Applicable To This Section

PART 3 – EXECUTION

I. SCHEDULE

A. Allow a $4,000 allowance for testing.

B. Allow a $3,000 allowance for toilet accessories.

C. Allow a $2.00 per foot allowance for ceramic tile material.

D. Allow a $1,000 allowance for interior signage.

E. Allow a $25 per yard allowance for carpet installed.

END OF SECTION 01020

Section 01030-Alternates

PART 1 – GENERAL

I. SUMMARY

A. Owner will determine which alternates are selected for inclusion in the Contract.

B. Alternates are described briefly in this section. The Contract Documents define the requirements for the alternate(s).

C. Coordinate alternates with related work to ensure that work affected by each selected alternate is properly accomplished.

PART 2 – PRODUCTS – None applicable to this section

PART 3 – EXECUTION

I. SCHEDULE OF ALTERNATES

A. Alternate #1 – Finish out of Youth Area

B. Alternate #2 – Construction of detached garage

END OF SECTION 01030

Section 01100-Project Coordination

PART 1 – GENERAL

I. SUMMARY

A. Coordination: Coordinate various elements of the work and entities engaged to perform work and coordinate the work with existing facilities/conditions, and with the work done by separate contractors.

B. Installer Inspections: Installer of each major unit of work to inspect substrate and conditions for installation and to report unsatisfactory conditions. Correct unsatisfactory conditions before proceeding. Inspect each product immediately before installation. Do not install damaged or defective products, materials or equipment.

C. Comply with Manufacturer's instructions and recommendations to extent printed information is more detailed or stringent than requirement contained directly in contract documents.

D. Timing: Install work during time and under conditions which will ensure best possible results, coordinated with required inspection and testing.

E. Anchor work securely in place, properly located by measured line and level, organized for best possible uniformity, visual effect, operational efficiency, durability, and similar benefit to Owner's use. Isolate non-compatible materials from contact, sufficiently to prevent deterioration.

F. Cleaning and Protection: Clean each element of work at time of installation. Provide sufficient maintenance and protection during construction to ensure freedom from damage and deterioration at time of substantial completion.

PART 2 – PRODUCTS – Not applicable to this section

PART 3 – EXECUTION – Not applicable to this section.

END OF SECTION 01100

Section 01300-Submittals

PART 1 – GENERAL

I. SUMMARY

A. Comply with project format for submittals.

B. Provide types of submittals listed in individual sections and number of copies required.

1. Shop drawings, reviewed and annotated by the Contractor – 6 blackline prints.
2. Product data – 6 copies
3. Samples – 2, plus extra samples as required to indicate range of color, finish, and texture to be expected.
4. Mock-ups – as required by the individual sections.
5. Inspection and test reports – 2 copies.
6. Warranties – 2 copies
7. Survey data – 2 copies
8. Close-out submittals (as-builts) and operation manuals – 2 copies.

C. Provide required resubmittals if original submittals are not approved. Provide distribution of approved copies including modifications after submittals have been approved.

D. Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note special coordination required. Note any deviations from requirements of the Contract Documents.

E. Provide warranties as specified; warranties shall not limit length of time for remedy of damages, Owner may have by legal statute. Warranties shall be signed by the Contractor, supplier or installer responsible for performance of the warranty.

PART 2 – PRODUCTS – Not applicable to this section

PART 3 – EXECUTION – Not applicable to this section

END OF SECTION 01300

Section 01500 – Temporary Facilities

PART 1 – GENERAL

I. SUMMARY

A. Provide temporary services and utilities, including utility costs:

1. Water
2. Lighting and power
3. Metering
4. Telephone or other means of communication at the job site.
5. Portable toilet facilities
6. Materials Storage

B. Provide construction facilities, including utility costs:

1. Construction equipment
2. Dewatering and pumping, as required.
3. Access.

C. Provide security and protections requirements:

1. Fire extinguishers
2. All items intended for installation on the project.
3. Environmental protection.

D. Provide personnel support facilities:

1. Contractor's field office
2. Sanitary facilities
3. Cleaning and trash removal

PART 2 – PRODUCTS – Not applicable to this section

PART 3 – EXECUTION – Not applicable to this section

END OF SECTION 01500

Section 01600-Products and Substitutions

PART 1 – GENERAL

I. SUMMARY

A. Provide products from one manufacturer for each type or kind as applicable. Provide secondary materials as recommended by manufacturers of primary materials.

B. Provide products selected or approved equal. Products submitted for substitution shall be submitted with acceptable documentation, and include costs of substitution including related work. All substitutions shall be documented and submitted in writing.

C. Conditions for substitution include:

1. An “or equal” phrase in the specifications.
2. Specified material cannot be coordinated with other work.
3. Specified material is not acceptable to authorities having jurisdiction.
4. Substantial advantage is offered Owner in terms of cost, time, or other valuable consideration.

D. Substitutions shall be submitted prior to award of contract, unless otherwise acceptable. Approval of shop drawings, product data, or samples is not a substitution approval unless clearly presented as a substitution at the time of submittal.

PART 2 – PRODUCTS – Not applicable to this section

PART 3 – EXECUTION – Not applicable to this section

END OF SECTION 01600

Section 01700- Contract Close-out

PART 1 – GENERAL

I. SUMMARY

A. The following are prerequisites to substantial completion. Provide the following:

1. Punch list
2. Supporting documentation
3. Warranties
4. Certifications
5. Occupancy permit
6. Start-up and testing of building systems
7. Change over of locks

B. Provide the following prerequisites to final acceptance:

1. Final payment request with supporting affidavits
2. Completed punch list

C. Provide a marked-up set of Record Drawings and Project Manual including changes which occurred during construction (as-builts).

D. Provide the following close-out procedures:

1. Submission of record documents
2. Submission of maintenance manuals
3. Review of systems and operating instruction with Owner prior to turnover to Owner
4. Final cleaning and touch-up
5. Removal of temporary facilities

PART 2 – PRODUCTS – Not applicable to this section

PART 3 – EXECUTION – Not applicable to this section

END OF SECTION 01700

Section 01800- Insurance Requirements

PART 1 – GENERAL

I. SUMMARY

A. Subcontractors are required to show Timbercon Construction, Inc. as additional insured on insurance.

END OF SECTION 01800

Section 02110-Site Clearing

PART 1 – GENERAL

I. SUMMARY

A. Clear and grub any remaining trees, stumps, vegetation, debris, rubbish, and designated improvements from the site. Coordinate with Timbercon Construction at final project stake-out to determine exact extents of vegetation to be removed and vegetation to remain.

B. Protect existing trees to remain as per landscaping plan and other items not scheduled for clearing, or that might be damaged by construction activities.

C. Strip any remaining topsoil and stockpile at approved location on-site.

D. Provide temporary erosion and dust control

E. Do not disturb benchmarks or monuments.

PART 2 – PRODUCTS – Not applicable to this section

PART 3 – EXECUTION

I. CLEARING

A. Prevent damage to existing improvements indicated to remain, including improvements on and off site. Protect existing trees and vegetation indicated to remain. Do not stockpile materials and restrict traffic within drip line of trees. Provide and maintain temporary guards to encircle trees or groups of trees as per the Landscape Plans and City requirements. Obtain approval from Timbercon Construction before beginning work.

B. Water vegetation as required to maintain health. Cover temporarily exposed roots with wet burlap and backfill as soon as possible. Coat cut plant surfaces with approved emulsified asphalt plant coating.

C. Repair or replace vegetation which has been damaged or pay damages. Remove heavy growths of grass before stripping. Stockpile satisfactory topsoil without stones, foreign matter and weeds in locations as directed.

D. Control erosion and siltration as required by authorities having jurisdiction. Control windblown dust. Remove waste materials and unsatisfactory topsoil from site and dispose of in a legal manner.

END OF SECTION 02110

Section 02200-Earthwork

PART 1 – GENERAL

I. SUMMARY

A. Perform excavation, filling, compacting and grading operations both inside and outside building limits as required for below-grade improvements and to achieve contours and elevations indicated. Provide trenching and backfill for mechanical and electrical work and utilities.

B. Provide base materials, drainage fill, and common fill materials for slabs and improvements.

C. Provide suitable fill from off-site if on-site quantities are insufficient or unacceptable, and legally dispose of excess fill off-site.

II. SUBMITTALS

A. Submit for approval test reports, list of materials and gradations proposed for use.

III. QUALITY ASSURANCE

A. Comply with governing codes and regulations. Use experienced installers. Deliver, handle and store materials in accordance with manufacturer's instructions.

B. Testing and inspection service: The Owner will employ a qualified independent geotechnical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.

IV. GEOTECHNICAL INVESTIGATION

GEOTECHNICAL INVESTIGATION
Proposed New Braunfels Church of Christ
On Highway 46 at FM 1863
New Braunfels, Texas

Reported to:
Timbercon Construction, Inc.
San Antonio, Texas

Prepared by:
Geoscience Engineering
& Testing, Inc.
Houston, Texas

PROJECT NO. : 05SG0652

June 2005

GEOSCIENCE ENGINEERING AND TESTING, INC.

GEOTECHNICAL & MATERIALS ENGINEERS

June 8, 2005

Timbercon Construction, Inc.
10822 Hillpoint Avenue
San Antonio, Texas 78217

Attention: Mr. Gray Shuck

Reference: Geotechnical Investigation
Proposed New Braunfels Church of Christ
On Highway 46 at FM 1863
New Braunfels, Texas
GET NO.:05SG0652

Dear Mr. Shuck:

GEOSCIENCE ENGINEERING & TESTING, INC. is pleased to submit this report for the above referenced project. This study was authorized by you on May 24, 2005. This report briefly describes the procedures employed in our investigation and presents the conclusions and recommendations of our studies.

We appreciate the opportunity to work with you on this phase of the project. If you have any question concerning this report or require additional information, please contact us.

Very Truly Yours,

Fred Naderi

Fred Naderi, P.E.
Project Engineer

Jim A. Palavan

Jim A. Palavan, MSCE, P.E.
Chief Engineer

STATE OF TEXAS
JIM A. PALAVAN
51001
REGISTERED
PROFESSIONAL ENGINEER

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I. INTRODUCTION

Geoscience Engineering and Testing, Inc. hereby submits this report of Geotechnical Investigation of subsurface conditions at the site of the proposed New Braunfels Church of Christ located On Highway 46 at FM 1863 in New Braunfels, Texas. GETI's investigation was authorized by Mr. Gray Shuck with Timbercon Construction, Inc. on May 24, 2005.

II. PURPOSE

The purpose of the Geotechnical Investigation was to determine the subsurface soil conditions at the site of the proposed New Braunfels Church of Christ with particular reference to the recommendations for the design of the foundation for the structures.

III. SUBSURFACE EXPLORATION

1. General

This report presents the results of a soil exploration and foundation analysis for the proposed New Braunfels Church of Christ located On Highway 46 at FM 1863 in New Braunfels, Texas.

Scope of this investigation included a reconnaissance of the immediate site, the subsurface exploration, field and laboratory testing, an engineering analysis and evaluation of the subsurface materials. The purpose of this subsurface exploration and analysis was to determine soil profile components, the engineering characteristics of the subsurface materials and to provide criteria for use by design engineers and architects in preparing the foundation design and pavement.

The exploration and analysis of the surface conditions reported herein are considered in sufficient detail and scope to form a reasonable basis for the recommendations. The recommendations submitted are based on the available soil information and the preliminary design details furnished by Mr. Gray Shuck with Timbercon Construction, Inc. Any revision in plans for the proposed New Braunfels Church of Christ from those enumerated in this report should be brought to the attention of the soil engineer, so that he may determine, if changes in the recommendations are required. If deviations from the noted subsurface conditions are encountered during construction, they should also be brought to the attention of the soil engineer.

2. Description of the Site:

The site of the proposed New Braunfels Church of Christ, upon which this subsurface exploration has been made, is located On Highway 46 at FM 1863 in New Braunfels, Texas. The site was relatively level and covered with grass and small trees. The surface soils were dry and hard at the time of drilling operation.

3. Field Investigation:

The field investigation, which was completed on May 26, 2004, to determine the engineering characteristics of the subsurface materials included a reconnaissance of the project site, drilling the exploratory borings and recovering the representative soil samples.

The subsurface soil conditions were explored by advancing and sampling seven (7) soil borings. The soil boring B-1 was drilled to a depth of twenty (20) feet, B-2 thru. B-4 were drilled to a depth of fifteen (15) feet and soil borings B-5 thru. B-7 were drilled to a depth of five (5) feet below the existing ground surface. The approximate soil boring locations are shown on the attached soil Boring Plan, Plate No. 1.

Sample depth and description of soil classification (based on the Unified Soil Classification System) are presented on the Soil Boring Logs, Plate Nos. 2 thru. 5. Keys to terms and symbols used on the soil boring logs are shown on Plate No. 6.

The soil borings were of three-inch nominal diameter. Undisturbed soil samples were obtained at two (2) foot intervals continuously to a depth of ten (10) feet and at five (5) foot intervals thereafter. The soil borings were performed with a drilling rig equipped with rotary head. Conventional solid-stem augers were used to advance the holes. Representative disturbed or undisturbed soil samples were obtained employing 2-inch split-barrel sampler using a controlled driving procedures in accordance with ASTM D-1586. The obtained soil samples were removed from the sampler and visually classified in the field. Soil samples were identified according to the boring number and depth and wrapped in aluminum foil and polyethylene plastic wrapping bags to prevent moisture loss and disturbance. All of the samples were transported to our geotechnical laboratory for examination, testing and analysis. All borings were backfilled after final water reading were obtained with the soil cuttings accumulated during the drilling operation unless noted otherwise on the soil boring logs.

3.1 Field Strength Tests:

During the field boring operation, samples of the cohesive soil from the thin-walled tube were frequently tested in unconfined compression by use of a calibrated soil penetrometer to aid in determining the strength of the soil.

3.2 Water Level Measurement:

The information in this report summarizes condition as found on the date the borings were drilled. Free ground water was not encountered during the drilling operation. Long-term monitoring of the groundwater level was beyond the scope of this study. It should be noted that the groundwater table may be expected to fluctuate with environmental variations such as frequency and magnitude of rainfall and the time of the year when construction begins.

4. Surface Fault:

A surface fault investigation is beyond the scope of this investigation. It should be noted that the coastal plains in this region has a complex geology, which included active surface faulting.

5. Laboratory Testing:

In addition to the field investigation, a supplemental laboratory investigation was conducted to ascertain additional pertinent engineering characteristics of the subsurface materials necessary in analyzing their behavior under the proposed loading conditions. During the laboratory investigation all field soil samples from the boring were examined and classified by a soil engineer. Laboratory tests were then performed on selected soil samples in order to evaluate and determine the physical and engineering properties of the soils in accordance with the prescribed ASTM procedures. Strength properties of the soils were determined by means of unconfined compression tests performed on undisturbed samples.

The type and number of the laboratory tests performed for this investigation are:

Descriptions	No. of Test
Moisture Content Test	41
Atterberg Limits	12

The tests noted above were performed to establish the index properties and to aid in the proper classification of the subsurface soils. The test results are shown on the soil boring logs and are presented on Plate Nos. 2 thru. 5.

IV. GENERAL DESCRIPTION OF SUBSURFACE MATERIALS

The specific subsurface stratigraphy as determined by the field exploration is shown in detail on the soil boring logs herein. However, the stratigraphy can be generalized as follow:

Depth (FT.)	Description
0-0.5'	Very dense light brown CLAY (CH)
0.5'-20'	Very dense Light tan LIMESTONE

*Classification is in accordance with Unified Soil Classification System

V. FOUNDATION RECOMMENDATION

1. Foundations and Risks:

Many lightly loaded foundations are designed and constructed on the basis of economics, risks, soil type, foundation shape and structural loading. Many times, due to economic considerations, higher risks are accepted in foundation design. It should be noted that some levels of risk are associated with all types of foundations. All of these foundations must be stiffened in the areas where expansive soils are present and trees should be removed prior to construction.

2. Foundation Discussion:

In general, the foundation for the structures must satisfy two independent criteria. First, the maximum design pressure exerted at foundation levels should not exceed the allowable net bearing pressure based on an adequate factor of safety with respect to soil shear strength.

Second, the magnitude of total and differential settlements or heave under sustained foundation loads must be such that the structure movement is within tolerable limits.

Various types of foundation such as Slab-on-Grade, Spread Footings, Underreamed Drilled Footings, Straight Shaft Footings etc. have been discussed for the support of the proposed structure. Based on the field investigation and laboratory test results, the soils are limestone. Details of soil strata are given in soil boring logs, Plate Nos. 2 thru. 5. In our opinion, for this type of soil strata Slab-on-Grade (Shallow Foundation) are considered suitable foundation systems. Details are given in the following section VI "Recommended Foundation System".

VI. RECOMMENDED FOUNDATION SYSTEM

1. Slab-on-Grade

A thickened reinforced slab can be used for this project. The grade beam under the slab should be a minimum of twelve (12) inches below existing grade. The recommendation design parameters are summarized below:

Bearing Capacity:

Dead Load Only:	2,000 psf
Total (dead and live):	2,500 psf

Foundation slab designed in accordance with above capacity values will have a factor of safety of 3.0 and 2.0 with respect to shearing failure for dead and total loading respectively. Footing weight below final grade can be neglected in the determination of design loading.

The surficial soil containing roots, organic and unsuitable materials should be stripped off and replaced with structural select fill and compacted as per recommendations for select fill. A bedding layer of leveling sand, maximum of two (2) inches thick may placed immediately beneath the floor slab. A vapor barrier consisting of 6 mil plastic sheeting should be placed over the sand cushion to prevent water migration through the concrete slab. The excavation for the grade beams should be clean and free of any loose materials prior to concrete placement.

Information was not available on whether fill will be used to raise site prior to construction. In the event fill is placed on the site, specifications should require a uniform thickness throughout the slab area and placement in accordance with our recommendation given in the section "Structural Fill and Subsurface Preparation". Lack of proper consideration of these factors will results in additional stresses and inferior slab performance.

In general, site preparation should consist of removing any grass, weeds and undesirable materials. The exposed subgrade should be proof-rolled to detect local weak areas which should be excavated, processed and recompacted in loose lifts of approximately eight-inch thickness. In floor slab and pavement area, subgrade soils should be compacted to a minimum of 95% of standard proctor Density Test (ASTM D-698) at moisture content within -1% to + 3 % of optimum moisture. Tree stumps, if present, should be removed below floor slab or pavement grade and backfill with structural select fill materials.

A detailed settlement analysis was beyond the scope of this study. However, previous studies by the author indicate that the total settlement should be less than one (1) inch. Differential settlement is typically assumed as about one-half the total settlement.

2. Straight Shaft Footings

Based on the soil condition revealed by the field soil borings, laboratory tests and encountered limestone materials, it is our understanding that the site is not suitable to make bell; however the structure at this site can be supported on a foundation system comprised of Straight Shaft Footings bearing at a depth of five (5) to six (6) feet below existing grade on the layer of hard light tan limestone. The footing may be sized for a net allowable bearing pressure of 8,000 psf for dead load plus sustained live load. The bearing pressure contains a factor of safety of 2.5 and be increased 25 percent for total load conditions, whichever is critical. Spacing between the centers of the two adjacent footings should be at least 2.5 times of the diameter of the shaft.

Straight Shaft Footings should be reinforced with sufficient reinforcing (tension) steel to resist the potential tension force caused by uplift loads due to expansive soils between the depth of seasonal moisture changes eight (8) feet and the final ground surface elevation. An adhesion value of 0.5 tsf should be applied to the straight shaft footings for computation of uplift loads.

Caving of shaft may occur during construction of the straight shaft footings. In order to minimize the possibility of shaft caving during construction, the construction contractor should be use cased straight-sided shaft foundation, if caving occurs. The bottom of the shaft should be dry and clean. If water encounters during installation, it should be pumped out prior to concrete placement. We recommend that the drilling be performed under the supervision of a Geotechnical Engineer.

Experience indicates that straight shaft can be successfully installed and based on local practice for performing straight shaft footings. Should caving occur during installation, the shaft diameter may have to be increased. If the soil conditions warrant the changing of the shaft diameter, the structural engineer of record should be informed about any changes, because they may require a change in reinforcing steel. The concrete should be place in a timely manner after drilling to minimize the potential for caving of the foundation soils.

No footing should be poured without the prior approval of the project engineer, architect or owner's representative. Since the exact and locations of the footings are not know at this time, a detailed settlement analysis was not authorized, nor performed. It is anticipated that the footing designed using the recommended allowable bearing capacity will experience small settlement that will be within the tolerable limits for the proposed structure.

VII. PAVEMENT RECOMMENDATIONS

Based on our field investigation and test results, the soils are high plastic in nature. Therefore, we recommend the upper 6 inch of the exposed final subgrade be stabilized with 6% by dry weight of hydrated lime. Therefore, for a soil dry weight of 100 pounds per cubic foot, this would require for the case of subgrade thickness of 6 inches the addition of 27 pounds of lime per square yard and for the case of subgrade thickness of 8 inches the addition of 36 pounds of lime per square yard. The actual stabilization requirements may vary in the field depending on conditions at the time of construction and should be established by running tests on the exposed subgrade soils. The stabilized subgrade should be compacted to at least 95% of the standard proctor maximum dry density (ASTM D 698) with in three percentage points of the optimum moisture content. Texas Department of Transportation 1993 Standard Specification, Item 260 and 264, should be used as a procedural guide for lime treatment of the subgrade soils.

The assumptions utilized in our pavement thickness analysis are summarized on Plate No. 8. The following pavement thicknesses are based on these assumptions and procedures published by the Portland Cement Association and the National Crushed Stone Association.

Recommendations for material properties for the paving layers are provided on Plate No. 9. It is estimated that the service life for a properly constructed and maintained pavement will be in order of 20 years. Proper civil design features such as joint design, quantity shoulder support should be incorporated into the plans and specifications. Joints for concrete pavements may be designed using the Texas Department of Highways Item 360.7 (Latest Revision). Periodic maintenance will be required.

Parking Lots - Automobile Only
(DI-1)

Flexible Base	Rigid Pavement
1.5" Hot Mix Asphaltic Concrete	5.0" Reinforced Concrete
6.0" Crushed Limestone*	6.0" Lime Stabilized Compacted Subgrade
6.0" Lime Stabilized Compacted Subgrade	

Parking Lots & Light Duty Access Lanes
(DI-2)

Flexible Base	Rigid Pavement
2.0" Hot Mix Asphaltic Concrete	6.0" Reinforced Concrete
8.0" Crushed Limestone*	6.0" Lime Stabilized Compacted Subgrade
6.0" Lime Stabilized Compacted Subgrade	

Medium Duty Access Drives
(DI-3)

Flexible Base	Rigid Pavement
3.0" Hot Mix Asphaltic Concrete	6.0" Reinforced Concrete
8.0" Crushed Limestone*	8.0" Lime Stabilized Compacted Subgrade
8.0" Lime Stabilized Compacted Subgrade	

* Plant mix, hot laid asphaltic base (black base) can be substituted on a ratio of one (1) inch of black base equal to 1.5 inches of crushed limestone.

VIII. CONSTRUCTION CONSIDERATIONS

1. Site Preparation:

Our recommendations for site preparations in the floor slab are summarized below:

1.1 In general, remove all vegetation, tree roots, organic topsoil, existing foundations, paved areas and any undesirable materials from the construction area. Tree trunks and roots under the floor slabs should be removed to a root size of less than 0.5-inch. We recommend that the stripping depth be evaluated at the time of construction by a soil technician.

1.2 Any on-site fill soils, encountered in the structure areas during construction, must have records of successful compaction tests signed by a registered professional engineer that confirms the use of the fill and record of construction and earthwork testing. These tests must have been performed on all the lifts for the entire thickness of the fill. In the event that no compaction test results are available, the fill soil must be removed, processed and recompacted in accordance with our recommendations of "Structural Fill and Subgrade Preparation". Excavation should extend at least two feet beyond the structure area. Alternatively, the existing fill soils should be tested comprehensively to evaluate the degree of compaction in the fill soils.

1.3 The subgrade areas should then be proofrolled with a loaded dump truck, scraper, or similar pneumatic-tired equipment. The proofrolling serves to compact surficial soils and to detect any soft or loose zones. Any soils deflecting excessively under moving loads should be undercut to firm soils and recompacted. The proofrolling operations should be observed by an experienced geotechnician.

1.4 In the areas where expansive soils are present, rough grade the site with structural fill soils to insure positive drainage. Due to their high permeability of sands, sands should not be used for site grading where expansive soils are present.

1.5 We recommend that the site and soil conditions used in the structural design of the foundation be verified by the engineer's site visit after all of the earthwork and site preparation has been completed prior to the concrete placement.

2. Structural Fill and Subgrade Preparation:

It is recommended that the subgrade and fill be prepared as follow:

2.1 The site should be stripped to suitable depth to remove any top soil and miscellaneous fill material. The exposed subgrade surface then should be proof-rolled. All soft or loose soils should be removed and replace with select fill materials.

2.2 The natural subgrade should be scarified to a minimum depth of six (6) inches. The scarified soils should then be recompacted to a minimum of 95 percent of the maximum dry density as determined by the Standard Proctor Density Test (ASTM-D 698). The moisture content should range -1% to +3% of optimum moisture.

2.3 Select fill used to elevate the grade should consist of a clean Sandy Clay with Liquid Limit less than 35 and a Plasticity Index (P.I.) between 10 and 20.

2.4 The select fill material should be place in maximum of eight (8) inch loose lift and compacted to a minimum of 95 percent of the maximum dry density as per ASTM D-698. The moisture contest should be with -1% to +3% of optimum moisture.

2.5 A bedding layer of leveling sand, a maximum of two (2) inches thick may be place immediately beneath the floor slab. A vapor barrier consisting of six (6) mil plastic sheeting should be placed over the sand cushion to prevent water migration through the concrete slab. The excavations for the grade beams should be clear and free of any loose materials prior to concrete placement.

2.6 In cut areas, the soils should be excavated to grade and the surface soils proofrolled and scarified to a minimum depth of six inches and recompacted to the previously mentioned density tests at the time of construction.

3. Surface Drainage:

It is recommended that the site drainage be well developed. Surface water should be directed away from the foundation soils (use a minimum of 5% with 10 feet of foundation). No ponding of surface water should be allowed near the structure. The following drainage precaution should be observed during construction and at all times after the structure has been completed.

1) Backfill around the structure should be a cohesive soil material which should be moistened and compacted to at lease ninety (90) percent of standard proctor density. Any cohesionless soil material accumulated around the perimeter of the structure during construction should be removed and not allowed to be mixed with or covered by the backfill material.

2) Where landscaping is to be installed next to the perimeter of grade beam, a moisture barrier or other suitable means should be installed to prevent moisture from entering the underlying clay soils.

3) Roof downspouts and drains should discharge well away from the limits of the foundation or grade beams.

4. Vegetation Control:

We recommend trees not to be closer than half the canopy diameter of the mature tree from the grade beams, typically a minimum of 20 feet. This will minimize possible foundation settlement caused by the tree root systems.

VIII. DISCLAIMER

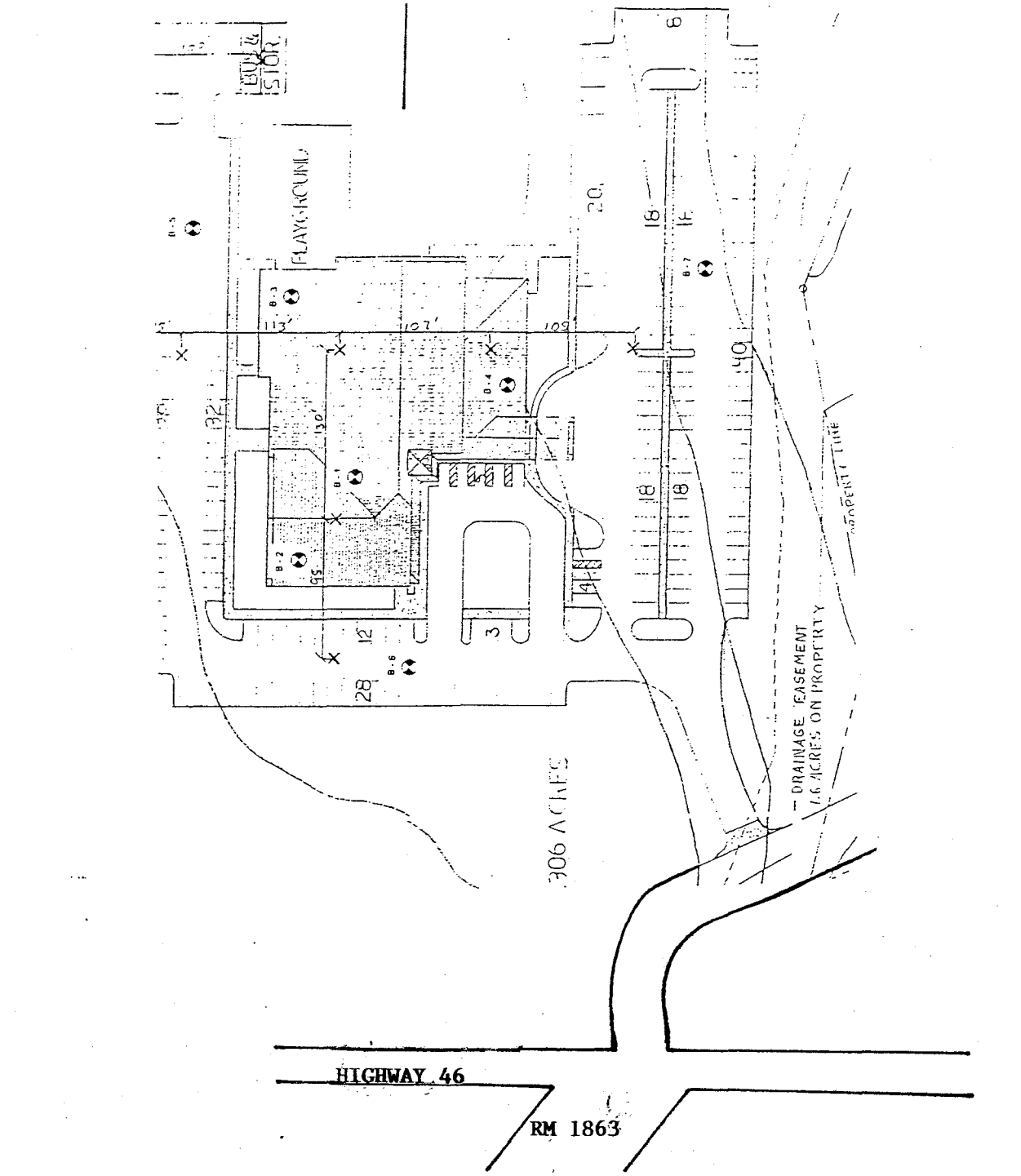
The information and recommendation contained in the report summarized condition found at the site specified and on the date the field exploration was completed. The attached soil boring logs are a true representation of the soils encountered at the stratigraphy as found during the field exploration and drilling of the subject site.

Reasonable variations from the subsurface information presented in this report are assumed. If condition encountered during construction are significantly different than those presented in this report, GETI should be notified immediately.

The report was prepared for the sole and exclusive use by our client, based on specific and limited objectives. All reports, boring logs, field data, laboratory test results, and other documents prepared by GETI as instruments of service shall remain the property of GETI. Reuse of these documents is not permitted without written approval by GETI. GETI assumes no responsibility or obligation for the unauthorized use of this report by other parties and for purposes beyond the stated project objectives and work limitations.

In addition, the construction process may itself alter site soil conditions. Therefore, experienced geotechnical personnel should observe and document the construction procedures and all conditions encountered. We recommend that the owner retain Geoscience Engineering and Testing, Inc. to provide this service as well as the construction material and testing and inspection required during the construction phase of the project. We would welcome the opportunity to discuss our recommendation with you and hope we may have the opportunity to provide any additional studies or service to complete this project.

The following illustrations are attached and complete this report:



Approximate Boring Locations

LOCATION
Proposed New Braunfels
Church of Christ
San Antonio, Texas
GET NO.:05SG0652

NOT TO SCALE

PLATE NO. 1

LOG OF BORING

PROJECT: Proposed New Braunfels Church of Christ
On Highway 46 at FM 1863
New Braunfels,, Texas

CLIENT: Timbercon Construction Inc.
San Antonio, Texas

BORING NO. B-1
PROJECT NO. 05SG0652
DATE 5-23-05
SURFACE ELEVATION

DRILLING METHOD(S):
Dry Auger

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling operation

DEPTH (FT)	SOIL SYMBOL	SAMPLES	FIELD DATA: N: BLOWS/FT T: INCHES/100 BLOWS P: TONS/SQ FT R: PERCENT RQD: PERCENT	LABORATORY DATA: MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%) LIQUID LIMIT LL	PLASTIC LIMIT PL	PLASTICITY INDEX PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TONS/SQ FT)	DESCRIPTION OF STRATUM
			N=50/3"	16		61	33	28			0.8 Very dense light brown CLAY with limstone fragments
			N=50/2"	1							Very dense light tan limestone with clay seams layer
			N=50/0"	3		9	8	1			
5			N=50/3"	2							- Reddish brown CLAY seams at 5'
			N=50/3"	5							
			N=50/0"	14							
10											-Reddish brown CLAY seam 11.5-12.5
			N=50/0"	2							
15											
			N=50/0"	1		20	15	5			20.0
20											
25											
30											

N - STANDARD PENETRATION TEST RESISTANCE
T - TXDOT CONE PENETRATION RESISTANCE
P - POCKET PENETROMETER RESISTANCE
R - PERCENTAGE OF ROCK CORE RECOVERY
RQD - ROCK QUALITY DESIGNATION

GEOSCIENCE ENGINEERING AND TESTING, INC.

LOG OF BORING 05SG0652.GPJ GETI.GDT 6/9/05

PLATE NO. 2

LOG OF BORING

PROJECT: Proposed New Braunfels Church of Christ
On Highway 46 at FM 1863
New Braunfels,, Texas

CLIENT: Timbercon Construction Inc
San Antonio, Texas

PROJECT NO.: 05SG0652

BORING NO. B-2 DATE 5-23-05 SURFACE ELEVATION

DRILLING METHOD(S): Dry Auger

GROUNDWATER INFORMATION: Groundwater was not encountered during drilling operation

DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%) LL	PL	PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TONS/SQ FT)	DESCRIPTION OF STRATUM
			N=53	15							0.8 Very dense Light brown CLAY with limestone fragments
			N=50/3"	1							Very dense light tan limestone with clay seams layer
			N=50/0"	5							
5			N=50/2"	7		13	10	3			
			N=50/4"	2							- Reddish brown CLAY seams at 7'
			N=50/3"	3		11	7	4			
10											
			N=50/0"								15.0
15											

BORING NO. B-3 DATE 5-23-05 SURFACE ELEVATION

DRILLING METHOD(S): Dry Auger

GROUNDWATER INFORMATION: Groundwater was not encountered during drilling operation

DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%) LL	PL	PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TONS/SQ FT)	DESCRIPTION OF STRATUM
			N=50/3"	14		52	26	26			0.8 Very dense Light brown CLAY with limestone fragments
			N=50/4"	5							Very dense light tan limestone with clay seams layer
			N=50/2"	2							
5			N=50/2"	3							
			N=50/0"	4							
			N=50/3"	4							
10											
			N=50/2"								15.0
15											

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
LL - LIQUID LIMIT
PL - PLASTIC LIMIT
PI - PLASTICITY INDEX

GEOSCIENCE ENGINEERING AND TESTING, INC.

2 LOGS ON PAGE 05SG0652.GPJ GETI.GDT 6/9/05

PLATE NO. 3

LOG OF BORING

PROJECT: Proposed New Braunfels Church of Christ
On Highway 46 at FM 1863
New Braunfels,, Texas

CLIENT: Timbercon Construction Inc
San Antonio, Texas

PROJECT NO.: 05SG0652

BORING NO. B-4 DATE 5-23-05 SURFACE ELEVATION

DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%) LL	PL	PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TONS/SQ FT)
			N=50/5"	16						
			N=50/3"	1						
			N=50/0"	2		10	8	2		
5			N=50/2"	5						
			N=50/1"	4		24	21	3		
			N=50/0"	7						
10										
			N=50/2"							
15										

DRILLING METHOD(S):
Dry Auger

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling operation

DESCRIPTION OF STRATUM

0.8 Very dense Light brown CLAY with limestone fragments
Very dense light tan limestone with clay seams layer

- Reddish brown CLAY seams 5'-6'

15.0

BORING NO. B-5 DATE 5-23-05 SURFACE ELEVATION

DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%) LL	PL	PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TONS/SQ FT)
			N=50/5"	15						
			N=50/4"	2						
			N=50/4"	2						
			N=50/3"	8		18	14	4		
5										
10										
15										

DRILLING METHOD(S):
Dry Auger

GROUNDWATER INFORMATION:
Groundwater was not encountered during drilling operation

DESCRIPTION OF STRATUM

0.8 Very dense Light brown CLAY with limestone fragments
Very dense light tan limestone

5.0

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
LL - LIQUID LIMIT
PL - PLASTIC LIMIT
PI - PLASTICITY INDEX

GEOSCIENCE ENGINEERING AND TESTING, INC.

2 LOGS ON PAGE 05SG0652.GPJ GETI.GDT 6/9/05

PLATE NO. 4

LOG OF BORING

PROJECT: Proposed New Braunfels Church of Christ
On Highway 46 at FM 1863
New Braunfels,, Texas

CLIENT: Timbercon Construction Inc.
San Antonio, Texas

PROJECT NO.: 05SG0652

BORING NO. B-6 DATE 5-23-05 SURFACE ELEVATION

FIELD DATA				LABORATORY DATA							
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%) LL	PL	PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TONS/SQ FT)	DESCRIPTION OF STRATUM
0			N=50/2"	14							0.8 Very dense Light brown CLAY with limestone fragments
			N=50/3"	6							Very dense light tan limestone
			N=50/0"	8		17	15	2			
			N=50/0"	4							5.0
5											
10											
15											

DRILLING METHOD(S): Dry Auger

GROUNDWATER INFORMATION: Groundwater was not encountered during drilling operation

BORING NO. B-7 DATE 5-23-05 SURFACE ELEVATION

FIELD DATA				LABORATORY DATA							
DEPTH (FT)	SOIL SYMBOL	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	DRY DENSITY POUNDS/CU.FT	ATTERBERG LIMITS (%) LL	PL	PI	MINUS NO. 200 SIEVE (%)	SHEAR STRENGTH (TONS/SQ FT)	DESCRIPTION OF STRATUM
0			N=50/4"	15							0.8 Very dense Light brown CLAY with limestone fragments
			N=50/2"	9							Very dense light tan limestone
			N=50/0"	8							
			N=50/1"	5		12	8	4			5.0
5											
10											
15											

DRILLING METHOD(S): Dry Auger

GROUNDWATER INFORMATION: Groundwater was not encountered during drilling operation

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE
LL - LIQUID LIMIT
PL - PLASTIC LIMIT
PI - PLASTICITY INDEX

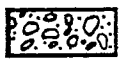
GEOSCIENCE ENGINEERING AND TESTING, INC.

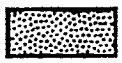
2 LOGS ON PAGE 05SG0652.GPJ GETI.GDT 6/9/05

PLATE NO. 5

KEY TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES


Gravel (GW, GP, GM, GC)


Sand (SW, SP)

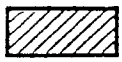

Silty Sand (SM)


Clayey Sand (SC)


Clayey Silt (ML)


Silt (ML)


Sandy Silt (ML)


Silty or Sandy Clay (CL)


Clay (CH)

CONSISTENCY OF COHESIVE SOILS

Description	Shear Strength-KSF	Penetration Resistance Blows / Ft
Very Soft	Less than 0.25	0 - 2
Soft	0.25 - 0.50	2 - 4
Firm	0.50 - 1.00	4 - 8
Stiff	1.00 - 2.00	8 - 15
VeryStiff	2.00 - 4.00	15 - 30
Hard	Greater than 4.00	> 30

RELATIVE DENSITY OF COHESIONLESS SOIL

Description	Penetration Resistance Blows / Ft	Relative Density . %
Very Loose	0 - 4	0 - 15
Loose	4 - 10	15 - 35
Medium Dense	10 - 30	35 - 65
Dense	30 - 50	65 - 85
Very Dense	> 50	85 -100

SOIL STRUCTURE

CALCAREOUS NODULES	- Nodules of Calcium Carbonate
FERROUS NODULES	- Nodules of Ferrous Material
SLICKENSIDED	- Having inclined planes of weakness that are slick and glossy
BLOCKY	- Having inclined planes of weakness that are frequent and rectangular in pattern
LAMINATED	- Composed of thin layers of varying soil type and texture
FISSURED	- Containing shrinkage cracks frequently filled with fine sand
INTERBEDDED	- Composed of alternate layers of different soil types

SAMPLE SYMBOLS


Shelby Tube Sample


Standard Penetration Test


Auger or Wash Sample


No Recovery

GROUNDWATER


(24 hr) - Water level after drilling (time increment after drilling)

- Free water observed during drilling

FAILURE DESCRIPTION (COMPRESSION TEST)

B - Bulge	SLS - Failure surface occuring along slickensided plane
S - Shear	SAS - Failure surface occuring along or in sand seam
M/S - Multiple Shear	SS - Failure surface occuring in or along other secondary structure such as calcareous pockets

PLATE NO:6

Soil samples are tested in the laboratory as specified by the following ASTM test procedures:

Designation	Short Title
ASTM D421	Dry Preparation of the Soil Sample for Practice Size Analysis Determination of Soil Constants
ASTM D422	Particle Size Analysis of Soils
ASTM D698	Moisture-Density Relation (Standard Proctor)
ASTM D854	Specific Gravity of Soils
ASTM D1140	Amount of Material in Soils finer than No. 200 Sieve
ASTM D1557	Moisture-Density Relations (Modified Proctor)
ASTM D2166	Unconfined Compressive Strength of Cohesive Soil
ASTM D2216	Water Contest of Soil, Rock & Soil-Aggregate Mixtures
ASTM D2217	Wet Preparation of Soil Samples for Practical Size Analysis and Determination of Soil Constants
ASTM D2435	One-Dimensional Consolidation Properties of Soils
ASTM D2487	Classification of Soils for Engineering Purposes
ASTM D2850	Undrained, Unconsolidated Strenght in Triaxial Compression Trixial (CU and CD)
ASTM D4318	Liquid Limit, Plastic Limits & Plasticity Index of Soils
ASTM D4546	One-Dimensional Swell/Settlement Potential of Cohesive Soils

Plate No.: 7

ASSUMPTIONS FOR PAVEMENT ANALYSIS

1.0 Traffic Conditions - (National Crushed Stone Assoc.)

1.01 Parking Lots (DI-1)

Light traffic - Few vehicles heavier than cars.
No regular use by trucks.

Daily EAL = 5 or less

1.02 Parking Lots & Light duty Access Lanes (DI-2)

Medium-Light traffic - Maximum of 1000 vehicles per day, including not more than 10 percent two axle loaded trucks or larger vehicles carrying light loads or empty.

Daily EAL = 6 to 20

1.03 Medium Duty Access Drives (DI-3)

Medium traffic - Maximum of 3000 vehicles per day, including not more than 10 percent two axle trucks or 1 percent heavy trucks with three or more axles.

Daily EAL = 21 to 75

2.0 Flexible Base Pavement

2.01 Saturated CBR of natural clay subgrade: 3

2.02 CBR of imported clay subgrade: 6

3.0 Rigid Pavement

3.01 Modules of subgrade reaction: 100 pci
(Imported clay subgrade)

3.02 Modules of rupture: 500 psi at 7 days
(Concrete)

Plate No. 8

PAVEMENT MATERIAL RECOMMENDATIONS

1.0 Limestone Base - Base material shall be composed of crushed limestone meeting the requirements of grade 1 in the Texas Department of Transportation (Tex DOT) 1993 Standard Specifications Item 247. The limestone shall be compacted to a minimum of 95 percent of the maximum density as determined by the Modified moisture/density relation (ASTM D1557).

2.0 Hot Mix Asphaltic Concrete Surface Course (Class "A") - The asphaltic surface course should be plant mixed, hot laid Type "D": (Fine Graded Surface Course) and meet the requirements specified in Tex DOT Item 340.

3.0 Asphalt Stabilized Base - Plant Mix - The asphaltic base should be plant mixed, hot laid and meet the requirements specified in the Tex DOT 1993 Standard Specifications Item 345.

4.0 Concrete - The materials and properties of concrete shall meet the applicable requirements in the ACI Manual of Concrete Practice. The concrete shall have a minimum modulus of rupture of 500 psi at 7 days as per ASTM C 293. It is our experience that concrete with a compressive strength of 3000 psi should meet these criteria. The mixture shall contain 3 to 5 percent entrained air.

Plate No. 9

END OF SECTION 02200

Section 02260-Grading

PART 1 – GENERAL

I. SUMMARY

A. The work called for by this section shall include, but not necessarily be limited to, finish grading and the spreading and shaping of topsoil to the finished contour elevations indicated by the drawings.

B. Refer to other sections for work related to that specified under this heading. Coordinate this work with that specified by other sections for timely execution.

PART 2 – PRODUCTS

I. MATERIALS

A. Topsoil: use stripped topsoil that has been stockpiled as specified elsewhere. If the quantity of topsoil on the job is inadequate, furnish enough additional topsoil. Topsoil furnished shall be natural, fertile friable soil possessing characteristics of representative productive soils in the vicinity. It shall be obtained from naturally well drained areas. It shall not be excessively acid or alkaline nor contain toxic substances that may be harmful to plant growth. Topsoil shall be without admixture of subsoil and shall be cleaned and reasonably free from clay lumps, stones, stumps, roots, or similar substances 2 inches or more in diameter, debris or other objects that are a hindrance to planting operations. Such material shall be subject to testing.

PART 3 – EXECUTION

I. PREPARATION

A. Do not begin work until earth is dry enough to be tillable.

B. Inspect subgrade to see that they generally conform to the standards called for elsewhere in these specifications, particularly with regard to the approximate depths required for the work. After work is completed, inspect it to ensure that all finish grading complies with design requirements.

C. Place finished grade stakes wherever necessary to bring the work accurately to the elevations required by the drawings.

II. INSTALLATION

A. Finish grade all areas outside the building line to the depths required for the work as follows:

1. Grade uniformly with rounded surfaces at the tops and bottom of abrupt changes of planes.
2. Hand grade steep slopes and areas that are inaccessible for machine work.
3. Protect graded areas from undue erosion, and repair and regrade areas where erosion does occur.
4. Refill areas where noticeable settlement has occurred.
5. Finish grade areas that are to receive topsoil up to 4 inches below the finished contour elevations called for by the drawings or, over rock, to 12 inches below these elevations.

B. Place topsoil uniformly over disturbed areas that do not receive other work as follows:

1. Obtain approval of the finish grading from Timbercon Construction before starting to place topsoil.
2. Scarify subgrade to a depth of 3 inches
3. Place the topsoil to a depth of 6” when lightly rolled or on rock, to a depth of 12 inches.
4. Level the topsoil so that it slopes uniformly and has no water pockets.
5. Carefully rake the topsoil by hand to remove all clods, roots, sticks, stones over 1 inch in diameter, and other foreign materials from the surface.

C. Dispose of acceptable excess excavated materials and debris by flattening fill slopes.

END OF SECTION 02260

Section 02510-Asphaltic Concrete Pavement

PART 1 – GENERAL

I. DESCRIPTION

A. This item shall consist of a surface course as shown on the plans, to be composed of a compacted mixture of mineral aggregate and asphaltic material. The pavement shall be constructed on the approved base as herein specified and in accordance with the details shown on the plans.

PART 2 – PRODUCTS

I. MATERIALS

A. Materials used in Hot Mix Asphaltic Concrete Pavement shall meet the requirements as set forth in Item 340 “Hot Mix Asphaltic Concrete Pavement (Class A)” of the Texas Department of Transportation (TX DOT) Standard Specification.

II. PAVING MIXTURES

A. Paving mixtures used shall be Type D. These mixtures shall conform to the requirements of “Hot Mix Asphaltic Concrete Pavement (Class A)” of the Standard Specifications of TX DOT.

III. EQUIPMENT

A. Equipment used in mixing, weighing, heating, spreading and compacting Hot Mix Asphaltic Concrete Pavement shall meet the requirements of “Hot Mix Asphaltic Concrete Pavement (Class A)” of the TX DOT Standard Specifications.

PART 3 – EXECUTION

I. CONSTRUCTION METHODS

A. Construction methods used in laying Hot Mix Asphaltic Concrete Pavement shall meet the requirements as set forth in “Hot Asphaltic Concrete Pavement (Class A)” of TX DOT Standard Specifications, with the following exception:

1. Application of Hot Mix Asphaltic Concrete Pavement shall not begin unless the air temperature is at least fifty degrees (50°) Fahrenheit in the shade and rising.

2. The surface upon completion shall be smooth and in conformity with typical sections and to the established lines and grades. Any deviation in excess of ¼" in cross section and length of 16 feet measured longitudinally shall be corrected. All irregularities, depressions, or weak spots which develop shall be corrected.

II. FIELD QUALITY CONTROL

A. A flood test will be performed to assure of proper drainage and to check for bird baths. Bird baths are not acceptable and will require remedial action.

END OF SECTION 02510

02577-Pavement Markings

PART 1 – GENERAL

I. SUMMARY

A. Apply pavement marking on surface of asphalt pavement that has been freshly sealcoated.

II. SUBMITTALS

A. Submit manufacturer's product specification and installation instruction for marking paint.

III. JOB CONDITIONS

A. Do not apply marking paint when weather is foggy or rainy, or when ambient or pavement temperature is below 40ºF. or when such conditions are anticipated during eight (8) hours after application.

IV. REGULATORY REQUIREMENTS

A. Handicap parking space markings shall conform to the State of Texas requirements.

PART 2 – PRODUCTS

I. MATERIALS

A. Marking Paint: Use chlorinated rubber type traffic-lane marking paint (FS TT-P-115, Type III). Colors as required for parking striping and fire lanes, etc.

B. Equipment: Pressurized, self-contained paint machine capable of applying a strait line from 2" to 6" wide, with consistent coverage of a minimum of 100 square feet per gallon.

PART 3 – EXECUTION

I. SURFACE PREPARATION

A. Make sure that pavement area to be marked is complete dry and free of all debris and foreign material.

II. LAYOUTS AND ALIGNMENT

A. Suitable layouts and lines of proposed stripes shall be spotted in advance of the paint application. Space Control points at such intervals as will ensure accurate location of marking

B. Provide experienced technician to supervise the location, alignment, layout, dimensions, and application of the paint.

III. APPLICATION

A. Rate of application: paint shall be applied evenly to the pavement surface to be coated at a rate recommended by the paint manufacturer.

B. Paint shall be applied to clean, dry surfaces and unless otherwise approved, only when air and pavement temperatures are above 40ºF and less than 95ºF. Paint temperature shall be maintained within these limits. The contractor shall provide guidelines and templates as necessary to control paint application. Special precautions shall be taken in marking numbers, letters and symbols. All edges of markings shall be sharply outlined. The maximum drying time requirements of the paint specifications will be strictly enforced. If there is a deficiency in drying of the markings, painting operations shall be discontinued until the cause of the slow drying is determined and corrected.

C. Suitable warning signs shall be placed near the work site to alert approaching traffic from all directions. Contractor shall be responsible for preventing damage to newly painted surfaces.

IV. DEFECTIVE WORKMANSHIP OR MATERIAL

A. When any material not conforming to the requirements of the specifications or plans has been delivered, contractor shall be responsible for correcting the defective and/or unsatisfactory results.

END OF SECTION 02577

03100-Formwork

PART 1 – GENERAL

I. SCOPE

A. Form all cast-in-place concrete indicated on the drawings and subsequently remove all such forms.

II. RELATED WORK SPECIFIED ELSEWHERE

A. Foundation Reinforcement Section 03200

B. Cast-in-place Concrete Section 03300

C. Concrete formwork included in other sections of these specifications that is not specifically described shall meet the requirements of this section.

D. Metal sleeves, base plates, anchors, hangers, dovetail anchor slots, and all embedments: Furnish and locate by respective trade or by Timbercon Construction. Secure approval of Engineer for installation of all sleeves and conduits in structural members.

III. QUALITY ASSURANCE

A. Qualification of Workmen: Provide at least one person who shall be present at all times during the execution of this portion of the work, who shall be thoroughly familiar with the type of materials being installed, the referenced standards, and the requirements of this work, and who shall direct all work performed under this section.

B. Codes and Standards: Comply with all pertinent codes and regulations for foundation formwork that have jurisdiction. When provisions of pertinent codes and standards conflict with the requirements of this section of these specifications, the more stringent provisions shall govern.

C. Provide a one (1) year written warranty to begin from date of substantial completion of the entire project.

IV. PRODUCT HANDLING

A. Protection: Use all means necessary to protect formwork materials before, during, and after installation and to protect work and materials of all other trades.

B. Replacements: In the event of damage, immediately make all repairs to the approval of the Engineer and Timbercon Construction.

PART 2 – PRODUCTS

I. FORM MATERIALS

A. Wood Forms: Capable of meeting all requirements described in FORM CONSTRUCTION paragraph in this section.

B. Unexposed surfaces: #2 common or better, plywood.

C. Exposed surfaces: New or like-new moisture resistant fir form plywood. Surface must be smooth, completely free from scratches, indentations, unsound surface knots, ripples, etching, prominent grain, depressions, warps or breaks. "Exposed surfaces" include concrete surfaces which are to be painted or dash coated.

II. MISCELLANEOUS MATERIALS

A. Vapor Barrier: At fill supported slabs, unless detailed otherwise, install 6 mil. Polyethylene plastic vapor barrier with minimum laps of 12".

B. Tie and Spreaders: All form ties shall be a type which does not leave an opening through the concrete (regular snap ties) and which permits neat and solid patching of every hole.

PART 3 – EXECUTION

I. FORM CONSTRUCTION:

All aspects of formwork, including the design, construction, upkeep, maintenance and removal, is the contractor's responsibility. The contractor shall provide formwork that is safe and properly designed for the specific method of concrete placement, type of vibration and construction loads which he will employ.

II. SURFACES TO BE FORMED

Form outside face of all grade beams above existing grade and 8" below finish grade unless shown otherwise on plans, and remove all such form work prior to backfilling.

III. FORMING DETAILS

Conform to shape, lines, grade and dimensions required by drawings; use plywood sheets as large as practical; all surfaces straight, plumb and properly braced; joints accurately matched and mortar-tight. Maintain sufficiently rigid to prevent deformation under load. Clean and oil forms before reuse. Forms shall be readily removable without hammering or prying against concrete.

IV. CONDUIT IN SLABS

Individual conduits in slabs shall not exceed 1" diameter. Groups of conduits or conduits larger than 1" diameter will require slab to be thickened to maintain full scheduled thickness.

V. FORM TIES

Use regular snap ties. No metal shall be within one inch of finished surface when forms are removed. Wire ties not permitted.

VI. CHAMFER STRIPS

Use at all angles of concrete which are exposed to view, unless shown otherwise.

VII. EXPANSION JOINTS

Unless noted otherwise, place preformed asphaltic expansion joint material in forms where indicated on plans.

VIII. SLAB AND BEAMS ON FILL

A. See structural plans for details. Form outside face of all perimeter beams, slabs, turndowns, and any other concrete exposed to view with wood forming to a depth of 8" below finished grade unless shown otherwise on plans, and remove all such formwork prior to backfilling. Form masonry lugs, floor drops and recesses as indicated on plans.

B. Except for wood forming specified above, form beams and slabs with carefully shaped fill material as specified on plans. Excavation of beam trenches shall be done with either a smooth-mouthed bucket or with hand labor to produce a firm undisturbed soffit. Failure to do so may require compaction of the bottom of the trenches according to recommendations of the geotechnical engineer.

C. Support reinforcing steel on concrete blocks or bricks spaced approximately 4'-0" o.c. in each direction.

D. Vapor barrier shall extend down sides of beams and under beam soffits.

IX. CONSTRUCTION JOINTS

A. Provide and locate as necessary in cast-in-place concrete.

B. Form keyways as required in cast-in-place concrete for transfer of shear and other forces through the joint.

X. OILING OF FORMS

A. Lightly coat with non-staining form oil for exposed surfaces. Before placing reinforcing, remove surplus oil.

B. Forms for unexposed surfaces may be thoroughly wetted with water in lieu of oiling immediately before placing concrete.

XI. REMOVAL OF FORMS

Side forms of beams may be removed after cumulatively curing at not less than 50ºF for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

END OF SECTION 03100

03200-Reinforcing Steel

PART 1 – GENERAL

I. SCOPE: Furnish and install all reinforcement and associated items required and/or indicated on the drawings for all cast-in-place concrete.

II. RELATED WORK SPECIFIED ELSEWHERE

A.	Foundation Formwork	Section 03100
B.	Cast-in-place Concrete	Section 03300

III. QUALITY ASSURANCE

A. Qualifications of Workmen: Provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being installed and the best methods for their installation and who shall direct all work performed under this section.

B. Codes and Standards: Comply with all pertinent codes and regulations for concrete reinforcement that have jurisdiction. Where provisions of pertinent codes and standards conflict with this specification, the more stringent provisions shall govern.

IV. SUBMITTALS

A. Shop Drawings

1. The contractor shall obtain completely detailed shop drawings showing placement plans, bar bending lists, etc. Include the specific location and size of all accessories, chairs and bar supports. The contractor shall carefully check these drawings, then submit them to Timbercon Construction/Engineer. Timbercon Construction/Engineer may conduct limited spot checks aimed solely at determining general comprehension of the design intent, then return them to the contractor. The contractor shall then carefully recheck the shop drawings and approve them prior to fabrication. Provide a minimum of 6 sets of drawings.

2. The Engineer’s spot check shall not relieve the contractor from correcting, at his own expense, any items that may thereafter be found not to comply with the plans and specifications.

B. Certificates: When requested by the Engineer, supplier of reinforcing steel and other embedded materials shall furnish certified evidence that all materials delivered to the project meet the requirements of this section of the specification.

V. PRODUCT HANDLING

A. Protection:

1. Use all means necessary to protect concrete reinforcement before, during and after installation and to protect the installed work and materials of all other trades.
2. Store in a manner to prevent excessive rusting and fouling with dirt, grease and other bond-breaking coatings.
3. Use all necessary precautions to maintain identification after the bundles are broken.
4. Concrete reinforcement included in other sections of these specifications that is not specifically described shall meet the requirements of this section.
5. Mechanical and electrical equipment, conduit, etc.: Provide adequate reinforcing steel as approved by Engineer for all required mechanical equipment and all required openings through beams, slabs, etc., and for distribution of equipment loads to structural members.

PART 2 – PRODUCTS: SEE DRAWINGS

PART 3 – EXECUTION: SEE DRAWINGS

I. FABRICATION

A. The contractor shall be responsible for obtaining properly fabricated reinforcement and placing it properly.

B. Reinforcing steel, at the time concrete is placed, shall be free from rust, scale, dried concrete, or other coatings that will destroy or reduce bond.

C. Reinforcing steel shall be accurately bent and placed in position, securely tied or supported to prevent movement during placing of concrete. Field bends will not be permitted without prior approval from Engineer. Spacer bars, supports and accessories are not scheduled but are to be furnished and placed as needed.

END OF SECTION 03200

Section 03300-Cast-In-place Concrete

PART 1 – GENERAL

I. SEE DRAWINGS AND GENERAL NOTES.

PART 2 – PRODUCTS

I. SEE DRAWINGS AND GENERAL NOTES.

PART 3 – EXECUTION

I. SEE DRAWINGS AND GENERAL NOTES.

END OF SECTION 03300

Section 03355-Stained Concrete

PART 1 – General

I. SCOPE

A. Furnish all labor and material for complete installation of all stained concrete as shown in Drawings.

II. SUBMITTALS

A. Submit manufacturer's product data and color chart of at minimum 8 basic colors of acid stain. Colors to be selected by Owner.

B. New concrete to be stained: Provide 36" x 36" sample panels, poured from the same concrete batch as is being poured for those areas to be stained.

C. Provide sample panels of stained and finished concrete for approval by Building Designer and Owner. If this sample is not satisfactory, additional samples will be provided until approval by Building Designer and Owner. Retain all samples until final work is complete.

III. QUALITY ASSURANCE

A. Use only trained installers for this portion of the work who have experienced working with specified materials. Installers are to have successful completed at least five installations of these materials in the last two years.

PART 2 – PRODUCTS

I. MATERIALS

A. Concrete Stain: Equal to “Kemiko Stone Tone Stain.”
Color to be selected by owner.

B. Concrete Sealer: Two part polyurethane sealer – submit for approval.

PART 3 – EXECUTION

I. EXAMINATION

A. Examine substrates and conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting application of special concrete finishes. Do not proceed with application until unsatisfactory conditions have been corrected.

II. FINISH CONCRETE

A. All new concrete to cure for a minimum of 30 days.

B. Prior to application of stain, thoroughly clean concrete and leave in dry, dust-free condition. Refer to manufacturer’s recommendations for removal of any deleterious materials.

C. On all new and existing concrete scheduled to be stained, provide plywood protection boards to keep concrete from becoming permanently soiled during construction.

D. Thoroughly cover and seal off any finished materials, including walls and bases, which could become damaged by the application of the material. (Note: This material is acidic and may cause damage to unprotected finishes and materials.)

E. Apply stain according to manufacturer's specifications, taking care to work stain well into surface while avoiding pooling. After this coat has dried, apply second in same manner as the first. After second coat has dried, scrub with water to remove all residue and salts. Refer to manufacture's application instructions for additional requirements.

F. After concrete has thoroughly dried, apply concrete sealer and final coat, according to manufacture's recommendations.

III. REPAIRS AND CLEANING

A. Repair damaged special concrete-finished surfaces to match color, texture, and uniformity of surrounding surfaces and to match repairs to approved mockups.

B. Clean surfaces given special concrete finishes after treatment to remove stains, markings, dust, and debris.

C. Wash and rinse surfaces according to special concrete finish applicator's recommendations. Protect other work from staining or damage due to cleaning operations.

1. Do not use cleaning materials or processes that could change the appearance of concrete finishes.

IV. PROTECTION AND CLEANING

A. Protect all finished stained concrete floors for duration of construction with non-staining covering.

B. Thoroughly clean all adjacent materials which may have become soiled during the staining of the concrete. Any materials which become permanently damaged by this work shall be replaced at no additional cost to the owner.

END OF SECTION 03355

Section 04100-Mortar

PART 1 – GENERAL

I. RELATED SECTIONS

A. Section 04410-Stone Masonry Veneer

II. QUALITY ASSSURANCE

A. Design Criteria: The compressive strength of the mortar Type M, S, or N as set forth in ASTM C-270 and C 91.

B. Provide type M mortar against earth up to 4" above grade. Type II Portland Cement, lime and sand.

C. Provide Type S mortar above grade; Type I Portland Cement, lime and sand.

D. Use of masonry cement will not be permitted.

III. SUBMITTALS

A. Test Report: Submit certified test reports showing compliance with compressive strength (2500 PSI-Type M, 1800 PSI-Type S, 750 PSI-Type N) meeting property or proportion standards set forth in ASTM Designation C 270, using test procedures in accordance with ASTM C 270.

B. Stone Samples: Sets for each color, grade, finish and variety of stone required showing the full range of variations expected.

C. Colored Pointing Samples: For each color required

D. Submit manufactures installation instructions under provisions of section 01300.

PART 2 – PRODUCTS

I. MATERIALS

A. Mortar shall consist of a blend of Portland Cement ASTM C 150 Type I or Type I/II, hydrated lime ASTM C 207 Type S and ASTM C 144 sand.

II. PRODUCT DELIVERY, STORAGE & HANDLING

A. Deliver mortar mix to job site in sealed unit bags. Identify each bag with material name and type.

III. MIXES

A. Water is to be clean and free of deleterious acids, alkalis or organic materials.

B. Mortar color is to be 99% pure synthetic oxide without fillers, factory blended with mortar mix.

1. Color is to be selected by Timbercon.

C. Admixtures are not allowed.

1. Antifreeze compounds: Calcium chlorides or other antifreeze agents are not allowed.

2. Use of accelerators are not allowed.

IV. MORTAR MATERIALS AND PROPORTIONS

A. A mortar mix Specification ASTM Designation C 270 M, S, or N.

B. Tempering Mortars: Mortars that have stiffened shall be re-tempered by adding water as frequently as needed to restore the required consistency. No mortars shall be used beyond 2 ½ hours after mixing.

V. MOCK-UP

A. Provide mock-up of masonry under provisions of Section 01300.

B. Erect stone to 3x4 feet minimum panel size; include specified mortar and accessories.

C. When accepted, mock-up will demonstrate minimum standard for the work. Mock-up may not remain as part of the work.

PART 3 – FIELD QUALITY CONTROL

A. Cleaning: Never use acid. Use a proprietary cleaner in accordance with the manufacturer's directions.

B. Protection: To inhibit efflorescence, keep masonry work covered and protected during construction.

END OF SECTION 04100

Section 04410-Stone Masonry Veneer

PART 1 – GENERAL

I. SCOPE

A. Provide stone work for exterior veneer wall panels.

II. SUBMITTALS

A. Stone Samples: Sets for each color, grade, finish, and variety of stone required showing the full range of variations expected.

B. Colored Pointing Mortar Samples: For each color required.

C. Mockups: Before installing stone masonry veneer, construct sample wall panels, in location and of size indicated, to verify selections made under sample submittals and to demonstrate aesthetic effects and qualities of materials and execution.

III. QUALITY ASSURANCE

A. Installer: An experienced installer who has successfully completed stone masonry veneer similar to that indicated for this project.

B. Stain Prevention: Immediately remove mortar and soil to prevent them from staining the face of stone masonry veneer.

C. Cold-Weather Requirements: Do not build on frozen subgrade or setting beds. Remove and replace stone masonry veneer damaged by frost or freezing conditions.

D. Hot-Weather Requirements: Protect stone masonry veneer from excessive evaporation of water from mortar. Do not apply mortar to substrates with temperatures of 100º F (38º C) and above.

PART 2 – PRODUCTS

I. MATERIALS

A. Limestone: Local limestone. Owner to select cut style from industry standard.

B. Corrugated-Metal Ties: Provide ties of metal indicated, not less than 0.0299 inch (.75 mm) thick by 7/8 inch (22 mm) wide by 7 inches (178 mm) long.

1. Galvanized Carbon-Steel Sheet: ASTM A 366 (ASTM A 366M), cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153, Class B-2 or B-3, as applicable.

C. Embedded Flashing Materials: As follows:

1. Copper-Fabric Laminate: Copper sheet weighing 7 oz./sq. ft. (2 kg/sq. m), bonded with asphalt between 2 layers of glass-fiber cloth.

D. Miscellaneous Masonry Accessories: As follows:

1. Dampproofing for Limestone: Cementitious or bituminous formulations recommended by ILI.

2. Weep Holes: Provide the following:

a. Wicking Material: Cotton sash cord, in length required to produce 2-inch (50-mm) exposure on exterior and 18 inches (450 mm) in cavity behind stone masonry veneer.

E. Masonry Cleaners: As follows:

1. Acidic Cleaner: Manufacturer's standard-strength masonry cleaner designed for removing mortar/grout stains, efflorescence, and other stains from stone masonry surfaces of type indicated without discoloring or damaging masonry surfaces; expressly approved for intended use by stone producer.

PART 3 – EXECUTION

I. INSTALLATION

A. Preparation: Accurately mark stud centerlines on face of asphalt-saturated felt before beginning stone installation.

B. Setting Stone Masonry Veneer, General: Execute stone masonry veneer by skilled masons experienced with the kind and form of stone and installation method indicated.

1. Arrange stones for uniformity of appearance, with color and size variations uniformly dispersed for an evenly blended appearance.

2. Install concealed flashing and weep holes at shelf angles, lintels, ledges, and similar obstructions to downward flow of water to divert water to exterior.

    a. At wood and metal frame walls, extend flashing from exterior face of veneer, through the veneer, up face of sheathing at least 8 inches (200 mm), and behind asphalt-saturated felt.

    b. At lintels and shelf angles, extend flashing a minimum of 4 inches (100 mm) into masonry at each end. At heads and sills, extend flashing 4 inches (100 mm) at ends and turn up not less than 2 inches (50 mm) to form a pan.

    c. Trim wicking material used in weep holes flush with outside face of wall after mortar has set. Weep holes to be at 24 inches on center maximum.

C. Construction Tolerances: As follows:

1. Variation from Plumb: For vertical lines and surfaces, do not exceed ¼ inch in 10 feet (6mm in 3 m) or ¼ inch in 40 feet (12mm in 12m) or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed ¼ inch in 20 feet (6mm in 6m) or ½ inch in 40 feet (12mm in 12m) or more.

2. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed ¼ inch in 20 feet (6mm in 6m) or ½ inch in 40 feet (12mm in 12m) or more.

3. Variation of Linear Building Line: For position shown in plan and related portion of walls, and partitions, do not exceed ½ inch in 20 feet (12mm in 6m) or ¾ inch in 40 feet (19mm in 12m) or more.

D. Install Anchored Stone Masonry Veneer: As follows:

1. Anchor masonry veneer to framing with adjustable masonry-veneer anchors to comply with the following requirements:

    a. Fasten each anchor section through sheathing to framing with 2 fasteners of type indicated.

    b. Embed tie section in mortar joints to within 1-1/2 inches (38mm) of face.

c. Space anchors as indicated, but not more than 18 inches (457mm) o.c. vertically and 24 inches (600mm) o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. (0.2 sq. m.) of wall area. Install additional anchors within 12 inches (305mm) of openings and at intervals around perimeter not exceeding 12 inches (305mm).

2. Set stone in full bed of mortar with full head joints, unless otherwise indicated. Build anchors and ties into mortar joints as stone is set.

3. Provide 1-inch (25mm) air space between stone masonry veneer and back-up construction, unless otherwise indicated. Keep air space free of mortar droppings and debris.

E. In-progress cleaning: Clean stone masonry veneer as work progresses. Remove mortar fins and smears before tooling joints.

F. Final Cleaning: After mortar is thoroughly set and cured, remove large mortar particles with wooden paddles and nonmetallic scrape hoes or chisels and clean stone masonry veneer as follows:

1. Test cleaning methods on mock-up; leave one-half of panel uncleaned for comparison purposes.

2. Protect adjacent stone and nonmasonry surfaces from contact with cleaner.

3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

4. Clean stone by bucket and brush hand-cleaning method described in BIA Technical Note No. 20 Revised II.

5. Clean limestone to comply with recommendations in ILI's "Indiana Limestone Handbook."

G. Waste Disposal as Fill Material: Dispose of clean masonry waste, including unusable stone, waste mortar, and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.

1. Do not dispose of masonry waste as fill within 18 inches (450mm) of finished grade.

END OF SECTION 04410

Section 05100-Structural Steel

PART 1 – GENERAL

I. SEE DRAWINGS AND GENERAL NOTES.

PART 2 – PRODUCTS

I. SEE DRAWINGS AND GENERAL NOTES.

PART 3 – EXECUTION

I. SEE DRAWINGS AND GENERAL NOTES.

END OF SECTION 05100

Section 05400-Cold Formed Metal Framing

PART 1 – GENERAL

I. SUMMARY

A. Types of cold-formed metal framing units include the following:

1. Load-bearing punched channel studs.

2. C-shaped load-bearing steel studs.

3. C-shaped steel joists.

B. Non-load bearing studs are specified in Section 09250, "Gypsum Drywall."

II. SUBMITTALS

A. Product Data: Submit product information and installation instructions from manufacturers for each item of cold-formed metal framing and accessories.

B. Shop Drawings: Shop drawings shall include placing drawings for framing members showing size and gauge designations, number, type, location, and spacing.

1. Indicate supplemental strapping, bracing, splices, bridging, accessories, and details required for proper installation.

C. Welding Certificates: Provide certificate signed by Contractor certifying that welders comply with requirements specified under “Quality Assurance” Article, prior to performing work.

III. QUALITY ASSURANCE

A. Component Design: Calculate structural properties of studs and joists in accordance with the American Iron and Steel Institute (AISI), "Specification for Design of Cold-Formed Steel Structural Members."

B. Welding Standards: Comply with applicable provisions of ANSI/AWS D1.1 “Structural Welding Code-Steel”, and ANSI/AWS D1.3 “Structural Welding Code-Sheet Steel.”

1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved, and if pertinent, has undergone recertification.

IV. DELIVERY, STORAGE, AND HANDLING

A. Deliver to project site in manufacturer's unopened containers or bundles, fully identified with name, brand, type, and grade. Store off the ground in a dry ventilated space or protect with impervious covering. Protect metal framing units from rusting and damage.

PART 2 - PRODUCTS

I. MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include but are not limited to the following:

Dale Industries, Inc.
Dietrich Industries, Inc.
USG Industries
Unimast, Inc.
Wheeling Corrugating Co.

II. METAL FRAMING

A. System Components: Manufacturers' standard load-bearing steel studs and joists of type, size, shape, and gauge as indicated. With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, reinforcements, shoes, clip angles, fasteners, and accessories for applications indicated, as needed to provide a complete metal framing system.

B. Materials and Finishes:

1. For 16 gauge and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 40,000 psi, ASTM A 446 Grade C.

2. For 18 and 20 gauge units, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi, ASTM A 446 Grade A.

3. Provide galvanized finish to metal framing components complying with ASTM A 525 for minimum G 60 coating.

4. Finish of installation accessories to match that of main framing components, unless otherwise indicated.

C. Fasteners: Provide nuts, bolts, washers, screws, and other fasteners with corrosion-resistant plated finish.

D. Electrodes for Welding: Comply with AWS Code and as recommended by stud manufacturer.

E. Galvanizing Repair: Where galvanized surfaces are damaged, prepare surfaces and repair in accordance with procedures specified in ASTM A 780.

III. FABRICATION

A. General: Framing components may be prefabricated into assemblies before erection. Fabricate panels plumb, square, true-to-line, and braced against racking with joints welded.

Perform lifting of prefabricated units to prevent damage or distortion.

1. Fabricate units in jig templates to hold members in proper alignment and position and to assure consistent component placement.

B. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Do not field weld units of 20 gauge or lighter. Wire tying of framing members is not permitted.

1. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting weld work.

2. Locate mechanical fasteners and install according to cold-formed metal framing manufacturer's instructions.

C. Fabrication Tolerances: Fabricate units to a maximum allowable tolerance variation from plumb, level, and true-to-line of 1/8 inch in 10 feet.

PART 3 – EXECUTION

I. INSTALLATION

A. General: Install cold-formed metal framing and accessories plumb, square, true to line, and with connections securely fastened, in accordance with manufacturer's recommendations and the requirements of this Section.

1. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.

2. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting weld work.

a. Where weld throat is not shown on the Contract documents, the weld throat shall be at least as large as the thickness of the thinnest sheet joined. All welds shall provide complete fusion of the sheets without "blow-out."

3. Locate mechanical fasteners and install according to cold-formed metal framing manufacturer's instructions.

B. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs.

1. Secure tracks as recommended by stud manufacturer for type of construction involved, spacing not to exceed 24 inches o.c. for nail or power-driven fasteners, or 16 inches o.c. for other types of attachment. Provide fasteners at corners and ends of tracks.

2. All track butt joints, abutting pieces of track shall be securely anchored to a common structural element or they shall be spliced together.

C. Wall Studs: Secure studs to top and bottom runner tracks, except where provisions for structure vertical movement is provided on drawings, by either welding or screw fastening at both inside and outside flanges.

1. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

2. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.

3. Axially loaded studs shall have full bearing against the inside web of top and bottom tracks. Splices in axially loaded studs are not permitted.

4. Structural wall stud connections to tracks, lintels, bridging and bracing shall be welded. Screwing of structural stud connections will not be allowed.

D. Install supplementary framing, blocking, and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations.

E. Frame wall openings larger than 2'-0" square with double stud at each jamb of frame, except where more than two studs are either shown or indicated in manufacturer's instructions.

1. Install runner tracks and jack studs above door openings, and above and below wall openings.

2. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall.

3. Secure stud system wall opening frame in manner indicated.

F. Frame both sides of expansion and control joints with separate studs; do not bridge the joint with components of stud system.

G. Install horizontal bridging in all load-bearing and exterior stud wall systems, with two (2) equally spaced rows for walls less than 10 feet high and rows spaced not more than 48 inches o.c. at walls higher than 10 feet.

H. Horizontal Bridging is not required for non-loadbearing interior stud walls unless noted on the drawings.

I. Provisions for structure vertical movement shall be provided where indicated on the drawings.

J. All welds shall be touched up using zinc-rich paint.

K. Erection Tolerances: Bolt or weld wall panels (at both horizontal and vertical junctures) to produce flush, even, true-to-line joints.

1. Maximum variation in plane and true position between prefabricated assemblies should not exceed 1/16 inch.

L. Installation of Joists: Install level, straight, and plumb, complete with bracing and reinforcing as indicated on drawings. Provide not less than 1-1/2 inch end bearing.

1. Reinforce ends with end clips, steel hangers, steel angle clips, steel stud section, or as otherwise recommended by joist manufacturer.

2. When required, reinforce joists at interior supports with single short length of joist section located directly over interior support, snap-on shoe, 30 percent side-piece lapped reinforcement, or other method recommended by joist manufacturer.

3. Secure joists to interior support systems to prevent lateral movement of bottom flange.

END OF SECTION 05400

Section 05520–Handrails

PART 1 – GENERAL

I. SECTION INCLUDES: HAND RAILING

II. SYSTEM DESCRIPTION

A. Design steel assemblies by licensed professional engineer, according to requirements of building code in force, for work to provide secure assemblies.

B. Verify conditions and details in which assemblies are to fit and design accordingly.

III. SUBMITTALS

A. Shop drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations and details.

PART 2 – PRODUCTS

I. MATERIALS

A. Steel sections: ASTM A36

B. Steel Plate: ASTM A283

C. Steel tubing: ASTM A500, Grade B.

D. Pipe: ASTM A53, Grade B Schedule 40.

E. Bolts, nuts, and washers: ASTM A325 galvanized to ASTM A153 for galvanized members.

F. Handrail fittings: Elbows, T-shapes, wall brackets, escutcheons; cast steel.

G. Welding materials: E60 Electrodes per AWS D1.1.

H. Shop and touch-up primer: SSPC 15, Type 1, red oxide.

I. Touch up primer for galvanized surfaces: Zinc rich type.

II. FABRICATION

A. Fit and shop assemble in largest practical sections for delivery to site.

B. Continuously seal joined members by continuous penetration welds.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush and hairline. Ease exposed edges to small uniform radius.

D. Exposed mechanical fastenings: flush countersunk screws or bolts, consistent with design component.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication.

F. Accurately form components required for anchorage of stair and railings to each other and to building structure.

III. FINISHES

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Shop prime items with one coat. Do not prime surfaces in direct contact with concrete or where field welding is required.

PART 3 – EXECUTION

I. EXAMINATION AND PREPARATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Make provisions for erection loads with temporary bracing, Keep work in alignment.

C. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.

II. INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads and provide temporary bracing to maintain true alignment until completion of erection and installation is permanent attachments.

C. Field weld components as indicated. Perform field welding in accordance with AWS D1.1.

D. Obtain General Contractor's approval prior to site cutting.

E. After final erection, grind all field welds smooth.

F. Prime field welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

END OF SECTION 05520

Section 06100-Rough Carpentry

PART 1 – GENERAL

I. SUMMARY

A. Provide rough carpentry work:

1. Wood framing
2. Wood decking
3. Sheathing
4. Subflooring
5. Backing panels for utilities
6. Nailers, blocking, furring, and sleepers

II. SUBMITTALS

A. Submit for approval product data.

III. QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle and store materials in accordance with manufacturer's instructions.

PART 2 – PRODUCTS

I. MATERIALS

A. Lumber, finished 4 sides, 19% maximum moisture content:

1. Concealed framing: #2 or better Southern Pine or Hem-fir. #1 or better where required by height and as noted.
2. Exposed framing: #1 Southern Pine
3. Wood for nailers, blocking, furring and sleepers: Construction grade.
4. Pressure preservative treat items in contact with roofing, flashing, waterproofing, masonry, concrete or the ground.
5. Provide blocking for all mounted items, including but not limited to:
   a. Casework and shelving
   b. Handrails and railings
   c. Toilet accessories and partitions

B. Plywood, APA rated for use and exposure

C. Subflooring: APA sheathing

D. Wall sheathing: 7/16" plywood or OSB

E. Backing panels: APA C-D plugged, interior with exterior glue, fire retardant treated, ¾" thick.

F. Moisture barrier: 30 pound felt

G. Wood treatment:

1. Preservative treatment: Pressure-treated with waterborne preservatives, to comply with AWPB LP-2 for above ground items, LP-22 for ground contact items. Kiln dry after treatment to 19% maximum moisture content for lumber and 15% for plywood. Treat above ground wood exposed to deterioration by moisture and all wood in contact with the ground or fresh water.
2. Fire-retardant treatment: Pressure impregnated, to comply with AWPA C20 for lumber and AWPA C27 for plywood; provide where indicated and where required by code. Do not use fire-retardant treatment containing ammonium phosphates.

PART 3 – EXECUTION

I. INSTALLATION

A. Wood framing: Comply with recommendations of NFPA Manual for House Framing, NFPA Recommended Nailing Schedule, and NFPA National Design Specifications for Wood Construction.

B. Plywood: Comply with recommendations of APA Design and Construction Guide-Residential and Commercial.

C. Provide nailers, blocking and grounds where required. Set work plumb, level and accurately cut.

D. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with other work.

E. Comply with manufacturer's requirements for cutting, handling, fastening and working treated materials.

F. Restore damaged components. Protect work from damage.

END OF SECTION 06100

Section 06200-Finish Carpentry and Millwork

PART 1 – GENERAL

I. SUMMARY

A. Provide finish carpentry for exterior items exposed to view:

1. Running and standing trim and moldings
2. Door frames

B. Provide finish carpentry for interior items exposed to view:

1. Running and standing trim and moldings
2. Door and window casings
3. Wood shelving and closet accessories as noted on drawings
4. Wood stair treads and risers

C. Provide custom millwork:

1. Wood casework and cabinets to be field finished
2. Countertops to be shop finished

II. SUBMITTALS

A. Submit for approval samples, shop drawings, product data, mock-ups of typical trim and moldings.

III. QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturer which have been in satisfactory use in similar service for three years. Use experience installers. Deliver, handle and store materials in accordance with manufacturer's instructions.

PART 2 – PRODUCTS

I. MATERIALS

A. Quality standard for fabrication and products: Architectural Woodwork Institute Quality Standards, Premium grade unless noted otherwise:

B. Exterior finish carpentry:

1. Trim and boards for transparent finish: #1 cedar with 19% maximum moisture content.

2. Trim and boards for painted finish: Fiber Cement Trim Planks

3. Soffit panels for painted finish: Fiber Cement Soffit Panels

C. Interior finish carpentry and millwork:

1. Trim and Millwork for transparent finish: as selected for cabinetry, other built-ins and trim.
2. Trim and Millwork for opaque finish: Closed-grain hardwood suitable for exposure and use.

D. Millwork finishes:

1. See section 09900 – Painting

E. Interior cabinets:

1. Cabinets
2. Cabinet shelving: minimum ¾" plywood shelving.
3. Open storage and bookshelves: ¾" or 1-1/2" thick, as shown on drawings.
4. Millwork hardware:
   a. Standards: Knape & Vogt (KV255) or equal
   b. Clips: Knape & Vogt (KV256) or equal
   c. European Hinges:
      1. Clip plate: Blum (BL175H713) or equal
      2. Clip hinge: Blum (BL75M355) or equal
      3. Drawer guides: Knape & Vogt (KV8400) 100# full extension or equal.
5. Countertops: Post-formed laminated plastic countertops shall be ¾" thick particleboard post formed with radius front edge and one-piece rolled 4" height cove splash. Provide square end splashes where cabinet butts wall. Refer to drawings for drawings and details for countertop construction.
   a. Laminate: Standard Formica or Wilson-Art plastic laminate. Color to be selected by Owner from standard colors.

PART 3 – EXECUTION

I. INSTALLATION

A. Cabinets to be shop-built, 1/2" overlay.

B. Provide work to sizes, shapes, and profiles indicated. Install work to comply with quality standards referenced. Back prime work and install plumb, level and straight with tight joints; scribe work to fit.

C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Use non-corrosive fasteners for exterior work. Coordinate with work of other sections.

D. Comply with manufacturer's requirements for cutting, handling, fastening and working treated materials.

E. Repair minor damage, clean and protect.

END OF SECTION 06200

Section 07100-Dampproofing

PART 1 – GENERAL

I. SUMMARY

A. Install dampproofing materials as needed.

B. Delivery of Products: Deliver materials to job site in manufacturer's original unopened containers with manufacturer's name and brand clearly marked thereon.

PART 2 – PRODUCTS

I. MATERIALS

A. Acceptable Manufacturers: Products of the following manufacturers may be considered as acceptable for use on this project, provided that such products conform to the specification requirements as hereinafter set forth:

1. AFCO Products, Inc.
2. Rubber & Plastics Compound Company, Inc.
3. Wasco Products, Inc.
4. Or Equal

B. Flashing: Equal to Nevastral HD, 20-mil (.020"), nonreinforced, homogeneous, waterproof, impermeable sheeting compound of elastomeric substances which have been reduced to a thermoplastic state.

C. Vapor Barrier: 6-mil polyethylene sheet under building slab.

D. Mastic: Compatible with flashing material, of troweling consistency, suitable for cold application and approved by manufacturer of membrane material.

PART 3 – EXECUTION

I. GENERAL:

A. Provide flashing for exterior walls as detailed.

B. When membrane flashings are installed against vertical surfaces of any type of substrate, apply a full, troweled-on coating of mastic to the substrate. Carefully embed flashing membrane into mastic and roll out wrinkles, air pockets and bulges.

C. As far as available roll widths permit, install through wall flashing without longitudinal joints within walls. If required material is not available in sufficient roll widths to prevent longitudinal joints, make such joints by lapping material a minimum of 6 inches and sealing joints throughout its length with mastic.

D. Where the flashing is not continuous, such as over and under openings in walls, the ends of the flashing should be extended beyond the jamb lines on both sides and turned up into the head joint several inches of each end to form a dam.

E. All flashing should extend beyond the face of the wall to form a drip including the flashing at the corners.

F. As far as possible, avoid necessity for making end joints in flashing material. When end joints are necessary, lap flashing material a minimum of 3 inches and seal joints throughout its length with mastic.

G. Where anchors, pipes, inserts, etc., puncture fabric, make opening in fabric as small as possible so that fabric will fit tightly to protruding material. Seal opening tightly and thoroughly with mastic.

H. After fabric is in place, apply a full 1/8" thick, protective coating of troweled-on mastic to all face areas of fabric.

I. When necessary to protect other trades' work in vicinity of flashing operations, protect such work by masking covering, or other precautionary methods. Remove such coating, etc., after they have served their purpose.

J. When flashing around corners the flashing should be continuous. To achieve this continuity, pieces of flashing may need to be cut and lapped a minimum of 3" and sealed to conform to the shape of the structure.

K. At completion of operations, clean all work of other trades that has in any way been soiled by these operations. Remove all excess materials, containers, and refuse resultant from operations.

L. Provide 24 gauge Z flashing at all exterior window and door jamb assemblies.

END OF SECTION 07100

Section 07200-Batt Insulation

PART 1 – GENERAL

I. DEFINITIONS

A. R-value designation is the thermal resistance of insulation only, not including air space or other factors assumed to result in higher R-values.

II. PRODUCT DELIVERY AND STORAGE

A. Deliver material to project site in manufacturer's original packaging.

B. Clearly identify manufacturer, contents, brand name, applicable standard R-value.

C. Store materials off ground and protect against weather, condensation and damage. Remove damaged materials from site.

PART 2 – PRODUCTS

I. MATERIALS

A. Thermal Batt Insulation

1. Exterior Walls: Owens-Corning, R-19 insulation or equal.
2. Roof Deck: Owens-Corning R-30 insulation or equal.
3. See drawings for location and R-Value.

B. Acoustical Insulation: Owens-Corning Fiberglass-Sound attenuation batt insulation (full thickness) to be installed in all walls in restrooms and mechanical rooms. See drawings for additional locations.

PART 3 – EXECUTION

I. INSPECTION: Examine areas scheduled to receive insulation to insure protection against inclement weather and other hazards and work of preceding trades is completed. Proceed with installation when conditions are satisfactory.

II. INSTALLATION

A. General: Fit batt insulation snugly between framing. Maintain integrity of insulation over entire area to be insulated. Insulate small areas between closely spaced framing members and behind mechanical and electrical services within insulated cavities. Cut and fit insulation around pipes, conduits, and other obstructions.

B. Install insulation within stud system full height and width in such a manner that voids or opening do not occur. Insulation between studs should fill the full width.

C. Securely attach and support insulation to prevent sagging or tearing from its own weight.

D. Remove and replace insulation which has become wet or otherwise is damaged.

E. Check surfaces to receive insulation to assure that they are in uniform plane and free of mortar chips, debris, grease, oil and other items.

F. Restroom and Mechanical Rooms: Take particular care to see that acoustical insulation is carefully fitted around all plumbing, outlet boxes, etc. Fill wall completely with sound insulation.

G. Cleaning up: Remove and dispose of excess materials, litter and debris, leaving work areas in a clean condition.

END OF SECTION 07200

Section 07215-Metal Building Insulation

PART 1 – GENERAL

I. PROJECT INCLUDES

A. Concealed building fiberglass insulation with reinforced poly face sheet.

B. Exposed building fiberglass insulation with reinforced poly face sheet.

C. See plans for R-Values.

II. QUALITY ASSURANCE

A. Submittals
1. Product Data: For each type of product indicated.
2. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.

B. Surface-Burning Characteristics: ASTM E 84.

C. Fire-Resistance Ratings: ASTM E 119.

D. Combustion Characteristics: ASTM E 136.

III. PRODUCTS

A. Poly vapor barrier adhered to insulation.

END OF SECTION

Section 07500-Standing Seam Metal Roof

SEE PRE-ENGINEERED METAL STRUCTURE 13121

- (roofing as specified for pre-engineered metal structure is to be used in all areas where metal roofing is shown on plans)

Section 07531 - EPDM Membrane Roofing

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Adhered EPDM membrane roofing system.
2. Roof walkway pads.
3. Roof insulation.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Factored Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems," after multiplication by a safety factor.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

C. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

1. Fire/Windstorm Classification: Class 1A-90, 72 MHP peak wind speed.

1.5 SUBMITTALS

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

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.

1. Base flashings and membrane terminations.
2. Tapered insulation, including slopes.

3. Insulation fastening patterns.

C. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

D. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of meeting performance requirements.

E. Qualification Data: For Installer and manufacturer.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.

G. Maintenance Data: For roofing system to include in maintenance manuals.

H. Warranties: Special warranties specified in this Section.

I. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.

1. Installer must have a minimum of three (3) years experience installing the roof system specified.

B. Manufacturer Qualifications: A qualified manufacturer that has UL listing and FMG approval for membrane roofing system identical to that used for this Project.

C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain components for membrane roofing system approved by roofing membrane manufacturer.

E. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.

F. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:

1. Meet with Owner, Building Designer, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 PROJECT CONDITIONS

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

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer's form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.

1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories roof insulation fasteners cover boards walkway products and other components of roofing system.
2. Warranties that allow for arbitration are not acceptable.
3. Indicate by letter that "All roofing components exclusive of the deck are approved and compatible with the warranty requirements of the roof system as specified, and that the warranty specified will be issued at completion of the project if system is installed as designed."

B. Installers Warranty: Submit roofing Installer's warranty, including all components of roofing system such as roofing membrane, ply sheets, base sheets, base flashing, roof insulation, fasteners, cover boards, and walkway products, for the following warranty period:

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 EPDM ROOFING MEMBRANE

A. EPDM Roofing Membrane: ASTM D 4637, Type I, nonreinforced uniform, flexible sheet made from EPDM, and as follows:

1. Manufacturers:

a. Carlisle SynTec Incorporated.
b. Firestone Building Products Company.
c. GenFlex Roofing Systems.
d. Johns Manville International, Inc.
e. Stafast Roofing Products.
f. Versico Inc.
g. Or approved equal

2. Thickness: 60 mils, nominal.
3. Exposed Face Color: As approved by Owner or Building Designer.

2.3 AUXILIARY MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.

1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

B. Sheet Flashing: 60-mil- (1.5-mm-) thick EPDM, partially cured or cured, according to application.

C. Bonding Adhesive: Manufacturer's standard bonding adhesive.

D. Seaming Material: Manufacturer's standard synthetic-rubber polymer primer and 3-inch- (75-mm-) wide minimum, butyl splice tape with release film.

E. Lap Sealant: Manufacturer's standard single-component sealant.

F. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.

G. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.

H. Metal Battens: Manufacturer's standard aluminum-zinc-alloy-coated or zinc-coated steel sheet, approximately 1 inch (25 mm) wide by 0.05 inch (1.3 mm) thick, prepunched.

I. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.

J. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

K. Liquid coating, specifically formulated for coating EPDM roofing membrane, as follows:

1. Type: Hypalon.
2. Color: White.

2.4 ROOF INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, felt or glass-fiber mat facer on both major surfaces.

1. Manufacturers:

a. Atlas Roofing Corporation

b. Carlisle SynTec Incorporated.
c. Celotex Corporation.
d. Firestone Building Products Company.
e. GAF Materials Corp.
f. GenFlex Roofing Systems.
g. Johns Manville International, Inc.
h. Or approved equal

C. Cellulosic-Fiber Board Insulation: ASTM C 208, Type II, Grade 2, fibrous-felted, rigid insulation boards of wood fiber or other cellulosic-fiber and water-resistant binders, asphalt impregnated, chemically treated for deterioration.

D. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/2 inch per 12 inches (1:48), unless otherwise indicated.

E. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated with min. slope of ½ inch per 12 inches, unless otherwise indicated.

2.5 INSULATION ACCESSORIES

A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

C. Low-Rise Foam Adhesive: Manufacturer's standard adhesive formulated to adhere roof insulation to substrate.

D. Cover Board: ASTM C 208, Type II, Grade 2, cellulosic-fiber insulation board, 1/2 inch (13 mm) thick.

2.6 ASPHALT MATERIALS

A. Roofing Asphalt: ASTM D 312, Type III, only to be used as insulation attachment.

B. Asphalt Primer: ASTM D 41.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Division 5 Section "Steel Deck."
4. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
5. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
6. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
7. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 INSULATION INSTALLATION

A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.

C. Install tapered insulation under area of roofing to conform to slopes indicated.

D. Install one or more layers of insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2 inches or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.

1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.

G. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:

1. Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft. (0.3 L/sq. m) and allow primer to dry.

2. Set each layer of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F (14 deg C) of equiviscous temperature.
3. Set each layer of insulation in a cold fluid-applied adhesive.

H. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Fasten insulation according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
2. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

I. Mechanically Fastened and Adhered Insulation: Install each layer of insulation and secure first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Fasten first layer of insulation according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
2. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
3. Install subsequent layers of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F (14 deg C) of equiviscous temperature.
4. Install subsequent layers of insulation in a manufacturer’s approved low-rise foam adhesive.

J. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Loosely butt cover boards together and fasten to roof deck.

1. Fasten insulation according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
2. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

3.4 ADHERED ROOFING MEMBRANE INSTALLATION

A. Install EPDM roofing membrane over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll roofing membrane and allow to relax before installing.

B. Start installation of roofing membrane in presence of membrane roofing system manufacturer's technical personnel.

C. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

D. Bonding Adhesive: Apply bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.

E. Mechanically or adhesively fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.

F. Apply roofing membrane with side laps shingled with slope of roof deck where possible.

G. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing membrane terminations.

H. Repair tears, voids, and lapped seams in roofing that does not meet requirements.

I. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

J. Install roofing membrane and auxiliary materials to tie in to existing roofing.

3.5 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

F. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.

1. Notify Building Designer or Owner 48 hours in advance of date and time of inspection.

G. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Building Designer and Owner.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.7 ROOFING INSTALLER'S WARRANTY

A. WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

B. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

C. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

    a. lightning;
    b. peak gust wind speed exceeding 72 mph;
    c. fire;
    d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    f. vapor condensation on bottom of roofing; and
    g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.

6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

END OF SECTION 07531

Section 08100-Metal Doors and Frames

PART 1 – GENERAL

I. SUMMARY

A. STANDARDS: In addition to other specified requirements, comply with Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" (SDI-100), for the following classifications:

1. Exterior Doors: SDI-100, Grade III, extra heavy-duty, Model 2, minimum 16-gage faces.

2. Interior Doors: SDI-100, Grade III, heavy duty, Model 1, minimum 18 gauge faces.

II. SUBMITTALS

A. With manufacturer's details and specifications for steel doors and frames, submit shop drawings showing application to project, as required.

PART 2 – PRODUCTS

A. Fire Rated Assemblies: Provide units that display appropriate UL or FM Labels for fire ratings indicated.

B. Materials: Steel doors and frames; hot-rolled, pickled and oiled per ASTM A 569 and A 568; cold-rolled per ASTM A 366 and A 568.

C. Anchors and accessories: Manufacturer's standard units. Use galvanized items for units built into exterior walls, complying with ASTM A 153.

PART 3 – EXECUTION

A. Fabrication: Fabricate units to be rigid, neat in appearance, and free from defects, warp or buckle. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible.

B. Prepare steel doors and frames to receive mortised and concealed finish hardware, including cutouts, reinforcing, drilling and tapping, complying with ASNI A115 "Specifications for Door and Frame Preparation for Hardware." Reinforce units to receive surface applied finish hardware to be field applied. Locate finish hardware as indicated or, if not indicated, per DHI "Recommended Locations for Builder's Hardware."

C. Shop paint exposed surfaces of doors and frame units, including galvanized surfaces, using manufacturer's standard baked-on rust inhibitive primer.

D. Doors: Comply with SDI-100, of the types and styles indicated for materials quality, metal gages, and construction details.

E. Frames: Comply with SDI-100, of the types and styles indicated, for materials quality, metal gages, and construction details. Provide standard hollow metal frames for doors and other openings as indicated. Prepare frames to receive 2 silencers on strike jambs of single-swing frames and on heads of double-swing frames. Provide 26-gage steel plaster guards or mortar boxes, welded to frame, at back of hardware cutouts where installed in concrete, masonry or plaster openings.

F. Installation: Install hollow-metal units in accordance with manufacturer's instructions and final shop drawings (if any). Fit doors to frames and floors with clearances specified in SDI-100.

G. Finish hardware is in another division in section 8.

END OF SECTION 08100

Section 08200 – Wood Doors

PART 1 – GENERAL

I. STANDARDS

A. Comply with requirements of ASNI/NWMA I.S. 1 and Section 1300 of AWI "Architectural Woodwork Quality Standards" except as otherwise indicated.

II. SUBMITTALS

A. Product data for each type of door.

B. Provide product warranty on door manufacturer's standard form, signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors and defined by referenced standards warranty shall be in effect during following periods of time after date of substantial completion.

1. Solid core flush interior doors: Two year minimum.

PART 2 – PRODUCTS

I. GENERAL

A. Fire rated assemblies: Provide units that display appropriate UL or FM Labels for fire ratings indicated.

B. General wood door product requirements:

1. Exposed surfaces: Same exposed surface material on both faces of each door, except as otherwise indicated.
2. Interior solid core flush doors for stain finish:
   a. Faces: Red Oak, plain sliced
   b. Grade: Custom
   c. Construction: Particleboard core

C. Prefitting and preparation for hardware:

1. Prefit and premachine wood doors at factory. Coordinate with finish hardware and door frame requirements.

D. Installation:

1. Install doors to comply with manufacturer's instructions.

END OF SECTION 08200

Section 08350 –Folding Doors and Partitions - Series 632 Paired Panels

PART 1 – GENERAL

I. DESCRIPTION

A. General

1. Furnish and install operable partitions and suspension system. Provide all labor, materials, tools, equipment, and services for operable walls in accordance with provisions of contract documents.

II. RELATED WORK BY OTHERS

A. Preparation of opening will be by General Contractor. Any deviation of site conditions contrary to approved shop drawings must be called to the attention of the architect.

B. All header, blocking, support structures, jambs, track enclosures, surrounding insulation, and sound baffles as required in 1.04 Quality Assurance.

C. Prepunching of support structure in accordance with approved shop drawings.

D. Paint or otherwise finishing all trim and other materials adjoining head and jamb of operable partitions.

III. SUBMITTALS

A. Complete shop drawings are to be provided prior to fabrication indicating construction and installation details. Shop drawings must be submitted within 60 days after receipt of signed contract.

IV. QUALITY ASSURANCE

A. Preparation of the opening shall conform to the criteria set forth per ASTM E557 Standard Practice for Architectural Application and Installation of Operable Partitions

B. The partition STC (Sound Transmission Classification) shall be achieved per the standard test methods ASTM E90.

C. Noise isolation classifications shall be achieved per the standard test methods ASTM E336 and ASTM E413.

D. Noise Reduction Coefficient (NRC) ratings shall be per ASTM C423.

E. Rack testing for 10 years. (tensional strength stress test)

F. The manufacturer shall have a quality system that is registered to the ISO 9001 standards.

V. PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Proper storage of partitions before installation and continued protection during and after installation will be the responsibility of the General Contractor.

VI. WARRANTY

A. Partition system shall be guaranteed for a period of two years against defects in material and workmanship, excluding abuse.

PART 2 - PRODUCTS

I. ACCEPTABLE MANUFACTURERS

A. Upon compliance with all of the criteria specified in this section, Manufacturers wishing to bid products equal to the product specified must submit to the architect 10 days prior to bidding complete data in support of compliance and a list of three past installations of products similar to those listed. The submitting manufacturer guarantees the proposed substituted product complies with the performance items specified and as detailed on the drawings.

II. MATERIALS

A. Product to be top supported Series 632 paired panels as manufactured by Hufcor Inc.

1. Panels shall be nominally 3” [76] thick, to 48” [1219] in width, and hinged in pairs.

2. Panel faces shall be laminated to appropriate substrate to meet the STC requirement in 2.04 Acoustical Performance.

a. Optional face material (Not all substrates are available for all STC ratings.
NA

b. Horizontal Splice: Heights over 16'3" [4953] with non-steel faces require a structural splice placed at approximately 12’3' [3734] from the floor.

3. Frames shall be of 16 gauge [1.42mm] painted steel with integral factory applied aluminum vertical edge and face protection. Optional: Face finish shall wrap around the vertical panel edges and provide no protective vertical face trim.

4. Vertical sound seals shall be of tongue and groove configuration, ensure panel-to-panel alignment and prevent sound leaks between panels.

5. Horizontal top seals shall be fixed continuous contact dual 4-finger vinyl. (Option: Horizontal top seals shall be retractable, provide 1” [25] nominal operating clearance, and exert upward force when extended. All panels, including pass door panels and lever closure panels must have retractable top and bottom seals. Not available with automatic bottom seals.)

6. Horizontal bottom seals shall be retractable, provide up to 2” [50] nominal operating clearance, and exert downward force when extended. Optional Seals: (Owner Selected)

    a. Horizontal bottom seals shall be automatic and provide up to 2” [50] nominal operating clearance.

    b. Horizontal bottom seals shall be fixed continuous contact dual 4-finger vinyl.

7. Horizontal trim shall be of aluminum.

8. Low profile hinges on basic panels shall be of steel and project no more than 1/4” [6] beyond panel faces. Each pair of panels to have a minimum of three hinges.

B. Weight of the panels shall be 5.7-10.2 lbs. per sq. ft. [27.8-49.8kg/sq.m] based on options selected.

C. Suspension system:

1. Track shall be of clear anodized architectural grade extruded aluminum alloy 6063-T6. Track design shall provide precise alignment at the trolley running surfaces and provide integral support for adjoining ceiling, soffit, or plenum sound barrier. Track shall be connected to the structural support by pairs of minimum 3/8" [10] dia. threaded steel hanger rods. Guide rails and/or track sweep seals shall not be required.

a. Each panel shall be supported by one 4-wheeled carrier. Wheels to be of hardened steel ball bearings encased with molded polymer tires.

2. Plenum closure (by others): Design of plenum closure must permit lifting out of header panels to adjust track height. Plenum closure required for optimum sound control of partition.

3. Option (available for select layouts-consult your Hufcor Distributor): The panels shall be supported by the Unispan pre-engineered truss and post system fabricated of steel and aluminum. Unispan is attached to the building structure for lateral support only. The load of the truss and partition is supported by end columns and the system transfers the partition weight to the floor.

D. Finishes

1. Face finish shall be: (select as required):

a. Factory applied reinforced vinyl fabric with woven backing, weighing not less than 15 oz. per lineal yard [465 g/m]. Color shall be selected from manufacturer's standard color selectors.

b. Standard upgrade fabrics (color shall be selected from manufacturer's standard color selector):
(1) Factory applied vertical ribbed carpet (N.R.C. .20)
(2) Factory applied 100% polyolefin stain resistant fabric
(3) DiVISIONS™ stain repellant fabric by Milliken

2. Exposed metal trim and seal color shall be: Owner Selected

a. Lamb's Wool (standard)

b. Brown (standard)

c. Gray (standard)

d. Custom powder coated (optional upgrade for metal trim)

3. Aluminum track shall be clear anodized

E. Available Accessories/Options

1. ADA compliant pass door of the same thickness and construction as the basic panels. Pass door panel legs require bottom seals that provide downward force to maintain stability during door operation. Pass door leaf has perimeter trim to protect face finish and to provide visual identification as required by International Building Code. Pass door leaf incorporates a self-adjusting retractable bottom seal providing sound control when door is closed.
   a. Automatic door closer
   b. Door lock
   c. Exit sign (consult your local code)
   d. Prepped for window

2. Inset chalk/writing/projection surfaces

3. Inset tackboards

4. Inset eraser pocket

5. Segmented faces

6. Finished end cover

7. Pocket doors

8. Inset chair rail pan (for field installation of chair rail).

9. Custom design options (consult your local Hufcor Distributor)

III. OPERATION

A. Panels shall be manually moved from the storage area, positioned in the opening, and seals set.

B. Retractable Horizontal Seals

1. Retractable horizontal seals shall be activated by a removable quick-set operating handle located approximately 42” [1067] from the floor in the panel edge.

2. All retractable seals in each hinged pair shall be operated simultaneously.

3. Seal activation requires approximately 15 lbs. [6.8 kg] of force per panel and approximately a 190 degree turn of the removable handle.

C. Automatic Floor Seals

1. Horizontal seals shall be activated by pressing the edge of the panel into the edge of the adjacent panel or wall.

2. Seal activation requires approximately 15 lbs. [6.8 kg] of force per panel.

D. Final partition closure to be by (select one):

1. Lever closure panel with expanding jamb which compensates for minor wall irregularities and provides a minimum of 250 lbs. [113.4kg] seal force against the adjacent wall for optimum sound control. The jamb activator shall be located approximately 45" [1143] from the floor in the panel face and be accessed from either side of the panel. The jamb is equipped with a mechanical rack and pinion gear drive mechanism and shall extend 4"-6" [100-152] by turning the removable operating handle.

2. Pivot Panel (Optional for heights to 12'3" [3734] and a maximum of 10 panels): Pivot panel is attached to the wall and permits access between adjacent rooms. Pivot panel is of the same construction as basic panels but with continuous contact multi-ply vinyl top and bottom seals. The lead end of the panel has full height finger pull and vertical seal of multi-ply vinyl

E. Stack/Store Panels

Retract seals and move to storage area. Panels may be stored at either or both ends of the track or in a pocket.

IV. ACOUSTICAL PERFORMANCE

A. Acoustical performance shall be tested at a laboratory accredited by the U.S. Dept. of Commerce, National Institute of Standards and Technology, under the National Voluntary Laboratory Accreditation Program (NVLAP) and in accordance with ASTM E90 Test Standards. Standard panel construction shall have obtained an STC rating of (Owner Selected): 41, 43, 47, 49, 51
(Not all substrates are available in all STC ratings)

1. Complete, unaltered written test report is to be made available upon request.

PART 3 - EXECUTION

A. Installation. The complete installation of the operable wall system shall be by an authorized factory-trained installer and be in strict accordance with the approved shop drawings and manufacturer's standard printed specifications, instructions, and recommendations.

B. Cleaning

1. All track and panel surfaces shall be wiped clean and free of handprints, grease, and soil.

2. Cartoning and other installation debris shall be removed to onsite waste collection area, provided by others.

C. Training

1. Installer shall demonstrate proper operation and maintenance procedures to owner's representative.

2. Operating handle and owners manuals shall be provided to owner's representative.

END OF SECTION 8350

Series 1500 Accordion Door Specifications

Part 1 - General

1.01 DESCRIPTION

A. General

1. Furnish and install accordion partitions and suspension system. Provide all labor, materials, tools, equipment, and services for accordion walls in accordance with provisions of contract documents.

1.02 RELATED WORK BY OTHERS

A. Preparation of opening will be by General Contractor. Any deviation of site conditions contrary to approved shop drawings must be called to the attention of the architect.

B. All header, blocking, support structures, jambs, track enclosures, surrounding insulation, and sound baffles as required in 1.04 Quality Assurance.

C. Prepunching of support structure in accordance with approved shop drawings.

D. Paint or otherwise finishing all trim and other materials adjoining head and jamb of accordion partitions.

1.03 SUBMITTALS

A. Complete shop drawings are to be provided prior to fabrication indicating construction and installation details. Shop drawings must be submitted within 60 days after receipt of signed contract.

1.04 QUALITY ASSURANCE

A. Preparation of the opening shall conform to the criteria set forth per ASTM E557 Standard Practice for Architectural Application and Installation of Operable Partitions

B. The manufacturer shall have a quality system that is registered to the ISO 9001 standards.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Proper storage of partitions before installation and continued protection during and after installation will be the responsibility of the General Contractor.

1.06 WARRANTY

A. The door shall be guaranteed for two years. In addition, the pantographs, trolleys, and tracks are guaranteed for 10 years from the date of acceptance for beneficial use.

Part 2 - Products

2.01 ACCEPTABLE MANUFACTURERS

A. Upon compliance with all of the criteria specified in this section, Manufacturers wishing to bid products similar to the product specified must submit to the architect 10 days prior to bidding complete data in support of compliance and a list of three past installations of products similar to those listed.

The submitting manufacturer guarantees the proposed substituted product complies with the product specified and as detailed on the drawings.

2.02 MATERIALS

A. Product to be top supported, manually operated, : Series 1500 accordion partition as manufactured by Hufcor Inc.

1. Covers will be semi-rigid 5-ply laminated construction with manufacturer's standard vinyl fabric providing wrinkle-free impact resistant surfaces. Covers shall be removable and replaceable in the field.

2. Partition shall have an internal framing of 14 ga. [2] half hard steel riveted to form "X" construction pantographs. Pantographs shall provide even extension and contraction without binding on straight runs of track or on curves as shown on the plans. Pantographs shall have built-in stops to prevent over-extending. Partition shall have pantographs located at top and bottom, plus intermediate pantographs located no more than 4' [1219] on center.

3. Vertical posts of steel channel shall support the pantographs at each end of the partition.

4. The lead post shall be trimmed with clear anodized aluminum and include mechanical latching.

6. Weight of the door shall be no less than 1.3 lbs. per sq. ft. [6.5 kg]

B. Suspension System:

1. Track shall be of clear anodized architectural grade extruded aluminum alloy 6063-T6 and be as specified by manufacturer for best performance as governed by overall size and weight of the partition.

2. Partition shall be supported by a 4-wheeled carrier at the lead post. Wheels to be of nylon-tired steel ball bearings. The lead carrier shall be adjustable to maintain proper alignment of the lead post to the jamb.

3. Intermediate carriers shall be spaced 18" [457] on center and have two wheels of nylon-tired steel ball bearings.

C. Finishes

1. Face finish shall be: To be selected by owner

a. Factory applied reinforced vinyl fabric with woven backing, weighing not less than 21 oz. per lin. yard. Color shall be selected from manufacturer's standard color selector.

b. Standard upgrade fabrics (color shall be selected from manufacturer's standard color selector):

(1) Factory applied vertical ribbed carpet (N.R.C. .55)

(2) Factory applied 100% polyolefin stain resistant fabric

c. Optional:

(1) Customer selected (requires factory approval for manufacturing compatibility)

D. Available Accessories/Options

1. Locks - one or both sides
   a. Hufcor standard key lock
   b. Customer supplied, master keyed to building system.
2. Track channel
3. Track configurations
   a. Curved tracks
   b. X, T, & L intersections
   c. Switches for partition use in alternate locations
      (1) glide switch
      (2) crossover switch
4. Posts for attaching multiple doors
5. Sliding jamb board
6. Cremone bolt
7. Pendant pulls
8. Over-the-counter sizes

2.03 OPERATION

A. Accordion door shall be manually moved from the storage area, pulled across the opening, and latched into the full height jamb molding with the latching handle.

B. Stack/Store Panels

1. The handle is manually unlatched and the door is moved into the stacked position.

Part 3 - Execution

A. Installation. The complete installation of the accordion partition system shall be by an authorized factory-trained installer and be in strict accordance with the approved shop drawings and manufacturer’s standard printed specifications, instructions, and recommendations.

B. Cleaning

1. All track and door surfaces shall be wiped clean and free of handprints, grease, and soil.
2. Cartoning and other installation debris shall be removed from the job site.

C. Training

1. Installer shall demonstrate proper operation and maintenance procedures to owner’s representative.

2. Owners manuals shall be provided to owner’s representative.

Section 8400 – Aluminum Framed Storefront

PART 1 – GENERAL

I. SUMMARY

A. Design and size components to withstand the following load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.

1. Design wind loads: Comply with requirements of IBC 2006.
2. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

B. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

C. Air Infiltration: limit air filtration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E 283.

D. Water Leakage: None, when measured in accordance with ASTM E 331 with a test pressure difference of 2.86 lbf/sq ft.

E. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

II. SUBMITTALS

A. Product data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details.

B. Shop drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.

III. QUALITY ASSURANCE

A. Manufacturer and installer: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

IV. DELIVERY, STORAGE, AND PROTECTION

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond to aluminum when exposed to sunlight or weather.

V. ENVIRONMENTAL REQUIREMENTS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

PART 2 – PRODUCTS

I. MANUFACTURERS

A. Kawneer Company, Inc.

B. Vistawall Architectural Products

C. Amarlite

D. YKK

II. COMPONENTS

A. Aluminum-framed storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.

1. Finish: Class I color anodized.
2. Color: As selected from manufacturer's standard colors.

B. Aluminum framing members: Tubular aluminum sections, drainage holes and internal weep drainage system.

1. See plans for other requirements

C. Doors: Glazed aluminum

1. See plans for other requirements

III. MATERIALS

A. Extruded aluminum: ASTM B221 (ASTM B221M).

B. Fasteners: Stainless steel

C. Perimeter Sealant: Acrylic emulsion latex; ASTM C 834, single component, paintable.

D. Glass: As specified in section 8800.

E. Glazing gaskets: Type to suit application to achieve weather, moisture and air infiltration requirements.

IV. FINISHES

A. Class I color anodized finish: AAMA 611 integrally colored anodic coating not less than 0.7 mils thick.

B. Touch-up materials: As recommended by coating manufacturer for field application.

V. HARDWARE

A. Door hardware: See section 08710-Finish Hardware

VI. FABRICATION

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.

C. Prepare components to receive anchor devices. Fabricate anchors.

D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.

E. Arrange fasteners and attachments to conceal from view.

F. Reinforce components internally for door hardware.

G. Reinforce framing members for imposed loads.

H. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.

1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 – EXECUTION

I. EXAMINATION

A. Verify dimensions, tolerances and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

II. INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances an other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

H. Set thresholds in bed of mastic and secure.

I. Install hardware using templates provided.

K. Install perimeter sealant in accordance with this section.

III. ERECTION TOLERANCES

A. Maximum variation from plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.

B. Maximum misalignment of two adjoining members abutting in plan, 1/32 inch.

IV. ADJUSTING

A. Adjust operating hardware for smooth operation.

V. CLEANING AND PROTECTION

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

D. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

E. Protect finished work from damage.

END OF SECTION

SECTION 08710 – DOOR HARDWARE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Any door shown on the drawings and not specifically referenced in the hardware sets shall be provided with identical hardware as specified on other similar openings and shall be included in the finish hardware suppliers bid.

B. All doors that are fire rated shall be provided with fire rated hardware to comply with the local code requirements whether specified that way or not as a part of the hardware supplier's base bid.

C. Hardware supplier shall notify the Architect in writing of any discrepancies no less than five (5) working days prior to the bid date that could result in hardware being supplied that is non-functional, that will not meet local codes, or any door that is not covered in this specification.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.3 SUMMARY

A. This Section includes the following:

1. Commercial door hardware for the following:

    a. Swinging doors.
    b. Other doors to the extent indicated.

B. Related Sections include the following:

1. Division 8 Section "Steel Doors and Frames" for astragals provided as part of a fire-rated labeled assembly and for door silencers provided as part of the frame.
2. Division 8 Section "Flush Wood Doors" for astragals provided as part of a fire-rated labeled assembly.

1.4 SUBMITTALS

A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.

    a. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

D. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items:

1. Approved hardware schedule, catalog cuts and keying schedule.
2. Hardware installation and adjustment instructions.
3. Manufacturer’s written warranty information.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced Installer who has completed standard hardware installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant or equivalent experience available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying. Supplier recognized by manufacturers to be a direct factory-authorized distributor of the specified hardware products.

1. Scheduling Responsibility: Preparation of door hardware and keying schedules.

C. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant (AHC) and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.

D. Source Limitations: Obtain each type and variety of aluminum, steel and wood door hardware from the same single source manufacturer and supplier, unless otherwise indicated.

E. Regulatory Requirements: Comply with provisions of the following:

1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:

   a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
   b. Door Closers: Comply with the following maximum opening-force requirements indicated:

      1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
      2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

   c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.

2. NFPA 101: Comply with the following for means of egress doors:

   a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
   b. Thresholds: Not more than 1/2 inch high.

3. International Building Code (2003).

F. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.

1. Test Pressure: Positive pressure labeling.

G. Keying Conference: Conduct conference to comply with requirements in Division 1 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control system.
4. Installation of permanent keys and cylinder cores.
5. Address and requirements for delivery of keys.

H. Pre-Installation Conference: Conduct conference at Project site attended by representatives of Door Hardware Manufacturers, Supplier, Installer, and Contractor to review proper hardware installation methods and the procedures for receiving and handling hardware. At completion of installation, provide written certification that hardware items were applied according to conference recommendations and to finish hardware specifications.

1.6 DELIVERY, STORAGE, AND HANDLING

A. One complete shipment of door hardware as detailed in approved Door Hardware Schedule Shop Drawings to be inventoried on site and upon receipt of material be secure in lock-up room provided with shelving for door hardware.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver permanent keys and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.7 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Two year from date of Substantial Completion, unless otherwise indicated.

C. Special Warranty Periods:

1. Five years for bored latches and locksets.
2. Five years for exit devices.
3. Ten years for manual door closers.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this Section and the Door Hardware Schedule at the end of Part 3.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated for named products listed in Hardware Sets.
2. Sequence of Operation: Provide electrified and access control hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Schedule at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

2.2 HINGES AND PIVOTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hinges:

a. Hager Companies (HA).
b. McKinney Products (MC).
c. Stanley Hardware (ST).

2. Continuous Geared Hinges (Aluminum):

a. Bommer Industries (BO).
b. McKinney Products (MC).
c. Pemko Manufacturing (PE).

B. Standards: BHMA Certified products complying with the following:

1. Butts and Hinges: BHMA A156.1.
2. Continuous Geared Hinges: BHMA A156.26.
3. Template Hinge Dimensions: BHMA A156.7.

C. Quantity: Provide the following, unless otherwise indicated:
1. Three Hinges: For doors with heights 61 to 90 inches.
2. Four Hinges: For doors with heights 91 to 120 inches.

D. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

1. Exterior Doors: Heavy weight, non-ferrous, ball bearing hinges.
2. Interior Doors: Heavy weight, ball bearing hinges unless Hardware Sets indicate standard weight.

E. Hinge Options: Comply with the following where indicated in the Door Hardware Schedule or on Drawings:

1. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:

a. Out-swinging exterior doors.

F. Continuous-Geared Hinges (Aluminum): Minimum 0.120-inch thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame. Fabricate hinges non-handed and to template screw locations. Continuous hinges guaranteed for the life of the opening.

G. Provide mortar guard enclosure on frames at each electrical hinge location specified.

2.3 DOOR BOLTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Flush Bolts and Coordinators:

a. McKinney Products (MC).
b. Rockwood Manufacturing (RO).
c. Trimco Manufacturing (TR).

B. Standards: Comply with the following:
1. Automatic and Self-Latching Flush Bolts: BHMA A156.3.
2. Manual Flush Bolts: BHMA A156.16.

C. Surface Bolts and Flush Bolts: BHMA Certified Grade 1.

D. Provide bolts with top rod of sufficient length to allow bolt location approximately six feet from the floor regardless if detailed as such in hardware sets. Furnish dust proof strikes for bottom bolts. Surface bolts to be 8” in length, unless otherwise noted and U.L. listed for labeled fire doors.

E. Bolt Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:

1. Mortise Flush Bolts: Minimum 3/4-inch throw.

2.4 LOCKS AND LATCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Mechanical Bored Locks and Latches:

a. Corbin Russwin Hardware (CR) - CL3300 Series.
b. Sargent Manufacturing (SA) - 10-Line Series.
c. Schlage (SC) – ND Series

2. Auxiliary Cylindrical Deadbolts:

a. Corbin Russwin Hardware (CR) - DL3000 Series.
b. Sargent Manufacturing (SA) - 480 Series.
c. Schlage (SC) – B600 Series

B. Standards: Comply with the following:
1. Bored Locks and Latches: BHMA A156.2.
2. Auxiliary Locks: BHMA A156.5.

C. Bored Locks: BHMA Certified Grade 1, Series 4000.

D. Auxiliary Locks: BHMA Certified Grade 1.

E. Lock Functions: Function numbers and descriptions indicated in the Door Hardware Schedule comply with the following:
1. Bored Locks: BHMA A156.2.

F. Lock Throw: Comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
1. Bored Locks: Minimum 1/2-inch latchbolt throw.
2. Deadbolts: Minimum 1-inch bolt throw.

G. Backset: 2-3/4 inches unless otherwise indicated.

2.5 CYLINDERS AND KEYING

A. Provide utility patented cylinders keyed to a new master key system as outlined by the owner and Architect during the keying conference.

B. Standards: Comply with the following:

1. Cylinders: BHMA A156.5.
2. Key Control System: BHMA A156.5.

C. Cylinder Grade: BHMA Certified Grade 1.

D. Construction Keying: Comply with the following:

1. Construction Master keying: Provide temporary construction master keyed cylinders as required to maintain adequate security during the construction period. Provide construction master keys in quantity as required by project Contractor.

E. Keying System: Unless otherwise indicated, provide for a keying system complying with the following requirements:

1. New Master Key System: Cylinders are factory keyed operated by a change key, master key, and a grand master key. Conduct keying meeting with End User to define and document keying system instructions and requirements.

F. Keys: Provide nickel-silver keys complying with the following:

1. Stamping: Permanently inscribe each key with a visual key control number and as directed by Owner.

2. Quantity: Provide the following:

    a. Cylinder Change Keys (Per Key Set): Three.
    b. Master Keys (Per Level): Five.
    c. Grand Master Keys: Two.

G. Key Registration List: Provide keying transcript list to Owner's representative for lock cylinders.

H. Key Control System: Provide one lockable cabinet for key control and storage for up to 150 percent capacity, type and model to be determined in the keying meeting with the owner.

2.6 EXIT DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Exit Devices:

    a. Corbin Russwin Hardware (CR) - ED5000 Series.
    b. Sargent Manufacturing (SA) - 80 Series.
    c. Von Duprin (VO) – 98 Series.

B. Standard: BHMA A156.3.

C. Exit Devices: BHMA Certified Grade 1.

D. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

E. Fire Exit Devices: Complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.

F. Outside Trim: Match design for locksets and latchsets, unless otherwise indicated.

G. Through Bolt Installation: For exit devices and trim as required for fire rated wood doors.

2.7 ACCESSORIES FOR PAIRS OF DOORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Coordinators:

    a. McKinney Products (MC).
    b. Rockwood Manufacturing (RO).
    c. Trimco Manufacturing (TR).

2. Keyed Removable Mullions:

    a. Corbin Russwin Hardware (C-R).
    b. Sargent Manufacturing (SA).

c. Von Duprin (VO).

B. Standards: Comply with the following:

1. Coordinators: BHMA A156.3.
2. Removable Mullions: BHMA A156.3.

C. Fire-Exit Removable Mullions: Provide keyed removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions shall be used only with exit devices for which they have been tested.

2.8 CLOSERS

A. Manufacturers: Subject to compliance with requirements, provide products by one the following:

1. Surface-Mounted Closers (Heavy Duty): BHMA Certified Grade 1.

a. Corbin Russwin Hardware (CR) - DC6000 Series with heavy duty arms.
b. LCN Door Closers (LC) – 4040 Series with heavy duty arms.
c. Norton Door Controls (NO) - 7500 Series with heavy duty arms.
d. Sargent Manufacturing (SA) - 351 Series with heavy duty arms.

2. Surface-Mounted Closers (Standard Duty): BHMA Certified Grade 1.

a. Corbin Russwin Hardware (CR) - DC3000 Series.
b. LCN Door Closers (LC) – 1460 Series.
c. Norton Door Controls (NO) - 8500 Series.
d. Sargent Manufacturing (SA) - 1431 Series.

B. Standards: Comply with the following:

1. Closers: BHMA A156.4.

C. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide non-handed, factory-sized closers adjustable to meet field conditions and requirements for opening force.

D. Closer Options: As indicated in hardware sets, provide door closer options including: delayed action, hold open arms, extra duty parallel arms, positive stop/hold open arms, compression stop/hold open arms, special mounting brackets, spacers and drop plates. Through bolt type mounting is required as indicated in the door hardware sets.

2.9 OPERATING and PROTECTIVE TRIM UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Metal Protective Trim Units:

a. McKinney Products (MC).
b. Rockwood Manufacturing (RO).
c. Trimco Manufacturing (TR).

B. Standard: Comply with BHMA A156.6.

C. Materials: Fabricate protection plates from the following:

1. Brass/Bronze and Stainless Steel: .050 inches thick, beveled four sides (B4E) with countersunk screw holes.

D. Push-Pull Design: 1" Round with 10" Centers. Provide 90 degree offset pulls at exterior openings.

E. Fasteners: Provide manufacturer's designated fastener type as indicated in door hardware sets.

F. Furnish protection plates sized 1-1/2 inches less than door width (LDW) on push side and 1 inch less door width on pull side by height specified in door hardware sets.

2.10 STOPS AND HOLDERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Stops and Holders:

a. McKinney Products (MC).
b. Rockwood Manufacturing (RO).
c. Trimco Manufacturing (TR).

B. Standards: Comply with the following:

1. Stops and Bumpers: BHMA A156.16.
2. Electromagnetic Door Holders: BHMA A156.15.
3. Combination Overhead Holders and Stops: BHMA A156.8.
4. Door Silencers: BHMA A156.16.

C. Stops and Bumpers: BHMA Certified Grade 1.

D. Combination Overhead Stops and Holders: Certified BHMA Grade 1.

1. Glynn-Johnson (GJ).
2. Rixson Hardware (RX).
3. Sargent Hardware (SA).

E. Floor Stops: For doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic.

1. Where floor or wall stops are not appropriate, provide overhead stops.

F. Silencers for Metal Door Frames: BHMA Grade 1; neoprene or rubber, minimum diameter 1/2 inch fabricated for drilled-in application to frame. Provide (3) per single door and (2) per paired door frame if applied gasketing is not specified in Hardware Sets.

2.11 DOOR THRESHOLDS, WEATHERSTRIPPING AND GASKETING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Door Thresholds, Weatherstripping and Gasket Seals:

a. McKinney Weatherstripping Products (MW).
b. NGP Manufacturing (NG)
c. Pemko Manufacturing (PE).

B. Standard: Comply with BHMA A156.22.

C. General: Provide continuous weatherstrip seal on exterior doors and smoke, light, or sound gasketing on interior doors where specified. Provide non-corrosive fasteners for exterior applications.

1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame. Install header seal before mounting door closer arms.
2. Meeting Stile Astragals: Fasten to meeting stiles, forming seal when doors are closed.
3. Door Sweep: Apply to bottom of door, forming seal with threshold when door is closed.

D. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

E. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Intumescent Seals and Gasketing: Provide concealed, Category A type gasketing systems on assemblies where an intumescent seal is required to meet IBC and UL-10C positive pressure labeling.

2.12 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.13 FINISHES

A. Standard: Comply with BHMA A156.18.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

D. BHMA Designations: Comply with base material and finish requirements indicated by the following:

1. BHMA 600: Primed for painting, over steel base metal.
2. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
3. BHMA 628: Satin aluminum, clear anodized, over aluminum base metal.
4. BHMA 630: Satin stainless steel, over stainless-steel base metal.
5. BHMA 652: Satin chromium plated over nickel, over steel base metal.
6. BHMA 689: Aluminum painted, over any base metal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Steel Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

C. Provide and coordinate concealed wood blocking for wall mount stops as detailed in Door Hardware Schedule.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

3.4 FIELD QUALITY CONTROL

A. The Contractor shall comply with AIA A201 1997 section 3.3.1 which reads as follows: “The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the contract Documents give other specific instructions concerning these matters.”

B. Field Inspection: Supplier and Door Hardware Manufacturer will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper finish and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

3.8 DOOR HARDWARE SETS

A. The hardware sets listed below represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process.

SET #1 - Exterior Aluminum Egress Pair

Doors: D121A, D121B, D122A, D122B, D123A, D123B, D124

2	Aluminum Continuous Hinge	MCK-12HD x Height Required	CLEAR	MC
1	Removable Mullion	11 L980S	PC	SA
1	Rim Exit Device - Pull x Cyl	11 8804 862	32D	SA
1	Rim Exit Device - Pull No Cyl	8810 862	32D	SA
2	PA Closer - HD Arm	351 P10	EN	SA
2	Heavy Duty Door Stop	DS08	US32D	MC

NOTE: Thresholds and Weatherstripping to be provided with doors from Aluminum Door supplier.

SET #2 - Exterior Receiving Egress Door

Doors: D129C

3	Hvy Wgt Hinges SS NRP	T4A3386 4 1/2 X 4 1/2 NRP	32D	MC
1	Rim Exit Device - Pull x Cyl	11 8804 PSB	32D	SA
1	PA Closer - HD HO Arm	351 PH10	EN	SA
1	Armor Plate	KP50 36" x 2" LDW B4E CSK F	US32D	MC
1	Heavy Duty Door Stop	DS08	US32D	MC
1	Set Weatherstrip	MCK303 AV (Head and Jambs)		MW
1	Raindrip	MCK346 C x Length Required		MW
1	Door Sweep with Drip	MCK345 AV x Length Required		MW
1	Panic Threshold	MCK2005 AV x Length Required		MW

SET #3 - Exterior Egress Pair

Doors: D101D, D101F

8	Hvy Wgt Hinges SS NRP	T4A3386 4 1/2 X 4 1/2 NRP	32D	MC
1	Removable Mullion	11 L980S	PC	SA
1	Rim Exit Device - Lever x Cyl	11 8813 ETL	32D	SA
1	Rim Exit Device - Lvr Dummy	8810 ETL-DT	32D	SA
2	PA Closer - HD Arm	351 P10	EN	SA
2	Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
2	Heavy Duty Door Stop	DS08	US32D	MC
1	Set Weatherstrip	MCK303 AV (Head and Jambs)		MW
1	Raindrip	MCK346 C x Length Required		MW
2	Split Astragal - Nylon Brush	MCK18061 CNB x Height Required		MW
2	Door Sweep with Drip	MCK345 AV x Length Required		MW
1	Panic Threshold	MCK2005 AV x Length Required		MW

SET #4 - Exterior Egress Door

Doors: D101E, D104C, D146

4	Hvy Wgt Hinges SS NRP	T4A3386 4 1/2 X 4 1/2 NRP	32D	MC
1	Rim Exit Device - Lever x Cyl	11 8813 ETL	32D	SA
1	PA Closer - HD Arm	351 P10	EN	SA
1	Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
1	Heavy Duty Door Stop	DS08	US32D	MC
1	Set Weatherstrip	MCK303 AV (Head and Jambs)		MW
1	Raindrip	MCK346 C x Length Required		MW
1	Door Sweep with Drip	MCK345 AV x Length Required		MW
1	Panic Threshold	MCK2005 AV x Length Required		MW

SET #5 - Exterior Egress Door

Doors: D125C, D125D, D202, D301A

3	Hvy Wgt Hinges SS NRP	T4A3386 4 1/2 X 4 1/2 NRP	32D	MC
1	Rim Exit Device - Lever x Cyl	11 8813 ETL	32D	SA
1	PA Closer - HD Arm	351 P10	EN	SA
1	Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
1	Heavy Duty Door Stop	DS08	US32D	MC
1	Set Weatherstrip	MCK303 AV (Head and Jambs)		MW
1	Raindrip	MCK346 C x Length Required		MW
1	Door Sweep with Drip	MCK345 AV x Length Required		MW
1	Panic Threshold	MCK2005 AV x Length Required		MW

SET #6 - Exterior Storeroom

Doors: D156

3	BB Hinges SS NRP	TA2314 4 1/2 X 4 1/2 NRP	32D	MC
1	Storeroom Lock	11 28 10G04 LL	26D	SA
1	Heavy Duty Door Stop	DS08	US32D	MC
1	Cylindrical Latch Protector	LP02	US32D	MC
1	Set Weatherstrip	MCK303 AV (Head and Jambs)		MW
1	Raindrip	MCK346 C x Length Required		MW
1	Door Sweep with Drip	MCK345 AV x Length Required		MW
1	Panic Threshold	MCK2005 AV x Length Required		MW

SET #7 - Egress Pair with OH Stop

Doors: D101G

8	Hvy Wgt Hinges	T4A3786 4 1/2 X 4 1/2	26D	MC
1	Removable Mullion	11 L980S	PC	SA
1	Rim Exit Device - Lever x Cyl	11 8813 ETL	32D	SA
1	Rim Exit Device - Lvr Dummy	8810 ETL-DT	32D	SA
2	PA Closer - Stop Arm	351 PS	EN	SA
2	Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
1	Split Astragal - Nylon Brush	MCK18061 CNB x Height Required		MW
2	Door Silencers	S1M		MC

SET #8 - Egress Pair with OH Stop/HO

Doors: D101A, D101B, D101C

8	Hvy Wgt Hinges	T4A3786 4 1/2 X 4 1/2	26D	MC
1	Removable Mullion	11 L980S	PC	SA
1	Rim Exit Device - Lever x Cyl	11 8813 ETL	32D	SA
1	Rim Exit Device - Lvr Dummy	8810 ETL-DT	32D	SA
2	PA Closer - Spring Stop/HO Arm	351 CPSH	EN	SA
2	Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
1	Smoke Seal	MCKS88 C (Head and Jambs)		MW
2	Split Astragal - Nylon Brush	MCK18061 CNB x Height Required		MW

SET #9 - Egress Door with OH Stop

Doors: D101H

4	Hvy Wgt Hinges	T4A3786 4 1/2 X 4 1/2	26D	MC
1	Rim Exit Device - Lever x Cyl	11 8813 ETL	32D	SA
1	PA Closer - Stop Arm	351 PS	EN	SA
1	Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
3	Door Silencers	S1M		MC

SET #10 - Egress Pair with Floor Stops

Doors: D101J

8	Hvy Wgt Hinges	T4A3786 4 1/2 X 4 1/2	26D	MC
1	Removable Mullion	11 L980S	PC	SA
1	Rim Exit Device - Lever x Cyl	11 8813 ETL	32D	SA
1	Rim Exit Device - Lvr Dummy	8810 ETL-DT	32D	SA
2	PA Closer - HD Arm	351 P10	EN	SA
2	Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
2	Heavy Duty Door Stop	DS08	US32D	MC
2	Door Silencers	S1M		MC

SET #11 - Egress Door with Wall Stop

Doors: D125A, D125B

3	Hvy Wgt Hinges	T4A3786 4 1/2 X 4 1/2	26D	MC
1	Rim Exit Device - Lever x Cyl	11 8813 ETL	32D	SA
1	PA Closer - HD Arm	351 P10	EN	SA
1	Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
1	Concave Wall Stop	WS04	US26D	MC
3	Door Silencers	S1M		MC

SET #12 - Storeroom with Wall Stop

Doors: D111, D130, D152, D153, D154, D201

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Storeroom Lock	11 28 10G04 LL	26D	SA
1	Concave Wall Stop	WS04	US26D	MC
3	Door Silencers	S1M		MC

SET #13 - Storeroom with OH Stop

Doors: D105A, D105B, D108

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Storeroom Lock	11 28 10G04 LL	26D	SA
1	Overhead Stop	10-336	652	RX
3	Door Silencers	S1M		MC

SET #14 - Storeroom with Floor Stop

Doors: D131

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Storeroom Lock	11 28 10G04 LL	26D	SA
1	Low Dome Floor Stop	FS01	US26D	MC
3	Door Silencers	S1M		MC

SET #15 - Storeroom Pair with OH Stop

Doors: D103

6	PB Hinges NRP	T2714 4 1/2 X 4 1/2 NRP	26D	MC
2	Flush Bolt - Metal Door	FB01M-12	US26D	MC
1	Storeroom Lock	11 28 10G04 LL	26D	SA
2	Overhead Stop	10-336	652	RX
1	Dust Proof Strike with Plate	DPS1	US32D	MC
1	Overlapping T Astragal	MCK355 CS x Height Required		MW
2	Door Silencers	S1M		MC

SET #16 - Kitchenette with Wall Stop

Doors: D127A, D127B

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Office Lock	11 28 10G05 LL	26D	SA
1	Mop Plate	KP50 4" x 1" LDW B4E CSK	US32D	MC
1	Concave Wall Stop	WS04	US26D	MC
3	Door Silencers	S1M		MC

SET #17 - Office with Wall Stop

Doors: D102A, D102B, D133A, D135

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Office Lock	11 28 10G05 LL	26D	SA
1	Concave Wall Stop	WS04	US26D	MC
3	Door Silencers	S1M		MC

SET #18 - Office with OH Stop

Doors: D104A, D104B

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Office Lock	11 28 10G05 LL	26D	SA
1	Overhead Stop	10-336	652	RX
3	Door Silencers	S1M		MC

SET #19 - Communicating with Wall Stop

Doors: D133B

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Communicating Lockset	11 28 10G30 LL	26D	SA
1	Concave Wall Stop	WS04	US26D	MC
3	Door Silencers	S1M		MC

SET #20 - Workroom with Wall Stop

Doors: D149

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Classroom Lock	11 28 10G37 LL	26D	SA
1	Concave Wall Stop	WS04	US26D	MC
3	Door Silencers	S1M		MC

SET #21 - Classroom with Wall Stop

Doors: D112, D113, D117, D118, D119, D136, D138, D139, D141, D142, D144

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Classroom Security Lock	11 28 10G38 LL	26D	SA
1	Concave Wall Stop	WS04	US26D	MC
3	Door Silencers	S1M		MC

SET #22 - Classroom with OH Stop

Doors: D114, D155, D107A

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Classroom Security Lock	11 28 10G38 LL	26D	SA
1	Overhead Stop	10-336	652	RX
3	Door Silencers	S1M		MC

SET #23 - Serving Pair with OH Stop

Doors: D129A, D129B

6	Hvy Wgt Hinges	T4A3786 4 1/2 X 4 1/2	26D	MC
1	Multi-Point Lock	11 7013 ETL	26D	SA
1	Multi-Point Lock	7010 ETL	26D	SA
2	PA Closer - Stop/HO Arm	351 PSH	EN	SA
2	Armor Plate	KP50 36" x 2" LDW B4E CSK F	US32D	MC
2	Split Astragal - Nylon Brush	MCK18061 CNB x Height Required		MW
2	Door Silencers	S1M		MC

SET #24 - Privacy with Wall Stop

Doors: D106, D109, D110, D126, D128, D134A, D134B, D137A, D137B, D140A, D140B, D143A, D143B, D150, D151

3	PB Hinges	T2714 4 1/2 X 4 1/2	26D	MC
1	Privacy Set	28 10U65 LL	26D	SA
1	Mop Plate	KP50 4" x 1" LDW B4E CSK	US32D	MC
1	Concave Wall Stop	WS04	US26D	MC
3	Door Silencers	S1M		MC

SET #25 - Shared Restroom with Wall Stop

Doors: D116, D120

3	BB Hinges	TA2714 4 1/2 X 4 1/2	26D	MC
1	Deadlock	11 487	26D	SA
1	Door Pull	DP603	US32D	MC
1	Reg/PA Closer	1431 UO	EN	SA
1	Push Plate - 4 x 16	P053	US32D	MC
1	Kickplate	KP50 10" x 2" LDW B4E CSK	US32D	MC
1	Mop Plate	KP50 4" x 1" LDW B4E CSK	US32D	MC
1	Concave Wall Stop	WS04	US26D	MC
1	Smoke Seal	MCKS88 C (Head and Jambs)		MW

SET #26 - Folding Partitions, Access Panels and Overhead Doors

Doors: D101K, D101L, D107B, D125E, D132, D301B, D301C, D301D, D301E

NOTE: All hardware to be provided with the door by door supplier.

END OF SECTION 08710

Section 09206 – Metal Lath

PART 1 – GENERAL

I. SECTION INCLUDES: METAL LATH FOR PORTLAND CEMENT PLASTER.

II RELATED SECTION: SECTION 09220 – PORTLAND CEMENT PLASTER.

III. SUBMITTALS

A. Product Data: Provide data on furring and lathing components, structural characteristics, material limitations and finish.

IV. QUALITY ASSURANCE

A. Installer qualifications: Company specializing in performing the work of this section with minimum three years experience.

PART 2 – PRODUCTS

I. LATH

A. Diamond Mesh Metal Lath: ASTM C 847; self-furring.
1. Weight: 3.0 lb/sq yd.
2. Backed with treated paper.
3. Galvanized.

B. Corner Mesh: Formed sheet steel, minimum 0.018 inch thick, perforated flanges shaped to permit complete embedding in plaster, minimum 2 inch size; same finish as lath.

C. Strip Mesh: Expanded metal lath, same weight as lath, 2 inch wide x 24 inch long; same finish as lath.

D. Casing beads: Formed sheet steel, depth governed by plaster thickness, maximum possible lengths, expanded metal flanges, with square edges; galvanized.

E. Corner beads: Formed sheet steel, depth governed by plaster thickness, maximum possible lengths, expanded metal flanges, with radiused edge; galvanized.

F. Base Screeds: Formed sheet steel, depth governed by plaster thickness, maximum possible lengths, expanded metal flanges, with beveled edge, galvanized.

G. Control Joints: Formed sheet steel, accordion profile, 2 inch expanded metal flanges each side, galvanized.

II. ACCESSORIES

A. Anchorage: Tie wire, nails and other metal supports, of type and size to suit application; to rigidly secure materials in place, galvanized.

B. Fasteners: ASTM C 1002, self drilling, self tapping screws.

C. Tie Wire: Annealed galvanized steel.

PART 3 – EXECUTION

I. EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that substrates are ready to receive work and conditions are suitable for application.

II. INSTALLATION – GENERAL

A. Install lath for plaster work in accordance with ASTM C 841.

III. CONTROL JOINTS

A. Control Joint Spacing: Not to exceed 12 feet on center.

B. Install control joints.

IV. LATH INSTALLATION

A. Apply metal lath taut, with long dimension perpendicular to supports.

B. Lap ends minimum 1 inch. Secure end laps with tie wire where they occur between supports.

C. Lap sides of diamond mesh lath minimum 1-1/2 inches.

D. Attach metal lath to metal supports using screws: space at maximum 16 inches on center.

F. Attach metal lath to concrete masonry using wire hair pins. Attach anchors to backup surface: space at maximum 16 inches on center.

G. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 3 inches from corner to form the angle reinforcement; fasten at perimeter edges only.

H. Place corner bead at external wall corners; fasten at outer edges of lath only.

I. Place base screeds at termination of plaster areas; secure rigidly in place.

J. Place 4 inch wide strips of metal lath centered over junctions of dissimilar backing materials. Secure rigidly in place.

K. Place casing beads at termination of plaster finish. Butt and align ends. Secure rigidly in place.

L. Place additional strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

V. ERECTION TOLERANCES

A. Maximum variation from true lines and levels: 1/8 inch in 10 feet.

B. Maximum variation from true position: 1/8 inch.

END OF SECTION 09206

Section 09220 – Portland Cement Plaster

PART 1 – GENERAL

I. SECTION INCLUDES PORTLAND CEMENT PLASTER FOR INSTALLATION OVER METAL LATH AND MASONRY.

II. RELATED SECTION: SECTION 09206 – METAL LATH: Metal furring and lathing for plaster.

III. SUBMITTALS

A. Product Data: Provide data on plaster materials, characteristics and limitations of products specified.

B. Samples: Two 2’ x 2’ mock-ups will be required for Owner to select color and approval of finish texture.

IV. QUALITY ASSURANCE: PERFORM WORK IN ACCORDANCE WITH ASTM C 926.

V. ENVIRONMENTAL REQUIREMENTS.

A. Do not apply plaster when substrate or ambient air temperature is under 50 degrees F or over 80 degrees F.

B. Maintain minimum ambient temperature of 50 degrees F during installation of plaster and until cured.

PART 2 – PRODUCTS

I. PLASTER MATERIALS

A. Finish Coat: System will receive an elastomeric paint finish. Color to be selected by Owner.

B. Portland Cement: ASTM C 150, Type I.

C. Lime: ASTM C 206, Type S.

D. Aggregate: In accordance with ASTM C 926.

E. Water: Clean, fresh, potable and free of mineral or organic matter which can affect plaster.

F. Admixture: Air entrainment type.

II. METAL LATH: AS IN SECTION 09206

III. PLASTER MIXES

A. Over metal lath: Three-coat application, mixed and proportioned in accordance with ASTM C 926.

B. Mix only as much plaster as can be used prior to initial set.

C. Mix materials dry, to uniform color and consistency, before adding water.

D. Add air entrainment admixtures to all coats to provide 5-7 percent entrainment.

E. Protect mixtures from freezing, frost contamination, and excessive evaporation.

F. Do not retemper mixes after initial set has occurred.

PART 3 – EXECUTION

I. EXAMINATION

A. Verify the suitability of existing conditions before starting work.

B. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.

II. PLASTERING

A. Apply plaster in accordance with ASTM C 926.

B. Moist cure base coats.

C. Apply second coat immediately following initial set of first coat.

D. After curing, dampen previous coat prior to applying finish coat.

E. Finish Texture: To be selected by owner

F. Avoid excessive working of surface. Delay troweling as long as possible to avoid drawing excess lines to surface.

III. ERECTION TOLERANCES

A. Maximum variation from true flatness: 1/8 inch in 10 feet.

END OF SECTION 09220

Section 09250 – Gypsum Board Systems

PART 1 – SUMMARY

I. GENERAL

A. Support System: Where stud partitions are called for, see plans for use of 4” or 6” (nom.) wood or Steel Studs at 16” c-c.

B. Gypsum Board Standard: ASTM C 840

C. Fire Resistance Ratings: Provide gypsum drywall work with ratings indicated and conforming to assemblies tested and listed by recognized authorities.

D. Gypboard Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Flintkote Products, Genstar Building Materials Co.
2. Georgia-Pacific Co.
3. Gold Bond Building Products Div., National Gypsum Co.
4. United States Gypsum Co.

PART 2 – PRODUCTS

I. DRYWALL MATERIALS

A. Exposed gypsum board: ASTM C 36. Provide type “X” where required in fire resistance rated assemblies.

1. Long edges: standard taper.
2. Thickness: 5/8”, unless otherwise indicated. 5/8” type “X” at rated ceiling assemblies.

B. Water-resistant gypsum backing board: ASTM C 630. Provide type “X” where required in fire resistance rated assemblies.

1. Thickness: 5/8”, unless otherwise indicated.

C. Trim accessories: Provide manufacturer’s standard metal trim accessories, of the beaded type with face flanges for concealment in joint compound except where semi-finishing or exposed type is indicated. Provide corner beads, L-type edge trim beads, U-type trim beads, special L-kerf-type edge trim-beads, and one piece control beads.

D. Gypsum board fasteners: Type recommended by gypsum board manufacturer, except as otherwise indicated.

E. Joint tape: ASTM C 475, paper reinforcing tape.

F. Joint compound: ASTM C 475, of the type indicated.

1. Provide ready-mixed vinyl-type for interior work.
2. Provide a single multi-purpose compound for 3 courses of compound application.
3. Provide water-resistant type manufactured by United States Gypsum Co. for use with water-resistant backing board.

PART 3 – INSTALLATION

I. GENERAL

A. Install supplementary framing, furring, blocking and bracing at openings and terminations in gypsum drywall and where required for support of other work which cannot be adequately supported in gypsum board alone.

B. Install gypsum boards in lengths and directions which will minimize number of end joints, and avoid end joints in central area of ceilings. Install walls and partitions with exposed gypsum boards vertical, with joints offset on opposite sides of partitions. Otherwise, install boards with edges perpendicular to supports, with end joints staggered over supports, except where recommended in a different arrangement by manufacturer.

C. Form control joints with ½" space between boards. Install trim accessory at face.

D. Screw gypsum board to metal supports.

E. Screw gypsum board to wood supports at ceilings and at exterior walls where stucco occurs.

F. Screw or nail gypsum board to wood supports at all other areas.

G. Drywall finishing: Except as otherwise indicated, apply joint tape and joint compound at joints (both directions) between gypsum boards. Apply compound at accessory flanges, penetrations, fasteners heads and surface defects.

1. Install compound in 3 coats (plus prefill of cracks where recommended by mfr.); sand after last 2 coats.

2. Treat joints, fasteners heads, cut edges and penetrations in water-resistant backing board using water-resistant joint compound to comply with water-resistant joint compound mfr's. directions.

END OF SECTION 09250

Section 09300 – Ceramic Tile

PART 1 – GENERAL

I. SUMMARY

A. Ceramic tile for floor and wall applications.

B. TCA (HB) – Handbook for Ceramic Tile Installation; Tile Council of America, Inc. 1999

II. SUBMITTALS

A. Product Data: Provide instructions for using grouts and adhesives.

B. Samples: Mount tile and apply grout on two plywood panels, 3’ x 3’ in size illustrating pattern, color variations and grout joint size variations.

III. QUALITY ASSURANCE

A. Maintain one copy of TCA Handbook and ANSI A108 Series/A118 on site.

B. Use experienced installers.

IV. ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials and/or follow manufacturer’s recommendations.

PART 2 – PRODUCTS

A. Tile: To be selected by Owner. For the purposes of bidding, allow a $2.00 per foot ceramic tile material allowance.

B. Mortar bond coat materials:
1. Dry-set Portland Cement type: ANSI A118.1.
2. Latex-Portland Cement type: ANSI A118.4.

C. Grout: Latex-Portland Cement type as specified in ANSI A118.6.
1. Color: As selected by Owner.

PART 3 – EXECUTION

I. EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within tolerances and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within tolerances and are dust-free and are ready to receive tile.

C. Verify that sub-floor surfaces are dust-free, and free of substances which would impair bonding of setting materials to sub-floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

II. PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

III. INSTALLATION

A. Install tile and grout in accordance with applicable requirements of ANSI A108.1 through A108.10, manufacturer's instructions and TCA Handbook recommendations.

B. Cut and fit tile, leaving sealant joint space. Form corners and bases neatly. Align floor and base joints.

C. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

D. Form internal angles square and external angles bullnosed.

E. Sound tile after setting. Replace hollow sounding units.

F. Allow tile to set for a minimum of 48 hours prior to grouting.

G. Grout tile joints. Use standard grout unless otherwise indicated.

H. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

IV. INSTALLATION – FLOORS – THIN-SET METHOD

A. Over interior concrete substrates, install in accordance with TCA Handbook Method F113, dry-set or latex-portland cement bond coat, with standard grout, unless otherwise indicated.

V. INSTALLATION – WALL TILE

A. Over gypsum wallboard on wood or metal studs install in accordance with TCA Handbook Method W243, thin-set with dry-set or latex-portland cement bond coat, with standard grout, unless otherwise indicated.

VI. CLEANING

A. Clean tile and grout surfaces.

VII. PROTECTION OF FINISHED WORK

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION 09300

Section 09510 – Suspended Acoustical Ceiling

PART 1 – GENERAL

I. SUMMARY

A. Acoustical materials: FS SS-S-118

B. Suspension Systems: ASTM C 635 for materials; ASTM C 636 for installation.

II. SUBMITTALS.

A. Submit 4”x6” square samples of acoustical unit; 12” long samples of each exposed suspension member and molding.

B. Submit product data.

PART 2 – PRODUCTS

I. GENERAL

A. Mineral composition with standard washable painted finish: NRC 50, LR 1, STC 35-39, square-edge, white, 24”x24”x5/8”, non-directional fissured pattern as manufactured by Armstrong World Industries, Inc. or equal.

B. Vinyl Faced Tile – “Clean Room VL” - Manufactured by Armstrong World Industries, Inc. or equal: White, 24x24x5/8”.

C. Suspension system: as required to support acoustical units, fixtures and other components as indicated, including anchorage, hangers, runners, cross runners, splines, clips, molding, fasteners, and other member, devices and accessories. Comply with requirements of ASTM C 635.

1. Hanger wire: Not less than 12-gage (0.106”) galvanized steel.
2. Type: Exposed direct hung steel suspension system painted white.

PART 3 – EXECUTION

I. INSTALLATION

A. Layout: Balance ceiling borders on opposite sides, using more-than-half width acoustical units.

B. Tolerance: 1/8” in 12’-0” level tolerance.

C. Pattern Direction: One-way, align joints.

D. Suspension system: Secure to building structure, with hangers spaced 4'-0" along supported members.

E. Edge moldings: Secure to substrate with screw anchors spaced 16" o.c. Miter corner joints.

F. Cope exposed flanges of intersecting suspension members for flush intersections.

G. Install acoustical panels without hold-down clips.

END OF SECTION 09510

Section 09520 – Suspended Tectum Acoustic Ceiling

PART 1 – GENERAL

I. SUMMARY

A. Section Includes: Cementitious wood fiber plank acoustical ceiling system

II REFERENCES

A. ASTM International:

1. ASTM C635 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
2. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
3. ASTM E1264 Standard Classification for Acoustical Ceiling Products.

B. Ceilings and Interior Systems Construction Association (CISCA):

1. CISCA Code of Practices.

III. SYSTEM DESCRIPTION

A. Performance Requirements:

1. Provide acoustical ceiling assembly designed and tested to provide surface burning characteristics (ASTM E84) as follows:
   a. Flamespread: 0.
   b. Smoke Developed: 0.
2. Provide acoustical ceiling system which has been manufactured, fabricated and installed to provide Noise Reduction Coefficient (NRC) rating as follows:
   a. .45 Min

IV. SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

B. Product Data: Submit manufacturer’s product data and installation instructions.

C. Samples: Submit selection and verification samples: 6 inch × 6 inch (152 × 152 mm) sample for each wood fiber ceiling unit required, showing full range of exposed texture to be expected in completed work.

D. Quality Assurance/Control Submittals: Submit the following:

1. Certificates: Submit manufacturer's certificate that products meet or exceed specified requirements.

V. QUALITY ASSURANCE

A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.

VI. DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 1 Product Requirement Section.

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

1. Provide labels indicating brand name, style, size and thickness.

C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

1. Prevent soiling, physical damage or wetting.
2. Store cartons open at each end to stabilize moisture content and temperature.

VII. PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Do not install ceiling panels until building is closed in and HVAC system is operational.
2. Locate materials onsite at least 24 hours before beginning installation to allow materials to reach temperature and moisture content equilibrium.
3. Maintain the following conditions in areas where acoustical materials are to be installed 24 hours before, during and after installation:
   a. Relative Humidity: 65 - 75%.
   b. Uniform Temperature: 55 - 70 degrees F (13 - 21 degrees C).

VIII. MAINTENANCE

A. Extra Materials: Provide additional material for use by owner in building maintenance and repair.

B. Provide new unopened cartons of extra materials, packaged with protective covering for storage and identified with appropriate labels.

PART 2 PRODUCTS

I. ACOUSTICAL CEILING SYSTEM

A. Manufacturer: Tectum Inc. or equal to

1. Contact: 105 South Sixth Street, Newark, OH 43055; Telephone: (888) 977-9691, (740) 345-9691; Fax: (800) 832-8869; E-mail: @tectum.com; website: .tectum.com.

B. Proprietary Systems. Acoustical ceiling systems, including the following:

1. Tectum Acousti-Tough Ceiling System:

a. Material: Aspen wood fibers bonded with inorganic hydraulic cement.

b. Thickness: 1 inch (25.4 mm).

c. Size: 24 inches × 48 inches (610 × 1219 mm).

II. PRODUCT SUBSTITUTIONS

A. Substitutions: Refer to Section 01600.

III. ACCESSORIES

1. Provide accessories as follows:

a. Acousti-Tough Keep Clips:

b. Material: Steel.

c. Manufacturer Designation: [ARC-100 for 1 inch (25.4 mm) panels] [ARC-200 for 1½ inch (38 mm) and 2 inch (51 mm) panels].

2. Tectum Touch-Up Paint:

a. Color: To be selected by Church Interiors Committee

PART 3 EXECUTION

I. MANUFACTURER'S INSTRUCTIONS

A. Comply with the instructions and recommendations of the ceiling system manufacturer.

B. Install materials in accordance with governing regulations, fire resistance rating requirements and industry standards applicable to work.

II. EXAMINATION

A. Site Verification of Conditions:

1. Examine surfaces scheduled to receive

suspended or directly attached acoustical units for unevenness, irregularities and dampness that would affect quality and execution of work.

2. Do not proceed with installation of ceiling system until unacceptable conditions are corrected.

III. INSTALLATION

A. General: Do not begin installation until materials sufficient to complete an entire room are received and prepared for installation.

B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders.

C. Symmetrically locate grid layout in each space. Coordinate work with other trades so that lighting fixtures, grilles and other ceiling fixtures work with grid layout.

D. Do not use universal splices or other splices that would obstruct passage of recessed lighting fixtures through grid openings or limit fixture relocation upon flanges of ceiling grids.

E. Support suspension system from structure above, not from ductwork, metal deck, equipment or piping.

F. Space hangers not more than 6 inches (152 mm) from ends and not more than 4 feet (1219 mm) on centers on runners.

G. Install wall moldings at the perimeter of each acoustical ceiling area and at locations where edge of units would otherwise be exposed.

1. Secure moldings to supporting construction by fastening with screw anchors into the substrate, through holes drilled in vertical leg. Space holes not more than 3 inches (76 mm) from each end and not more than 16 inches (406 mm) on center along each molding.

2. Level moldings with ceiling suspension system, to a level tolerance of 1/8 inch (3.2 mm) in 12 feet (3658 mm).

3. Miter corners of moldings accurately to provide hairline joints, securely connected to prevent dislocation. Cope exposed flanges of intersecting suspension system members, so that flange faces will be flush.

4. Furnish additional tees for supporting grilles, diffusers and light fixtures. Refer to reflected ceiling, HVAC and electrical plans for locations.

5. Provide reveal edge at walls, other abutting vertical surfaces.

H. Field paint cut edges to match surface color and sheen.

I. Arrange acoustical units and orient directionally patterned units, if any, in manner shown on reflected ceiling plans.

IV. CLEANING

A. Clean exposed surfaces of acoustical ceilings, trim, edge moldings and suspension members to comply with manufacturer’s instructions for cleaning.

B. Touch up any minor finish damage.

C. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

V. PROTECTION

A. Protect installed work from damage due to subsequent construction activity, including temperature and humidity limitations and dust control, so that the work will be without damage and deterioration at the time of acceptance by the Owner.

END OF SECTION 09520

Section 09650 – Resilient Flooring

PART 1 – GENERAL

I. SUMMARY

A. Provide resilient flooring and base.

II. SUBMITTALS

A. Submit for approval samples, product data, extra stock.

III. QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Provide materials and adhesives which do not contain asbestos.

PART 2 – PRODUCTS

I. MATERIALS

A. Tile flooring: Vinyl composition tile to be selected by Owner.
Acceptable manufacturers: Tarkett, Armstrong, Azrock, or equal.

B. Rubber Base: To be selected by owner
Acceptable manufacturers: Burke or equal.

C. Use manufacturer recommended waterproof adhesive.

PART 3 – EXECUTION

I. INSTALLATION

A. Comply with manufacturer's instructions and recommendations. Install in proper relation to adjacent work.

B. Prepare surfaces by cleaning, leveling and priming as required. Test adhesive for bond before general installation. Level to 1/8" in 10' tolerance.

C. Tile flooring: Install tile with tight joints and with one-way pattern. Layout to prevent less than ½ tile units.

D. Install necessary transitions applicable to floor covering changes.

E. Clean, polish and protect.

END OF SECTION 09650

Section 09680 – Carpeting

PART 1 – GENERAL

I. SUMMARY

A. Provide carpeting for glued-down installation.

II. SUBMITTALS

A. Submit for approval samples, product data, warranty, maintenance data, extra stock, proposed seaming layout.

III. QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experience installers. Deliver, handle and store materials in accordance with manufacturer's instructions.

B. Provide carpet materials meeting applicable fire regulations.

PART 2 – PRODUCTS

I. MATERIALS

A. Carpet: To be selected by Owner.
See Section 01020-Allownace.

B. Mounting: Direct glue down; waterproof, strippable adhesive.

C. Accessories: Provide all necessary accessories for a complete job. Include proper transitions between floor covering changes.

PART 3 – EXECUTION

I. INSTALLATION

A. Comply with recommendations of Carpet and Rug Institute "Specifier's Handbook."

B. Prepare surfaces and install materials in accordance with manufacturer's instructions and approved submittals. Clean, patch, and level substrate. Install materials in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.

C. Install edge guards and reducer strips as required; clean and protect.

END OF SECTION 09680

Section 09900 – Painting

PART 1 – GENERAL

I. SUMMARY

A. Provide surface preparation and painting for unfinished interior and exterior surfaces, including electrical and mechanical equipment with shop primed surfaces and exposed red iron.

II. SUBMITTALS

A. Submit for approval samples, product data, 4'x4' mock-ups, extra stock.

III. QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 – PRODUCTS

I. MATERIALS

A. First-line standard products for all systems by Sherwin Williams, Benjamin-Moore, Glidden, Devoe, or approved equal. Match color chips selected.

B. Exterior Paint Systems:

1. Wood for transparent finish: Filler coat (for open grained wood only); Stain, 1 coat; Sealer, 1 coat; Exterior varnish (gloss), 2 coats
2. Ferrous Metal, Unprimed: Alkyd primer, 1 coat; Alkyd enamel (semi-gloss), 2 coats.
3. Ferrous Metal, Primed: Touch up with zinc chromate primer; Alkyd enamel (semi-gloss), 2 coats.
4. Stucco: Block surfacer, 1 coat; Elastomeric, 2 coats
5. Cement Fiber Board: Exterior primer, 1 coat; Exterior latex (semi-gloss finish), 2 coats.

C. Interior Paint Systems:

1. Drywall: Medium texture orange peal; Latex primer, 1 coat; Interior latex (flat or eggshell finish) 2 coats.

2. Drywall (toilet rooms, heavy duty): Medium texture orange peal; Latex primer, 1 coat; water-based epoxy (semi-gloss finish), 2 coats.
3. Wood for opaque finish (to be selected at later date - doors, trim, cabinets, solid stock): Alkyd enamel undercoat, 1 coat; Alkyd enamel (semi-gloss finish), 2 coats.
4. Wood for semi-transparent finish (to be selected at later date - doors, trim, cabinets, solid stock): Filler coat (for open grained wood only); Stain, 1 coat; Sealer, 1 coat; varnish (satin), 2 coats.
5. Ferrous Metal, Unprimed (steel framing and supports, stairs, handrails, railing, joists, trusses, beams, bar gratings, misc. & ornamental iron, doors, frames, pumps, motors, machines, ducts [ventilating], non galvanized metals): Alkyd primer, 1 coat; Alkyd enamel (semi-gloss), 2 coats.
6. Ferrous Metal, Primed (steel framing and supports, stairs, handrails, railing, joists, trusses, beams, bar gratings, misc. & ornamental iron, doors, frames, pumps, motors, machines, ducts [ventilating], non galvanized metals): Touch up with alkyd primer; Alkyd enamel (semi-gloss), 2 coats.
7. Galvanized Metal: Galvanized primer, 1 coat; Alkyd enamel, 2 coats.

PART 3 – EXECUTION

I. INSTALLATION

A. Inspect surfaces, report unsatisfactory conditions in writing; beginning work means acceptance of substrate.

B. Comply with manufacturer’s instructions and recommendations for preparation, priming, and coating work. Coordinate with work of other sections.

C. At existing areas to be repainted, remove blistered or peeling paint to sound substrates. Remove chalk deposits and mildew and wash all surfaces with mild detergent. Perform related minor preparation including caulk and glazing compounds. Spot prime bare areas before priming and painting as specified. All existing exterior surfaces that receive paint will be repainted to match new construction.

D. Match approved mock-ups for color, texture, and pattern. Re-coat or remove and replace work which does not match or shows loss of adhesion. Clean up, touch up and protect work.

END OF SECTION 09900

Section 10165 – Plastic Laminate Toilet Partitions

PART 1 – GENERAL

I. DESCRIPTION

A. Particle board core compartment work includes the followings:
1. Floor anchored/overhead braced

B. Furnish all labor and materials necessary for the completion of work in this section as shown on the contract drawings and specified herein.

C. Work in this section shall include but is not limited to:
1. Toilet compartments
2. Hardware for toilet compartments
3. Shop drawings and working drawings
4. Manufacturer's guarantee

D. Related work specified elsewhere shall include accessories and anchorage/blocking for attachment of compartments.

II. SUBMITTALS

A. Submittal of shop drawings and details, for Timbercon's approval.

B. Colors shall be selected from the manufacturer's standard range of colors.

C. Color and hardware samples shall be submitted for approval to the Owner upon request.

PART 2 – PRODUCTS

I. MANUFACTURER

A. Toilet compartments to be supplied by Global Steel Products Corp. Deer Park, New York or approved equal.

II. MATERIALS

A. Doors and panels shall be 1" thick, constructed of decorative plastic laminate, bonded with a non-toxic waterproof adhesive under pressure to a 7/8" particle board core; the laminate to be 0.050" with a matte finish; the core to be 45 pound density, resin impregnated particle board.

B. Pilasters shall be 1-1/4" thick, constructed of decorative plastic laminate, bonded with a non-toxic waterproof adhesive under pressure to a 1-1/8"

particle board core; the laminate to be 0.050" with a matte finish; the core to be 45 pound density, resin impregnated particle board.

III. CONSTRUCTION

A. Doors and panels to be 1". All face and edge surfaces to be covered with decorative laminate, face surfaces to overlap all edges so that joints between laminates fall on the edge surface of components only. Doors to be recessed to accept hinges within the door and yield bi-directional operation about an axis within the plane of the door.

B. Pilasters finish thickness shall be 1-1/4". All face and edge surfaces to be covered with decorative laminate, face surfaces to overlap all edges so that joints between laminates fall on the edge surface of components only. Pilasters shall include a mounting system comprising a mounting bar. Each mounting bar shall be secured to the building structure with 3/8" cadmium-plated studs. A shoe shall conceal each floor mounting, having an internal cross section conforming to the pilaster, and being formed of type 304 stainless steel #4 finish.

C. The color and texture of the finish on plastic laminate units is determined by the selected decorative pattern.

IV. HARDWARE

A. All exposed door hardware shall be of chromium-plated diecast Zamac and shall be as noted:
   1. Upper door hinge is recessed within the plane of the door and saddled on the adjacent pilaster, to yield bidirectional operation about an axis within the plane of the door. All hinges to include adjustable cams to support the door and establish set positions by gravity only.
   2. Slide latches shall be mounted at the mid-point of the door, 29" up from the bottom. Keepers shall be designed and installed permitting emergency access to the compartment by lifting the door until the latch bolt is clear of the keeper.
   3. Hardware includes coat hook, bumper, stop, keeper and all necessary fasteners for installation.

B. Fasteners shall be of chrome-plated steel; door hinges will be mounted with tamper resistant barrel nuts and machine screws; hooks and handles will be mounted with tamper resistant, full thread screws.

C. Wall brackets shall be secured to walls with anchoring and/or expansion shields.

D. Pilaster shoes shall be of type 304 steel #4 finish.

PART 3 – EXECUTION

I. PREPARATION

A. Examine areas to receive toilet compartments for correct height and spacing of anchorage/blocking and plumbing fixtures that may affect installation of compartments. Report any discrepancies to Timbercon.

B. Take complete and accurate measurements of complete toilet compartment locations.

C. Start of work constitutes acceptance of the job.

II. INSTALLATION

A. Install compartments in a rigid, straight, plumb and level manner as shown on the shop drawings and manufacturer's installation instructions.

B. All doors and panels to be mounted at 12" above the finished floor.

C. Clearance at vertical edges of door shall be uniform top to bottom.

D. No evidence of cutting, drilling and/or patching shall be visible on the finished work.

E. Finished surfaces shall be cleaned after installation and be left free of all imperfections.

III. WARRANTY

A. Global Steel Products Corp. guarantees its plastic laminated units, properly maintained, against discoloration or delamination for 2 years from the date of receipt by the customer. If materials are found defective during that period for the reasons listed above, the material will be replaced free of charge. No credits or allowances will be issued for any labor or expenses relating to the replacement of components covered under the warranty plan. All such expenses are to be borne by the installer.

END OF SECTION 10165

Section 10440 – Signs

PART 1 – GENERAL

I. SUMMARY

A. See related section – Allowances.

B. Owner to select style and placement of signage.

PART 2 – PRODUCTS - NOT APPLICABLE

PART 3 – EXECUTION - NOT APPLICABLE.

END OF SECTION 10440

Section 10523 – Fire Extinguishers & Cabinets

PART 1 – GENERAL

I. SUMMARY

A. Location and number of units will be determined by the Fire Marshall. Provide standard recessed cabinets with 5 lb. fire extinguishers. They shall be installed by the Contractor. See Division 15 for smoke detectors.

PART 2 – PRODUCTS—NOT APPLICABLE

PART 3 – EXECUTION—NOT APPLICABLE.

END OF SECTION 10523

Section 10800 – Toilet Accessories

PART 1 – GENERAL

I. SUMMARY

A. Provide toilet accessories.

B. See related section – Allowances.

II. SUBMITTALS

A. Submit for approval samples, product data, and accessory schedule.

III. QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle and store materials in accordance with manufacturer's instructions.

PART 2 – PRODUCTS

I. MATERIALS

A. Stainless steel fabrication with satin finish; American Specialties, Inc. or approved equal. Surface and recessed mounted as indicated.

B. Types and quantities - minimum requirements:
1. Provide 1 each of the following per restroom:
   a. Surface mount paper towel dispenser: ASI 0210
2. Provide 1 each of the following per water closet compartment or toilet room:
   a. Surface mounted dual roll toilet paper dispenser:
3. Provide 1 each of the following per women's water closet compartment:
   a. Surface mounted sanitary napkin disposal: ASI 0852.
4. Provide 2 each of the following per handicap water closet:
   a. Surface mounted grab bars in lengths required by TAS and ADA.
5. Provide 1 each of the following per restroom:
   a. Surface mounted baby changing station: ASI 9012
6. Provide 1 each of the following per countertop lavatory:
   a. Soap Dispenser: ASI 0332D
7. Provide 1 each of the following per wall hung lavatory:
   a. Soap Dispenser: ASI 9343

8. Provide 1 each of the following ADA/TAS required fold up shower seats:
   a. ASI 8206 (L), ASI 8206 (R)
9. Provide 1 corner grab bar for each shower stall in lengths required by ADA/TAS. (1 left hand, and 1 right hand)

C. Full-size frameless mirrors: ¼" float glass with polished edges. See plans for size.

PART 3 – EXECUTION

I. INSTALLATION

A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.

A. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION 10800

Section 13121 – Pre-engineered Metal Structure

PART 1 – GENERAL

I. SUMMARY

A. PROJECT INCLUDES

1. Pre-engineered metal buildings.

a. Structural framing.
b. Roofing.
c. Trim, gutters, downspouts.

B. Codes and standards: In addition to complying with the Standard of A.I.S.C. and the IBC 2006, the standards of the Metal Building Manufacturers Association shall be met or exceeded. In case of difference between the standards, the higher quality requirement shall prevail.

PART 2 – PRODUCTS

I. MANUFACTURER

A. Structural Framing: structural steel shapes, ASTM A 36, and primary, secondary, and endwall framing including columns, beams, purlins, girts, struts and bracing.

B. Ceco Metal Building Manufacturing or approved equal.

C. Roofing Panels:

a. Type: Factory-formed structural standing-seam roof panel system. (Straight Rib Architectural Roof Panel)
b. Roofing Panel Finish: Galvalume

D. Related Materials:

a. Vapor barriers.
b. Gutters and downspouts.
c. Caulking and sealants.
d. Wall louvers.
e. Roof ventilators.

PART 3 – EXECUTION

I. INSTALLATION

A. Comply with all local, state and federal building codes applicable to the installation of the metal building components. Install as per manufacturer's instructions.

II. WARRANTY

A. 20 YEAR WEATHER TIGHTNESS WARRANTY

1. Submit executed original of preformed metal roofing system manufacturer's single source non-prorated, systems warranty agreement, signed by an authorized representative of preformed metal roofing system manufacturer, on form published with product literature as of date of Contract Documents. The warranty shall cover the entire roofing system including but not limited to: hip flashings, ridge flashings, eave flashings, valley flashings, and other flashings, end laps, panels and associated accessories, trim components, tape sealants, sealants, curbs, penetrations, transitions, terminations, and other items installed under this section.

a. The preformed metal roofing manufacturer will warranty that furnished roofing system, as herein defined, will not allow intrusion of water from the exterior of the roofing manufacturer's roofing system into the building envelope, when exposed to ordinary weather conditions and ordinary wear and usage.

b. The preformed metal roofing system manufacturer will take appropriate actions necessary to cause the non-performing portions of the roofing system to perform their proper function during the warranty period.

c. The warranty will be direct from the preformed metal roofing system manufacturer as indicated in this section and the manufacturer is responsible for the full term of the warranty.

d. The owner will not accept a warranty that requires the owner or the owner's team to ensure that the roofing system is installed in accordance with the preformed metal roofing system manufacturer's requirements.

e. The preformed metal roofing system manufacturer will provide the sole and exclusive obligation for all warranty work from the date of substantial completion and under all circumstances, terminate on the expiration of the indicated warranty period.

f. Length of coverage:
   1. 20 years.

END OF SECTION 13121

Section 15400 – Plumbing

PART 1 – GENERAL

I. SUMMARY

A. Related work specified elsewhere.

II. SUBMITTALS

A. Submit product data for specified fixtures for approval prior to ordering.

III. QUALITY ASSURANCE

A. Requirements of regulatory agencies: comply with local, state, and national ordinances, codes and health regulations.

B. Reference standards: American Society for Testing and Materials (ASTM):

1. D2665-68, Poly Vinyl Chloride (PVC) plastic drain, waste and vent pipe and fittings.
2. B88-71, copper water tube, seamless.

PART 2 – PRODUCTS

I. PIPE AND PIPE FITTINGS

A. Soil, waste and vent piping: PVC drain, waste and vent pipe fittings (ASTM D2665).

B. Domestic water pipe and fittings:

1. Under floor slab or cast in concrete: Type L soft copper (no fittings): ASTM B88
2. Exterior service line: Type L hard copper with wrought fittings: ASTM B88
3. Interior above slab: Type L hard copper with wrought fittings: ASTM B88.

C. Piping specialties:

1. Escutcheons: Chrome plated.
2. Access Panels: Milcor, Style DW
3. Copper Tube Straps: Mueller Brass Style WS-1100
4. Valves: Mueller Brass Style V-1026

5. Hose Bibbs: Freeze proof, w/ back flow preventer
6. Floor Drains: Wade W-1742-UF, or equal to

II. DOMESTIC WATER PIPING INSULATION

A. Owens-Corning Fiberglass, Universal Fire Retardant, FRJ, ½" thickness.

III. PLUMBING FIXTURES

A. Brand as specified in schedule or equal to, submit for approval

B. Color of all fixtures: white

C. Schedule: See Plans

PART 3 – EXECUTION

I. EXCAVATION AND BACKFILL

A. Locate and protect existing utilities and other underground work to insure against damage or interruption to existing services.

B. Provide and maintain barricades, lighting and warning signs as necessary for the protection of persons and property.

C. Saw cut existing pavement and concrete slabs prior to removal of asphalt or concrete to provide straight clean lines.

D. Perform all excavations and trenching required for the work under this section. Comply with the "Texas Safety Standard for Excavation Work and Shoring."

E. Backfill with applicable fill material that meets all applicable codes. Compact backfill with vibratory tampers to maximum density for the material at optimum moisture.

F. Replace asphalt pavements and concrete slabs with like materials and finish to match adjacent surfaces.

II. WASTE AND VENT PIPING

A. All soil, waste and vent piping shall be sized and installed in accordance with the Uniform Plumbing Code and any other codes having jurisdiction.

B. Install cleanouts at the base of all vent stacks and at each change in direction of drains.

C. Slope horizontal pipe runs ¼" per foot.

D. Test by filling with water to the topmost opening for one hour. Remake any leaking joint and replace any leaky pipes.

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III. DOMESTIC WATER SERVICE

A. Piping for mains, branches and runouts shall be cut accurately to measurements taken at the jobsite and shall be worked into place without springing or forcing. Do not allow copper pipes to contact ferrous metals. Wrap copper piping in concrete slab with roofing felt or plastic to prevent contact with reinforcing steel. Use only copper tube straps for securing pipe to structural supports.

B. Notching or boring of structural members shall be held to a minimum and shall be accurately and carefully done. Notches shall be closed at stud or joist faces with sheet metal plates to prevent nail penetrations in pipes.

C. Piping above grade shall be run parallel to building lines.

D. No joints shall be made in pipe in under concrete slab.

E. Dielectric unions shall be provided between ferrous and nonferrous pipes to prevent galvanic action.

F. Water hammer shock arrestors, consisting of 12 inch high, capped pipe stubs shall be installed at the end of all fixture runs.

G. Test water lines for 4 hours at 125 psi pressure and prove tight before covering. Remake all leaking joints and retest.

V. DOMESTIC WATER PIPING INSULATION

A. Insulate hot water lines throughout and all cold water lines in attic and in exterior walls.

B. Install insulation in accordance with the manufacturer's printed instructions, using the recommended adhesives.

VI. WATER LINE STERILIZATION

A. Sterilize water lines upon completion with a chlorinated lime solution, as required by the Texas Department of Health.

VII. FIXTURE INSTALLATION

A. Install and anchor plumbing fixtures in accordance with the manufacturer's printed instructions.

B. Level and support fixtures as recommended by the fixture manufacturer.

VIII. CLEAN UP

A. Remove from the site all excess materials and debris resulting from work under this section. If debris is disposed of in construction dumpster, all boxes, etc. must be broken down.

B. Repair any damage to the building or grounds, resulting from these operations, to the Owner's satisfaction.

END OF SECTION 15400

15500 – Heating, Ventilating, and Air Conditioning

SEE DRAWINGS

END OF SECTION 15500

15600 – Fire Protection System

Part I – GENERAL

I. SCOPE

A. The work included under this section of the specifications consists of the providing of all materials, labor, and equipment required for a complete and workable automatic fire sprinkler system as shown on the plans and hereinafter specified and described. The Contractor is to provide 100 percent fire sprinkler coverage in all areas of the building; this includes, but is not limited to: Assemby, classrooms, corridors, toiletrooms, mezzanine, mechanical room, storage rooms, etc.

II. SUBMITTALS

A. Working Plans

1. As soon as practical, but not later than twenty-one (21) days after the award of the Contract, the Fire Sprinkler System Subcontractor is to provide engineered fire sprinkler design drawings to the Building Designer for building permit/city plan review purposes. Drawings shall be complete, showing entire piping layout, sprinkler heads, hydraulic calculations, etc. Drawings shall be prepared on minimum 24” x 36” sheets and shall be provided on mylar or vellum media for reproduction purposes.

2. The Fire Sprinkler System Subcontractor shall also submit the necessary sets of these design drawings to the City Fire Marshal for review and comments.

III. QUALITY ASSURANCE

A. Codes

1. The Automatic Sprinkler System shall be installed in accordance with and meet the standards of the following codes and/or standards of the latest issue:

a. NFPA Pamphlet 13, AUTOMATIC SPRINKLER SYSTEMS
b. Building Codes of the city of New Braunfels.
c. Fire Prevention Requirements of Texas.
d. Other codes as specified by section 15400

B. APPROVAL AND ACCEPTANCE

1. The system shall be installed subject to the approval and/or acceptance of the following:

   a. State Fire Rating Office.
   b. Building Department of the City of New Braunfels.
   c. Fire Marshal of the City of New Bruanfels.

2. All inspections and tests required by the above listed agencies shall be arranged and paid for by the Contractor and certificates of letters of approval from the inspecting agencies shall be provide to the Building Designer and Engineer.

3. Inspection Services: The Contractor shall perform two (2) inspections of the sprinkler system during the one year guaranteed period. Items to be inspected shall be as described in NFPA-13A. The first inspection shall be made 6 months after the church opening and the second approximately 6 months later. Inspections shall be coordinated with the church office. The following maintenance shall be performed during the course of the second inspection:

   a. Operation of all control valves.
   b. Lubrication of operating stems of all interior control valves.
   c. Operation of water motor gong.
   d. Cleaning of alarm valves.
   e. Lubrication of Fire Department hose connection inlets.

   Each inspection report shall be filled out with copies sent to the church office.

IV. PERMITS

A. Any permits for the installation or construction of any of the work included in this section, which are required by any of the authorities and/or agencies having jurisdiction, shall be obtained and paid for by the Contractor.

PART 2 – PRODUCTS

I. MATERIALS, EQUIPMENT, VALVES AND DEVICES

A. All materials, equipment, valves and devises installed and/or provided under this section shall be listed and/or approved for use in the fire

protection installation by the authorities, agencies, codes and standards named in this section of the specifications.

PART 3 – EXECUTION

I. SPRINKLER HEAD POSITIONING AND PIPE ROUTING

A. A complete fire sprinkler layout showing all heads and piping throughout the building shall be prepared by the Contractor. It is understood that this contract shall include the proper and required installations throughout. Rout piping to avoid conflicts with ductwork, pipes, conduits, and other equipment or systems. In finished areas especially, sprinkler heads shall not interfere with lighting fixtures, air conditioning outlets, or with general aesthetics and shall be located to provide a symmetrical layout. Sprinkler heads in public areas shall be centered in ceiling tiles. Submit drawings to Building Designer for review before fabrication.

II. VALVES AND CONNECTIONS

A. All drain valves, test valves, bleed valves, flushing connections, etc., required by codes and/or Fire Marshal shall be provided and installed by the Contractor. Inspector's test pipe shall be extended in attic space and dropped down on wall in storage room adjacent to fire sprinkler riser. Test pipe shall be minimum 1", but shall be increased in size if necessary to compensate for friction loss.

END OF SECTION 15600

Section 16000 – Electrical

SEE DRAWINGS

END OF SECTION 16000

Section 16700 - Fire Alarm & Detection System

PART 1 – GENERAL

I. RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specifications sections, apply to work of this section.

II. DESCRIPTION OF WORK:

A. Types of fire alarm and detection systems in this section include the following:

1. Combination Manual/Automatic

III. QUALITY ASSURANCE:

A. Manufactures: Firms regularly engaged in manufacture of fire alarm and detection systems, of types, sizes, and electrical characteristics required, whose products have been in satisfactory use in similar services for less than five years.

B. Installer: Qualified with at least five years of successful installation experience on projects with fire and alarm detection system installation work similar to that required for this project.

C. NEC Compliance: Comply with NEC as applicable to construction and installation of fire alarm and detection system components and accessories.

D. UL Compliance and Labeling: Provide fire alarm and detection system components which are UL-listed and labeled.

E. FM Compliance: Provide fire alarm and detection systems and accessories which are FM-approved.

IV. SUBMITTALS

A. Product Data: Submit manufacture’s data on fire alarm and detection systems including, but not limited to, roughing-in diagrams and instructions for installation, operation and maintenance, suitable for inclusion in maintenance manuals. Also include standard or typical riser and wire diagrams.

B. Shop Drawings: Provide shop drawings showing equipment/devise locations and connecting wiring of entire fire alarm and detection system. Include wiring diagrams and riser diagrams.

PART 2 – PRODUCTS

I. ACCEPTABLE MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, the following manufactures (or approved equal) offering fire alarm and detections systems may be incorporated in the work:

1. Fire-Lite
2. Silent Knight
3. GE FireworX
4. Hochiki
5. System Sensor
6. Wheelock
7. Gentex

II. FIRE ALARM AND DETECTION SYSTEMS

A. General: Provide fire alarm and detection system products of types, sizes, and capacities indicated, which comply with manufacturer's standard design, materials, components; construct in accordance with published product information, and as required for complete installation. Provide fire alarm and detection systems for applications indicated, and with sequence of operations, components, and function features as follows.

1. Combination: Either manual activation of a fire alarm station or activation of an automatic initiating device energizes all fire alarm system signaling devises, sounding and alarm.

B. Equip and wire system so that energizing the fire alarm audible/visual signaling devises also activated the following:

1. Air Handler Fan Shutdown
2. Fire/Smoke Dampers
3. Public Address Speaker Strobe Devices.
4. Visual Devices.

C. Materials and Equipment

1. Wiring System Materials: Provide basic wiring materials which comply with Drawings, "Raceways, Wires, Box/Fittings, and Devices;" types to be selected by installer.

2. Wiring System Materials: Refer to Drawings for wiring materials required in conjunction with fire alarm and detection systems.

D. Manual Fire Alarm Stations: Provide manufacturer's standard construction, red enclosure, manual fire alarm stations. Station will mechanically latch upon operation and remain so until manually reset by opening with a key common to all system locks. Pull stations will be double lock.

1. Surface Mounted: Fire-Lite BG-12 or equal

E. Automatic Smoke (Combustion Products) Detectors: Provide manufacture's standard construction automatic smoke detectors of the following types.

1. Photoelectric duct detectors: Fire-Lite InnovairFlex or equal.

2. Ionization type, restorable, for area detection: Fire-Lite I3 Series or equal.

F. Audio-Visual Alarms: Audio-visual signaling devises shall be manufacturer's standard construction with the following features:

1. Integral speaker and high-intensity strobe light.
2. Surface mounting.
3. Fire-Lite or equal

G. Control Panels: Provide manufacture's standard construction fire alarm control panels to house devises and circuits necessary to perform required functions, and to serve as test points, and trouble-signal points.

H. Voice Evacuation: Provide manufacturer's standard construction voice evacuation panel to play an approved pre-recorded message in accordance with the Uniform Fire Code.

III. SYSTEM OPERATION

A. System alarm operation for any manual or automatic fire alarm device activation shall be as follows:

1. The Alarm LED/Light shall be energized on the Fire Alarm Control Panel (FACP) until the alarm has been manually acknowledged. When the alarm has been silenced, the same LED/Light shall remain "On" and the master alarm shall flash. A subsequent alarm received after any silencing shall again re-sound the audible circuits.

2. All speaker/strobe devises in the building shall be activated by the new fire alarm output.

3. All alarm conditions shall be visually indicated at the system control panel.

B. The System operation shall be such that the alarm operation of any zone alarm initiating device shall not prevent the subsequent alarm operation of any other zone initiating device.

C. Activation of any manual or automatic fire alarm in the building shall energize an associated output point for the fan shutdown relays. All fans are to be de-energized, with all capable of automatic re-start upon reset of the fire alarm system.

PART 3 – EXECUTION

I. INSTALLATION OF FIRE ALARM AND DETECTION SYSTEMS

A. Install fire alarm and detection systems as indicated, in accordance with equipment manufacturer's written instructions and complying with applicable portions of NEC and NECA's "Standard of Installation".

II. INSTALLATION OF BASIC WIRING SYSTEM MATERIALS

A. Install wiring, raceways, and electrical boxes and fittings in accordance with the Drawings.

III. FIELD QUALITY CONTROL

A. Inspect relays and signals for malfunctioning, and where necessary, adjust units for proper operation to fulfill project requirements.

B. Final adjustment shall be performed by specially trained personnel in direct employ of manufacturer of fire alarm and detection system equipment.

END OF SECTION 16700