

**MOORE PUBLIC SCHOOLS
HIGHLAND WEST JUNIOR HIGH SCHOOL
CLASSROOM ADDITION**

**INDEPENDENT DISTRICT NO. 2
CLEVELAND COUNTY, MOORE, OKLAHOMA**

**901 NORTH SANTA FE
MOORE, OKLAHOMA 73160**

PROJECT MANUAL
JULY 2023

AGP | the Abla Griffin
Partnership



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901 NORTH SANTA FE
MOORE, OKLAHOMA 73160

ARCHITECT:

AGP | the Abla Griffin
Partnership

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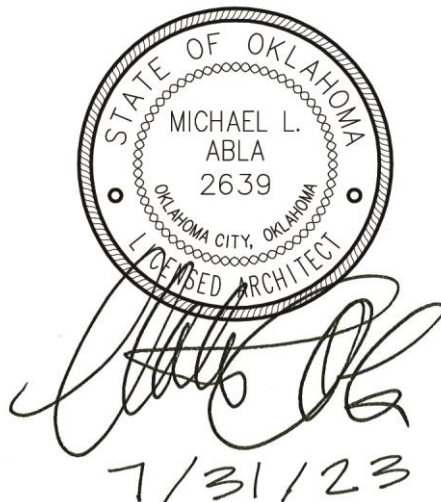


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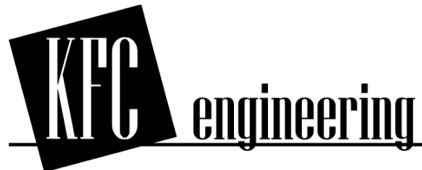
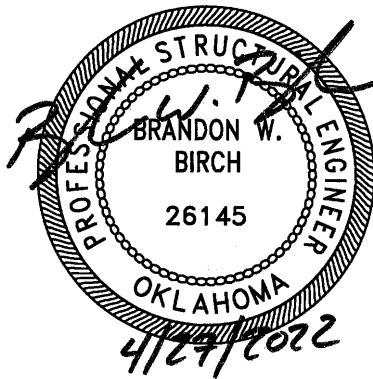
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Kirkpatrick Forest Curtis PC
Structural Engineering
OK CA #3888, EXP. 06/30/23
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Oklahoma City, OK 73105
Telephone: 405.528.4596
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Engineer of Record
Divisions 21, 22, 23
Dwayne McDonald Gordon
Mechanical Engineer
Salas O'Brien, LLC
OK 30822 / EXP 02.28.2024
CA 7058/ EXP 06.30.2023



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Engineer of Record
Divisions 26, 28
Timothy Van Ostran
Electrical Engineer
Salas O'Brien, LLC
OK 32650 / EXP 03.31.2023
CA 7058 / EXP 06.30.2023



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Construction Drawings – Highland West Jr. High
CCC Project No. 23069, dated July 31st, 2032
SWPPP, prepared by Cedar Creek Inc
Project No. 23069, dated 08.09.23
Geotech Report by PSI, dated 07.22.20

Local and/or State jurisdictional requirements and specifications shall govern if requirements are stricter and different than as stated in these specifications.

PROJECT: 23069 – Highland West Jr. High

PROJECT ENGINEER: Andrew Wilson, P.E.



(Engineer's Seal & Signature)

SPECIAL CONDITIONS

TIME FOR COMPLETION AND LIQUIDATED DAMAGES:

- A. Upon execution of the contract agreement between the Owner and the Contractor, it shall become an obligation of the contractor to complete all work to be performed under this agreement for the Construction of the new Highland West Junior High School STEM Classroom Addition to be located at 901 North Santa Fe, Moore, OK - **within 270 Calendar Days.**
- B. Penalty for noncompliance by the above date shall be cessation of all further periodical payments until the work is completed and can be fully used for the purpose intended.

PAYMENTS:

- A. The Owner's payment schedule indicating the payment dates established by Moore Public Schools shall be provided to the contractor to establish a monthly payment schedule.
- B. **Certificates of payment shall be submitted to the Architect on or before 7 days prior to Owner's cut-off date.**
- C. Until the Work is 50 percent complete, the Owner will pay 95 percent of the amount due the Contractor on account of progress payments. At the time the Work is 50 percent complete, any **remaining** partial payments shall be paid at 97.5 percent of amount due. The retainage shall be retained until the project is completed.

INSURANCE AND BONDS:

- A. Insurance provided shall be with a company or companies licensed to do business in the state of Oklahoma.
- B. Policies shall be provided in the following types and amounts:
 - 1. a. Workmen's Compensation-Statutory
 - b. Employer's Liability-\$500,000 each accident.
 - 2. Comprehensive General Liability:
 - a. Bodily Injury - \$1,000,000 each occurrence.
 - b. Personal Injury - \$1,000,000
 - c. Property Damage - \$1,000,000 each occurrence
 - 3. Automobile Liability:
 - a. Bodily Injury - \$500,000 each person/\$1,000.000 each occurrence

- b. Such Comprehensive Automobile Liability Insurance shall include all owned and non-owned hired motor vehicles.
- 4. Owner's Protective Liability - Same limits as above.
- 5. Products and Completed Operations - Same limits as above.
- 6. Contractual Liability - Same limits as above.
- C. Furnish one copy of Certificates herein required for each copy of the Agreement; specifically set forth evidence of all coverage required by Subparagraphs 11.1 and 11.2. Furnish to the Owner copies of any endorsements that are subsequently issued amending coverage or limits.
- D. **The Contractor shall provide property insurance in the amount of the initial contract sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis without voluntary deductibles. This insurance coverage shall be the "all-risk" form for completed value.**

TEMPORARY SERVICES:

- A. Sanitary Facilities: The Contractor shall provide and maintain necessary sanitary conveniences for the use of those employed on/or about the work. The sanitary facilities shall be properly secluded from public observation and shall be such locations as shall be approved by the Owner, and their use shall be strictly enforced.

SHOP DRAWINGS and SUBMITTALS:

- A. Unless otherwise specified, the shop drawings and product data shall be submitted **electronically**. Physical samples of materials shall be submitted to the Architect as required.
- B. Construction Manager is responsible for obtaining and distributing required prints of shop drawings to his subcontractors and material suppliers after as well as before final approval.
- C. Shop drawings and samples shall be dated and marked to show the names of the Project, Architect, CM, originating Sub-Contractor, manufacturer or supplier, and separate detailer if pertinent.

Shop drawings shall completely identify Specifications section and locations at which materials or equipment are to be installed. Reproduction of Contract Drawings are acceptable as Shop Drawings only when specifically authorized in writing by the Architect.

- D. If materials or specified items other than those specified in these Contract Documents are supplied - and approved by the Architect - it shall be the Construction Manager's responsibility to provide ALL additional materials, accessories, substrates, utility connection, etc. for a complete and operational installation at NO additional cost to the Owner.

CHANGES IN THE WORK:

- A. Cost shall be limited to the following: cost of materials, including sales tax and cost of delivery; cost of labor, including social security, old age and unemployment insurance, and fringe benefits under collective bargaining agreements; workmen's compensation insurance; bond premiums; and rental value of power tools and equipment. Overhead shall include the following; supervision, superintendence, wages of time keepers, watchmen and clerks, hand tools, incidentals, general office expense, and all other expenses not included in "cost".
- B. Change Order markups shall be limited to 10% overhead and 10% profit. No other markups shall be allowed.

AS BUILT DRAWINGS:

- A. Provide and maintain in proper order and in good, clean condition in the field office at the project site, one complete full-size set of all working drawings. On this set of drawing prints, in red ink, neatly and accurately inscribe any and all changes in the work.
- B. Upon completion of work, the Contractor shall furnish one set of "as built" drawings. These drawings shall be contract drawings corrected in **red ink** to show any differences between contract drawings and actual construction. All changes made during construction shall be noted. Each drawing showing changes in dimensions, details, or containing supplemental information shall be plainly marked "**As Built**" and shall contain the signature of both the Architect and the Contractor.

CLOSEOUT SUBMITTALS:

Prepare project data in the form of an instructional manual supplied electronically on media as requested by Owner (CD or flash drive). The following information shall be included and arranged under a Table of Contents:

1. Directory listing names, addresses, and telephone numbers of the Architect/Engineer(s), General Contractor, Subcontractors, and major material/equipment suppliers.
2. Operation and Maintenance Instructions arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and Suppliers. Include equipment, parts list for each, operating instructions, maintenance instructions for equipment, special finishes, etc.
3. Project documents and certificates, including shop drawings and product data, air and water balance reports, photocopies of warranties.
4. Record As-Built Drawings as described above.
5. Completed Non-Asbestos Affidavit.

DEBRIS DISPOSAL:

Waste disposal shall be the responsibility of the Contractor. The Contractor shall make arrangements with the local authorities having jurisdiction for accommodation of all waste disposal. If local facilities are not available, the contractor shall be responsible for all other arrangements for waste disposal.

SUPPLEMENTARY CONDITIONS AND SPECIAL CONDITIONS:

In the following sections where the term "General Conditions" is used, it shall include the "Supplementary Conditions" and/or "Special Conditions" bound in this project manual.

MISCELLANEOUS PROVISIONS:

A. TESTS AND INSPECTIONS

Add the following clarification: **Regardless of how it is described elsewhere in the drawings and specifications, the CM shall engage all testing laboratories / subcontractors as approved by the Architect; and, pay for ALL testing as required by the drawings and specifications.** The CM shall pay for any additional testing due to defective work. The Owner shall pay for any additional testing requested and found to be non-

defective.

B. EQUAL OPPORTUNITY

The Contractor shall maintain policies of employment as follows:

The Construction Manager and all Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated fairly during employment without regard to their race, religion, color, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment advertising; layoff or termination; rates of pay or any other forms of compensation; and selection for training, including apprenticeship. The CM agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

C. COOPERATION WITH BUILDING OFFICIALS

Cooperate with applicable Federal, State, City or other governmental officials and inspectors at all times. If such officials or inspectors deem special inspections are necessary, provide assistance and facilities that will expedite their inspection.

Construction Manager shall be responsible for obtaining and paying for ALL building permits required for this project. This cost shall be included in the Construction Manager's General Conditions.

D. MEASUREMENTS

Before doing any work or ordering any materials, the Contractor shall verify all measurements of existing and new work and shall be responsible for their correctness.

Any differences which may be found shall be submitted to the Architect for consideration before proceeding with the work. No extra compensation will be allowed because of differences between actual dimensions and measurements indicated on the working drawings.

E. MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS

Install all manufactured items of materials or equipment in strict accordance with manufacturer's recommended specifications, except that the specifications herein, where more stringent, shall be complied with.

At the completion of the project and prior to final acceptance by the Owner, provide the Owner with three complete sets of operating and maintenance instructions, and demonstrate to him the procedures for proper operation and maintenance of all equipment.

F. JOB MAINTENANCE

During the course of their work, all crafts and trades shall protect all work which preceded theirs from damage, and they shall make repairs or replacements to any damage caused either directly or indirectly by them.

G. COMPLIANCE WITH STATE AND FEDERAL LAWS

Construction Manager assumes full responsibility for the payment of all contributions and payroll taxes (state and federal) as to all subcontractors and employees engaged in the performance of work pursuant hereto and further agrees to check and meet all requirements that might be specified under regulations of the administrative officials or board charged with the enforcement of any state or federal act on the subject referred. CM agrees to furnish Owner, upon request, a certificate or other evidence of compliance therewith.

H. OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970 (OSHA)

The Construction Manager shall comply with the latest edition and revision of The Federal Occupational Safety and Health Act of 1970 for construction.

I. GUARANTY BONDS

1. Prior to the Owner signing the contract agreement, he will require the Construction Manager to furnish performance and payment bonds covering the faithful performance of the entire construction contract agreement. The performance bond and the payment bond shall each be made out in one hundred percent (100%)

of the contract sum and shall be in a company or companies against which the Owner has no reasonable objection.

2. Bonds shall be signed by an official of the bonding company and shall be accompanied by the bonding agent's written power-of-attorney in order that one copy may be attached to each copy of the contract agreement.
3. The Construction Manager shall include in his proposal amount the total premiums for all required bonds.
4. The Contractor does hereby warrant and/or guarantee against defects in all workmanship and materials performed or furnished by him directly or by his subcontractors for a period of one (1) year from the date of completion, as evidenced by the date of the Final Certificate or final acceptance of the project. Said warranty and/or guarantee shall be in the form of a good and sufficient bond in a sum equal to one hundred percent (100%) of the contract price.

End of Special Conditions



Project Number: 05462142-4
July 22, 2020

Professional Service Industries, Inc.
11825 S. Portland Avenue
Oklahoma City, OK 73170
Phone: (405) 735-6052
Fax: (405)735-6086

Mr. Michael L. Abla, AIA
AGP – The Abla Griffin Partnership, LLC
201 North Broadway, Suite 210
Moore, OK 73160

Re: Report of Geotechnical Engineering Services
Proposed Moore Public Schools Pre-Planning Services
Highland West Junior High School
New Classroom Addition
NWQ NW 7th Place and N Santa Fe Avenue
Moore, Oklahoma

Dear Mr. Abla:


Thank you for choosing Professional Service Industries, Inc. (PSI), an Intertek company. The information you requested is attached.

PSI performed the geotechnical exploration that you requested on February 25, 2020. PSI transmits the geotechnical report with this letter.

We thank you for your business and we look forward to finding ways to grow our partnership, expand our services, and continue Building Better Together.

For Professional Service Industries, Inc.
CA NO. 1111 Expires 06/30/21


Yicheng Zhang, EI
Project Manager
Geotechnical Services


Adedamola I.O. Oyesanya, P.E.
Senior Geotechnical Engineer
Geotechnical Services



7/22/2020





Report of Geotechnical Engineering Services

Proposed Moore Public Schools Pre-Planning
Services

Highland West Junior High School

New Classroom Addition

NWQ NW 7th Place and N Santa Fe Avenue
Moore, Oklahoma

Prepared for

AGP – The Abla Griffin Partnership, LLC
201 North Broadway, Suite 210
Moore, OK 73160

Prepared by

Professional Service Industries, Inc.
11825 S. Portland Avenue
Oklahoma City, OK 73170

July 22, 2020

PSI Project 05462142-4

A blue ink signature of Yicheng Zhang.

Yicheng Zhang, EI
Project Manager
Geotechnical Services

A blue ink signature of Adedamola T.O. Oyesanya over a circular professional seal. The seal contains the text: 'PROFESSIONAL ENGINEER', 'ADEDAMOLA T. O. OYESANYA', 'BIKUNLE OLUWAKEMI OYESANYA', 'OCTOBER 1998', 'OKLAHOMA'.

Adedamola T.O. Oyesanya, P.E.
Senior Geotechnical Engineer
Geotechnical Services

7/22/2020

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1 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Professional Service Industries, Inc. (PSI), an Intertek company, has completed a geotechnical exploration for the proposed Moore Public Schools Pre-Planning Project's New Classroom Addition at the Highland West Junior High School in Moore, Oklahoma. PSI's services were authorized by Mr. Michael Abla, Principal, Abla Griffin Partnership, by signing PSI's proposal on February 25, 2020. This exploration was accomplished in general accordance with PSI Proposal No. P0546-303281 dated February 18, 2020.

1.2 PROJECT DESCRIPTION

Project information was provided by Mr. Clay Griffin, Principal, AGP. The proposed construction will consist of classroom additions to the south areas of the existing Highland West Junior High buildings in Moore, Oklahoma. The proposed construction will also include a new roadway from Santa Fe Avenue to the west side of the building. The existing school buildings in the areas of the proposed addition are essentially single-story. Detail information about the construction type is not available to PSI; however, PSI anticipates the construction will be typical and not unusual for the type of project and use proposed. Available information includes the following:

Loading:

- Maximum column loads on the order of 10 to 200 kips.
- Maximum wall loads on the order of 4 kips per linear feet (estimated by PSI)
- Floor slab load not exceeding 250 pounds per square feet.

The report is also based on the following:

Grading:

- Cut and fill on the order of 0 to 2 feet to achieve design grade.

1.3 PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to explore the subsurface conditions at the site and prepare recommendations for geotechnical design considerations for the proposed building addition. PSI's scope of services included drilling a total of 4 soil test borings, laboratory testing of select soil samples, and preparation of this geotechnical report. This report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and includes the approximate boring locations, boring logs, and recommendations regarding the following:

- General site development and subgrade preparation.
- Foundation types and depths, allowable bearing capacities, and estimates of potential settlement.
- Seismic site class and site coefficients according to the 2015 IBC criteria.
- Lateral soil load parameters for retaining wall design.
- Comments regarding factors that may impact construction and performance of the proposed project.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous or toxic materials in the soil, bedrock, surface water, groundwater, or air, on or below, or



around this site. Statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

PSI did not provide any service to investigate or detect the presence of moisture, mold, or other biological contaminants in or around any structures, or any service that was designed or intended to prevent or lower the risk of the occurrence or the amplification of the same. The client should be aware that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. Client should also be aware that site conditions are outside of PSI's control, and that mold amplification will likely occur, or continue to occur, in the presence of moisture. As such, PSI cannot and shall not be held responsible for the occurrence of, or recurrence of, mold amplification.

Laboratory consolidation testing for detailed analysis of settlement characteristics is not included in the present scope. However, consolidation settlements are not anticipated to be an issue for this project site.



2 SITE AND SUBSURFACE CONDITIONS

2.1 SITE LOCATION AND DESCRIPTION

The site for the proposed New Classroom Addition is at the Highland West Junior High School located at the northwest quadrant of NW 7th Place and N Santa Fe Avenue in Moore, Oklahoma. The latitude and longitude of the proposed construction site are approximately 35.3445°N and 97.5127°W, respectively. The site is the existing Highland West Junior High School and surface of the proposed project area is generally covered with grass and visually appears generally flat. Underground utilities exist in the areas of the proposed development. The ATV-mounted drill rig experienced no mobility difficulty in accessing the boring locations.

2.2 SUBSURFACE CONDITIONS

The site subsurface conditions were explored with 4 soil test borings. The borings were located in the field by the drilling crew with a handheld GPS device and by estimating distances from known site reference points.

The exploration was performed with a truck-mounted CME-55 drill rig equipped with an automatic hammer using a 140-pound hammer dropping 30 inches. Soil samples were routinely obtained during the drilling process. Drilling and sampling techniques were accomplished generally in accordance with ASTM procedures. The approximate location of the borings performed are presented on the boring logs.

Select soil samples were tested in the laboratory for evaluation and determination of material properties including moisture content, Atterberg limits, and fines content. Laboratory testing was accomplished generally in accordance with ASTM procedures.

The subgrade materials encountered in the borings consisted of lean and fat clays with various sand contents and shaley clay to depths of approximately 8 to 12½ feet below the surface. These materials are underlain by shale bedrock that extended to the boring depths of approximately 25 feet below the surface. Please refer to the attached boring logs for more specific information. The following table briefly summarizes the range of results from the field and laboratory testing programs:

General Range of Material Property Values						
Soil Description	Approx. Depth Range, ft.	Standard Penetration, N, blows/foot	TCP inches/100 Blows	Moisture Content, %	Percent Fines (Passing # 200 Sieve)	Liquid Limit, % Plastic Limit, % Plasticity Index
Fat CLAY (various sand contents)	0 – 3	5 – 15	-	18 – 27	86.7	LL=54 PL=19 PI=35
Lean CLAY (various sand contents)	0 – 12½	6 – 26	-	14 – 24	86.0 – 91.4	LL=30 – 44 PL=16 – 19 PI=11 – 27
Shaley CLAY	8 – 10½	36	-	-	-	-
SHALE (Bedrock)	8 – 25	PR	0.9 – 8.3	9 – 12	-	-



PR – Practical Refusal

2.2.1 SOIL CORROSIVITY LABORATORY TESTING

PSI performed laboratory testing on a select soil sample of Boring DB-3 to assess the pH and water-soluble sulfate content. The water-soluble sulfate testing was performed in general accordance to the ODOT’s OHD L-49. The pH testing was performed in general accordance to the ASTM G51. The results of the tests are summarized and provided in the table below:

Water Soluble Sulfate Test Results				
Boring	Depth (ft)	Soil pH	Sulfate Content	
			ppm (mg/kg)	Percent by Weight
DB-3	3	7.8	360	0.036

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring log included in the Appendix should be reviewed for specific information at the boring location. The boring log includes soil/rock descriptions, stratifications, penetration resistances, and locations of the samples. The stratifications shown on the boring log represent the conditions only at the actual boring location. Variations may occur and should be expected at other building section locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual. Water level information obtained during field operations is also shown on the boring log. The samples that were transported to the laboratory will be retained for 60 days from the date of this report and then discarded.

2.3 GROUNDWATER INFORMATION

Groundwater was observed to collect in Borings DB-3 and DB-4 at depths of approximately 15 feet during drilling and at depths of approximately 22 and 20 feet, respectively, after completion of drilling. Groundwater was not observed to collect in Borings DB-1 and DB-2 during drilling nor upon completion of drilling, indicating measurable groundwater may be below the maximum depths of the borings or the groundwater may require additional time to stabilize in the open holes. Groundwater can exist at varying depths during other times of the year depending upon climatic and rainfall conditions. Discontinuous zones of perched water can exist within the overburden materials and/or at the contact with bedrock.



3 EVALUATION AND RECOMMENDATIONS

3.1 GEOTECHNICAL DISCUSSION

The geotechnical related recommendations presented in this report have been developed on the basis of the subsurface conditions encountered and PSI's understanding of the proposed project. Should changes in the project criteria occur, a review must be made by PSI to determine if modifications to the recommendations will be required. The performance of the construction will be dependent upon site preparations and the shear strength of the overburden soils and the underlying bedrock.

There is a primary geotechnical related concern at this project site that should be expected to affect lightly loaded grade supported elements such as floor slab type constructions. The concern involves the shrink/swell potential of the upper soils encountered in some of the borings. The concern is discussed in the report subsection below.

3.1.1 SWELL POTENTIAL CLAYS

Medium to high plasticity clay soils with moderate to high shrink/swell potentials were encountered in the upper soil strata of the borings. Some of these moderate to high shrink/swell potential materials are expected to exhibit significant volume changes with variations in subgrade moisture. The calculated Potential Vertical Rise (PVR) for slab-on-grade type construction at this project site could be up to 2 inches for these soils, assuming that the medium to high plasticity subgrade materials are allowed to increase in moisture content from a relatively dry condition to a relatively wet condition over a depth of approximately 8 feet. The relatively dry condition can occur with severe dry weather situations, thereby resulting in a significant degree of shrinkage and eventual potential swell in the foundation material. Differential movements are expected to be about ½ of the PVR. However, it should be noted that for extreme conditions (i.e., soils dry and shrink in one area with soils in another area being exposed to water and swelling) differential movement can be equal to or even double the PVR.

A reduction in potential vertical movement can be achieved by supporting the floor slab on a minimum of 2 feet of properly compacted low plasticity structural fill or modified existing soils to reduce the calculated PVR to 1 inch or less. However, due to the potential for "bathtub effect" usually created by granular structural fill replacing and overlying relatively low permeability clay material in undercut areas, PSI recommends the amount of material in the structural fill passing the #200 sieve not be less than 60 percent, at least in replacing the undercut. The greater the structural fill or modified existing soil (used as structural fill) thickness beneath the slab, the less the probability of structural distress due to shrinkage and swelling of the clay soils. The structural fill should extend a minimum of 5 feet beyond the edges of the structure. The desired thickness of fill can be provided by raising the site grade with the properly compacted recommended materials or undercutting and replacing with the recommended materials. Proof-rolling and visual observation, as discussed later in this report, should be accomplished to aid in identifying soils which should be removed from the floor slab area prior to fill placement and/or floor slab construction.

3.1.1.1 LIME, CEMENT, OR FLY ASH STABILIZATION

The existing medium to high plasticity clay subgrade soils with moderate to high shrink/swell potential can also be modified with hydrated lime, Portland cement, or class 'C' fly ash from a source approved by ODOT and used as structural fill. This will also reduce potential for "bathtub" effect when used as backfill in undercuts. Stabilizing the subgrade soil with an estimated 5 to 7 percent cement or lime or an estimated 12 to 14 percent fly ash, by dry weight, will reduce the potential volumetric changes due to the high shrink/swell potential soils. The actual



cement, lime, or fly ash percentage should be determined based on laboratory tests after the source of the stabilizing agent has been determined.

3.1.2 BUILDING ADDITION CONSIDERATIONS

Information about the existing building foundations is not available to PSI. For new footings in proximity of existing foundation, additional stress may and should be expected to be exerted on the subsurface material supporting the existing footings. The additional stress may result in additional settlement of the footings supporting the existing structures. Generally, the deeper the new foundation and the closer the new foundation will be to the existing foundation, the higher the potential for the additional settlements. If shallow foundations are considered and if practical for the new foundation, PSI recommends as much separation as possible between the old and new foundations. Evaluation of the influence may be based on a straight-line projecting outward and downward at an angle of 45° from the bottom of the new footing. The line not intersecting the lower existing footing and vice versa may be considered adequate and non-influential; else, additional stress analysis will be required. However, it is recommended the existing footing also be monitored during construction.

3.2 GEOLOGIC UNIT

Division Three publication of the “Engineering Classification of Geologic Materials” manual published by ODOT indicates the project site is underlain by the Hennessey Unit (Phy) in Cleveland County.

This unit consists of red platy to blocky clay shales and mudstone. The mudstones are hard and appear blocky. The red clay shale of the Hennessey Unit is characterized by numerous bands of streaks of white or light green color ranging from a few inches to four feet in thickness. Small spheres of light green color up to 10 inches in diameter are an odd characteristic of the unit.

The total thickness of the unit varies from 400 to 600 feet.

The Hennessey Unit outcrops in a 5 to 20 miles wide north-south band across Cleveland, McClain, and Garvin Counties in Division 3.

Topographically, the unit is near level to gently rolling prairies, but most of the more level outcrops of the unit are cultivated.

3.3 SEISMIC INFORMATION

The 2015 International Building Code requires a site class for the calculation of earthquake design forces. This class is a function of soil type (i.e. depth of soil and strata types). Based on the type of materials encountered to the boring termination depths and the estimated shear strength of the soil at the boring locations, Site Class C is recommended. The IBC-2015 probabilistic ground motion values near the project site are as follows:



Seismic Design Parameters			
Period (seconds)	2% Probability of Event in 50 years (g)	Site Coefficient F_a	Site Coefficient F_v
0.2 (S_s)	0.273	1.2	N/A
1.0 (S_1)	0.079	N/A	1.7

S_{DS} : 0.218g
 S_{D1} : 0.089g
PGA: 0.162g
PGA_M: 0.195g (Site modified peak ground acceleration)
Seismic Design Category (SDC): B

3.4 SITE PREPARATION

Vegetation, topsoil, deleterious materials, and soft and loose soil in the construction area should be stripped from the site and either wasted or stockpiled for later use in non-load bearing areas such as landscaping. The depth of removal should be determined by a representative of the Geotechnical Engineer at the time of construction.

After stripping and excavating to the proposed subgrade level, the construction area should be proof rolled with a tandem axle dump truck or similar rubber-tired vehicle. Soils which are observed to rut or deflect excessively (typically greater than 1 inch) under the moving load (typically 9 tons/axle) should be undercut and recompacted in place or replaced with properly compacted recommended fill. The recompacted soil or imported structural fill or engineered fill should be moisture conditioned during placement. The proof-rolling and undercutting activities should be witnessed by a representative of the Geotechnical Engineer and should be performed during a period of dry weather. Access to compaction equipment may be limited in some of the proposed construction areas due to existing building. Other modes of compaction and site preparation, such as walk-behind portable compaction machines may be applicable.

After proof-rolling and correcting soft areas or areas exhibiting rutting or pumping, the subgrade soils should be scarified and compacted for a depth of at least 8 inches below the surface.

After subgrade preparation and testing have been completed, fill placement that will be required to establish site design grades should begin. The first layer of fill material should be placed in a relatively uniform horizontal lift and adequately keyed into the stripped and scarified subgrade soils. PSI recommends fill materials be free of organic or other deleterious material, have a maximum particle size less than 3 inches, have a liquid limit not more than 35 and plasticity index in the range of 5 to 18 and percent of fines passing the #200 sieve not less than 60 percent, at least in replacing undercuts. The on-site soils generally do not appear suitable for use as structural fill without modification/stabilization as previously discussed but may be stockpiled for later use in non-load bearing areas such as landscaping. Accurate moisture control will be required to achieve the recommended degree of compaction. Structural fill should be compacted to at least 95 percent of standard Proctor maximum dry density as determined by ASTM D698.

Fill should be placed in maximum lifts of 8 inches of loose material and should be compacted at a moisture content ranging from -2 to +3 percentage points of optimum moisture content. Stabilized materials should be placed at a minimum water content of 2 percentage points above the optimum moisture content. If water must be



added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Each lift of compacted engineered fill should be tested by a representative of the Geotechnical Engineer prior to placement of subsequent lifts. The edges of compacted fill should extend a minimum of 5 feet beyond the edges of the proposed structure prior to sloping on as flat a gradient as practical. Care should be taken to apply compaction effort throughout the entire fill area.

For structural fill, PSI recommends that such fill be tested by a Geotechnical Technician and directed by a Geotechnical Engineer to monitor and document the placement of fill material. It should be noted that the Geotechnical Engineer of record can only certify the testing that is performed, and the work observed by that engineer or staff in direct report to that engineer. PSI recommends that the fill be monitored in general accordance with the following table:

Fill Placement Criteria				
Material Tested	Proctor Type	Min % Dry Density	Placement Moisture Content Range from OMC	Frequency of Testing (Based on 8-inch lifts)
Structural Fill	Standard	95%	-2 to +3%	1 per 2,500 ft ² of fill placed
Stabilized Existing Soil			≥+2%	
Random Fill (non-load bearing)	Standard	90%	-2 to +3%	1 per 10,000 ft ² of fill placed
Utility Trench Backfill	Standard	95%	-1 to +3%	1 per 200 cy of fill placed

A minimum of 3 field density tests per lift is recommended. If the borrow or source of fill changes, a new reference moisture/density test should be performed.

The overall performance of the construction will also depend on how well the site drains during the construction and the life of the structure. Grading of the site around the structure’s pads should be accomplished to enable positive drainage away from the pads by providing an adequate gradient. The surface gradient provided will be dependent on the landscaping type and vegetation. Water infiltration and seepage into the foundation should be avoided as much as possible. If it is possible for water to collect beneath the foundation and foundation areas, it will be necessary to use interceptor drains to remove the collected water.

Excavation for utility trenches should be performed in accordance with OSHA regulations as stated in 29 CFR Part 1926. It should be noted that utility trench excavations have the potential to degrade the properties of the adjacent fill materials. Utility trench walls that are allowed to move laterally can lead to reduced bearing capacity and increased settlement of adjacent structures and structural elements.

Backfill for utility trenches is as important as the original subgrade preparation or structural fill placed to support foundations. Unless otherwise specified, the backfill for the utility trenches should be placed in 4- to 6-inch loose lifts and compacted to a minimum of 95% of the maximum dry density achieved by the standard Proctor test. The backfill soil should be moisture conditioned in the range of 1 percentage point below to 2 percentage points above the optimum moisture content value as determined by the standard Proctor test. Up to 4 inches of bedding material placed directly under the pipes or conduits placed in the utility trench can be compacted to the 90% compaction criteria with respect to standard Proctor maximum dry density. Compaction testing should be



performed for every 200 cubic yards of backfill placed or for each lift within 200 linear feet of trench, whichever is less. Backfill of utility trenches should not be performed with water standing in the trench. Structural fill should be used as the trench backfill material.

3.5 SHALLOW FOUNDATION RECOMMENDATIONS

The types and depths of foundations suitable for a given structure depend on several factors including the subsurface conditions, the functions of the structure, the loads they will carry, the external (lateral and uplift) forces they will resist, and the cost of the foundations. A conventional type spread footing foundation system or a monolithic slab-on-grade foundation system (conventionally reinforced or post-tensioned) may be considered for support of the building units. PSI has provided in this report section parameters that may be considered for the recommended shallow foundation systems.

A shallow foundation system may be considered for the support of the building, based on the subsurface conditions encountered by the borings. PSI has provided recommendations for both a conventional type spread/continuous footing foundation system and a monolithic slab-on-grade foundation system (reinforced or post-tensioned) for consideration and support of the proposed structure.

3.5.1 CONVENTIONAL SPREAD FOOTING RECOMMENDATIONS

The planned structure may be supported on conventional spread footing foundations. Spread footings for columns and continuous wall footings bearing on the existing soil or properly compacted structural fill or modified existing fill, as discussed, can be designed for allowable unit bearing pressures of 3,500 psf and 2,500 psf, respectively, based on dead load plus design live load. Foundation elements should bear a minimum depth of 2 feet below the final grade for frost protection. The allowable bearing capacities are based on a factor of safety of 3.

It is important that PSI observes and documents the footing excavations prior to concrete placement. Minimum dimensions of 24 inches for square footings and 18 inches for continuous wall footings should be used in design of the footings to reduce the possibility of a local bearing capacity failure.

The foundation excavations should be observed by a representative of PSI prior to steel or concrete placement to document that the foundation materials are consistent with the materials discussed in this report. Soft or loose soil zones encountered at the bottom of the footing excavations should be removed to the level of acceptable residual soils or adequately compacted structural fill as directed by the Geotechnical Engineer. The bottom of the footings should be probed to identify and locate soft areas. Cavities formed as a result of excavation of soft or loose soil zones should be backfilled with lean concrete or properly compacted structural fill.

The uplift resistance of the foundations will be limited by the weight of the foundation concrete and soil above them and the dead weight of the structure. For design purposes, the ultimate uplift resistance should be based on effective unit weights derived from presumptive total unit weights of 120 pcf and 150 pcf for soil and concrete, respectively. A factor of safety of 2 should be applied to the uplift resistance.

Footing excavations should be observed, and concrete placed as quickly as possible to avoid exposure of the footing bearing surfaces to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, the foundation concrete should be placed during the same



day the excavation is made. If footing excavations are left open for more than 1 day, they should be protected to reduce evaporation or entry of moisture.

Based on the known subsurface conditions, site geology, laboratory testing, anticipated loading, and allowable bearing pressures, properly designed and constructed footings for the building supported on the properly compacted recommended materials should experience maximum total and differential settlements between adjacent columns of less than 1 inch and $\frac{3}{4}$ inch, respectively.

3.5.2 MONOLITHIC SLAB-ON-GRADE FOUNDATION RECOMMENDATIONS

As an alternative to remediation of the existing subgrade for the new construction due to the medium high to high plasticity clay and the existing undocumented fill, the use of alternative type of foundation such as a monolithic slab type foundation may be considered. PSI has not performed a cost/benefit analysis of suitable foundation type for the project.

If additional movements can be tolerated, a steel-reinforced (conventional or post-tension reinforcing) slab on-grade foundation system (with or without waffle-type grade beam configuration) may be considered for support of the proposed structure. The slab-on-grade foundation system may be supported on the existing subgrade material, provided the associated expected movements can be tolerated, or structural fill as recommended. The thickened edge portion may also be supported on the existing soils or the structural fill.

Structural fill should consist of materials as described in the Site Preparation and Fill Materials section of this report. Proof rolling, as discussed earlier in this report, should be accomplished to identify any soft or unstable soils that should be removed from the slab area prior to fill placement and floor slab construction. Select fill required to achieve grade should extend a minimum 5 foot beyond the perimeter of the slab. Fill soil below the slab should be moisture conditioned.

Thickened edges supported on properly compacted existing soils or structural fill materials may be designed using a maximum allowable unit bearing capacity of 2,000 pounds per square foot based on dead load plus design live load considerations. The grade beams should have a minimum width of 10 inches even if actual bearing pressure is less than the design value. If frost heave is a design consideration, the perimeter grade beams should bear at least 24 inches below adjacent surface grades. If soft or very loose soils are encountered at the design bearing level, they should be undercut to stiff residual soils and the excavation backfilled with concrete or controlled low strength material (CLSM) or properly compacted fill.

Several design methods use the modulus of subgrade reaction, k , to account for soil properties in design of flat grade-supported floor slabs. Based on our laboratory test results and the slab recommendations provided in this document, k -value of 120 pounds per cubic inch (pci) may be used in the grade slab design based on values typically obtained from 1 ft x 1 ft plate load tests. However, depending on how the slab load is applied, the value will have to be geometrically modified. The value should be adjusted for larger areas using the expression/formula presented in the “Floor Slab Recommendations” section of this report.

Uniform compaction of fill materials is important to reduce total and differential settlements. If the site is prepared as recommended, and based on the anticipated loading conditions, total and differential settlements of the foundation should be about 1 inch and $\frac{1}{2}$ inch, respectively, or less. To reduce moisture problems below the floor slab, a vapor retarder such as polyethylene sheeting should be provided beneath the slab. PSI recommends that a minimum four-inch-thick, free draining granular mat be placed beneath the slab. Adequate



construction joints, as necessary, and reinforcement should be provided to reduce the potential for cracking of the floor slab due to differential movement. The design should take into account the added effect of trees and non-seasonal moisture sources, such as irrigation, plumbing or drainage leaks and poor surface drainage.

The foundation excavations should be observed by a representative of PSI prior to concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Soft or loose soil zones encountered at the bottom of the excavations should be removed to the level of firm soils or adequately compacted fill or stabilized soil as directed by the Geotechnical Engineer. Cavities formed as a result of excavation of soft or loose soil zones should be backfilled with lean concrete or recommended fill, as determined by the Geotechnical Engineer.

Surface run-off water should be drained away from the excavations and not be allowed to pond. The structures' foundation concrete should be placed during the same day the excavation is made. If it is required that excavations be left open for more than one day, they should be protected to reduce evaporation or entry of moisture. Consideration should be given to the use of interceptor drains to collect and remove water accumulating around the perimeter and underneath the slab. The interceptor drains could be incorporated with the storm drains of other utilities located on-site.

3.6 DRILLED PIER FOUNDATION RECOMMENDATIONS

It is anticipated drilled pier foundations are also under consideration for support of the proposed classroom additions. Properly sized straight shaft cast-in-place concrete drilled piers bearing in the shale bedrock material can be used for the project.

The piers should be founded in the shale bedrock a minimum of 2 feet or one pier diameter, whichever is greater, and should be a minimum length of 10 feet or a length to diameter ratio (L/D) not less than 3, whichever is deeper, below the grade beam. The piers founded as recommended can be designed for allowable unit end-bearing capacity of 22,500 psf and allowable unit skin friction capacity of 1,200 psf, based on dead load plus design live load. The skin friction capacities are applicable to the portion of drilled shaft extended beyond the recommended minimum length into the bearing material. The allowable values are based on factors of safety of 2 and 3 for end bearing and skin friction, respectively.

The piers should be reinforced for the full depth to resist uplift forces due to the expansive clays. Reinforcement quantity should be adequate to resist tensile uplift forces generated by the clay soils equal to 600 psf over the upper 8 feet of the pier shaft. The piers should be designed after considering the dead load, the friction force in the rock, and the uplift force within the active depth.

Piers should be designed with a shaft diameter of at least 18 inches. Properly constructed piers bearing in the recommended bearing materials should experience total maximum settlement on the order of ½ inch or less.

It may be difficult for the drilling contractor to determine or identify proper recommended bearing material. Therefore, it is recommended PSI perform the pier construction observations and documentation.

The pier construction should also be observed by a representative of the Geotechnical Engineer to assess that the foundation materials have adequate strength to support the design loads and are consistent with the



materials recommended in this report. Particular attention should be given to observation at locations where soil sloughing or groundwater inflow problems may occur.

Soft or loose soil zones encountered at the bearing level should be removed from the drilled shafts. If the exposed bearing material becomes significantly wet or dry, it should be removed, and the pier deepened until more uniform moisture conditions are achieved. Concrete should be placed in the piers the same day they are excavated to prevent weakening of the shaft wall and bottom.

Although not anticipated, slurry and/or casing may be required to advance the drilled piers, especially if sloughing soil or groundwater is encountered. Concrete placed in the piers should have a slump in the range of 5 to 7 inches. This range of slump will help to reduce the potential for formation of voids, especially as casing is extracted. The concrete mix should be designed to attain the required strength when placed at such a slump. The drilled shafts should be filled with concrete as soon as practical to reduce the potential of groundwater related problems and weathering of the excavation wall. During simultaneous concrete placement and casing removal operations, sufficient concrete head should be maintained inside the casing to offset hydrostatic head outside the casing, and to prevent the intrusion of soil and possible groundwater into the pier concrete, if present.

3.6.1 LATERAL RESISTANCE DESIGN PARAMETERS

For drilled shafts, the soils and bedrock as well as the rigidity of the shaft will resist the lateral loads applied to the shaft. Lateral load analysis can be performed based on methods ranging from chart solutions to the 'p-y' approach utilizing computer programs such as LPILE or the public domain COM624.

The lateral design information regarding the 'p-y' data is provided in this section. The relationship between the soil resistance (p) and pile deflection (y) is commonly referred to as 'p-y'. Along the depth of the shaft, soil resistance (p) is expressed as a non-linear function of lateral shaft deflection (y). Various researchers developed 'p-y' criteria for different kinds of soils. The 'p-y' curves can be automatically generated utilizing the computer program LPILE or the public domain COM 624. The program LPILE was developed by Lymon Reese and Shin-Tower Wang, Ensoft, Inc. and based on the COM 624 developed for the FHWA by the authors and made available by the FHWA. The parameters for generation of 'p-y' criteria from LPILE as well as COM 624 are provided for the analyses of the shafts.

Parameters to Be Used in the Lateral Load Analyses					
Stratum	'p-y' Criteria	**Total Unit Weight, γ (pcf)	ϕ (deg.) or S_u or Q_u (psf)	*** K_s or $K_{unsat.}$ (pci) or K_c or $K_{sat.}$ (pci) or E (psi)	*** ϵ_{50} or K_{rm} or RQD
I*	Clay Criteria	120	$S_u = 1,500$	$K_s = 500$ or $K_c = 200$	$\epsilon_{50} = 0.0070$
II	Clay Criteria (Shaley)	130	$S_u = 5,400$	$K_s = 1,800$ or $K_c = 720$	$\epsilon_{50} = 0.0042$
III	Rock Criteria	135	$Q_u = 15,000$	$E = 50,000$	$k_{rm} = 0.0003$ RQD = 50% (idealized)



Note: S_u : Undrained Shear Strength (psf); Q_u : Unconfined Compressive Strength (psf); ϕ , Angle of Internal friction; K_{unsat} : modulus of subgrade reaction (pci) for unsaturated soil condition; K_{sat} : modulus of subgrade reaction (pci) for saturated soil condition; K_s : modulus of subgrade reaction (pci) for static loading condition; K_c : modulus of subgrade reaction (pci) for cyclic loading condition; E : Initial modulus (psi); ϵ_{50} : strain corresponding to one-half the principle stress. K_{rm} : a constant for overall stiffness; RQD: Rock Quality Designation.

* Neglect the top 3' of Stratum I soils for the lateral load analysis appropriately based on the location of the pile head
 ** For submerged portion of pier, use effective unit weight γ'
 ***It may be possible to default to the computer program generated values

PSI can assist in performing the lateral response analysis under a separate work proposal.

3.7 FLOOR SLAB RECOMMENDATIONS

The building's grade supported floor slab used in conjunction with the conventional spread footing or drilled pier and grade beam foundation system should be supported on a minimum 2 feet of properly compacted structural fill or modified existing soil used as fill. When supported on a minimum 2 feet of the recommended materials, the potential vertical rise (PVR) is expected to be 1 inch or less. Proof-rolling, as discussed earlier in this report, should be accomplished to identify soft or unsuitable soils that should be removed from the floor slab areas prior to fill placement and floor slab construction. Fill soils under the slabs should be moisture conditioned at or above the optimum moisture content throughout the construction process.

For the properly compacted structural fill and existing soil, modulus of subgrade reaction, k , value of 120 pounds per cubic inch (pci) may be used in the grade slab design based on a 1 ft. x 1 ft. plate load test. However, depending on how the slab load is applied, the value will have to be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesive and cohesionless soils:

Modulus of Subgrade Reaction,

$$k_s = \frac{k}{B} \text{ for cohesive soil, and}$$

$$k_s = k \left(\frac{B+1}{2B} \right)^2 \text{ for cohesionless soil (not recommended for replacing undercut in}$$

relatively impermeable soils)

where:

- k_s = coefficient of vertical subgrade reaction for loaded area,
- k = coefficient of vertical subgrade reaction for 1x1 square foot area,
- B = width of area loaded, in feet (or effective width, B' , for grade beam, continuous footing, or mat/raft foundation)

PSI recommends that a minimum four-inch thick free draining granular mat be placed beneath the building floor slabs to enhance drainage. Prior to placing drainage layer, the subgrade should be graded to drain and not provide pockets to trap water. In moisture sensitive areas for equipment and flooring, vapor retarder should be installed with the grade supported slab construction according to ACI criteria. The floor slabs should have an adequate number of joints to reduce cracking resulting from differential movement and shrinkage.



3.7.1 STRUCTURAL SLAB

As an alternative to providing a minimum of 2 feet of suitable material below grade supported floor slab, a structural slab with a minimum of 4 inches of void space along with the drilled pier and grade beam foundation system may be considered. The 4-inch void space should be provided below the slab and the grade beam elements. If a structural slab as recommended above is used, removing and replacing 2 feet of the existing soil will not be required.

3.8 LATERAL EARTH PRESSURE RECOMMENDATIONS

It is anticipated a below grade earth retention system may be required as part of the proposed construction. To control hydrostatic loading on earth retention systems, it is recommended that a perforated drainpipe be installed at the footing level. The drainpipe should be sloped to provide positive drainage to a sump where water can be collected and removed or to a site storm sewer/drainage. The drain line should be wrapped with filter fabric to prevent intrusion of fines and backfilled with free draining granular material extending vertically above the drain line to within 1 foot of final grade. The granular section behind the earth retention system should have a minimum width of 1 foot and should be encapsulated in a suitable filter fabric to minimize intrusion of fines. The remaining portion of the excavation should be backfilled with structural fill or completed with granular material. The use of a prefabricated drainage blanket on the earth retention system may also be considered to prevent hydrostatic loading. Drainage blankets should be installed in accordance with manufacturer’s recommendations.

The actual earth pressure on the walls will vary according to the type of material to be retained and backfill materials used and how the backfill is compacted. The equivalent fluid pressures (γ_{eq}) presented below, provide lateral earth pressures for design of walls using compacted granular backfill where the cut slope, if applicable, is 60° or less from the horizontal and for existing soil and structural backfill soil, and are applicable for a horizontal surface behind the earth retention system.

Lateral Soil Resistance Design Parameters								
Soil Supported	Angle of Internal Friction, ϕ	Lateral Coefficient, K			Presumptive Total Unit Weight, pcf	Equivalent Fluid Unit Weights, γ_{eq} , psf/ft		
		Active, K_a	Passive, K_p	At-Rest, K_o		Active	Passive	At-Rest
Granular Soil Placed	32°	0.31	3.25	0.47	115	35	374	54
In-Situ Shaley Clay Soil	25°	0.41	2.46	0.58	130	53	320	75
In-Situ Clay Soil	20°	0.49	2.04	0.66	120	59	245	79

The at-rest values should be used if walls cannot yield at top during backfilling and service conditions and passive pressure values should be used where the structure will push into the soil. The active condition is applicable where the ratio of the horizontal movement of the top of the wall to the wall height is equal to or greater than 1/240.

If granular soil is utilized at the base of the structure, ultimate base friction coefficient of 0.53 may be considered and if granular support is not provided at the base of the structure an ultimate base adhesion value of 600 psf may be considered. An appropriate factor of safety should be applied.



Typically, only half of the passive pressure may be used to resist lateral loads due to the amount of strain required to fully mobilize the passive pressure. The above values of equivalent fluid pressure are based upon horizontal grade at the top of the wall including no surcharge loads within a distance that is twice the wall height.

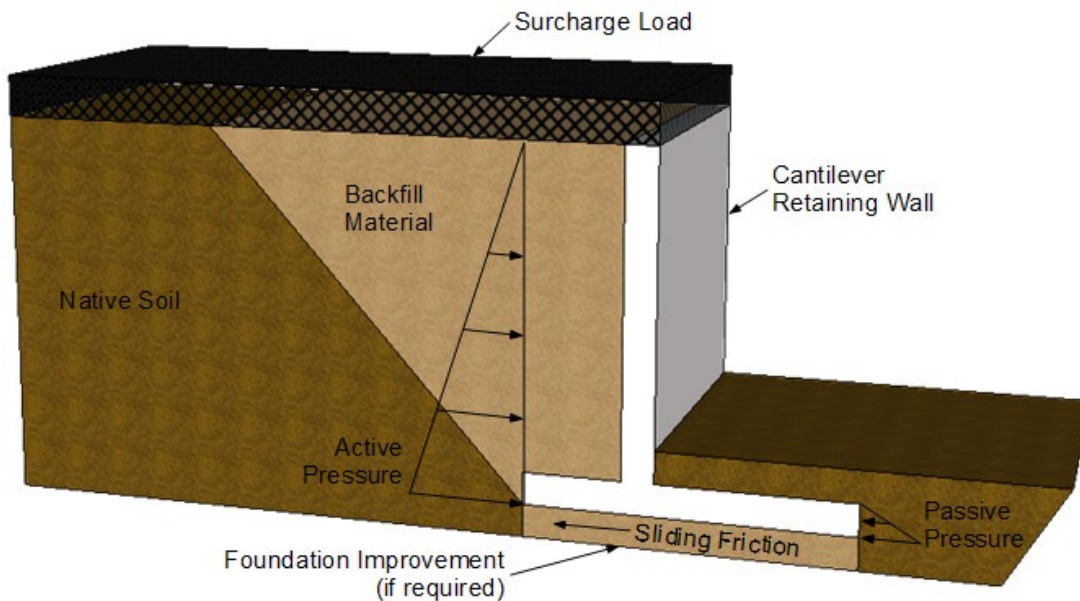
Since specific information about potential backfill material is not available for this report, PSI estimates the material may also consist of compacted clays or silts, apart from sand or structural fill assumed above, or combinations. For compacted lean clay and sandy silt, the following lateral pressure coefficient values behind the wall can be considered when applicable.

Compacted Soil Lateral Pressure Coefficients				
Soil Type	Active		At-Rest	
	K_a	γ_{eq} , psf/ft	K_o	γ_{eq} , psf/ft
Clay	0.59	74	0.74	93
Silt	0.53	66	0.69	86

γ_{eq} , - equivalent fluid pressure

When loads including traffic are present near wall, the wall should be designed to resist an additional uniform lateral load based on the active coefficient. This additional traffic load may be taken as a 2-foot surcharge load with a total unit weight of 125 pcf. Care should be exercised during the backfilling of the walls to prevent overstressing and damage to the walls. Sub-drains should be installed to avoid the buildup of hydrostatic pressure behind the retaining walls.

The following illustration provides general requirements for the design and installation of retaining walls.





3.9 CORROSIVITY OF SOIL

The concentration of water-soluble sulfates is considered to be a good indicator of the potential for chemical attack on concrete. PSI performed pH and soil water soluble sulfate content tests of a select soil sample from the project site. The results are reproduced below:

Water Soluble Sulfate Test Results				
Boring	Depth (ft)	Soil pH	Sulfate Content	
			ppm (mg/kg)	Percent by Weight
DB-3	3	7.8	360	0.036

Based on the ACI Manual of Concrete Practice (ACI 201.2R-10) or (ACI 318/318R-33), the amount of water-soluble sulfates in soil can be used to evaluate the need for protection of concrete based on the following table:

REQUIREMENTS FOR CONCRETE EXPOSED TO SULFATE	
Water Soluble Sulfate in soil (percent by weight)	Sulfate Exposure
0.00 to 0.10	Negligible or Class 0 Exposure
0.10 to 0.20	Moderate or Class 1 Exposure
0.20 to 2.00	Severe or Class 2 Exposure
Over 2.0	Very Severe or Class 3 Exposure

Based on the test result, the water-soluble sulfates ion concentration is relatively low and the potential for reactions within concrete exposed to sulfates is in the Negligible or Class 0 exposure. The evaluation of soluble sulfate content contained within the selected sample indicates that any cement type may be used at this site. The actual cement type to be used should be determined by the project Structural Engineer.

The corrosion potential of the soils as regards buried conduits and metals may be dependent on the acidity and/or basicity (pH value) of the soil. The results of laboratory pH tests performed on selected soil samples obtained from drilling are indicated in the following table:

Resistivity (ohm-cm) and pH			
Boring No.	Depth (ft)	pH	Corrosivity
DB-3	3	7.8	Moderately Corrosive

Based upon the corrosivity test results, the soils can be considered moderately corrosive to underground metallic conduits. Therefore, metal pipe may be used, but should be analyzed by the structural/corrosion engineer for protection recommendations.

However, generally for risk of corrosion, it should be noted that the building area contained 1 main mapped soil series, the Kirkland-Urban land-Pawhuska complex, based on the USDA/NRCS web based published information.



The components of the soil complex are rated as moderate risk of corrosion to concrete and high risk of corrosion of uncoated steel for Kirkland soil and high risk of corrosion to concrete and high risk of corrosion of uncoated steel for Pawhuska soil. Properties of Urban land soils could vary significantly and cannot be readily quantified.



4 PAVEMENT RECOMMENDATIONS

4.1 SUBGRADE SOIL PREPARATION

PSI has based its recommendation on subgrade soils prepared to achieve a minimum CBR value of 3, with proper proof-rolling and the site not being wet at the time of construction. The pavement subgrade should be prepared as discussed in the “Site Preparation” section of this report.

4.2 PAVEMENT DESIGN

The PSI scope of services did not include extensive sampling or CBR testing of the existing subgrade or potential sources of imported fill for the specific purpose of detailed pavement analysis. Instead, PSI has estimated pavement related design parameters that are considered to be typical for the area and soil types.

The recommended pavement sections presented below are considered minimum for the pavement design parameters used. PSI understands that non-technical considerations sometimes result in thinner pavement sections than those presented. However, the client, the owner, and the project principals should be aware that thinner pavement sections might result in increased maintenance costs and lower than anticipated pavement life.

Pavement sections were evaluated using Pavement Assessment Software (PAS) which is based on the 1993 AASHTO Design equations; a reliability factor of 85%; and a flexible pavement 18-kip single axle load (ESAL) of 13,000 for standard duty (car parking) and 48,000 for heavy duty parking areas and drive areas. The design life for standard duty and heavy-duty pavements are 10 years and 20 years, respectively. Flexible Pavements were evaluated based on an initial serviceability of 4.2 and a terminal serviceability of 2.0. Rigid pavements were evaluated based on an initial serviceability of 4.5, a terminal serviceability of 2.0, and an unreinforced concrete mix with a 28-day modulus of rupture of 650 psi (approximately 3,500 psi compressive strength). The pavement sections presented for the rigid pavements represent minimum thickness recommendations by PSI and the ESAL loads are in excess of 0.2 million. PSI should be contacted if traffic loads, especially truck traffic in loading areas and the frequency idealized, are greater than used in the analysis. Pavement materials should conform to local and state guidelines, if applicable.

Flexible Pavement Thickness (Inches)		
Pavement Materials	Light Duty	Heavy Duty
Asphaltic Surface Course	1½	2
Asphaltic Base Course	2½	3
Stabilized Subgrade	8	8
ODOT Type A Aggregate Base (Optional)	6	



Rigid Pavement Thickness (Inches)		
Pavement Materials	Light Duty (minimum)	Heavy Duty (minimum)
Portland Cement Concrete	5	6
Stabilized Subgrade	8	8
ODOT Type A Aggregate Base (Optional)	4	

Water should not be allowed to pond behind curbs. In down grade areas, base stone should extend through the slope to allow any water entering the base stone a path to exit.

Proper finishing of concrete pavements requires the use of appropriate construction joints to reduce the potential for cracking. Construction joints should be designed in accordance with current Portland Cement Association (PCA) guidelines. Joints should be sealed to reduce the potential for water infiltration into pavement joints and subsequent infiltration into the supporting soils.

The design of steel reinforcement should be in accordance with accepted codes. The concrete should have a minimum compressive strength of 3,500 psi at 28 days. The concrete should also be designed with 5±1 percent entrained air to improve workability and durability. All pavement materials and construction procedures should conform to ODOT or appropriate city and county requirements.

Large front-loading trash dump trucks frequently impose concentrated front-wheel loads on pavements during loading. This type of loading typically results in rutting or cracking of the pavement and ultimately, pavement failures. **Therefore, we recommend that the pavement in trash pickup areas consists of a minimum 7 inches thick, reinforced concrete slab placed over a minimum 4-inches thick crushed stone base in addition to the required subgrade stabilization.**

4.2.1 CEMENT, LIME, OR FLY ASH STABILIZATION FOR PAVEMENT

To reduce the shrink/swell potential of the subgrade soils, the upper 8 inches of the subgrade soil should be stabilized with Portland cement, hydrated lime, or Class 'C' fly ash from a source approved by ODOT. Stabilizing the soil with an estimated 5 to 7 percent cement or lime or an estimated 12 to 14 percent fly ash, by dry weight, will reduce the potential volumetric changes due to the medium high to high shrink/swell potential soil and extend the life of the pavement. The actual cement, lime or fly ash percentage should be determined based on laboratory tests after the source of the stabilizing agent has been determined.



5 CONSTRUCTION CONSIDERATIONS

5.1 EXCAVATIONS

The following is provided in this report for the client's information. In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". It is mandated by this Federal regulation that excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is PSI's understanding that these regulations are being strictly enforced and if not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and Federal safety regulations.

PSI is providing this information solely as a service to the client. PSI does not assume responsibility for construction site safety or the contractor's compliance with local, state, and Federal safety or other regulations.



6 REPORT LIMITATIONS

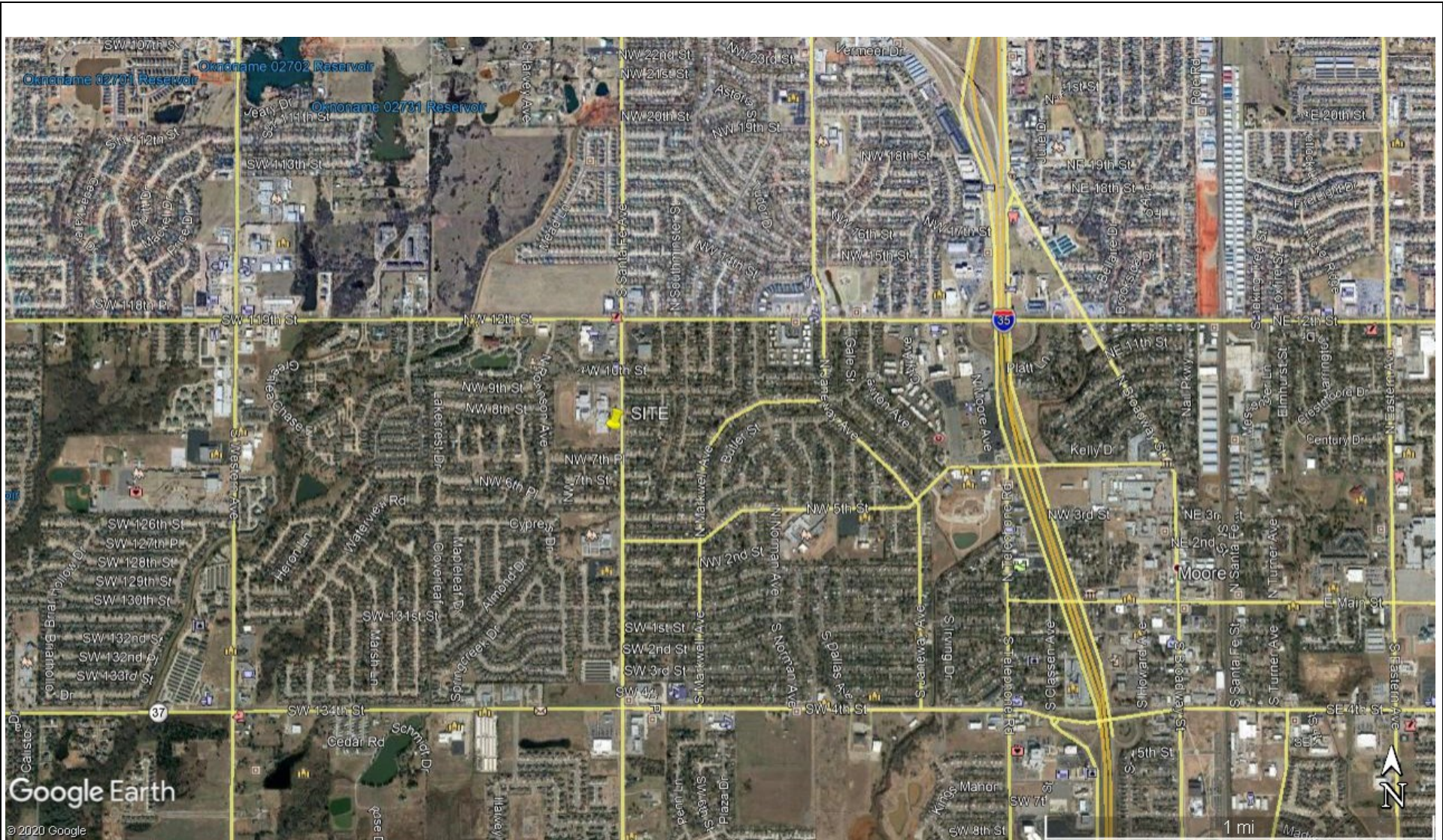
The recommendations submitted are based on the available subsurface information obtained by PSI and details furnished by AGP for the proposed project. If there are revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the foundation recommendations are required. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the project.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

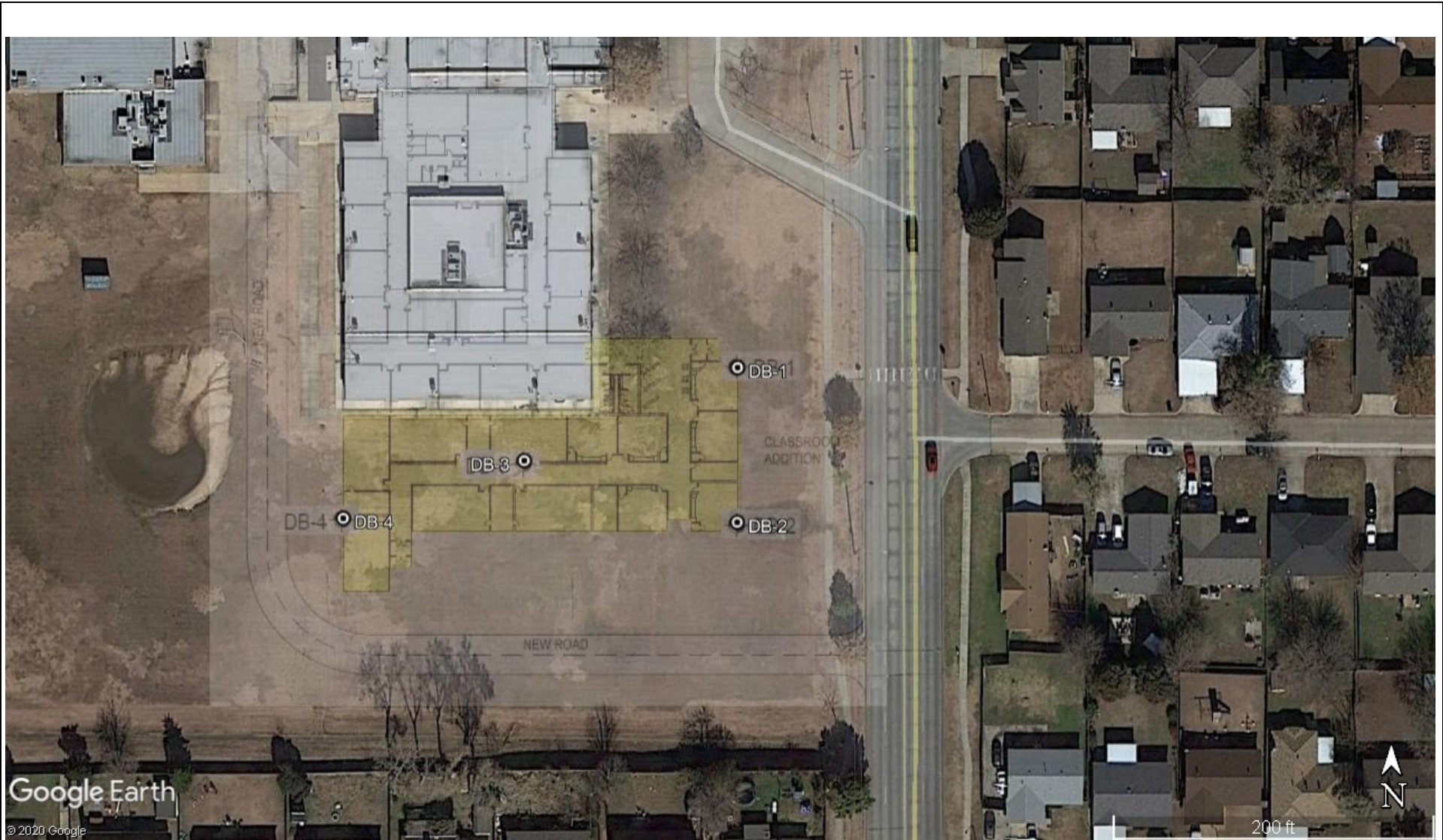
After the plans and specifications are more complete, the Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that PSI's engineering recommendations have been properly incorporated into the design documents. At this time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of AGP for the specific application to the proposed Moore Public Schools Highland West Junior High School New Classroom Addition in Moore, Oklahoma.



FIGURES



Project	HIGHLAND WEST JUNIOR HIGH SCHOOL ADDITION—MOORE, OK	
Drawing	SITE VICINITY	Project No. 05462142-4
Drawn By	Y. Zhang	Figure FIGURE 1
Date	July 2020	



<i>Project</i>	HIGHLAND WEST JUNIOR HIGH SCHOOL ADDITION—MOORE, OK		
<i>Drawing</i>	BORING LAYOUT PLAN	<i>Project No.</i>	05462142-4
<i>Drawn By</i>	Y. Zhang	<i>Figure</i>	FIGURE 2
<i>Date</i>	July 2020		



LIST OF APPENDICES



APPENDIX A – BORING LOGS AND PROFILES

DATE STARTED: 3/25/20 **DRILL COMPANY:** DSO
DATE COMPLETED: 3/25/20 **DRILLER:** T. Simpson **LOGGED BY:** B. Long
COMPLETION DEPTH: 25.0 ft **DRILL RIG:** ATV
BENCHMARK: N/A **DRILLING METHOD:** Soild Flight Auger
ELEVATION: 100 ft **SAMPLING METHOD:** SS/TC
LATITUDE: 35.32732° **HAMMER TYPE:** Automatic
LONGITUDE: -97.55017° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** A. Oyesanya
REMARKS:

BORING DB-1

Water	▽ While Drilling	None observed
	▼ Upon Completion	None observed
	▽ Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS) Texas Cone (TC)	Moisture, %	STRENGTH, tsf	Additional Remarks	
0	0			1		Fat CLAY , stiff, dark grayish-brown to grayish-brown, fine roots, ferrous nodules to 1'	CH	2/2/3 N=5	25		STANDARD PENETRATION TEST DATA N in blows/ft ⊙ × Moisture ◼ PL ◼ LL STRENGTH, tsf ▲ Qu * Qp LL = 54 PL = 19 Fines=86.7%	
	2											
	3					3		Lean CLAY , very stiff, reddish-brown, brown mottling, calcareous inclusions, ferrous nodules at 3'	3/6/10 N=16	18		
95	5					4			4/6/13 N=19	18		
	4					5		Shaley CLAY , hard, red, calcareous inclusions	8/13/23 N=36	15		
	5					6		SHALE , highly weathered to 20', moderately hard to very hard, red with gray, siltstone layers interbedded throughout	15 50 (5.00")	12		
90	10					7			50 (5.50") 50 (2.75")			
	15					8			50 (0.75") 50 (0.38")			
85	20					9		End of boring	50 (0.75") 50 (0.13")			



Professional Service Industries, Inc.
 11825 S. Portland Avenue
 Oklahoma City, OK 73170
 Telephone: (405) 735-6052

PROJECT NO.: 05462142-4
PROJECT: Highland West Junior High School Addition
LOCATION: Moore, OK

DATE STARTED: 3/25/20 **DRILL COMPANY:** DSO
DATE COMPLETED: 3/25/20 **DRILLER:** T. Simpson **LOGGED BY:** B. Long
COMPLETION DEPTH: 25.0 ft **DRILL RIG:** ATV
BENCHMARK: N/A **DRILLING METHOD:** Soild Flight Auger
ELEVATION: 100 ft **SAMPLING METHOD:** SS/TC
LATITUDE: 35.34437° **HAMMER TYPE:** Automatic
LONGITUDE: -97.5125° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** A. Oyesanya

BORING DB-2

Water	▽ While Drilling	None observed
	▼ Upon Completion	None observed
	▽ Delay	N/A

BORING LOCATION:

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS) Texas Cone (TC)	Moisture, %	STRENGTH, tsf	Additional Remarks		
0	0			1		Fat CLAY , very stiff, brown with red, fine roots, ferrous nodules at 1', possible fill		3/7/8 N=15	24				
	2									18			
	3							Lean CLAY , stiff to very stiff, reddish-brown, possible fill to 4.5'		4/5/7 N=12	24		
95	5						...light gray inclusions	CL	4/7/11 N=18	18		LL = 35 PL = 16 Fines=91.4%	
	4												
	5						...becomes shaley clay		13/27 50 (6.00")	12			
90	10						SHALE , moderately hard to hard, red with gray, siltstone layers interbedded throughout		50 (1.50") 50 (1.25")				
	6												
85	15								50 (2.00") 50 (0.75")				
	7												
80	20						50 (1.00") 50 (0.50")						
	8												
75	25					End of boring	50 (0.75") 50 (0.38")						
	9												



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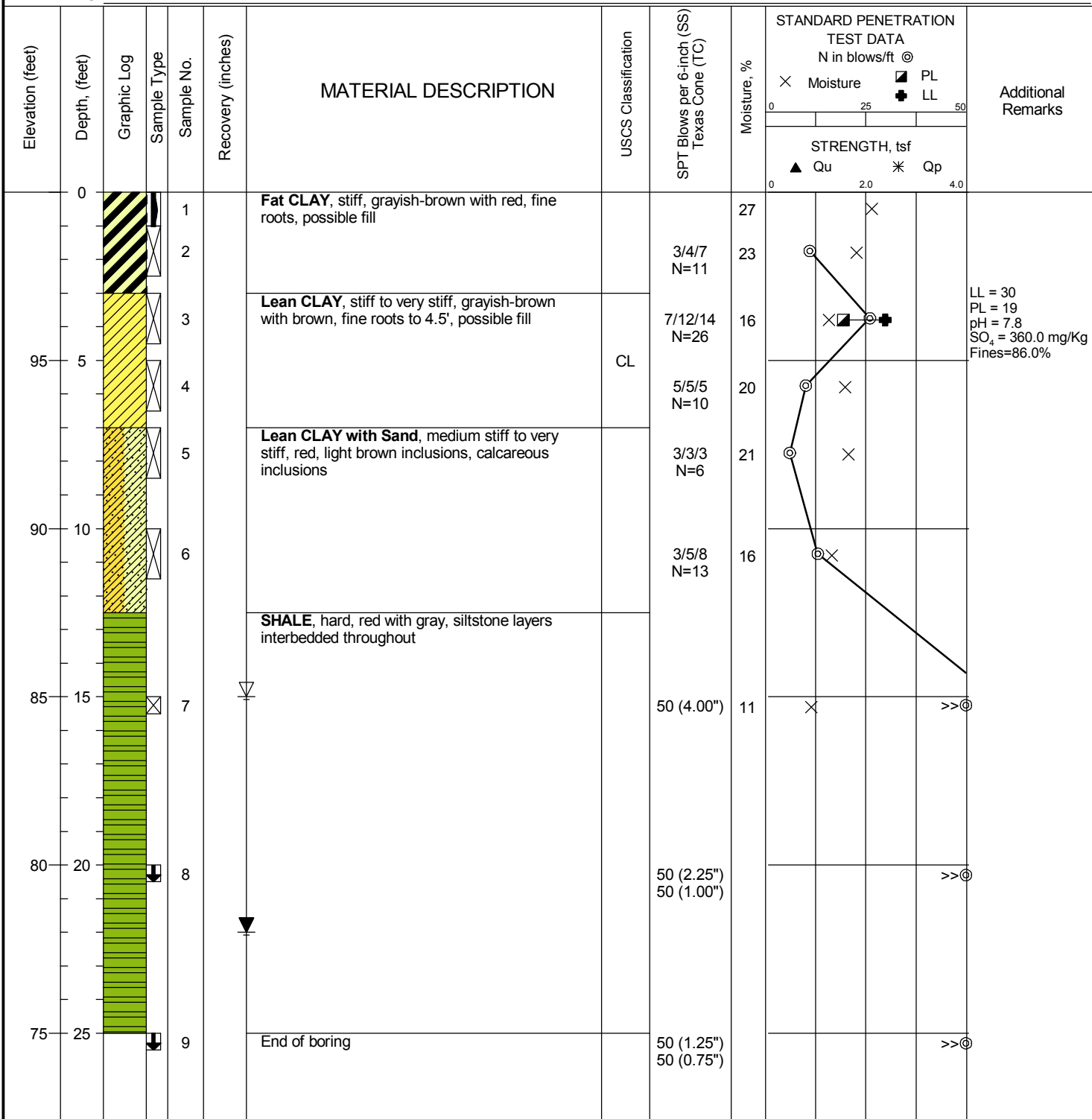
PROJECT NO.: 05462142-4
PROJECT: Highland West Junior High School Addition
LOCATION: Moore, OK

DATE STARTED: 3/25/20 **DRILL COMPANY:** DSO
DATE COMPLETED: 3/25/20 **DRILLER:** T. Simpson **LOGGED BY:** B. Long
COMPLETION DEPTH: 25.0 ft **DRILL RIG:** ATV
BENCHMARK: N/A **DRILLING METHOD:** Soild Flight Auger
ELEVATION: 100 ft **SAMPLING METHOD:** SS/TC
LATITUDE: 35.34448° **HAMMER TYPE:** Automatic
LONGITUDE: -97.51295° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** A. Oyesanya
REMARKS:

BORING DB-3

Water	▽	While Drilling	15 Ft.
	▼	Upon Completion	22 Ft.
	▽	Delay	N/A

BORING LOCATION:



Professional Service Industries, Inc.
 11825 S. Portland Avenue
 Oklahoma City, OK 73170
 Telephone: (405) 735-6052

PROJECT NO.: 05462142-4
PROJECT: Highland West Junior High School Addition
LOCATION: Moore, OK

DATE STARTED: 3/25/20 **DRILL COMPANY:** DSO
DATE COMPLETED: 3/25/20 **DRILLER:** T. Simpson **LOGGED BY:** B. Long
COMPLETION DEPTH: 25.0 ft **DRILL RIG:** ATV
BENCHMARK: N/A **DRILLING METHOD:** Soild Flight Auger
ELEVATION: 100 ft **SAMPLING METHOD:** SS/TC
LATITUDE: 35.34438° **HAMMER TYPE:** Automatic
LONGITUDE: -97.51332° **EFFICIENCY:** N/A
STATION: N/A **OFFSET:** N/A **REVIEWED BY:** A. Oyesanya

BORING DB-4			
Water	▽	While Drilling	15 Ft.
	▼	Upon Completion	20 Ft.
	▽	Delay	N/A

BORING LOCATION: _____

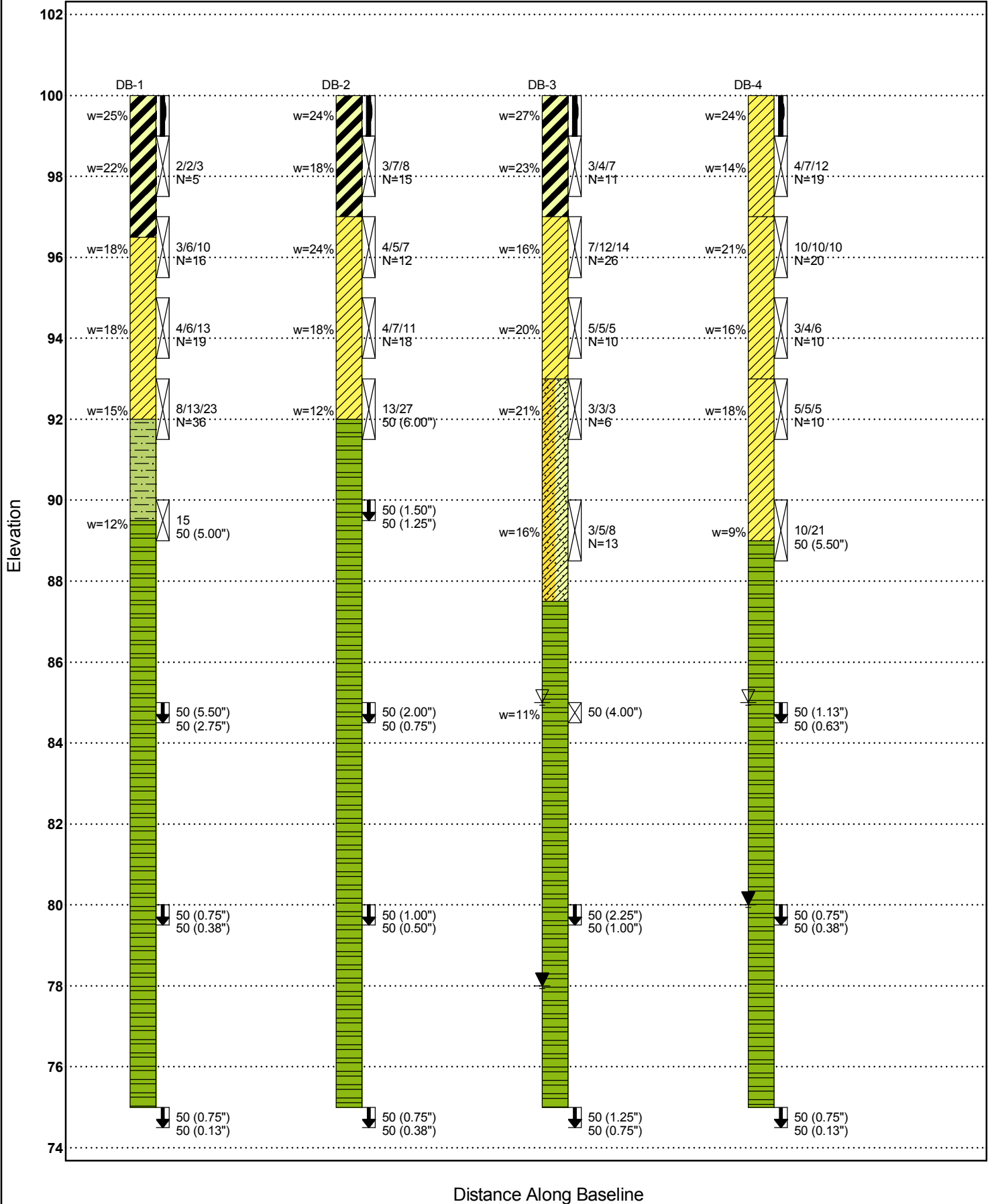
Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6-inch (SS) Texas Cone (TC)	STANDARD PENETRATION TEST DATA N in blows/ft @		Additional Remarks
									Moisture, %	STRENGTH, tsf	
0				1		Lean CLAY , very stiff, dark brown, fine roots, possible fill			24	×	
				2				4/7/12 N=19	14	⊗	
				3		Lean CLAY , stiff to very stiff, brown with orange to dark brown mixed with brown and rust, ferrous nodules, fine roots, possible fill	CL	10/10/10 N=20	21	⊗	LL = 44 PL = 17 Fines=87.6%
95	5			4				3/4/6 N=10	16	×	
				5		Lean CLAY , stiff, red with light gray		5/5/5 N=10	18	×	
90	10			6		...becomes shaley clay SHALE , moderately hard to very hard, red with light gray, siltstone layers interbedded throughout		10/21 50 (5.50")	9	×	>>⊗
85	15			7				50 (1.13") 50 (0.63")			>>⊗
80	20			8				50 (0.75") 50 (0.38")			>>⊗
75	25			9		End of boring		50 (0.75") 50 (0.13")			>>⊗



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PROJECT NO.: 05462142-4
PROJECT: Highland West Junior High School Addition
LOCATION: Moore, OK

Profile



Distance Along Baseline



APPENDIX B – LABORATORY TEST REPORTS



APPENDIX C – GENERAL NOTES

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.	☒ SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
HSA: Hollow Stem Auger - typically 3 1/4" or 4 1/4" I.D. openings, except where noted.	■ ST: Shelby Tube - 3" O.D., except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry	▮ RC: Rock Core
R.C.: Diamond Bit Core Sampler	↓ TC: Texas Cone
H.A.: Hand Auger	☞ BS: Bulk Sample
P.A.: Power Auger - Handheld motorized auger	☑ PM: Pressuremeter
	CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N ₆₀ : A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q _u : Unconfined compressive strength, TSF
Q _p : Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼, ▼, ▼ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

<u>Relative Density</u>	<u>N - Blows/foot</u>
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 49
Very Dense	50+

ANGULARITY OF COARSE-GRAINED PARTICLES

<u>Description</u>	<u>Criteria</u>
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

<u>Component</u>	<u>Size Range</u>
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

<u>Description</u>	<u>Criteria</u>
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

<u>Q_u - TSF</u>	<u>N - Blows/foot</u>	<u>Consistency</u>
0 - 0.25	0 - 1	Very Soft
0.25 - 0.50	2 - 3	Soft
0.50 - 1.00	4 - 6	Medium Stiff
1.00 - 2.00	7 - 12	Stiff
2.00 - 4.00	13 - 26	Very Stiff
4.00 +	26+	Hard

MOISTURE CONDITION DESCRIPTION

<u>Description</u>	<u>Criteria</u>
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

<u>Descriptive Term</u>	<u>% Dry Weight</u>
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

<u>Description</u>	<u>Criteria</u>	<u>Description</u>	<u>Criteria</u>
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick	Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick	Lensed:	Inclusion of small pockets of different soils
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing	Layer:	Inclusion greater than 3 inches thick (75 mm)
Slickensided:	Fracture planes appear polished or glossy, sometimes striated	Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
		Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

<u>Q_u - TSF</u>	<u>Consistency</u>
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

<u>Description</u>	<u>Criteria</u>
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

<u>Voids</u>	<u>Void Diameter</u>
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

<u>Component</u>	<u>Size Range</u>
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

<u>Rock Mass Description</u>	<u>RQD Value</u>
Excellent	90 - 100
Good	75 - 90
Fair	50 - 75
Poor	25 - 50
Very Poor	Less than 25

DEGREE OF WEATHERING

Slightly Weathered:	Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered:	Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered:	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS	
			GRAPH	LETTER		
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS (LITTLE OR NO FINES)	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	(APPRECIABLE AMOUNT OF FINES)			GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
		SAND AND SANDY SOILS (LITTLE OR NO FINES)	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
						SP
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES			SM	SILTY SANDS, SAND - SILT MIXTURES
			(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
		FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML
					CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50				MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
				CH	INORGANIC CLAYS OF HIGH PLASTICITY	
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
	HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

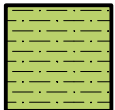
Graphic Symbols for Materials and Rock Deposits



CONCRETE
Portland Cement Concrete



BITUMINOUS CONCRETE



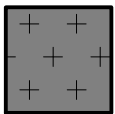
CLAYSTONE



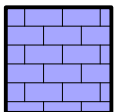
COAL
Coal, Anthracite Coal



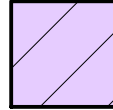
CONGLOMERATE/BRECCIA
Conglomerate, Breccia



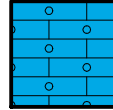
IGNEOUS ROCK
Anorthosite, Basalt, Metabasalt, Diabase (Gabbro), Gabbro, Granite/Granodionite, Homfels, Pegmatite, Rhyolite/Metarhyolite



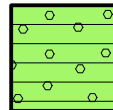
LIMESTONE
Limestone, Dolomite



METAMORPHIC ROCK
Amphibolite, Gneiss, Marble, Phyllite, Quartzite, Schist, Serpentinite, Slate



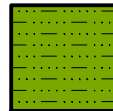
CHERT



SANDSTONE
Sandstone, Orthoquartzite (Sandstone)



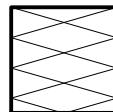
SHALE



SILTSTONE



NO RECOVERY



VOID

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010-SUMMARY OF THE WORK

Part 1 - General

1.01 Work Included:

- A. The General Conditions, Bidding Requirements, and Division I are hereby made a part of each of the technical sections that follow, and shall be understood to apply and shall apply in full to all individuals or corporations who contract or subcontract to perform any part or all of the project work.
- B. Indications on the working drawings or in any section of the specifications of an article or material, operation, or method, requires that the Contractor shall provide each item or service or quality or is subject to qualifications noted; and, the Contractor shall perform each operation prescribed according to the conditions stated providing, therefore, all necessary labor, equipment and incidentals to complete the project work.
- C. The project:
 - 1. Name: Highland West Junior High School STEM Addition
- Moore Public Schools.
 - 2. Location: 901 N. Santa Fe - Moore, Oklahoma.

1.02 Summary of Work:

- A. **Base Bid:** Provide and pay for all materials, labor, services, equipment, licenses, taxes, permits, and other items necessary for the complete construction of an (approximately) 20,865 s.f. new STEM classroom addition including new sidewalks, and site utilities. Contractor shall maintain all barriers, guards and other environmental items required at the site during construction.
- B. Owner: Moore Public Schools
 - 1. Owner's Representative:
Jeff Horn, Assistant Superintendent, Operations
Moore Public Schools
1500 SE 4th Street
Moore, OK 73160
405-735-4221
- C. Design Team:
 - 1. Architect:
Mike Abla, Principal Architect
AGP
201 N. Broadway, Suite 210
Moore, OK 73160
405-735-3477
 - 2. Structural Engineer:
Brandon Birch, Structural Engineer
KFC Engineering, Inc.
205 NW 63rd, Suite 390
Oklahoma City, OK 73116

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010-SUMMARY OF THE WORK

3. Mechanical, Electrical and Plumbing Engineers:
Dwayne Gordon, Mechanical Engineer
Salas O'Brien LLC
2600 Van Buren St., Suite 2604
Norman, OK 73072
405-364-9926
 4. Civil Engineer:
Derek Harris, Engineering Intern
Cedar Creek
P.O. Box 14534
Oklahoma City, OK 73113
405-863-8984
 4. Construction Manager:
Joe Sherga, Project Manager
Omni Construction LLC
1909 S. Eastern Ave.
Moore, OK 73160
405-735-3992
- 1.04 Work to be Provided and Installed By Others:
Not applicable.
- 1.05 Use of the Site:
- A. Confine operations at the site to the areas permitted under the contract. Portions of the site beyond areas on which work is indicated are not to be disturbed.
 - B. Keep facility free from accumulation of waste material, rubbish or construction debris.
- 1.06 Safety of Persons and property:
- A. Contractor shall at all times protect the building from damage from rainwater.
 - B. Contractor shall provide barricades and clearly mark work zone areas.
 - C. Refer to Special Conditions "Temporary Services" for additional information.
 - D. During the period of construction, the OSHA Standards shall be followed as applicable by law.
 - E. The Contractor shall post emergency telephone numbers.
- 1.07 Preconstruction Conference:
- A. A preconstruction meeting will be held at a time and place designated by the Architect or Owner's Representative, for the purpose of identifying responsibilities of the Owner's and the Architect's personnel and explanation of administrative procedures.
 - B. The Contractor shall use this meeting for the following minimum agenda:
 1. Construction Schedule/Project Phasing.
 2. Use of areas of the site.
 3. Delivery and storage.
 4. Safety.
 5. Security.
 6. Cleaning up.
 7. Subcontractor procedures relating to:
 - a. Submittals.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010-SUMMARY OF THE WORK

- b. Change orders.
 - c. Applications for payment.
 - d. Record documents.
 - C. The attendees shall include:
 - 1. The Owner's Representatives.
 - 2. The Architect.
 - 3. The Contractor and its superintendent.
- 1.08 Project Scheduling:
 - A. The Contractor is responsible for the scheduling of construction and must prepare a schedule and charting system described below. This schedule is to ensure adequate planning and execution of the work by the contractor and to assist the Architect in appraising the schedule and evaluating the progress of the work.
 - B. The project schedule shall be presented within ten (10) days after receipt of the Notice to Proceed. Electronic copies of the schedule shall be submitted to the Architect for review and approval.
 - C. The schedule logic must be in the form of a "fenced" bar chart or Critical Path Method network indicating the planned start and completion dates of the activity, logical constraints between activities, and total float of each activity.
 - D. An updated project schedule shall be provided when requested by the Architect.
- 1.09 Environmental Controls:
 - A. Water Resources:
 - 1. Oily substances: prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water.
 - 2. Mosquito abatement: prevent ponding of stagnant water conducive to mosquito breeding habitat.
 - B. Land Resources:
 - 1. Erodible soils: plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use the areas developed. Immediately protect side slopes and back slopes upon completion of rough grading.
 - C. Air resources:
 - 1. Prevent creation of dust, air pollution, and odors.
 - 2. Use water sprinkling, temporary enclosures, and other appropriate methods to limit dust and dirt rising and scattering in air to locate practical level.
 - 3. Store volatile liquids, including fuels and solvents, in closed containers.
 - 4. Properly maintain equipment to reduce gaseous pollutant emissions.
 - D. Comply with all applicable environmental control guidelines as required by the City of Moore.
- 1.10 Temporary Utilities:
 - A. The Contractor shall provide and pay for all temporary utilities required for the complete construction of the project including, but not limited to, electricity, lighting, heating,

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010-SUMMARY OF THE WORK

cooling, ventilating, telephone, water, sanitary facilities, exterior and interior enclosures, access roads and parking areas, cleaning and waste removal, project identification and signs, etc.

1.11 Cleaning:

- A. Use cleaning materials and agents recommended by manufacturer or fabricator of surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property, or that might damage finished surfaces.
- B. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of work to condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's published instructions.
- C. Complete cleaning operations prior to requesting a Final / Substantial Completion Inspection.

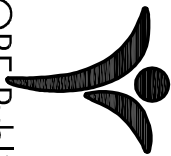
1.12 Project Sign:

- A. Provide and install painted plywood project sign on wooden posts securely erected at the project site in a location approved by the Owner.
- B. No other project signs or advertisement shall be allowed at the project site unless approved by the Owner.
- C. Graphics and form of letter of the project sign shall be as indicated in the attached detail.

End of Section

8'-0"

YOUR BOND FUNDS AT WORK



MOORE Public Schools
LEARNING FOR LIFE

HIGHLAND WEST JUNIOR HIGH SCHOOL STEM CLASSROOM ADDITION

ARCHITECT:

AGP - ABLA GRIFFIN PARTNERSHIP L.L.C.
MOORE, OKLAHOMA

CONTRACTOR:

OMNI CONSTRUCTION, L.L.C.
MOORE, OKLAHOMA

4'-0"

NOTES:

1. WHITE LETTERS ON DARK BLUE BACKGROUND
2. 3/4" EXTERIOR PLYWOOD - PAINTED ALL SIDES
3. MOUNT ON 4" X 4" WOOD POST
4. CONTRACTOR TO HAVE LAYOUT APPROVED PRIOR TO INSTALLATION

This SWP3 was prepared prior to an assigned General Contractor. General Contractor is responsible for reading and reviewing this SWP3 in its entirety. All highlighted areas will need to be completed prior to construction.

Stormwater Pollution Prevention Plan (SWP3)

Authorization No. OKR10

For Construction Activities At:

**Highland West Jr High
901 N Santa Fe Ave
Moore, OK 73160**

SWP3 Prepared For:

**OMNI Construction
PO Box 892245
Oklahoma City, OK 73189**

SWP3 Prepared By:

**Cedar Creek Consulting, Inc
PO Box 14534
Oklahoma City, OK 73113
405.778.3385
Cedarcreekinc.com**

SWP3 Preparation Date:

08/09/23

Estimated Project Dates:

Project Start Date: 09/01/23

Project Completion Date: 09/01/24

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Section 1: Stormwater Team and Project/Site Information

1.1 Stormwater Team

Stormwater team is responsible for overseeing development of the SWP3, making any modifications to it, implementing and maintaining control measures, taking corrective actions when required, performing site inspection and monitoring, supervising pollution prevention and waste management activities, providing staff training, and communicating changes in the SWP3 to the people working on the site. The following personnel, along with their role and responsibility, will be part of the **stormwater team** for my construction site:

Team Leader (Name/Title/Telephone)	Roles & Responsibilities
	Supervision & implantation of housekeeping program Providing Staff Training Routine Facility Inspection

Team Member # 1 (Name/Title/Telephone)	Roles & Responsibilities
	Maintenance of different structural BMPs Documenting changes to SWP3 Corrective Action Report

Team Member # 2 (Name/Title/Telephone)	Roles & Responsibilities
	Communicating the changes in SWP3 to people working on site. Development & amendment of SWP3

Team Member # 3 (Name/Title/Telephone)	Roles & Responsibilities
	Installation of different types of structural BMPs/stormwater controls

Team Member # 4 (Name/Title/Telephone)	Roles & Responsibilities

1.2 Nature of Construction Activity and Project Information

Project/Site Name and Address	
Project/Site Name: Highland West Jr High	
Project/Site Street/Location: 901 N Santa Fe Ave	
City: Moore	County: Cleveland
State: OK	ZIP Code: 73160

General Description of the Project/Site: Construction of building with supporting pavement, drainage, and utility facilities

Estimated project start date: 09/01/23	
Estimated project end date: 09/01/24	
Total area of the construction site:	1.80(acres)
Estimated area to be disturbed:	1.80(acres)
Estimated current impervious area at the site:	0.38(acres)
Estimated impervious area after construction:	.85(acres)
Pre-construction runoff coefficient of the site: .4	
Post-construction runoff coefficient of the site: .68	
Purpose of the Construction Project/Site: <input type="checkbox"/> Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Wind Farm <input type="checkbox"/> Road/Bridge <input type="checkbox"/> Other(s), please specify: Click here to enter text.	

Project Latitude/Longitude (for linear project, include latitude/longitude of start and end points)			
Latitude:	Longitude:		
1. 35°20'43.40"N (degrees, minutes, seconds)	1. 97°30'46.39"W (degrees, minutes, seconds)		
2. ____ . ____ ° N (decimal)	2. ____ . ____ ° W (decimal)		
Latitude:	Longitude:		
1. ____ ° ____ ' ____ " N (degrees, minutes, seconds)	1. ____ ° ____ ' ____ " W (degrees, minutes, seconds)		
2. ____ . ____ ° N (decimal)	2. ____ . ____ ° W (decimal)		
Method for determining latitude/longitude:			
<input type="checkbox"/> DEQ Flex-viewer	<input type="checkbox"/> EPA Website	<input type="checkbox"/> USGS topographic map	<input checked="" type="checkbox"/> GPS

<p>Description of soil type(s) and fill materials: 49-Kirkland-Urban land-Pawhuska Complex</p>
<p>Description of slopes (describe existing slopes and note any changes due to grading or fill activities): 0-3%</p>
<p>Description of drainage patterns (describe existing drainage patterns and note any changes dues to grading or fill activities): The property drains away from buildings toward concrete trickle channel located at the southeast of site.</p>
<p>Description of existing or baseline vegetation on or immediately surrounding the project area: Site is currently developed with buildings, structures, pavement and grasses</p>
Climate/Rainfall Patterns - check the box that applies:
<input type="checkbox"/> (0-20" annual rainfall) <input type="checkbox"/> (20" -30" annual rainfall)
<input type="checkbox"/> (30"-40" annual rainfall) <input checked="" type="checkbox"/> (40" -50" annual rainfall)
<p><i>(Note: Annual rainfall data can be found at the following link: https://www.mesonet.org/index.php/weather/category/rainfall)</i></p>

1.3 Operators and Contactor's Contact Information

Operator(s) Information:		
Name: Omni Construction, LLC		
Address: PO Box 892245		
City: Oklahoma City	State: OK	Zip Code: 73189
Operator's Point of Contact: Joe Sherga		
Telephone Number: 405-735-3992		
Email address: jsherga@coxinet.net		Fax number: 405-622-5649

Contractor's Information:		
Name:		
Address:		
City:	State:	Zip Code:
Telephone Number:		
Email address:		Fax number:

(If owner is a separate entity)

Sub-Contractor's Information:		
Name:		
Address:		
City:	State:	Zip Code:
Telephone Number:		
Email address:		Fax number:

SWP3 Contact(s):	
SWP3 Contact Name (Primary): Sheila Cruze	
Telephone number: 405.778.3385	
Email address: scruze@cedarcreekinc.com	Fax number:
SWP3 Contact Name (Backup): Andrew Wilson	
Telephone number: 405.778.3385	
Email address: awilson@cedarcreekinc.com	Fax number:

1.4 Construction Support Activities *(if applicable)*

List of construction support activities that will be available at the construction project/site:

Type of Construction Support Activities ¹	Will be Present at the Construction Site?
Equipment Staging Yards	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Material Storage Areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Excavated Material Disposal Areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Borrow Areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Concrete Batch Plant ²	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Asphalt Plant ²	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

(Note-1: Locate all the construction support activities on the site map. Appropriate/additional controls & measures are required for construction support activities. Support activities should not be located within the watershed of an Outstanding Resources Water (ORW).

Note-2: Include Section 8 if you have Concrete Batch Plant and/or Asphalt Plant as construction support activities at your construction site. Exclude/delete Section 8 if you don't have Concrete Batch Plant and/or Asphalt Plant at your construction site.)

1.5 Sequence of Construction Activities

(Note: You may edit sequence of construction activities in the following table to reflect your project's sequences along with estimated start date and duration)

No.	Sequence of Construction Activities	Estimated Start Date	Duration (in Days)
	Phase I		
1.	A pre-construction meeting shall be held by the general contractor's manager and the operator's engineer prior to land disturbing activities.	09/01/23	1
2.	Prepare and pull all necessary permits.	09/01/23	1
3.	Construct temporary construction exits at locations shown on the SWPPP plans and prepare temporary parking and storage area. Upon implementation and installation of the following areas: trailer, parking, lay down, port-a-potty, wheel wash, concrete washout, masons area, fuel and material storage containers, solid waste containers, etc., denote them on the site maps immediately and note any changes in the locations as they occur throughout the construction process	09/01/23	7
4.	Construct the silt fences on the site	09/01/23	7
5.	Demo, clear and grub the site	09/01/23	30
6.	Install public water, sewer, and box culvert	10/01/23	14
7.	Begin grading the site	09/01/23	14
8.	Start Construction of Building Pad and Structures.	10/16/23	14
9.	Disturbed areas of the site where construction activity has ceased for more than 14 days shall be temporarily seeded and watered	09/01/23	365
	Phase II		
10.	Install utilities, underdrains, storm sewers, curb and gutters	10/15/23	45
11.	Install inlet protection devices	10/15/23	45
12.	Install rip rap around outlet structures	09/15/23	45
13.	Finalize pavement subgrade preparation	11/01/23	7

14.	Install base material as required for pavement	11/09/23	7
15.	Pave lot	11/18/23	7
16.	Remove temporary construction exits only prior to pavement construction in these areas (these areas are to be paved last)	11/18/23	7
17.	Disturbed areas of the site where construction activity has ceased for more than 14 days shall be temporarily seeded and watered	09/01/23	365
18.	Fine grade and install permanent seeding and plantings	11/27/23	30
19.	Remove all temporary erosion and sediment control devised (only if site is stabilized)	12/27/23	4
20.	Remove inlet protections around inlets and manholes no more than 48 hours prior to placing stabilized base course.	01/01/24	3

1.6 Allowable Non-Stormwater Discharges

List of allowable non-stormwater discharges that will be present at the construction site:

No.	Type of Allowable Non-Stormwater Discharge	Likely to be Present at Construction Site?
1.	Fire hydrant flushing	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2.	Waters used to wash vehicles and equipment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
3.	Water used to control dust	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4.	Potable water including uncontaminated water line flushing	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5.	Routine external building wash down	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.	Pavement washing waters	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
7.	Uncontaminated air conditioning or compressor condensate	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
8.	Uncontaminated, non-turbid discharges of ground water or spring water	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
9.	Foundation or footing drains	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
10.	Landscape Irrigation	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
11.	Discharges from emergency fire-fighting activities	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
12.	Uncontaminated construction dewatering water	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

(Note: You are required to identify the likely locations of these allowable non-stormwater discharges on your site maps.)

Section 2: Site Description and Site Map

2.1 Receiving Waters/Discharge Information

Receiving Water body's Information: Stormwater discharges from this construction project will flow to the following receiving water body(ies).

No.	Name of the Receiving Waters	Is this surface water listed as impaired?	Cause of Impairment ¹	Has a TMDL ² been completed?	TMDL Pollutant(s)
1.	Pond Creek-Canadian River	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
2.		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3.		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4.		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5.		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	

(Note: Name of the receiving waters can be found at the DEQ website using the following link: <http://gis.deq.ok.gov/flexviewer/>. Cause of impairment and TMDL information can be found at the DEQ website using the following link: <http://www.deq.state.ok.us/WQDnew/wqprogrms.html>)

¹ If you discharge to impaired water that is impaired for **Sediment and/or Turbidity and located within 1 mile**, you are required to comply with the additional requirements in Part 3.5.1 of OKR10 permit.

² Total Maximum Daily Load (TMDL)

Does the project/site discharge stormwater to an **Aquatic Resource of Concern (ARC)** or an **Outstanding Resource Water (ORW)**?

Yes No, If yes, I must comply with specific buffer requirements (see Part 3.5.2 of OKR10 permit) and stabilization deadlines requirements (see Part 3.5.2 of OKR10 permit).

Does the project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)?

Yes No

If yes, what is the name of the MS4 operator? CITY OF MOORE

Note: See Table R-5 in the [MS4 Permit's Factsheet](#) for the MS4s information.

2.2 General Location Map

Provide a general location map (e.g., DEQ GIS Data Viewer or U.S. Geological Survey (USGS) quadrangle map or aerial image from the internet) with enough detail to identify the location of your facility and all receiving waters for your stormwater discharges within one mile of the construction site (see Part 4.3.5.D of the OKR10 permit).

A **general location map** is included in **Attachment A** of this SWP3.

2.3 Site Map

SWP3 includes a legible site map or series of site maps/erosion and sediment control plans showing all the features (see also Part 4.3.5 of OKR10 permit) listed below:

- Pre-construction topographic view including vegetation, showing the location of
 - ✓ all surface water bodies within one mile of the site (including wetlands); and
 - ✓ direction of stormwater flow across the construction site (i.e., use arrows to show which direction stormwater will flow);
- Boundaries of property and identify the location(s) of:
 - ✓ Earth-disturbing activities;
 - ✓ boundary lines of any natural buffers;
 - ✓ approximate slopes before and after major grading activities,
 - ✓ areas of steep slopes, surface water crossings, Structures and other impervious surfaces upon completion of construction
- Locations of all structural and nonstructural controls/BMPs identified in the plan including showing the location of:
 - ✓ construction entrance/exit,
 - ✓ concrete wash-out area,
 - ✓ construction support activity areas such as locations of off-site materials, waste, borrow area, or equipment storage area;
 - ✓ stockpiled materials (sediment, topsoil, etc.), and
 - ✓ locations of all potential pollutant-generating activities;
- Locations where stormwater and allowable non-stormwater will be discharged off-site (should be continuously updated); sampling locations if project is subject to numeric limitations due to presence of an asphalt batch plant;
- Location where stabilization practices are expected to occur; Areas where final stabilization will be accomplished and no further construction phase permit requirements apply.

The **site map or series of maps** for this facility can be found in **Attachment B** of this SWP3 showing all the above-mentioned features in Part 2.3 of this SWP3.

Section 3: Construction Site Pollutants

3.1 Pollutant-Generating Activities

Potential sources of sediment to stormwater runoff:

Clearing and grubbing operations, grading and site excavation operations, vehicle tracking, topsoil stripping and stockpiling, landscaping operations

Potential sources of pollutants, other than sediment, to stormwater runoff:

- Combined Staging Area - small fueling activities, minor equipment maintenance, sanitary facilities, and hazardous waste storage.
- Materials Storage Area - general building materials, solvents, adhesives, paving materials, paints, aggregates, trash, etc.
- Construction Activity - paving, curb/gutter installation, concrete pouring/mortar/stucco, and building construction
- Concrete Washout Area

3.2 List of Potential Pollutants

List of Pollutants that can be present at the construction site:

(Note: Check all the boxes applicable to your project site; include additional pollutants, if necessary, in the space below)

Check	Materials/ Chemicals	Stormwater Pollutants	Location at the Site
<input checked="" type="checkbox"/>	Dirt from land disturbed area	Sediment	Graded Areas
<input type="checkbox"/>	Pesticides (insecticides, fungicides, herbicides, rodenticides)	Chlorinated hydrocarbons, organophosphates, carbonates, arsenic	
<input checked="" type="checkbox"/>	Fertilizer and dirt/soil	Nitrogen, phosphorous	Landscaped Areas
<input type="checkbox"/>	Plaster	Calcium sulphate, calcium carbonate, sulfuric acid	
<input type="checkbox"/>	Cleaning solvents	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	
<input type="checkbox"/>	Asphalt	Oil, petroleum distillates	
<input checked="" type="checkbox"/>	Concrete	Limestone, sand, pH, chromium	Drives/Building Construction
<input type="checkbox"/>	Glue, adhesives	Polymers, epoxies	
<input checked="" type="checkbox"/>	Paints	Metal oxides, Stoddard solvent, talc, calcium carbonate, arsenic	Buildings

<input type="checkbox"/>	Curing compounds	Naphtha	
<input type="checkbox"/>	Wood preservatives	Stoddard solvent, petroleum distillates, arsenic, copper, chromium	
<input checked="" type="checkbox"/>	Hydraulic oil/fluids	Mineral oil	Trucks and Equipment
<input checked="" type="checkbox"/>	Gasoline	Benzene, ethyl benzene, toluene, xylene, MTBE	Trucks and Equipment
<input checked="" type="checkbox"/>	Diesel Fuel	Petroleum distillate, oil & grease, naphthalene, xylenes	Trucks and Equipment
<input checked="" type="checkbox"/>	Antifreeze/coolant	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)	Trucks and Equipment
<input checked="" type="checkbox"/>	Sanitary toilets	Bacteria, parasites, and viruses	Edge of Construction Site
<input type="checkbox"/>			
<input type="checkbox"/>			
<input type="checkbox"/>			
<input type="checkbox"/>			

Section 4: Compliance with Federal and State Requirements

4.1 Endangered or Threatened Species Protection

Eligibility Criterion

Under which criterion listed in NOI is the construction project/site eligible for coverage under the OKR10 permit?

A B C D E

For reference purposes, the eligibility criteria listed in Part 1.2.2.E.2 of OKR10 permit are as follows:

- Criterion A.** The proposed construction site or land disturbing activity is not located within any of the corridors of the Federal or State identified Aquatic Resources of Concern, and further investigation is not required.
- Criterion B.** The proposed construction site or land disturbing activity is located within a corridor of a Federal or State identified Aquatic Resources of Concern. The SWP3 describes this area in relation to the identified water or watershed and specifies the measures to be employed to protect the endangered or threatened species or their critical habitat (see Parts 3.5.2 and 10 and Addendum A).
- Criterion C.** If one of those eligibility criteria under Part 1.2.2.E.2.b, d, or e cannot be met, applicants may use Addendum I Buffer Guidance to evaluate alternatives of buffer requirements and select equivalent sediment controls or contact DEQ for further consultation.
- Criterion D.** The applicant's federally approved construction activities are authorized by the appropriate Federal or State agency and that authorization addresses the Endangered Species Act Section 7 consultation for the applicant's stormwater discharge or stormwater discharge-related activities. Applicants selecting option d must include documentation from USFWS (U.S. Fish and Wildlife Service) or a qualified biologist that demonstrates Section 7 consultation has been completed. The SWP3 must comply with any conditions resulting from that consultation.
- Criterion E.** The applicant's stormwater discharges and stormwater discharge-related activities were already addressed in another operator's certification of eligibility under Part 1.2.2.E.2.a, b, c, or d. that included the applicant's project area. By certifying eligibility under Part 1.2.2.E.2.e, the applicant agrees to comply with applicable measures or controls upon which the other operator's certification under Part 1.2.2.E.2.b, c. or d. was based.

Note: For Criterion B, C, D, or E, you may subject to comply with additional requirements.

4.2 Federal, State, or Local Historic Preservation Laws

Will stormwater discharges or stormwater discharge-related activities (e.g., catch basin, pond, culver, etc.) affect a property that is protected by Federal, State, or local historic preservation laws? Yes No

If yes, describe any actions taken to mitigate those effects: [Click here to enter text.](#)

Describe how this determination was made: [Per Register of Historic Places](#)

4.3 TMDL Requirements

If a TMDL or watershed plan or local compliance plan has been approved for the waterbody, SWP3 must include all the applicable requirements in consistent with the TMDL or watershed plan or local compliance plan that are applicable to the stormwater discharges from the construction site.

Does the construction project/site discharge stormwater into a receiving stream that has an approved TMDL or watershed plan or local compliance plan?

Yes No

If yes, is there any waste load allocations (WLAs) and/or the TMDL's associated implementation plan requirements applicable to stormwater discharges from the construction activity?

Yes No

If yes, SWP3 must incorporate any limitations, conditions, or requirements applicable to permittee's discharges to ensure that the waste load allocations (WLAs) and/or the TMDL's associated implementation plan will be met within any timeframe established in the TMDL report or watershed plan. Monitoring and reporting of the discharges may also be required as appropriate to ensure compliance with the TMDL or watershed plan.

Note: *Approved TMDL reports or watershed plans can be downloaded from DEQ's website at <http://www.deq.state.ok.us/wqdnew/tmdl/index.html>*

Does the construction project/site discharge stormwater to the **Lake Thunderbird watershed**?

Yes No

If **yes**, the following control measures will be used to meet the Lake Thunderbird TMDL requirements:

- Additional Pollutant Prevention or Discharge Monitoring** - You must comply with any additional requirements established by the local MS4 municipalities;
- Sites of Five Acres or Larger** - You must submit a copy of SWP3 to DEQ for review;
- Vegetated Buffer** - You must ensure that a vegetated buffer of at least 100 feet is retained or successfully established or planted between the area disturbed and all receiving streams. If the nature of the construction activity or the construction site makes a buffer impossible, you must provide equivalent controls. There are exceptions from this requirement for water crossings, limited water access, and stream restoration authorized under a CWA Section 404 permit;
- Sediment Basins** - For all drainage locations serving 5 or more acres disturbed at one time, you must use a temporary or permanent sediment basin and/or sediment traps to minimize sediment discharges;
- Site Inspection** - You must conduct site inspections once every 7 calendar days at a minimum, and within 24 hours of a storm event of 0.5 inches or greater and within 24 hours of a discharge caused by snowmelt;
- Corrective Actions** - You must implement corrective actions (e.g., repair, modify, or replace any stormwater control used at the site, clean up and dispose of spills, releases, or other deposits, or remedy a permit violation) by no later than 7 calendar days from the time of discovery. If it is infeasible to complete the installation or repair within 7 calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7 calendar days timeframe and document your schedule for installing the stormwater controls and making them operational as soon as practicable after the 7 days timeframe;
- Stabilization** - You must initiate stabilization measures immediately whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. You are required to complete the stabilization activities within 7 calendar days after the permanent or temporary cessation;
- Soil Nutrient Testing** - You are required to conduct a soil nutrient test to determine actual nutrient needs before applying fertilizer on your site. Fertilizer application must be limited to that necessary to meet actual needs on the site.
- Describe any additional measures or controls you will implement to comply with the Lake Thunderbird TMDL requirements: [Click here to enter text.](#)

Section 5: Stormwater Control Measures

The purpose of the implementation of different stormwater pollution controls is to reduce pollutants in the stormwater and the volume of stormwater leaving the construction site. All pollution control measures will be selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices.

5.1 Stabilization Practices

Type of Site Stabilization Practice(s) that will be implementing at the construction project/site (select all that apply):

- Temporary Permanent Vegetative Non-Vegetative

Deadline to Initiate Stabilization: I shall initiate stabilization measures **immediately** whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days.

Deadline to Complete Stabilization:

- I shall complete stabilization measures **as soon as practicable** but no later than 14 calendar days after the initiation of soil stabilization.
- My project/site is located in ARC/discharge to ORW; I shall complete stabilization measures **as soon as practicable** but no later than 7 calendar days after the initiation of soil stabilization.

Temporary Non-Vegetative Stabilization: The following **non-vegetative** controls/BMPs will be used to temporarily stabilize exposed portions of the construction site (*select all that apply*):

- Rolled erosion control products such as geotextiles, blankets or plastic cover Soil binders
- Straw mulch Wood mulch Compost Blanket Other, _____

If any of the above-referenced controls is used to temporarily protect areas that are being vegetative stabilized, one of the effective non-vegetative cover will be used to stabilize any such exposed portions of our site.

Temporary Vegetative Stabilization: The following **vegetative** controls will be used to temporarily stabilize the exposed portions of the construction site (*select all that apply*):

- Hydroseeding with mulch Sod Other, _____

Permanent Vegetative Stabilization: The following **vegetative** controls will be used to permanently stabilize the exposed portions of the construction site (*select all that apply*):

- Hydroseeding with mulch Sod Planted vegetation Other, _____

One of the following criteria will be used for vegetative cover:

- Provide a vegetative cover which covers 70% or more of the vegetation prior to commencing earth-disturbing activities and no large bare areas (10 square feet).
- Immediately after seeding, you must select, design, and install non-vegetative erosion controls that provide cover (such as **straw mulch, jute matting, and straw blankets**) to the area while vegetation is being established.

Stabilization Practices Record: A record of the dates when grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be included with the plan. Yes No

If No, explain: _____

A record of the dates when grading activities occur will be documented using the Grading & Stabilization Activity logs in **Attachment-I** of this SWP3.

5.2 Natural Buffers and/or Equivalent Sediment Controls

Buffer Compliance Alternatives

Are there any **waters of the State** that are located within 50 feet (or 100 feet if the construction site is located in ARC or ORW or Lake Thunderbird Watershed) of your construction disturbances as measured from the top of the bank to the disturbed portions of your site? Yes No

(Note: Waters of the State means all named/unnamed stream, creeks, rivers, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, storm sewers and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private located within the boundary of Oklahoma State.)

Construction Project/Site Location (check one only):

- My construction project/site isn't located in **ARC** or discharge to **ORW**
- My construction project/site is located in **ARC** or **ORW**
- My construction project/site is located in Lake Thunderbird Watershed or in a watershed with established TMDL that has Wasteload Allocation (WLA) for Construction Project

Check the compliance alternative that you have chosen:

- I will provide and maintain a 50 feet (or **100 feet** if the construction site is located in ARC or ORW or Lake Thunderbird Watershed) undisturbed natural buffer.

(Note (1): You must show the boundary line of the natural buffer on your site map.)

(Note (2): You must show on your site map how all discharges from your construction disturbances through the natural buffer area will first be treated by the site's erosion and sediment controls.)

- I will provide and maintain an undisturbed natural buffer that is less than 50 feet (or **100 feet** if the construction site is located in ARC or ORW or Lake Thunderbird Watershed) and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to required undisturbed natural buffer.

(Note (1): You must show the boundary line of the natural buffer on your site map.)

(Note (2): You must show on your site map how all discharges from your construction disturbances through the natural buffer area will first be treated by the site's erosion and sediment controls.)

- i. Width of natural buffer to be retained: _____
- ii. Method used to determine equivalent sediment load reduction:
 - Addendum-I: Buffer Guidance in OKR10 permit
 - a. Soil Type: _____
 - b. Buffer Vegetation: _____
 - OR
 - Site-specific calculation
 - a. Model or other tool used to estimate sediment load reductions:

 - b. Results of calculations: _____

 - c. Description of additional erosion and sediment controls used:

It is infeasible to provide and maintain an undisturbed natural buffer of any size; therefore, I will implement erosion and sediment controls that will achieve the sediment load reduction equivalent to a 50 feet (or 100 feet if the construction site is located in ARC or ORW or Lake Thunderbird Watershed) undisturbed natural buffer.

- i. Rationale for concluding that it is infeasible to provide and maintain a natural buffer of any size:

- ii. Method used to determine equivalent sediment load reduction:
 - Addendum-I: Buffer Guidance in OKR10 permit
 - a. Soil Type: _____
 - b. Buffer Vegetation: _____
 - OR
 - Site-specific calculation
 - a. Model or other tool used to estimate sediment load reductions:

 - b. Results of calculations: _____

 - c. Description of additional erosion and sediment controls used:

I qualify for one of the following exceptions (*select one that applies to your project/site*):

- There is no discharge of stormwater to the surface water that is located 50 feet from my construction disturbances.

- No natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for this project.
- Buffer disturbances are authorized under a CWA Section 404 permit.
- Buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail).

5.3 Structural Controls/Best Management Practices (BMPs)

The table below listed Structural and Non-Structural Stormwater Controls/Best Management Practices (BMPs) that should be considered for every construction project/site to meet **the non-numeric technology-based effluent limitations, water-based effluent limitations and applicable numeric technology-based effluent limitations.**

The following BMPs will be used or implemented at the construction project/site (*select all that apply*):

Erosion Controls		Sediment Controls	
<input type="checkbox"/>	Preservation of Existing Vegetation	<input checked="" type="checkbox"/>	Silt Fence
<input type="checkbox"/>	Vegetative Swales	<input type="checkbox"/>	Silt Dikes
<input type="checkbox"/>	Hydroseeding with Mulch	<input type="checkbox"/>	Compost Sock
<input type="checkbox"/>	Hydraulic Mulch	<input type="checkbox"/>	Check Dam
<input checked="" type="checkbox"/>	Wood Mulching	<input type="checkbox"/>	Fiber Rolls
<input checked="" type="checkbox"/>	Straw Mulching	<input checked="" type="checkbox"/>	Storm Drain Inlet Protection
<input type="checkbox"/>	Compost Blankets	<input type="checkbox"/>	Outlet Protection/Velocity Dissipation Devices
<input type="checkbox"/>	Soil Binders	<input type="checkbox"/>	Earth Berms and Drainage Swales
<input type="checkbox"/>	Geotextiles and Mats	<input checked="" type="checkbox"/>	Sand Bag Barrier
<input type="checkbox"/>	Soil Preparation/Roughening	<input type="checkbox"/>	Gravel Bag Berm/Barrier
<input checked="" type="checkbox"/>	Sod	<input type="checkbox"/>	Sediment Basin
<input type="checkbox"/>	Streambank Stabilization	<input type="checkbox"/>	Sediment Trap
Tracking Controls		<input type="checkbox"/>	Rip-rap
<input checked="" type="checkbox"/>	Stabilized Construction Entrance/Exit	<input type="checkbox"/>	Gabions
<input type="checkbox"/>	Stabilized Construction Roadway	Non-Structural Controls	
<input checked="" type="checkbox"/>	Entrance/Exit Tire Wash	<input checked="" type="checkbox"/>	Phasing and Scheduling
<input checked="" type="checkbox"/>	Street Sweeping and Vacuuming	<input checked="" type="checkbox"/>	Dust Suppression
Other Structural Controls		<input checked="" type="checkbox"/>	Dust Suppression
<input checked="" type="checkbox"/>	Vegetative Buffers	<input checked="" type="checkbox"/>	Good Housekeeping
<input checked="" type="checkbox"/>	Non-Vegetative Stabilization	<input type="checkbox"/>	Preventive Maintenance
<input type="checkbox"/>	Concrete Waste Management	<input type="checkbox"/>	Preservation of Top Soil

<input type="checkbox"/>	Dewatering Controls	<input type="checkbox"/>	Minimizing Soil Compaction
<input checked="" type="checkbox"/>	SOD	<input type="checkbox"/>	Fertilizer Application Management
<input type="checkbox"/>		<input type="checkbox"/>	

Did you **include specifications** of all the selected structural BMPs with the SWP3?

Yes No, if no, explain the reason:

5.3.1 Perimeter Control

Permit requirement: *You must install controls along the perimeter of your site that will receive stormwater from your construction activities. (Examples of perimeter controls include, but are not limited to, silt fences, fiber rolls, filter berms, and temporary diversion dikes.)*

To comply with Part 3.3.1.C of OKR10 permit, I shall use the following type of perimeter control(s) at my construction site:

Perimeter Control Description: Silt Fence

Installation Date(s): _____ prior to construction

Maintenance Requirements: I shall remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control. Silt fence will be inspected for rips or tears in the fabric, areas where the fence has been knocked down and areas where the fence has been undermined.

5.3.2 Sediment Track-Out

Permit requirement: *You must minimize the track-out of sediment onto off-site streets, other paved areas, and sidewalks from vehicles exiting your construction site. (Note: you may use most recent ODOT or OKC specifications for construction entrance/exit - use of aggregate stone with an underlying geotextile or non-woven filter fabric, or turf mats.)*

To comply with the Part 3.3.1.D of OKR10 permit, I shall use the following type of sediment track-out control at my construction site:

Track-Out Control/Construction Entrance/Exit Description: Construction Entrance & Wheel Washout

Installation Date(s): _____ prior to construction

Maintenance Requirements: I shall minimize the track-out of sediment onto off-site streets, other paved areas, and sidewalks from vehicles exiting our construction site.

Track-out Removal/Cleaning:

- I shall remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal.
- I shall remove the deposited sediment by the **end of the same work day** in which the track-out occurs or by the end of the next work day if track-out occurs on a non-work day where sediment has been tracked-out from my construction site onto the surface of off-site streets, other paved areas, and sidewalks.
- I am prohibited from hosing or sweeping tracked-out sediment into any stormwater conveyance (unless it is connected to a sediment basin, sediment trap, or similarly effective control).

5.3.3 Stockpiled Sediment or Soil

Permit requirement: *You must control discharge of stormwater from Stockpiled Sediment or Soil.*

To comply with the Part 3.3.1.E of OKR10 permit, I shall use temporary perimeter sediment barrier such as **berms, dikes, fiber rolls, silt fences, sandbag, or gravel bags** to protect from contact with stormwater (including run-on).

I shall use appropriate cover or temporary stabilization such as **mulching or hydro-mulching** to avoid direct contact with precipitation or to minimize sediment discharge.

Installation Date(s): _____ TBD _____

Maintenance Requirements: I shall not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, and/or surface water.

5.3.4 Minimize Dust

Permit requirement: *You must minimize the generation of dust to avoid pollutant discharges to the extent feasible through application of water or other dust suppression techniques.*

Dust Control Description: To comply with the permit requirement and to avoid any pollutants, particularly soil/sediment, from being discharged into surface waters, I shall apply/spray water using spray truck or sprinklers to minimize the generation of dust from my construction site.

5.3.5 Minimize the Disturbance of Steep Slopes

Permit requirement: *You must minimize the disturbance of steep slopes (i.e., slopes of 40% or greater).*

Steep Slope Control Description: _____ N/A _____

Installation Date(s): _____

Maintenance Requirements: [Click here to enter text.](#)

5.3.6 Preserve Topsoil

Permit requirement: *You must preserve native topsoil on your site, unless infeasible; you must stockpile and reuse it in areas that will be stabilized with vegetation.*

Topsoil Control Description: I shall preserve native topsoil on our site as much as possible and practicable.

Maintenance Requirements: I shall stockpile and reuse preserved top soil in areas that will be stabilized with vegetation.

5.3.7 Minimize Soil Compaction

Permit requirement: *In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed, you must minimize soil compaction.*

Soil Compaction Control Description: In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed, I shall restrict vehicle and/or equipment use in these areas to avoid or minimize soil compaction.

5.3.8 Protection of Storm Drain Inlets

Permit requirement: *If you discharge to a storm drain inlet that you have access to, you must install protection measures that remove sediment from your stormwater discharge. (Examples of inlet protection measures include **fabric filters, sandbags, or gravel barriers** -- Install inlet protection measures that remove sediment from your discharge prior to entry into the storm drain inlet.)*

Storm Drain Inlet Control Description: [sand bags](#)

Installation Date(s): prior to construction

Maintenance Requirements: I shall clean, or remove and replace the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, I shall remove the deposited sediment by **the end of the same work day** in which it is found or by the end of the following work day if removal by the same work day is not feasible.

5.3.9 Constructed Stormwater Conveyance Channels

(Note: Examples of velocity dissipation devices include check dams, sediment traps, riprap, or grouted riprap at outlets, include design specifications)

Stormwater Conveyance Channel Control Description: N/A

- If Silt dikes/Check dams are **used in series**, I shall space them at appropriate interval so that ***the base of the upstream dike is at the same elevation as the top of the next downstream dike***. Spacing of silt dikes/check dams is indicated on the site plans of SWP3.

Installation Date(s): _____

Maintenance Requirements: all check dams/rip-rap will be inspected during facility inspection for erosion, undermining or breeches. Any damage will be repaired immediately.

5.3.10 Sediment Basins

Permit requirement: For common drainage locations that serve an area of 10 or more acres disturbed at one time (or 5 acres if it is located in ARC), a temporary (or permanent) sediment basin shall be provided where attainable until final stabilization of the site.

Are 10 or more (or 5 or more if site discharges to an ORW/ARC) acres draining to a common point?

- Yes No

Is a sediment basin included in the project? Yes No

If yes, what is the designed capacity for the storage?

- 3600 cubic feet per acre: _____

OR

- 2-year, 24 hour storm: _____

OR

- Other criteria were used to design basin: _____

If no, explain why no sedimentation basin was included and describe required natural buffer areas and other controls implemented instead: _____

Maintenance Requirements: I shall keep the sediment basin in effective operating condition and remove accumulated sediment to maintain at least ½ of the design capacity of the sediment basin at all times.

5.3.11 Dewatering Practices

Permit requirement: *You are prohibited from discharging stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation associated with a construction activity, unless such waters are first effectively managed by appropriate controls.*

Dewatering Practice Description: [Click here to enter text.](#)

Installation Date(s): _____

Maintenance Requirements: [Click here to enter text.](#)

5.3.12 Other Stormwater Controls

Stormwater Control Practice # 1

Description: [Click here to enter text.](#)

Installation Date(s): _____

Maintenance Requirements: [Click here to enter text.](#)

Stormwater Control Practice # 2

Description: [Click here to enter text.](#)

Installation Date(s): _____

Maintenance Requirements: [Click here to enter text.](#)

Section 6: Pollution Prevention Controls

6.1 Spill Prevention and Responses

Spill Prevention

Is there an existing Spill Prevention Control and Countermeasure (SPCC) plan developed for the site?

Yes No, if yes, keep a copy of the SPCC plan onsite with this SWP3.

If No, describe procedures for quickly stopping, containing, and cleaning up spills, leaks, and other releases:
Contractor will follow Corrective Action Protocol. Contractor shall use spill kit and contact appropriate agencies and clean up spills immediately, using dry-clean up where possible

Emergency Spill Notification

In case of a toxic or hazardous material spill, notify:	Phone Numbers
Project Manager/Team Leader	Samuel Harle 214-455-3472
Emergency – Fire, Police	911
County Local Emergency Planning Committee (LEPC)	405-713-1360
DEQ Spill Reporting Hotline (24-hr)	800-522-0206
NRC (National Response Center)	800-424-8802

6.2 Waste Management Procedures

All wastes generated at the construction site, including, but not limited to, clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste, shall be prevented from being discharged to Waters of the State. The following BMP measures will be used to handle trash disposal, hazardous or toxic waste, sanitary waste, recycling, and proper material handling:

- Trash Dumpsters:** dumpsters will have a secure watertight lid, will be closed during precipitation or not in use, and will be placed away from stormwater conveyances and drains, and meet all federal, state, and municipal regulations. Only trash and construction debris from the site will be deposited in the dumpster. No construction materials will be buried on site.
- Hazardous Waste Containment:** hazardous waste materials will be stored in appropriate and clearly marked containers and segregated from other non-waste materials.

- Portable Toilets:** portable toilets will be secured to prevent tipping, located away from stormwater inlets and conveyances. These toilets will be anchored with the ground to prevent any tipped or knocked over and/or sand bags around to ensure wastewater doesn't mix with the stormwater.
- Recycling Bins/Dumpsters:** wood pallets, cardboard boxes, and other recyclable construction scraps will be disposed of in a designated dumpster for recycling. The dumpster will have a secure watertight lid, will be closed during precipitation or not in use, and will be placed away from stormwater conveyances and drains and meet all local and state solid-waste management regulations.
- Proper Material Handling:** containers will be tightly sealed when not in use, and excess paint shall be disposed of according to Oklahoma requirements and manufacturer's recommendations. Minimum amounts of fertilizer, as recommended by the manufacturer, will be used. Upon application the fertilizer will be worked into the soil to limit exposure to stormwater. Contents of partially used bags will be transferred to a sealable plastic bin, and then stored in a covered area.
- Good housekeeping:** construction debris, trash, and other floatable material will be collected and prevented from becoming a pollutant source on the following schedule:
[Click here to enter text.](#)
- Minimizing exposure:** construction products, materials, chemicals, and wastes will be stored in such a way that they are prevented from coming into contact with stormwater (e.g., plastic sheeting or temporary roofs).
- Designated concrete washout:** all concrete washwater will be directed into a leak-proof container or pit. The container or pit will be designed so that no overflows can occur due to inadequate sizing or precipitation and located as far away as possible from surface waters and stormwater inlets or conveyances. I shall use ***20 mil synthetic liners or similar equivalent liners*** to make the pit leak proof.
- Other: [Click here to enter text.](#)

6.3 Prohibited Discharges

The following discharges from the construction project/site are prohibited under the permit, and are considered a violation should any occur.

- Wastewater from the washout of concrete, unless managed by an appropriate control as described in Part 3.3.3.B.4 of OKR10 permit;
- Wastewater from the washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials, unless managed by an appropriate control as described in Part 3.3.3.B.4 of OKR10 permit;
- Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
- Soaps, detergents or solvents used in vehicle and equipment washing; and
- Toxic or hazardous substances from a spill or other release.

In the event that one of these above-mentioned discharges occurs, I will take corrective action consistent with Part 7.4 of this SWP3.

Section 7: Procedures and Documentations

7.1 Maintenance and Repair

I shall ensure that all pollution prevention controls installed in accordance with the requirements of OPDES Construction General Permit OKR10 and remain in effective operating condition and are protected from activities that would reduce their effectiveness. All structural BMPs (i.e. all the Erosion & Sediment Controls) that require a repair of any kind (due to normal wear and tear, or as a result of damage) or require maintenance in order for the control to continue operating effectively shall be required/maintained in accordance with the OPDES Construction General Permit requirements. At a minimum, maintenance will be performed in the following specific instances:

- for perimeter controls, whenever sediment has accumulated to $\frac{1}{2}$ or more the above-ground height of the control (Part 3.3.1.C of OKR10 permit);
- where sediment has been tracked-out onto the surface of off-site streets or other paved areas (Part 3.3.1.D of OKR10 permit);
- for inlet protection measures, when sediment accumulates, the filter becomes clogged, and/or performance is compromised (Part 3.3.1.J of OKR10 permit); and
- for sediment basins, as necessary to maintain at least $\frac{1}{2}$ of the design capacity of the basin (Part 3.3.1.L of OKR10 permit).
- for all structural BMPs, repair of any kind (due to normal wear and tear, or as a result of damage) or maintenance will be performed in order for the BMPs to continue operating effectively.

7.2 Approval from Local Office

- I **already checked** local offices (city and county offices) to ensure SWP3 for my construction activities is consistent with requirements of the City and/or County Offices.
- I shall update the SWP3, if necessary, to make consistent with any changes applicable to protecting surface water resources in sediment erosion site plans or site permits, or stormwater management site plans or site permits approved by local officials for which I received written notice.

7.3 Inspections

(Note: An inspector must be knowledgeable in the principles and practices of erosion and sediment controls and pollution prevention to assess conditions at the construction site that could impact stormwater quality, and the effectiveness of any stormwater controls.)

Person Responsible for Inspections:

General Procedures: During each inspection, the following areas of the construction site will be inspected:

- Cleared, graded, or excavated areas of the site;
- Stormwater controls (e.g., perimeter controls, silt dykes, check dams, sediment basins, inlets, exit points etc.) and pollution prevention practices (e.g., pollution prevention practices for vehicle fueling/maintenance and washing, construction product storage, handling, and disposal, etc.) at the site;
- Material, waste, or borrow areas covered by the permit, and equipment storage and maintenance areas;
- Evidence of a spill, leak, or other type of pollutant discharge, or failure to have properly cleaned up a previous spill, leak, or other type of pollutant discharge;
- Areas where stormwater flows within the site, stormwater discharge points;
- Identify any other incidents of non-compliances observed; and
- Areas where stabilization has been implemented.

Inspection Frequency:

- Once every 7 calendar days** and within 24 hours of the end of a storm event of 0.5 inches or greater, since my project is located in **ARC** or discharge to an impaired water.
- Once every 14 calendar days** and within 24 hours of the end of a storm event of 0.5 inches or greater.

Reductions in Inspection Frequency (if applicable):

- For the reduction in inspections resulting from stabilization: **Once per month** for the portion of the site that was stabilized per Part 3.3.2 of OKR10 permit.

Rain Gauge to Measure Qualified Storm Event of 0.5 inches or greater:

Location of the Rain Gauge: Mesonet

Inspection Report Forms:

Inspection Report Form has been prepared in accordance with the requirements of Part 4.3.13 of OKR10 permit. A copy of the Inspection Report Form that will be used during construction of this project included in [Attachment E](#) of this SWP3.

7.4 Corrective Action

General: Corrective actions are actions taken to modify, replace, or reinstall any stormwater control used at the site; clean up and dispose of spills, releases, or other deposits; or remedy a permit violation.

Corrective actions are triggered only for specific, more serious conditions. For any of the following conditions, a new or modified control shall be installed **no later than 7 calendar days** from the discovery:

- A required stormwater control was never installed or was installed incorrectly, or not in accordance with the corresponding OKR10 permit requirement;
- A stormwater controls needs to be repaired or replaced (beyond routine maintenance required in Part 4.3.12 of OKR10 permit);
- A stormwater control is not effective enough for the discharge to meet applicable water quality standards;
- A prohibited discharge (Parts 3.1 and 3.3.3.A of OKR10 permit) is occurring or has occurred; or
- DEQ or MS4 Operator requires corrective action as a result of permit violations found during a inspection.

I shall immediately take all reasonable steps to minimize or prevent the discharge of pollutants until a permanent solution is installed and made operational, including cleaning up any contaminated surfaces so that the material will not discharge in subsequent storm events. I shall conduct corrective action(s) for each of the above-mentioned triggering conditions should they occur at my construction site.

Person Responsible for Corrective Actions: [Click here to enter text.](#)

Corrective Action Schedule/Specific Action Frequency:

I shall perform all Corrective Actions (modify, replace, or reinstall), if identified, **no later than 7 calendar days from** the time of discovery.

Corrective Action Forms:

Corrective Action Report Form has been prepared in accordance with the requirements of Part 4.3.14 of OKR10 permit. A copy of the Corrective Action Report Form that will be used during construction of this project included in [Attachment F](#) of this SWP3.

7.5 Employee Training

Person Responsible for Staff Training

Name: _____ Title: _____

Staff Training Requirements

Prior to the start of earth-disturbing activities, personal with the following responsibilities shall be trained to understand all the requirements of this SWP3:

- Proper design, installation, and maintenance/repair of stormwater controls.
- The proper application and storage of chemicals.
- Proper Inspection and corrective actions.

At minimum, all Personnel must be trained to understand:

- The location of all stormwater controls and the maintenance requirements for each of the control.
- The pollution prevention requirements outlined in this SWP3.
- When and how to conduct inspections, record applicable findings and take necessary corrective actions.

Frequency/Schedule of Employee Training: annually

(Note: Employee training shall be conducted at least annually or more often if employee turnover is high).

Employee training records and documentations shall be maintained using the **Employee Training Report** located in **Attachment G** of this SWP3.

7.6 Notification of Change of Ownership (NCO) for Individual Lots

- SWP3 will include documents if lots are sold and transfer to other new operator(s), (see Part 2.2.3 of OKR10 permit). Documents will be included under **Attachment M** of this SWP3.
- NCO is not applicable to my project/site.

7.7 Sub-contractor Certifications

- Sub-contractor certification forms will not be used for this project.
- DEQ's sub-contractor certification form (**Attachment M**) will be used and kept onsite with the SWP3.

- A form other than DEQ's form will be used and kept onsite with the SWP3.

7.8 Record Keeping and Record Retention

- I shall retain copies of the SWP3 and all reports required by the 2017 OKR10 permit, and records of all data used to complete the NOI to be covered by this permit, for a **period of at least 3 years** from the date that the site is finally stabilized.

7.9 Posting a Notice

- I shall post a notice near the main entrance of the construction site with the following information:
 - The OPDES permit number for the project or a copy of the NOI if a permit number has not yet been assigned;
 - The name and telephone number of a local contact person;
 - A brief description of the project; and
 - Location of the SWP3

A **sample copy of the Notice** is included in [Attachment M](#) of this SWP3.

Section 8: Additional Monitoring (if applicable)

(Note: Only applicable if you have Concrete Batch Plant and/or Asphalt Plant that is covered under your OKR10 authorization)

8.1 Support Activity Covered by this Plan

Concrete Batch Plant Asphalt Plant Both Not Applicable

8.2 Representative Outfall(s)

Are there substantially identical outfalls? Yes No

If yes, which outfalls are substantially identical? _____

Which outfall(s) will be sampled? _____

8.3 Structural & Non-Structural BMPs

Perimeter control and retention/detention pond will be installed. All exposed areas will be kept clean and orderly manner to minimize exposure. Structural controls will be maintained to keep these effective and operational.

8.4 Quarterly Visual Monitoring

In addition to routine site inspection, quarterly visual monitoring, qualified facility inspector will perform quarterly visual monitoring:

1. Quarterly visual monitoring assessments will be conducted using the form in [Attachment J](#) of this SWP3. Each drainage point will be visually inspected on a quarterly basis. If no qualifying storm event occurs during a monitoring quarter, this will be noted on the quarterly visual monitoring report for that quarter.
2. Samples will be collected from each outfall, will be examined and documented observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollution using the quarterly visual monitoring form and will occur during daylight hours (e.g., normal working hours).
3. Completed quarterly visual monitoring forms will be kept with the SWP3.

8.5 Comprehensive Site Compliance Evaluation

1. A comprehensive site compliance evaluation will be conducted at least once annually. If the project is less than one year, at least one inspection will be conducted, which will include all areas where industrial materials or activities are exposed to stormwater and areas where spills and leaks have

occurred within the past **3 years**.

2. A report resulting from this inspection will be submitted to DEQ by **March 1** of the year following the monitoring period using the form in **Attachment K** of this SWP3.

8.6 Numeric Effluent Limitation Monitoring for Asphalt Plant

1. Stormwater discharges from asphalt plants must comply with the limitations and monitoring requirements listed below.

Parameter	Limitation	Monitoring Frequency	Sample Type
Total Suspended Solids	23 mg/L, daily max. 15 mg/L, 30-day avg.	1/year	Grab
Oil and Grease	15 mg/L, daily max. 10 mg/L, 30-day avg.	1/year	Grab
pH	6.5 - 9.0, min. and max.	1/year	Grab

2. Annual monitoring period is from **January 1 to December 31**. If the project is less than one year, at least one sample must be collected.
3. Laboratory analyses for the parameters specified above must be performed by a laboratory certified by DEQ for those parameters.
4. Monitoring will be performed on a storm event that results in an actual discharge from the construction site (at least **0.1 inch** of stormwater event defined as a **measurable storm event**) that follows the preceding measurable storm event by at least 72 hours (3 days).
5. A minimum of one grab sample will be collected within the first 30 minutes of the discharge resulting from a measurable storm event. If it is not practicable to take the sample during the first 30 minutes, the sample must be collected as soon as practicable after the first 30 minutes and document why it was not possible to take samples within 30 minutes.
6. Monitoring information will be submitted on a discharge monitoring report (DMR) form (see **Attachment L**) by **March 1** of the year following the monitoring period.
7. If an exceedance of a numeric effluent limit occurs, follow-up monitoring will be conducted within 30 calendar days, or during the next qualifying storm event, of implementing corrective actions.

Person(s) and positions of person(s) responsible for monitoring: [Click here to enter text.](#)

Sample location(s): [Click here to enter text.](#)

Monitoring Schedules: [Click here to enter text.](#)

8.7 Additional Procedures for Concrete Batch Plant

Is there a mobile batch plant associated with this construction project/site?

No Yes, If yes, permit number: OKG11_____

How long will the batch plant be utilized?

- Less than 180 days
 Greater than 180 days

Will wastewater be used for dust suppression?

No Yes, If yes, the following requirements must be met:

- a. The wastewater to be land applied shall be free from visible sheen of oil or globules of oil or grease and shall have a pH of between 6.5 s.u. and 9.0 s.u.
- b. The wastewater to be land applied for dust suppression shall be visually inspected prior to land application. An inspection log shall be maintained at the site and made available to DEQ personnel upon request.
- c. There shall be no land application of wastewater in areas where the depth to maximum seasonal groundwater level is less than 2 feet in accordance with OAC 252:616-5-1(b)(2)(E).
- d. There shall be no land application of wastewater during periods of precipitation or when soil is saturated or frozen.
- e. There shall be no runoff of wastewater from the land application site(s).
- f. The permittee shall keep a logbook which records the time and date, the source and the volume of wastewater used, and the area to which the wastewater .

Describe the liner used for any surface impoundments: [Click here to enter text.](#)

Is the bottom of all surface impoundments at least 15 feet above groundwater levels?

No Yes

The following berm/dike slope requirement will be followed:

- For sites utilized less than 180 days, a 1:2 (1 vertical to 2 horizontal) slope
 For sites utilized more than 180 days, a 1:3 (1 vertical to 3 horizontal) slope

Section 9: SWP3 Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____ **Title:** _____

Signature: _____ **Date:** _____

Section 10: SWP3 Modifications

I shall maintain records of modifications that will be made per Part 4.3.19 of OKR10 permit, and other reasons in [Attachment H](#) of this SWP3:

[Click here to enter text.](#)

Section 11: SWP3 Attachments & Additional Documentation

The following documentations are attached to the SWP3:

Attachment A – General Location Map

A copy of general location map is included in Attachment A.

Attachment B – Site Map(s)

Copy of the site map(s) is/are included in Attachment B.

Attachment C – 2017 OKR10

Note: it is helpful to keep a printed-out copy of the 2017 OKR10 so that it is accessible to you for easy reference. However, you do not need to formally incorporate the entire 2017 OKR10 into your SWP3. As an alternative, you can include a reference to the permit and where it is kept at the site.

Attachment D – Notice of Intent (NOI)

A copy of your NOI is included in Attachment D.

Attachment E – Inspection Report

A copy of the Routine Facility Inspection Report Form is included in Attachment E.

Attachment F – Corrective Action Report

A copy of Corrective Action Report Form is included in Attachment F.

Attachment G – Employee Training Report

A copy of Employee Training Log is included in Attachment G.

Attachment H – SWP3 Modifications Log

A copy of Report on SWP3 Modifications/Amendments Log is included in Attachment H.

Attachment I – Site Stabilization Log

A copy of Site Stabilization Log is included in Attachment I.

Attachment J – Quarterly Visual Monitoring Report

N/A

Attachment K – Annual Site Evaluation Report

N/A

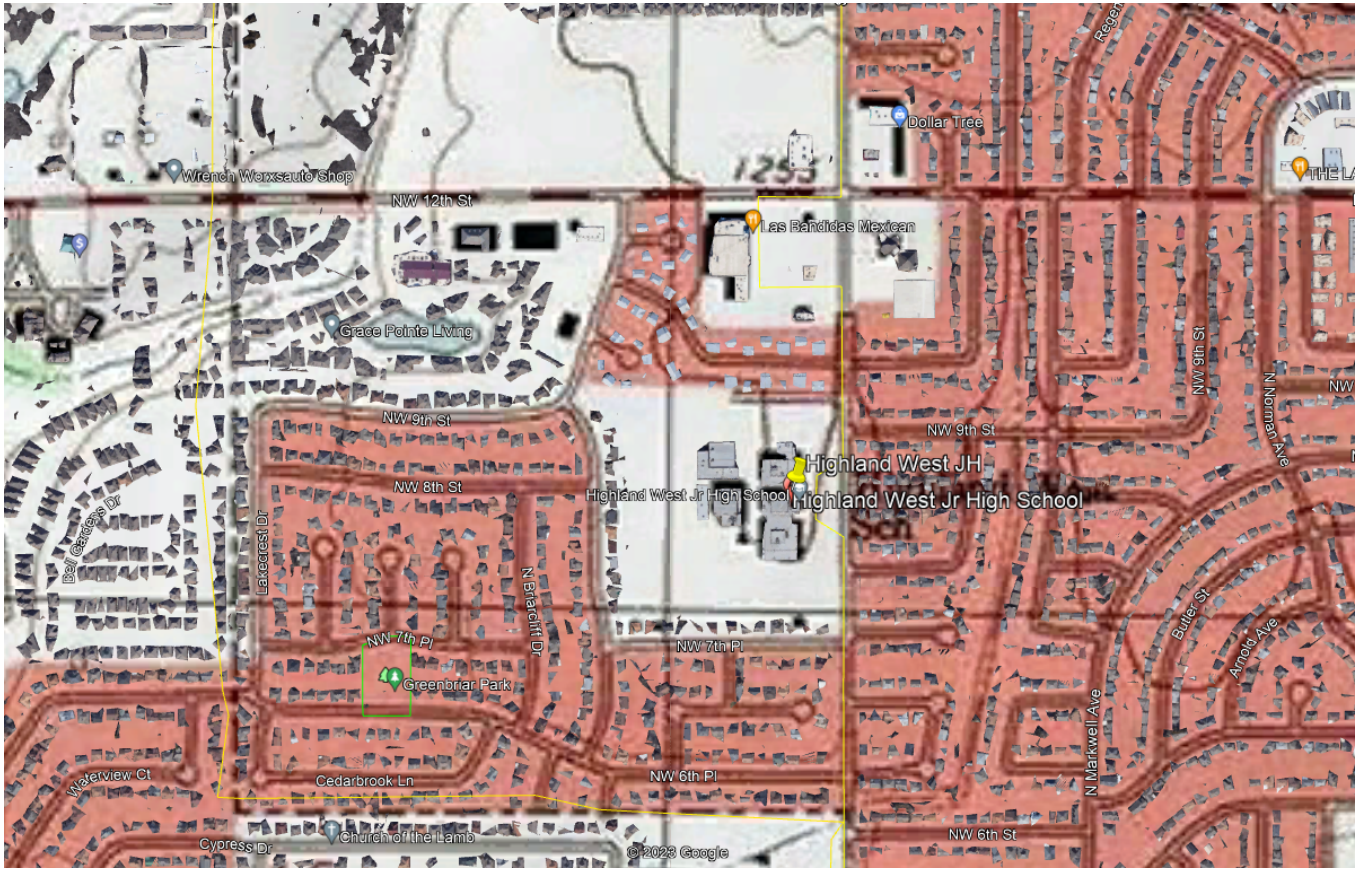
Attachment L – Discharge Monitoring Report (DMR)

N/A

Attachment M – NCOs and Other Documentations

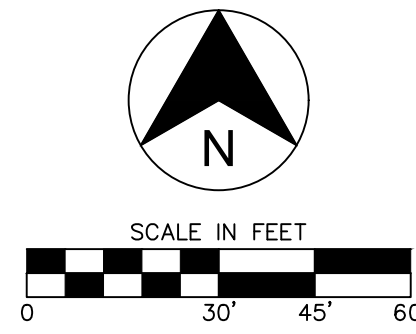
Construction Site Notice

Attachment "A" - General Location Map



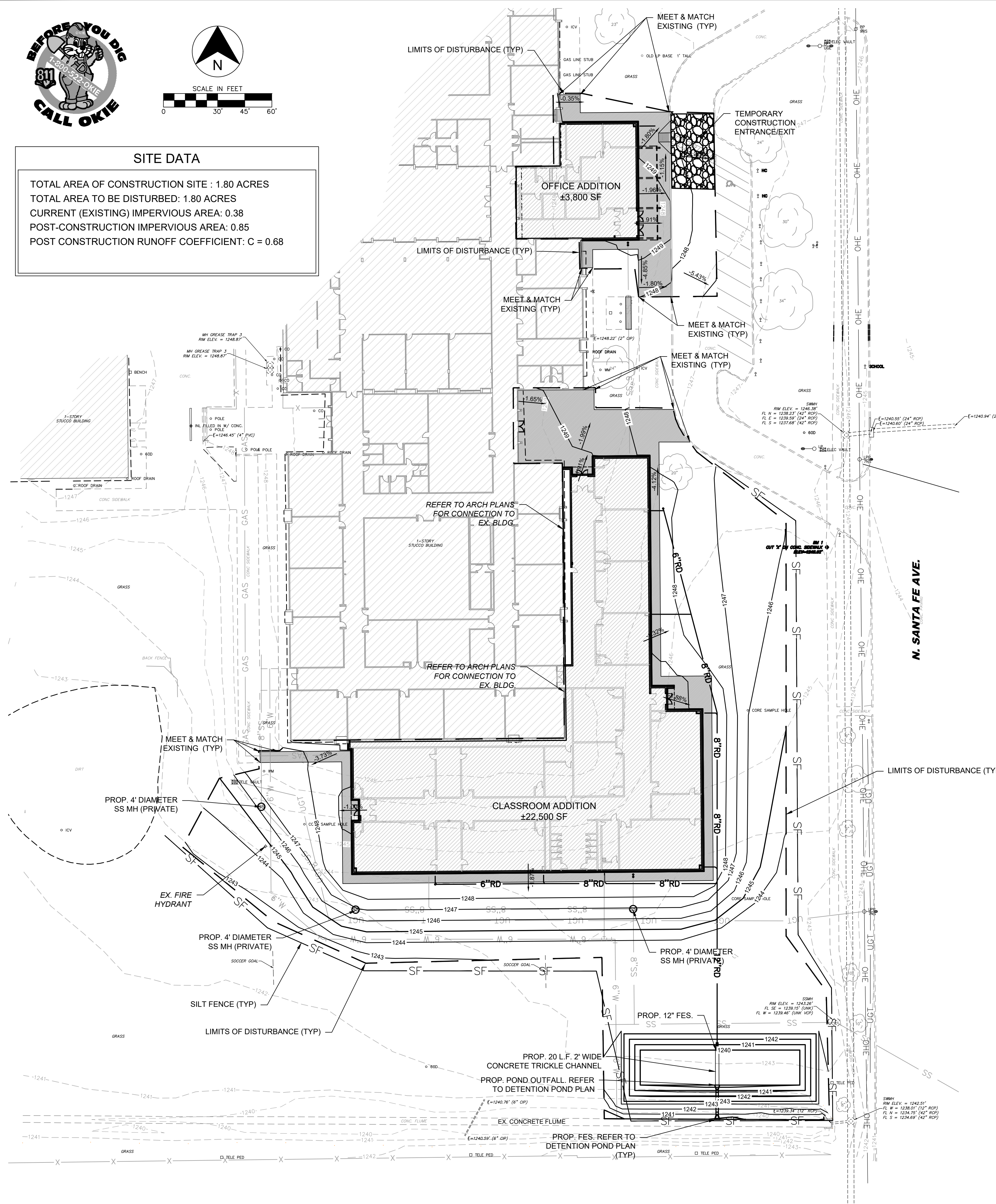
Attachment "B" - Site Maps

Contractor to keep up with latest plans



SITE DATA

TOTAL AREA OF CONSTRUCTION SITE : 1.80 ACRES
 TOTAL AREA TO BE DISTURBED: 1.80 ACRES
 CURRENT (EXISTING) IMPERVIOUS AREA: 0.38
 POST-CONSTRUCTION IMPERVIOUS AREA: 0.85
 POST CONSTRUCTION RUNOFF COEFFICIENT: C = 0.68



EROSION CONTROL NOTES

- SEDIMENT BASINS ARE ATTRACTIVE TO CHILDREN AND CAN BE VERY DANGEROUS. IN ALL CASES, LOCAL ORDINANCES AND REGULATIONS REGARDING HEALTH AND SAFETY MUST BE ADHERED TO.
- ALL CONTRACTORS AND SUBCONTRACTORS INVOLVED WITH STORM WATER POLLUTION PREVENTION SHALL OBTAIN A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN AND THE STATE OF OKLAHOMA NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM GENERAL PERMIT (NPDES PERMIT) AND BECOME FAMILIAR WITH THEIR CONTENTS.
- ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE DISPOSED OF WITHIN 30 DAYS AFTER FINAL STABILIZATION. FINAL STABILIZATION HAS OCCURRED WHEN ALL SOIL DISTURBING ACTIVITIES ARE COMPLETED AND A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70% OF THE COVER FOR UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES HAS BEEN EMPLOYED.
- BEST MANAGEMENT PRACTICES (BMP'S) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE, OR LOCAL REQUIREMENTS OR MANUAL OF PRACTICE, AS APPLICABLE CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY PERMITTING AGENCY OR OWNER.
- CONTRACTOR SHALL MINIMIZE CLEARING TO THE MAXIMUM EXTENT PRACTICAL OR AS REQUIRED BY THE GENERAL PERMIT.
- GENERAL CONTRACTOR SHALL DENOTE ON PLAN THE TEMPORARY PARKING AND STORAGE AREA WHICH SHALL ALSO BE USED AS THE EQUIPMENT MAINTENANCE AND CLEANING AREA, EMPLOYEE PARKING AREA, AND AREA FOR LOCATING PORTABLE FACILITIES, OFFICE TRAILERS, AND TOILET FACILITIES.
- ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) SHALL BE DETAINED AND PROPERLY TREATED OR DISPOSED.
- SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLotation BOOMS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.
- DUST ON THE SITE SHALL BE CONTROLLED. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.
- RUBBISH, TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DEPOSITED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE PREMISES THROUGH THE ACTION OF WIND OR STORMWATER DISCHARGE INTO DRAINAGE DITCHES OR WATERS OF THE STATE.
- ALL STORM WATER POLLUTION PREVENTION MEASURES PRESENTED ON THIS PLAN, AND IN THE STORM WATER POLLUTION PREVENTION PLAN, SHALL BE INITIATED AS SOON AS PRACTICABLE.
- DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS STOPPED FOR AT LEAST 14 DAYS, SHALL BE TEMPORARILY SEEDED. THESE AREAS SHALL BE SEEDED NO LATER THAN 14 DAYS FROM THE LAST CONSTRUCTION ACTIVITY OCCURRING IN THESE AREAS.
- DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS PERMANENTLY STOPPED SHALL BE PERMANENTLY SEEDED. THESE AREAS SHALL BE SEEDED NO LATER THAN 14 DAYS AFTER THE LAST CONSTRUCTION ACTIVITY OCCURRING IN THESE AREAS. REFER TO THE GRADING PLAN AND/OR LANDSCAPE PLAN.
- IF THE ACTION OF VEHICLES TRAVELING OVER THE GRAVEL CONSTRUCTION ENTRANCES IS NOT SUFFICIENT TO REMOVE THE MAJORITY OF DIRT OR MUD, THEN THE TIRES MUST BE WASHED BEFORE THE VEHICLES ENTER A PUBLIC ROAD. IF WASHING IS USED, PROVISIONS MUST BE MADE TO INTERCEPT THE WASH WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFF THE SITE.
- ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.
- CONTRACTORS OR SUBCONTRACTORS WILL BE RESPONSIBLE FOR REMOVING SEDIMENT IN THE DETENTION POND AND ANY SEDIMENT THAT MAY HAVE COLLECTED IN THE STORM SEWER DRAINAGE SYSTEMS IN CONJUNCTION WITH THE STABILIZATION OF THE SITE.
- ON-SITE & OFFSITE SOIL STOCKPILE AND BORROW AREAS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION THROUGH IMPLEMENTATION OF BEST MANAGEMENT PRACTICES. STOCKPILE AND BORROW AREA LOCATIONS SHALL BE NOTED ON THE SITE PLAN AND PERMITTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS.
- SLOPES SHALL BE LEFT IN A ROUGHENED CONDITION DURING THE GRADING PHASE TO REDUCE RUNOFF VELOCITIES AND EROSION.
- DUE TO THE GRADE CHANGES DURING THE DEVELOPMENT OF THE PROJECT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE EROSION CONTROL MEASURES (SILT FENCES, STRAW BALES, ETC.) TO PREVENT EROSION.
- ALL CONSTRUCTION SHALL BE STABILIZED AT THE END OF EACH WORKING DAY. THIS INCLUDES BACKFILLING OF TRENCHES FOR UTILITY CONSTRUCTION AND PLACEMENT OF GRAVEL OR BITUMINOUS PAVING FOR ROAD CONSTRUCTION.
- A 3' STRIP OF SOD SHALL BE PLACED ALONG THE EDGE OF ALL PAVING TO ACT AS A SEDIMENT BUFFER AND AID IN THE ESTABLISHMENT OF VEGETATION.

LEGEND

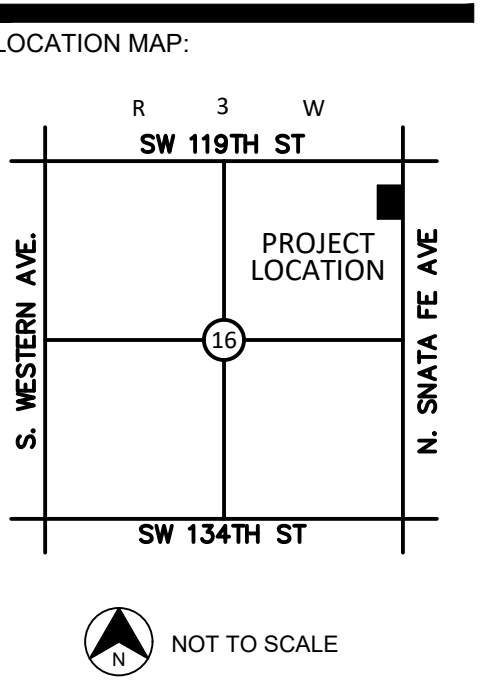
- BOUNDARY LINE
- RIGHT OF WAY LINE
- EASEMENT LINE
- EXISTING CONCRETE CURB AND GUTTER
- PROPOSED CONCRETE CURB AND GUTTER
- PROPOSED FIRE LANE STRIPING
- OHE OVERHEAD ELECTRIC
- UGE UNDERGROUND ELECTRIC
- GAS GAS LINE
- UGT UNDERGROUND TELEPHONE
- FO UNDERGROUND FIBER OPTIC
- SS SANITARY SEWER
- 8" W WATERLINE
- BENCHMARK
- ⊕ FIRE HYDRANT
- ⊕ WATER VALVE
- ⊕ EX. WATER METER PIT
- ⊕ EX. WATER METER
- ⊕ PROP. WATER METER
- ⊕ EX. SPRINKLER VALVE
- ⊕ EX. AUTO SPRINKLER
- ⊕ EX. ELECT. PEDESTAL
- ⊕ EX. ELECT. TRANSFORMER
- ⊕ EX. ELECT. METER
- ⊕ PROP. ELECT. METER
- ⊕ EX. AIR CONDITIONER
- ⊕ EX. SIGNAGE
- ⊕ EX. LIGHT POLE
- ⊕ EX. LIGHT POLE
- ⊕ EX. BOLLARD
- ⊕ PROP. INLETS (SEE GRADING PLAN FOR TYPE)
- LIMITS OF DISTURBANCE
- SILT FENCE
- TD --- TEMPORARY DIVERSION DIKE
- SODDING
- ⊕ INLET PROTECTION
- ⊕ CONCRETE WASHOUT AREA
- ⊕ EX. POWER POLE
- ⊕ PROP. POWER POLE
- ⊕ EX. TELEPHONE PED.
- ⊕ EX. TELEPHONE MANHOLE
- ⊕ EX. TRAFFIC SIGNAL LIGHT
- ⊕ EX. TRAFFIC CONTROL BOX
- ⊕ EX. FLAG POLE
- ⊕ EX. YARD LIGHT
- ⊕ EX. GREASE TRAP
- ⊕ EX. SS MANHOLE
- ⊕ PROP. SS MANHOLE
- ⊕ EX. GAS METER
- ⊕ PROP. GAS METER
- ⊕ EX. ELECT. MANHOLE
- ⊕ EX. STORM MANHOLE

SEQUENCE OF CONSTRUCTION

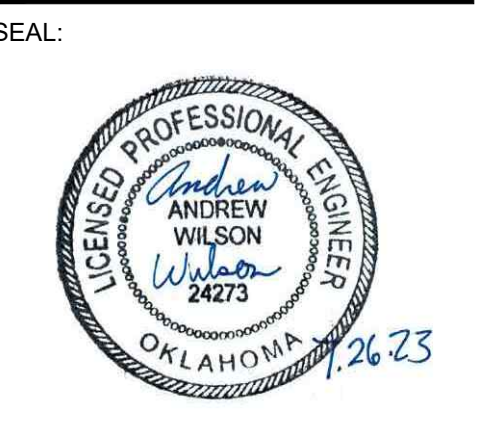
- PHASE 1**
- A PRE-CONSTRUCTION MEETING SHALL BE HELD BY THE GENERAL CONTRACTOR'S MANAGER, AND THE OPERATOR'S ENGINEER PRIOR TO LAND DISTURBING ACTIVITIES.
 - PREPARE AND PULL ALL NECESSARY PERMITS.
 - CONSTRUCT TEMPORARY CONSTRUCTION EXITS AT LOCATIONS SHOWN ON THE SWPPP PLANS AND PREPARE TEMPORARY PARKING AND STORAGE AREA. UPON IMPLEMENTATION AND INSTALLATION OF THE FOLLOWING AREAS: TRAILER, PARKING, LAY DOWN, PORTA-POTTY, WELL WASH, CONCRETE WASHOUT, MASONS AREA, FUEL AND MATERIAL STORAGE CONTAINERS, SOLID WASTE CONTAINERS, ETC., DENOTE THEM ON THE SITE MAPS IMMEDIATELY AND NOTE ANY CHANGE IN THE LOCATIONS AS THEY OCCUR THROUGHOUT THE CONSTRUCTION PROCESS.
 - CONSTRUCT THE SILT FENCES ON THE SITE. HALT ALL ACTIVITIES AND CONTACT THE CIVIL ENGINEERING CONSULTANT TO PERFORM INSPECTION AND CERTIFICATION OF BMP'S. GENERAL CONTRACTOR SHALL SCHEDULE AND CONDUCT STORMWATER PRE-CONSTRUCTION MEETING WITH ENGINEER AND ALL GROUND-DISTURBING CONTRACTORS BEFORE PROCEEDING WITH CONSTRUCTION.
 - INSTALL PUBLIC WATER, SEWER AND BOX CULVERT
 - DEMO, CLEAR AND GRUB THE SITE.
 - BEGIN GRADING THE SITE.
 - START CONSTRUCTION OF BUILDING PAD AND STRUCTURES.
 - DISTURBED AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS CEASED FOR MORE THAN 14 DAYS SHALL BE TEMPORARILY SEEDED AND WATERED.
- PHASE 2**
- INSTALL UTILITIES, UNDER DRAINS, STORM SEWERS, CURB AND GUTTERS.
 - INSTALL INLET PROTECTION DEVICES.
 - INSTALL RIP RAP AROUND OUTLET STRUCTURES.
 - FINALIZE PAVEMENT SUBGRADE PREPARATION.
 - INSTALL BASE MATERIAL AS REQUIRED FOR PAVEMENT.
 - PAVE LOT.
 - REMOVE TEMPORARY CONSTRUCTION EXITS ONLY PRIOR TO PAVEMENT CONSTRUCTION IN THESE AREAS. (THESE AREAS TO BE PAVED LAST)
 - DISTURBED AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS CEASED FOR MORE THAN 14 DAYS SHALL BE TEMPORARILY SEEDED AND WATERED.
 - FINE GRADE AND INSTALL PERMANENT SEEDING AND PLANTINGS.
 - REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROLS DEvised. (ONLY IF SITE IS STABILIZED)
 - REMOVE INLET PROTECTIONS AROUND INLETS AND MANHOLES NO MORE THAN 48 HOURS PRIOR TO PLACING STABILIZED BASE COURSE.



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 405-778-3385
 www.cedarcreekinc.com



PROJECT:
HIGHLAND WEST JR. HIGH
 MOORE, OK
 PROJECT NUMBER: 23069
 DRAWING DATE: 07.26.23
 ISSUE DATE: 07.26.23



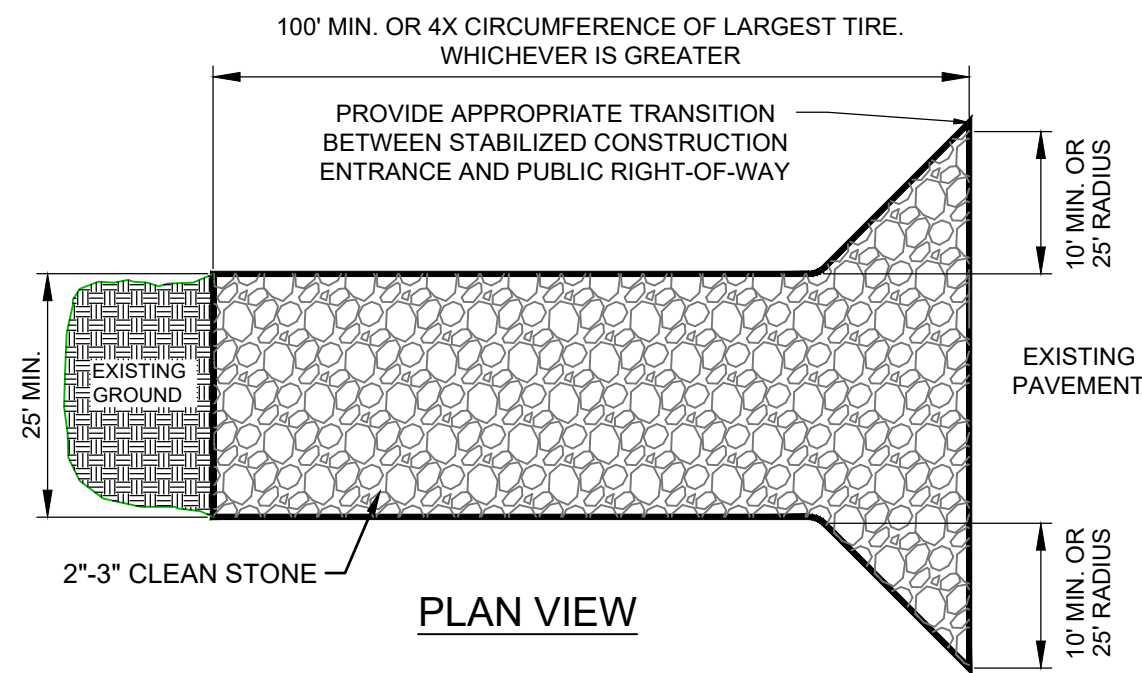
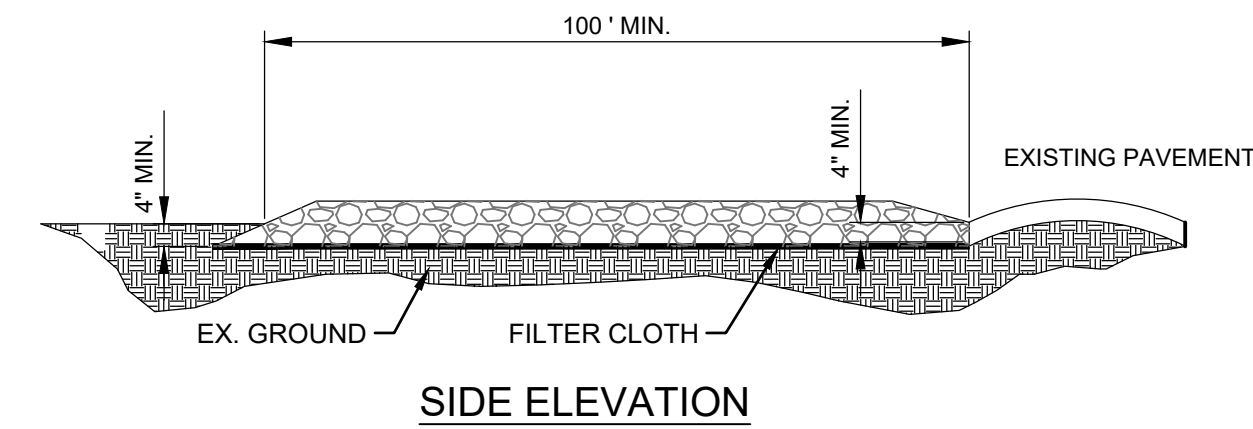
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PERMIT SET

REVISIONS:

MARK	DATE	DESCRIPTION

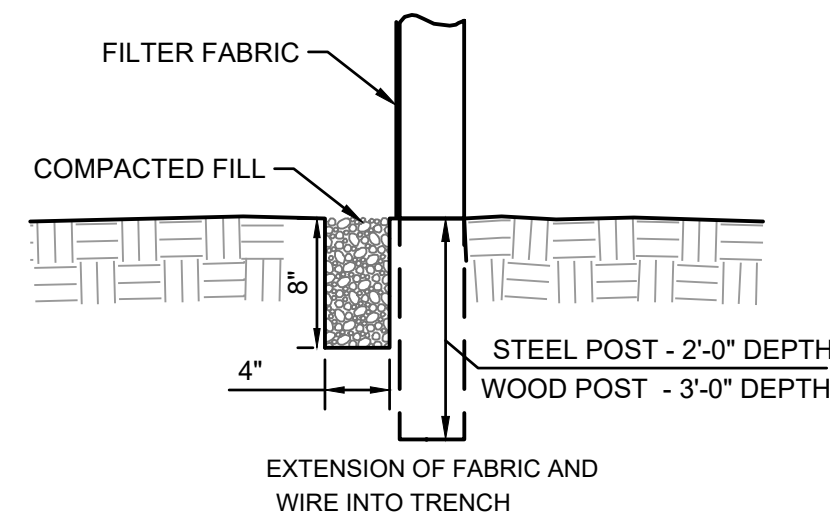
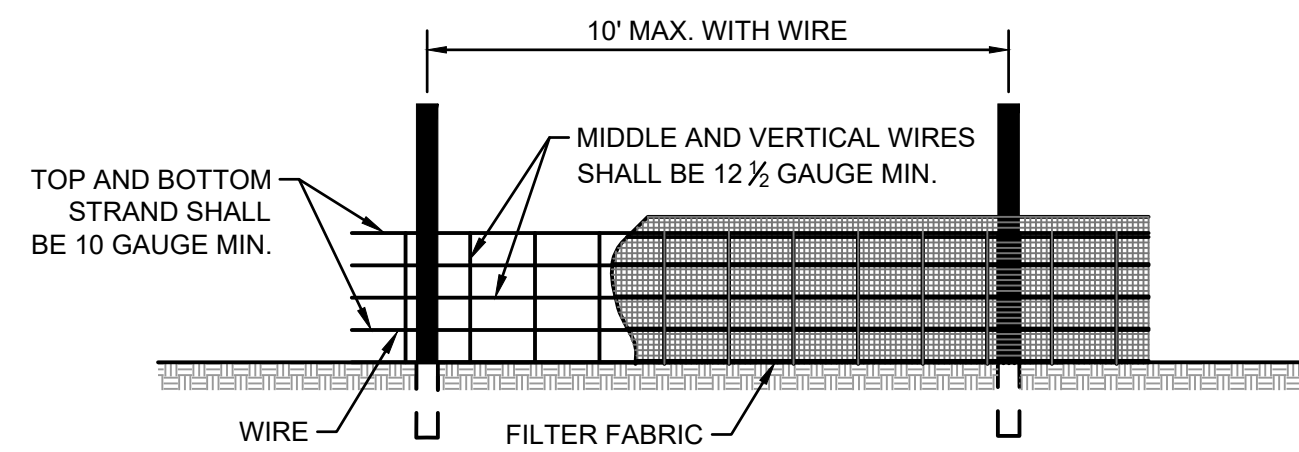
THESE PLANS AND DRAWINGS ARE NOT TO BE REPRODUCED, CHANGED OR COPIED IN ANY FORM OR MANNER WHATSOEVER WITHOUT FIRST OBTAINING THE WRITTEN PERMISSION AND CONSENT OF CEDAR CREEK CONSULTING INC. THIS SHEET IS NOT TO BE USED FOR CONSTRUCTION UNLESS THE ISSUE DATE IN THE TITLE BLOCK COINCIDES WITH OR POST DATES THE DRAWING DATE. ANY CHANGES MADE FROM THESE PLANS WITHOUT CONSENT OF CEDAR CREEK CONSULTING INC. ARE UNAUTHORIZED AND SHALL RELIEVE CEDAR CREEK CONSULTING OF RESPONSIBILITY FOR ALL CONSEQUENCES ARISING OUT OF SUCH CHANGES.

DRAWING TITLE:
EROSION CONTROL PLAN
 SHEET:
C5.00



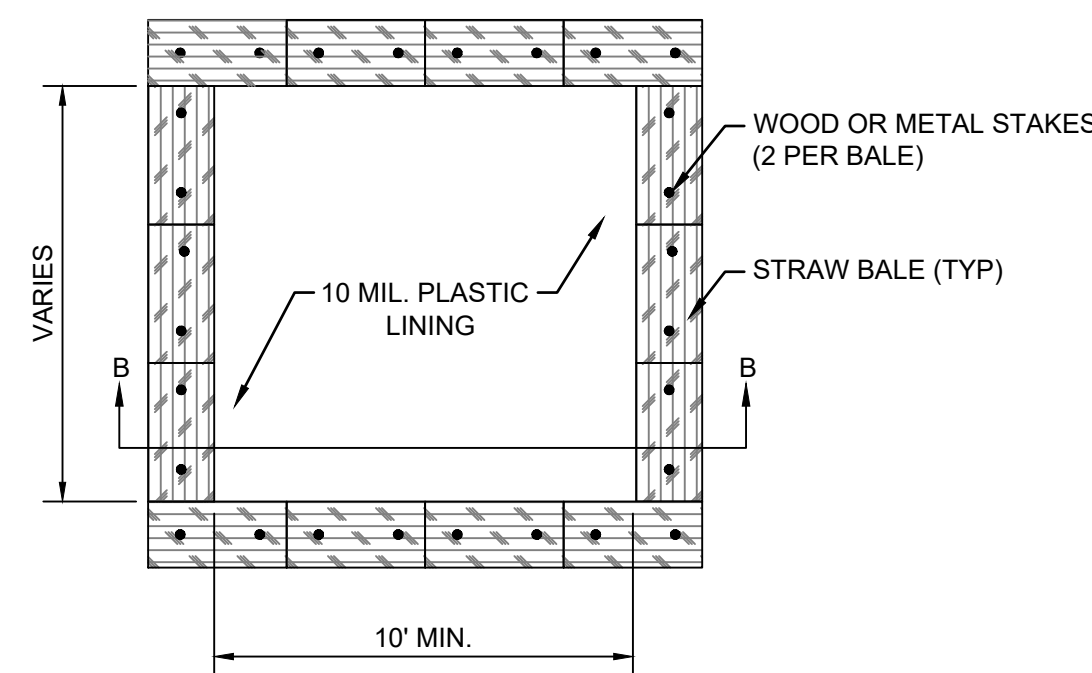
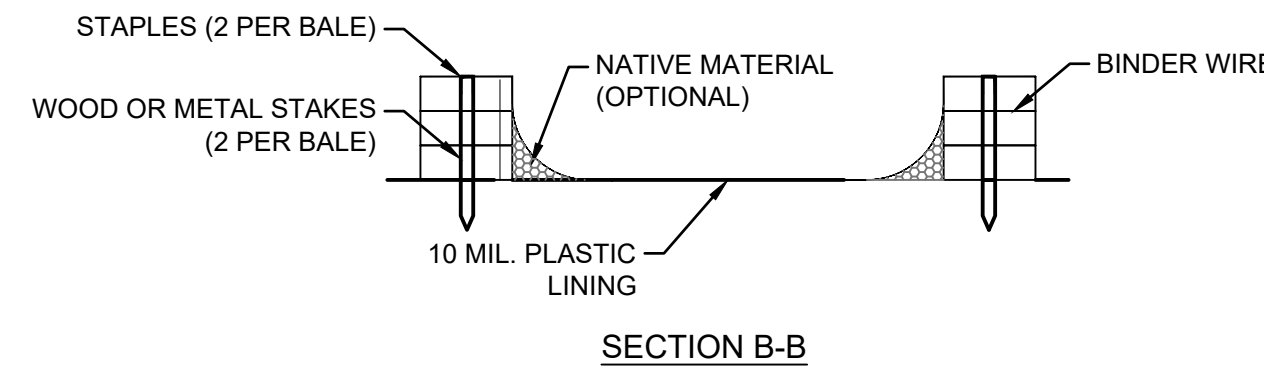
- NOTES:
1. STONE - USE COARSE AGGREGATE (2 - 3 INCH STONE)
 2. LENGTH - AS EFFECTIVE, BUT NOT LESS THAN 100 FEET.
 3. THICKNESS - NOT LESS THAN EIGHT (8) INCHES.
 4. WIDTH - NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
 5. WASHING - WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH, OR WATERCOURSE THROUGH USE OF SAND BAGS, GRAVEL, BOARDS OR OTHER APPROVED METHODS.
 6. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
 7. 12 X 24" METAL GRATE MAY BE USED. GRATE SHALL BE 25' AWAY FROM PAVEMENT AND APPROPRIATE SEDIMENT CONTROL TRAPPING DEVICE SHALL BE USED AT GRATE OUTLET POINT.

STABILIZED CONSTRUCTION ENTRANCE
 NOT TO SCALE

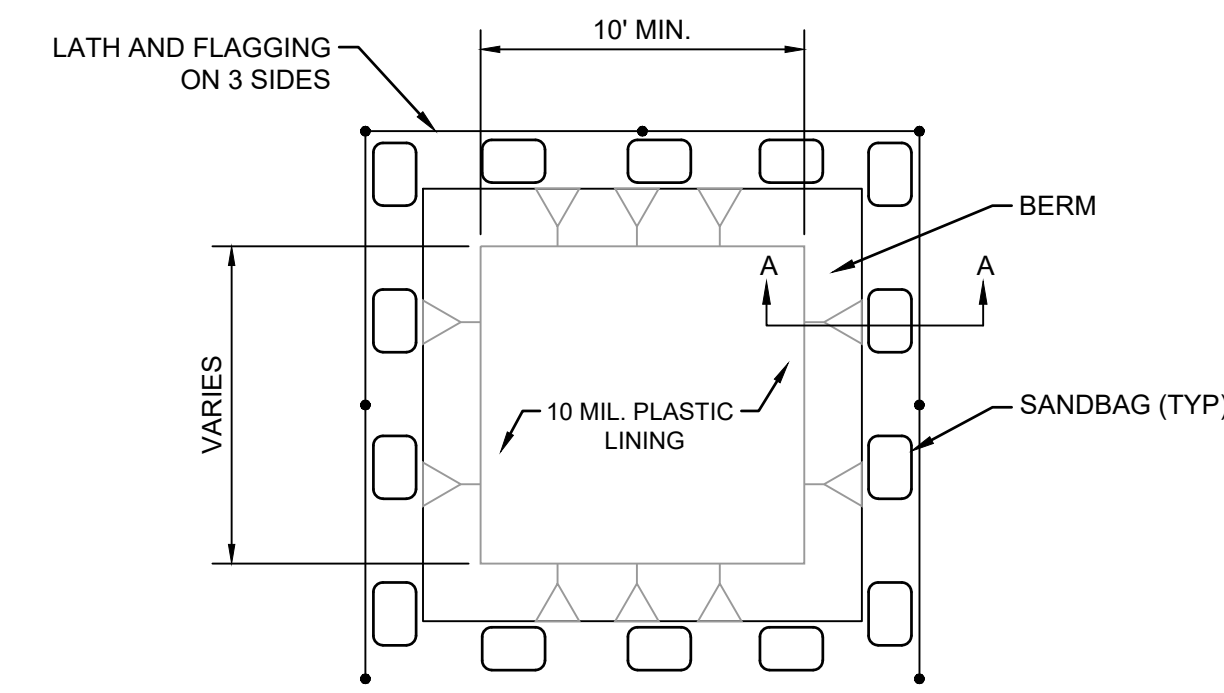
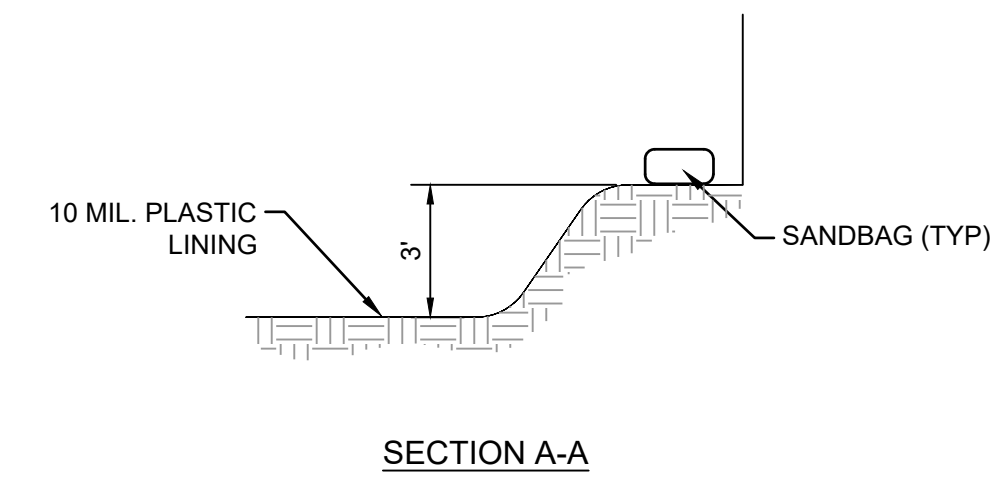


- NOTES:
1. WIRE SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
 2. FILTER FABRIC SHALL BE A MINIMUM OF 36" IN WIDTH AND SHALL BE FASTENED ADEQUATELY TO THE WIRE.
 3. STEEL POST SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
 4. WOOD POST SHALL BE 6'-0" IN HEIGHT AND 3" IN DIAMETER.

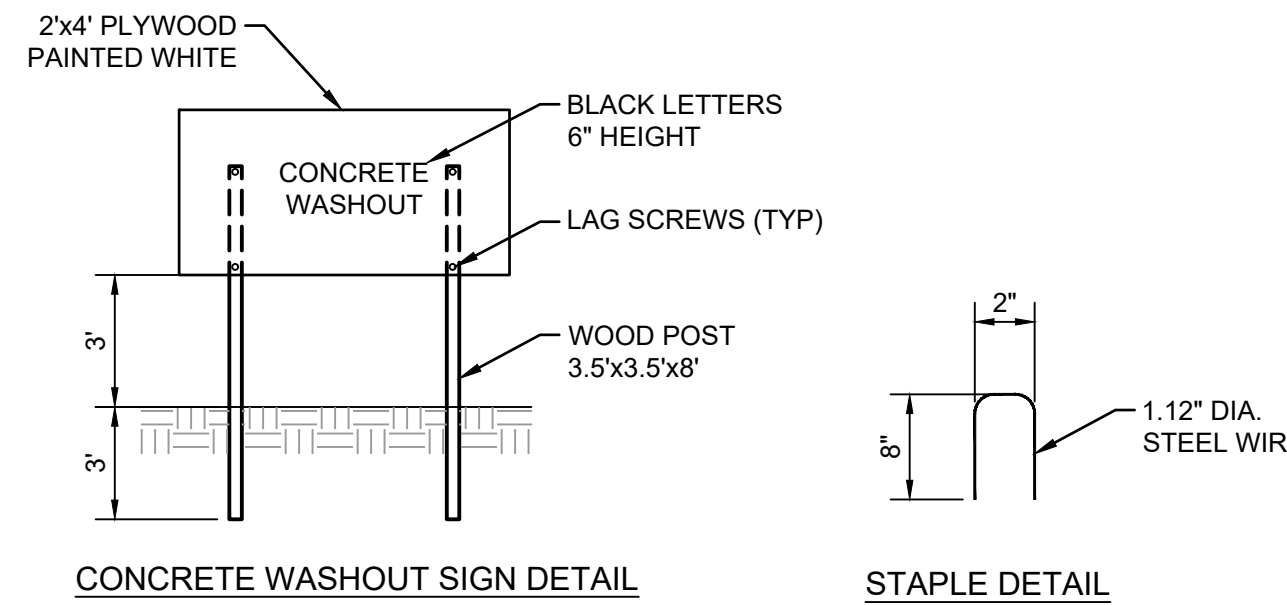
SILT FENCE DETAIL
 NOT TO SCALE



TYPE 'ABOVE GRADE' WITH STRAW BALES

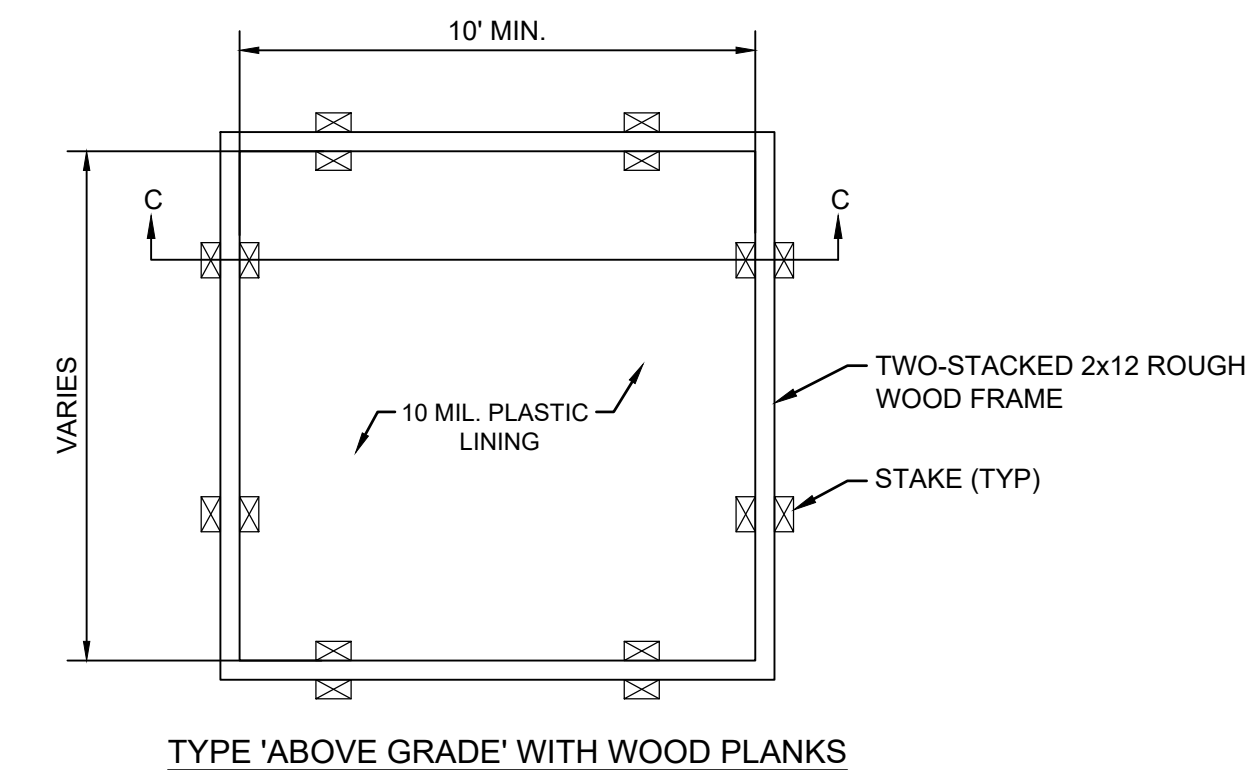
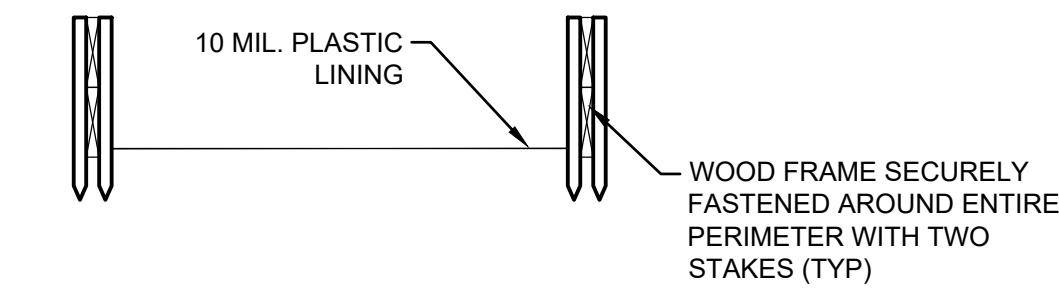


TYPE 'BELOW GRADE'

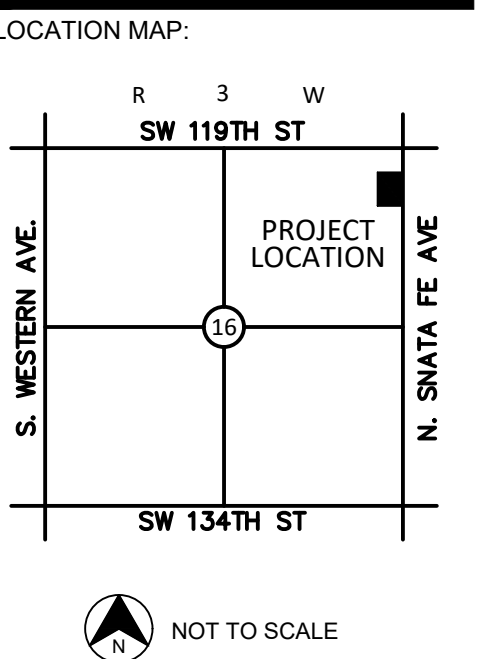


- NOTES:
1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
 2. A CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
 3. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF OR RECYCLED.
 4. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE BACKFILLED, REPAIRED AND STABILIZED TO PREVENT EROSION.

CONCRETE WASHOUT DETAIL
 NOT TO SCALE



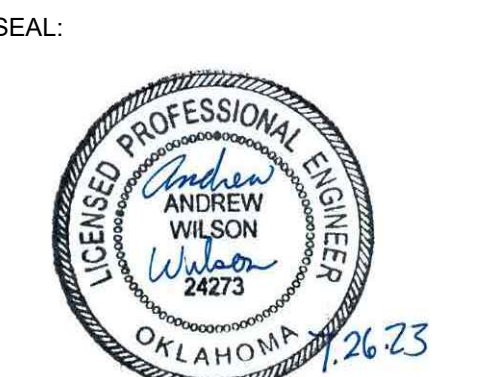
TYPE 'ABOVE GRADE' WITH WOOD PLANKS



PROJECT:
HIGHLAND WEST JR. HIGH

MOORE, OK

PROJECT NUMBER: 23069
 DRAWING DATE: 07.26.23
 ISSUE DATE: 07.26.23



SUBMITTAL:
PERMIT SET

REVISIONS:

MARK	DATE	DESCRIPTION

THESE PLANS AND DRAWINGS ARE NOT TO BE REPRODUCED, CHANGED OR COPIED IN ANY FORM OR MANNER WHATSOEVER WITHOUT FIRST OBTAINING THE WRITTEN PERMISSION AND CONSENT OF CEDAR CREEK CONSULTING INC. THIS SHEET IS NOT TO BE USED FOR CONSTRUCTION UNLESS THE ISSUE DATE IN THE TITLE BLOCK COINCIDES WITH OR POST DATES THE DRAWING DATE. ANY CHANGES MADE FROM THESE PLANS WITHOUT CONSENT OF CEDAR CREEK CONSULTING INC. ARE UNAUTHORIZED AND SHALL RELIEVE CEDAR CREEK CONSULTING OF RESPONSIBILITY FOR ALL CONSEQUENCES ARISING OUT OF SUCH CHANGES.

DRAWING TITLE:

EROSION CONTROL DETAILS

SHEET:
C5.01

Attachment "C" - 2017 OKR10 Permit

Contractor to insert OKR 10 or write here where kept at site

Attachment "D" - Notice of Intent (NOI)

DEQ Form
606-002A
Oct 18, 2017



Oklahoma Department of Environmental Quality
Notice of Intent (NOI)
for Stormwater Discharges Associated with Construction Activity under
the OPDES Construction General Permit OKR10

Submission of this NOI constitutes notice that the party identified in Section I of this form intends to be authorized by DEQ for stormwater discharges associated with construction activity on land disturbance of equal to or greater than 1 or more acres, or less than 1 acre of total land area that is part of a larger common plan of development or sale in the State of Oklahoma. Becoming a permittee obligates such discharger to comply with the terms and conditions of the OKR10 permit. To obtain an authorization from DEQ, this form must be complete with all the pertinent information.
All associated fees must be submitted with this NOI. See instructions for completing the NOI on pages 3 and 4 of this form.

NEW APPLICATION, MODIFICATION or RENEWAL of current permit, enter the authorization number: OKR10 _____

I. Operator Information

Operator Name: Omni Construction, LLC Phone: (405) 735-3992
Mailing Address: PO Box 892245
City: Oklahoma City State: OK Zip Code: 73189
Operator's Point of Contact: Joe Sherga Title: _____
Phone: (405) 735-3992 E-mail: jsherga@coxinet.net

II. Site/Project Information

Site/Project Name: Highland West Jr High Phone: (405) 735-4600
Site/Project Address: 901 N Santa Fe Ave
City: Moore County: Cleveland State: OK Zip Code: 73160
Site/Project's Point of Contact: _____ Title: _____
Phone: _____ E-mail: _____

Site/Project's purpose: Road/Bridge Wind Farm Residential Subdivision Commercial Building Others
Latitude: 35°20'43.40"N Longitude: 97°30'46.39"W at the center of the Site/Project or starting and ending points for Linear Project
Latitude: _____ Longitude: _____
Estimated construction start date: 09/01/2023 Estimated construction end date: 09/01/2024
Total area of the construction site: 1.80 (acres) Estimated area to be disturbed: 1.80 (acres)
Current total impervious area: 0.38 (acres) Post-construction total impervious area: 0.85 (acres)
Post-construction runoff coefficient of the site: 0.68 Soil and fill material description: Kirkland-Urban land-Pawhual
Is this site part of the common plan of development or sales? Yes No

Endangered Species Eligibility

- a. My site/project is not located within any of the corridors of Federal and State identified Aquatic Resources of Concern (ARC);
- b. My site/project is located within a corridor of Federal and State identified ARC and I agree to implement the control measures specified in Step 2 of Part 10.2 of the OKR10 permit;
- c. If one of eligibility criteria cannot be met, I may use Addendum H for equivalent sediment controls or contact DEQ at (405)702-8100 for further assistance;
- d. I am required to have an Endangered Species Act Section 7 consultation process and
- e. I am relying on another permittee's certification of eligibility and agree to comply with the conditions of that certification.

III. Site/Project Discharge Information

Does the facility discharge stormwater into a MS4? Yes No, If yes, name of the MS4 Operator: Moore

Receiving Water Information (note: use additional sheet of paper if necessary)

Name of the Receiving Waterbody	Is this waterbody impaired? If so, what are its impairments?	Is there a TMDL for that impairment?
Pond Creek-Canadian River	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

IV. Stormwater Pollution Prevention Plan (SWP3) Information

Has the SWP3 been prepared and available on site? Yes No

Is the operator registered for construction activities with the Secretary of State of Oklahoma? Yes No

Proposed Best Management Practices to control pollution in the stormwater discharges, check all that apply:

- | | | | |
|---------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| <input checked="" type="checkbox"/> Construction phased | <input type="checkbox"/> Sediment basin/trap | <input checked="" type="checkbox"/> Mulching/seeding/sodding | <input type="checkbox"/> Vegetated buffer |
| <input checked="" type="checkbox"/> Vehicle/concrete wash-out | <input checked="" type="checkbox"/> Site inspection | <input type="checkbox"/> Diversion dikes | <input checked="" type="checkbox"/> Inlet protection |
| <input checked="" type="checkbox"/> Construction entrances | <input checked="" type="checkbox"/> Silt fence | <input type="checkbox"/> Waste management | <input type="checkbox"/> Stream crossings |
| <input type="checkbox"/> Spill prevention/cleanup | <input type="checkbox"/> Employee training | <input type="checkbox"/> Compost blanket/geotextiles | <input checked="" type="checkbox"/> Check dams |
| <input checked="" type="checkbox"/> Construction sequencing | <input checked="" type="checkbox"/> Riprap | <input type="checkbox"/> Gradient terraces | <input type="checkbox"/> Silt dikes |

Other BMPs: _____

Post-construction Best Management Practices for construction activities, Check all that apply:

- | | | | |
|-----------------------------------------------------|--------------------------------------------------|-----------------------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> Narrow street/turnaround | <input checked="" type="checkbox"/> Wet/dry pond | <input type="checkbox"/> Protected natural features | <input type="checkbox"/> Vegetated filter trips |
| <input type="checkbox"/> Eliminated curbs & gutters | <input type="checkbox"/> Wetland | <input type="checkbox"/> Infiltration basin/trench | <input type="checkbox"/> Porous pavement |
| <input type="checkbox"/> Bio-retention/rain gardens | <input type="checkbox"/> Riparian | <input type="checkbox"/> Redevelopment/retrofit | <input type="checkbox"/> Grassed swales |
| <input type="checkbox"/> Low impact development | <input type="checkbox"/> Green designs | <input type="checkbox"/> Conservation easements | <input type="checkbox"/> Retrofit |

Other BMPs: _____

V. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: _____ Title: _____

Signature: _____ Date: _____

For DEQ use only: Assigned Authorization Number: OKR10

Additional 2017 OKR10 Reports Templates

Site Inspection Report

Corrective Action Report

Employee Training Report

SWP3 Modification Log

Site Grading and Stabilization Log

Construction Site Notice Template

Site Inspection Report

Inspection Date: _____

General Information (OKR10 Part 4.3.13.E)	
Name of Project:	DEQ Permit No.:
Inspector Name:	Inspector Title:
Inspector's Contact Information:	
Inspection Frequency: Standard Frequency: <input type="checkbox"/> Every 7 days and within 24 hours of a 0.50" rain, or discharge from snowmelt <input type="checkbox"/> Every 14 days and within 24 hours of a 0.50" rain, or discharge from snowmelt Reduced Frequency: <input type="checkbox"/> Once per month (for stabilized areas)	
Weather at the time of this inspection: _____	
Was this inspection after a 0.50" storm event? <input type="checkbox"/> Yes <input type="checkbox"/> No, Total rainfall that triggered the inspection (in inches):	
Are there any discharges at the time of inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No	

List all areas where soil stabilization is required to begin because construction work in that area has permanently or temporarily stopped and all areas where stabilization has been implemented:

Stabilization of Exposed Soil (OKR10 Part 4.3.13.D)			
Stabilization Area	Stabilization Method	Have You Initiated Stabilization?	Notes (describe your observation)
		<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide date:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide date:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide date:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide date:	
		<input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide date:	

(Notes: For each area where stabilization has been initiated, describe the progress that has been made, and what additional actions are necessary to complete stabilization. Note the effectiveness of stabilization in preventing erosion. If stabilization has been initiated but not completed, make a note of the date it is to be completed. If stabilization has been completed, make a note of the date it was completed. If stabilization has not yet been initiated, make a note of the date it is to be initiated, and the date it is to be completed.)

Provide a list/description of all structural and non-structural BMPs that your SWP3 indicates will be installed and implemented at your site. You must separately identify the **location** of each control. During Inspection, identify whether they are **installed and operating properly**, or any **corrective action** is necessary. Provide the **date** on which the condition that triggered the need for maintenance or corrective action was first identified. In the notes section you must describe the **specifics about the problem** you observed.

Condition and Effectiveness of BMP Controls & Pollution Prevention (OKR10 Part 3.3, 4 & 5)

No.	BMP Description & Location	Is BMP Installed & Operating Properly?	Corrective Action (CA) Required?	Date on Which Maintenance or CA First Identified?	Notes (describe if you observed any problem)
1.	Silt Fence/Fiber Rolls/Berm/Wattles Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2.	Silt Dikes/Check Dams/Rock Dams Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3.	Stabilized Construction Entrance/Exit Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4.	Inlet Protection on all storm drain Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5.	Sand Bag Barrier/Gravel Bag Barrier Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
6.	Vegetated Swales Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
7.	Compost Blankets/Geotextiles/Mats Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
8.	Vegetative Buffers Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
9.	Sediment Trap/ Sediment Basin Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
10.	Concrete Washout Pit Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
11.	Dust Control/Prevention	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
12.		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
13.		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
14.		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
15.		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
16.		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

(Note: The permit differentiates between conditions requiring repairs and maintenance, and those requiring corrective action. The permit requires maintenance in order to keep controls in effective operating condition and requires repairs if controls are not operating as intended. Corrective actions are triggered only for specific, more serious conditions – whether a required stormwater control was never installed, or was installed incorrectly, or not installed in accordance with the requirements of OKR10)

Pollution Prevention and Waste Management (OKR10 Part 3.3.3)

Items of Inspection	Response & Reason	Action(s) Needed
Is the site free of floatables, litter, and construction debris?	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, reason:	
Are material storage and handling areas, including fueling areas, free of spills and leaks?	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, reason:	
Are spill kits available where spills and leaks are likely to occur?	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, reason:	
Are dumpsters and waste receptacles covered when not in use?	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, reason:	
Has preventative maintenance been conducted on equipment and machinery?	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, reason:	
Are material stockpiles sufficiently contained?	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, reason:	
Has there been any sediment tracked-out from the site onto the surface of paved street, sidewalks or other paved areas outside of the site?	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, reason:	
Is the project free from visible erosion and/or sedimentation?	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, reason:	

Complete the following section if a discharge is occurring at the time of inspection:

Description of Discharges (OKR10 Part 4.3.13.D.2.f)

Was a stormwater discharge or other discharge occurring from any part of your site at the time of the inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No, if yes, provide the following information for each point of discharge:	
Specify Discharge Location	Observations (Visual Quality of the Discharge)
1.	Describe the discharge (color, odor, floating, settled/suspended solids, foam, & oil sheen): Are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No, If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:
2.	Describe the discharge (color, odor, floating, settled/suspended solids, foam, & oil sheen): Are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No, If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:

Contractor or Subcontractor Certification and Signature:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____

Date: _____

Print Name: _____

Affiliation: _____

Corrective Action Report

Today's Date: _____

(You are only required to fill out this form if any of the corrective action triggering conditions occurs on your site. Routine maintenance and repairs are generally not considered to be a corrective action triggering condition.)

Section A: Initial Report (Part 4.3.14.B.1 of OKR10)	
(Complete this section <u>within 24 hours</u> of discovering the condition that triggered corrective action)	
Name of Project:	DEQ's Permit No. OKR10
Date Problem First Discovered:	Time Problem First Discovered:
Name & Contact Information of the Individual:	
What site conditions triggered the requirement to conduct corrective action (check the box that applies): <input type="checkbox"/> A required stormwater control was never installed or was installed incorrectly, or not in accordance with the corresponding OKR10 permit requirement <input type="checkbox"/> A stormwater control is not effective enough for the discharge to meet applicable water quality standards <input type="checkbox"/> A prohibited discharge (OKR10 Parts 3.1 and 3.3.3.A) is occurring or has occurred. <input type="checkbox"/> DEQ requires corrective action as a result of permit violations found during an DEQ inspection	
Provide a description of the problem:	
Deadline for completing corrective action:	<i>not more than 7 calendar days after the date you discovered the problem</i>

Section B: Corrective Action Progress (Part 4.3.14.B.2 of OKR10)			
(Complete this section <u>no later than 7 calendar days</u> after discovering the condition that triggered corrective action)			
Section B.1: Why the Problem Occurred			
Cause(s) of Problem	How It Was Determined & Date of Determining the Cause		
1.			
2.			
Section B.2: Stormwater Control Modifications to be Implemented to Correct the Problem			
Stormwater Control Modification(s) Needed to Correct Problem	Date of Completion	SWP3 Update Necessary?	SWP3 Modifications Notes
1.		<input type="checkbox"/> Yes <input type="checkbox"/> No, If yes, provide date SWP3 modified:	
2.		<input type="checkbox"/> Yes <input type="checkbox"/> No, If yes, provide date SWP3 modified:	

Section C: Certification and Signature by Permittee

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____ Title: _____

Signature: _____ Date: _____

SWP3 Employee Training Report

Project Name: _____ DEQ Authorization No. OKR10 _____

Instructor's Name: _____ Instructor's Title: _____

Course Location: _____ Date: _____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

- | | |
|-------------------------------------------------------------------|--------------------------------------------------------------|
| <input type="checkbox"/> Overview of SWP3 | <input type="checkbox"/> Temporary & Permanent Stabilization |
| <input type="checkbox"/> Erosion & Sediment Controls Installation | <input type="checkbox"/> Good Housekeeping |
| <input type="checkbox"/> Erosion & Sediment Controls Maintenance | <input type="checkbox"/> Inspections and Corrective Actions |
| <input type="checkbox"/> Spill Prevention & Response | <input type="checkbox"/> Emergency Procedures |

Specific Training Objective: _____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Signature of the Attendees	Date
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

SWP3 Modification Log

No.	Description of the Modification	Date of Modification	Modification Prepared by [Name(s) and Title]	Signature by Designated Corporate Official
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Grading and Stabilization Activities Log

Date Grading Initiated	Description of Grading Activity	Description of Stabilization Measure and Location	Date Grading Activity Ceased (Temporary or Permanent)	Date When Stabilization Initiated

CONSTRUCTION SITE NOTICE

FOR THE NPDES GENERAL PERMIT

Contractor Firm:	
Contractor Address:	
Contact Name & Number:	<hr/> <p style="text-align: center;">Name Phone Number</p>
Project Description:	

DIVISION 2 - SITE WORK

SECTION 02110 - TEMPORARY CONSTRUCTION FENCING

Part 1 - General

1.01 Summary

- A. Section includes: Erection, maintenance and dismantling of temporary fencing around construction site and materials storage areas. This section does not apply where security fencing is required.
- B. Refer to Drawings for temporary fencing layout and location of gates.

1.02 Submittals

- A. Submit the following:
 - 1. Shop drawing indicating layout of temporary fencing, location and size of gates, existing pavement and roads, access to fire hydrants and hose connections, and other site specific conditions. Prepare drawing after site observation and verification of existing conditions.

Part 2 - Products

2.01 Temporary Chain Link fencing:

- A. Unless otherwise indicated, type of temporary chain link fencing shall be Contractor's option. Following types are acceptable:
 - 1. New materials or previously used salvaged chain link fencing in good condition.
 - 2. Posts: Galvanized steel pipe of diameter to provide rigidity. Post shall be suitable for setting in concrete footings, driving into ground, anchoring with base plates, or inserting in precast concrete blocks.
 - 3. Fabric: Woven galvanized steel wire mesh. Provide in continuous lengths to be wire tied to fence posts or prefabricated into modular pipe-framed fence panels.
 - 4. Height: Minimum Height shall be 8'-0".
- B. Gates: Provide personnel and vehicle gates of the quantity and size indicated on the Drawings or required for functional access to site.
 - 1. Fabricate of same material as used for fencing.
 - 2. Vehicle gates:
 - a. Minimum width: 20 feet to allow access for emergency vehicles.
 - b. Capable of manual operation by one person.

Part 3 - Execution:

3.01 Layout:

- A. Installation of temporary fencing shall not deter or hinder

DIVISION 2 - SITE WORK

SECTION 02110 - TEMPORARY CONSTRUCTION FENCING

access to existing and new hose connections and fire hydrants.

1. Maintain 3 feet diameter clear space around fire hydrants.
 2. Where fire hydrant or hose connection is blocked by fencing, provide access gate.
- B. Access: Provide gates for personnel, delivery of materials, and access by emergency vehicles.

3.02 Installation:

- A. Chain link posts:
1. Space at 10'-0" maximum.
 2. Drive posts, set in holes and backfill, or anchor in precast concrete blocks.
 3. For soft and unstable ground conditions, cast concrete plug around post.
 4. Posts over pavement: Use steel post plates or precast concrete blocks.
 5. Gate posts: Use bracing or concrete footings to provide rigidity for accommodating size of gate.
- B. Fabric: Securely attach to posts.
- C. Gates: Install with required hardware.
- D. Plastic mesh fencing: Space steel support posts to ensure mesh remains vertical and at proper height. Securely tie mesh to posts.

3.03 Maintenance and Removal:

- A. Maintain fencing in good condition. If damaged, immediately repair.
- B. Remove temporary fencing upon completion of Work or when no longer required for security or control. Backfill holes and compact. Holes in pavement shall be surfaced to match existing paving. Repair damage caused by installation of temporary fencing.

End of Section

DIVISION 3 - CONCRETE

SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 Section Includes

- A. Concrete formwork.
- B. Slabs on grade.
- C. Concrete foundation walls and retaining walls.
- D. Concrete reinforcement.
- E. Joint devices associated with concrete work.
- F. Miscellaneous concrete elements, including equipment pads and equipment pits.
- G. Concrete curing.

1.02 Related Requirements

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints, construction joints and isolation joints in slabs.

1.03 Reference Standards

- A. For all reference standards listed below, comply with the version year in the governing building code adopted by the Authority Having Jurisdiction. For those reference standards that are not directly referenced by the building code, use the latest edition unless noted otherwise.
- B. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.
- C. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
- D. ACI 301 - Specifications for Structural Concrete.
- E. ACI 302.1R - Guide to Concrete Floor and Slab Construction.
- F. ACI 302.2R - Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
- G. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- H. ACI 305R - Guide to Hot Weather Concreting.
- I. ACI 305.1 - Specification for Hot Weather Concreting.
- J. ACI 306R - Guide to Cold Weather Concreting.
- K. ACI 308R - Guide to External Curing of Concrete.
- L. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.
- M. ACI 347R - Guide to Formwork for Concrete.
- N. ACI SP-66 - ACI Detailing Manual.
- O. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- P. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.

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- Q. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- R. ASTM C33/C33M - Standard Specification for Concrete Aggregates.
- S. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- T. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
- U. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.
- V. ASTM C150/C150M - Standard Specification for Portland Cement.
- W. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
- X. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- Y. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete.
- Z. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
- AA. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
- AB. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
- AC. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
- AD. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.
- AE. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- AF. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.
- AG. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- AH. CRSI (DA4) - Manual of Standard Practice.
- AI. ICC (IBC)-2015 - International Building Code.

1.04 Definitions

- A. Cold Weather: A period when for more than three successive days the average daily outdoor temperature drops below 40 F. The average daily temperature is the average of the highest and lowest temperature during the period from midnight to midnight. When temperatures above 50 F occur during more than half of any 24 hr duration, the period shall no longer be regarded as cold weather.

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- B. Hot Weather: Hot weather is any combination of the following conditions that tends to impair the quality of freshly mixed or hardened concrete by accelerating the rate of moisture loss and rate of cement hydration, or otherwise causing detrimental results:
 - 1. High ambient temperature
 - 2. High concrete temperature
 - 3. Low relative humidity
 - 4. Wind speed
 - 5. Solar radiation
- 1.05 Submittals
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
 - B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
 - C. Mix Design: Submit proposed concrete mix design.
 - 1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
 - 2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 26 - Concrete Documents and Inspection.
 - D. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
 - E. Test Reports: Submit report for each test or series of tests specified.
 - F. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
 - G. Formwork Design Submittal: As required by authorities having jurisdiction.
 - H. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.
 - I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- 1.06 Quality Assurance
- A. Perform work of this section in accordance with ACI 301 and ACI 318.
 - B. Follow recommendations of ACI 305R when concreting during hot weather.
 - C. Follow recommendations of ACI 306R when concreting during cold weather.

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- D. For slabs required to include moisture vapor reducing admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for placement as required by the manufacturer's warranty.

1.07 Warranty

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- C. Slabs with Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover cost of flooring failures due to moisture migration from slabs for life of the concrete.
 - 1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.
 - 2. Provide warranty by manufacturer of MVRA matching terms of flooring adhesive or primer manufacturer's material defect warranty.

PART 2 PRODUCTS

2.01 Formwork

- A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
 - 2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces of trenched footings unless expressly allowed in the General Notes in the structural drawings. Natural rock formations that maintain a stable vertical edge may be used as side forms for below-grade concrete.
 - 3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 - 4. Form Ties: Cone snap type that will leave no metal within the clear cover zone of the concrete surface as specified in the Minimum Concrete Cover for Cast-in-Place Non-Prestressed Members table included in the General Notes of the structural drawings.

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2.02 Reinforcement Materials

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Type: Deformed billet-steel bars.
 - 2. Finish: Unfinished, unless otherwise indicated.
- B. Reinforcing Steel: ASTM A706/A706M, deformed low-alloy steel bars, weldable.
 - 1. Unfinished.
- C. Reinforcement Accessories:
 - 1. Joint Dowel Bars: ASTM A615/A615M, Grade 60 (60,000 psi) plain-steel bars, cut true to length with ends square and free of burrs.
 - 2. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
 - 3. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 - a. Continuous slab bolsters shall be used to support the bottom reinforcing bars of all reinforced slabs-on-grade.
 - 4. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement of reinforcing steel within 1-1/2 inches of weathering surfaces and for concrete surfaces that will be exposed to view.
- D. Fabrication of Reinforcing:
 - 1. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
 - 2. Welding of reinforcement is permitted only with the specific approval of Architect/Engineer. Perform welding in accordance with AWS D1.4/D1.4M.
 - 3. Locate reinforcing splices not indicated on drawings at point of minimum stress.

2.03 Concrete Materials

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
 - 1. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
 - 1. Acquire aggregates for entire project from same source.
- C. Fly Ash: ASTM C618, Class C or F.
- D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.04 Admixtures

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M.
- C. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- D. Water Reducing Admixture: ASTM C494/C494M Type A.

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- E. Moisture Vapor Reducing Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs) and formulated to close capillary systems formed during curing to reduce moisture vapor emission and transmission with no adverse effect on concrete properties or finish flooring.
 - 1. Provide admixture in slabs to receive adhesively applied flooring.
 - 2. Manufacturers:
 - a. Barrier One, Inc; Barrier One Moisture Vapor Reduction Admixture: www.barrierone.com/#sle.
 - b. Substitutions: Substitutions shall comply with the use of concrete staining/dye products. See Section 01 6000 - Product Requirements.
- 2.05 Accessory Materials
- A. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Grout: Comply with ASTM C1107/C1107M.
- 2.06 Bonding And Jointing Products
- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
 - B. Epoxy Bonding System:
 - 1. Complying with ASTM C881/C881M and of Type required for specific application.
 - C. Waterstops: Bentonite and butyl rubber, complying with NSF 61 and NSF 372.
 - D. Slab Isolation Joint Filler: 1/2 inch (13 mm) thick, height equal to slab thickness.
 - 1. Material: ASTM D1751, cellulose fiber.
- 2.07 Evaporation Retarders
- A. Evaporation Retarder: Liquid thin film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement. These products provide a protective film shield over plastic concrete, dissipate as soon as the concrete is no longer plastic, and are not curing products.
 - 1. Manufacturers:
 - a. Euclid Chemical Company ; EUCOBAR: www.euclidchemical.com/#sle.
 - b. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: www.specchemllc.com/#sle.
 - c. W. R. Meadows, Inc ; Evapre or Evapre-RTU: www.wrmeadows.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.

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2.08 Curing Materials

- A. Moisture-Retaining Sheet: ASTM C171.
 - 1. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch.
 - 2. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard.
- B. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch thick, clear.
- C. Water: Potable, not detrimental to concrete.

2.09 Concrete Mix Design

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- D. Normal Weight Concrete: Refer Structural General Notes for mix requirements for various classes of concrete.

2.10 Mixing

- A. Transit Mixers: Comply with ASTM C94/C94M.
- B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 Examination

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 Preparation

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Verify that forms are clean and free of rust before applying release agent.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent according to bonding agent manufacturer's instructions.

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1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
 2. Use latex bonding agent only for non-load-bearing applications.
- E. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.
- F. In locations where new concrete is doweled to existing work, drill holes in existing concrete, clean out drilled holes, inject the adhesive indicated on drawings and/or General Notes, and insert steel dowels, all in accordance with adhesive manufacturer's installation instructions.
- G. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade in accordance with manufacturer's instructions, ASTM E1643, ASTM F710 and ACI 302.2R.
1. Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.
 2. Lap vapor retarder sheet over footings and seal to previously placed concrete foundations.
 3. Lap joints minimum 6 inches (150 mm).
 4. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.
 5. No penetration of vapor retarder is allowed except for reinforcing steel and permanent utilities.
 6. Repair damaged vapor retarder before covering with other materials.
 7. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.
- 3.03 Installing Reinforcement And Other Embedded Items
- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
 - B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
 - C. Verify that anchors, seats, plates, reinforcement, waterstops and other items to be cast into concrete are

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accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 Placing Concrete

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Architect not less than 48 hours prior to commencement of placement operations.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- F. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- G. Finish slab-on-grade and shored elevated floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 Slab Jointing

- A. Locate and install joints as indicated on drawings and Slab-On-Grade Schedule or as submitted by Contractor and approved by structural engineer.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler, total height equal to thickness of slab, set flush with top of slab.
 - 1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.
- D. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.
- E. Saw Cut Contraction Joints: Saw cut joints shall be installed with early-entry dry-cut saw before concrete begins to cool, within 1 to 4 hours after completing the slab finishing operations; commence in approximately 1 hour in hot weather or approximately 4 hours in cold weather. Use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab. Refer to Slab-On-Grade Schedule in drawings for additional requirements.

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3.06 Floor Flatness And Levelness Tolerances

- A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for compliance with specified tolerances.
- B. Maximum Variation of Surface Flatness:
 - 1. Exposed Concrete Floors: 1/4 inch in 10 feet.
 - 2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
 - 3. Under Carpeting: 1/4 inch in 10 feet.
- C. Correct the slab surface if surface variations exceed specified tolerances.
- D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 Concrete Finishing

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
 - 2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
 - 3. Decorative Exposed Surfaces: Trowel as described in ACI 302.1R; take measures necessary to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, surfaces to receive liquid hardeners, surfaces to receive dry-shake hardeners, surfaces to be polished, and all other exposed slab surfaces.
 - 4. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

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- E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal (approximately 1/8 inch per foot).
- 3.08 Curing And Protection
- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
 - B. Uniformly apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss due to evaporation approaching 0.2 lb/sq.ft./h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing. A methodology for calculating the moisture loss due to evaporation is provided in ACI 305.1.
 - C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - 1. Normal concrete: Not less than seven (7) days.
 - D. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
 - E. Surfaces Not in Contact with Forms:
 - 1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than seven (7) days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 - a. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for seven (7) days.
 - b. Spraying: Spray water over floor slab areas and maintain wet.
 - c. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
 - 2. Final Curing: The surface shall be protected against rapid moisture loss upon the termination of initial curing by replacing wet burlap or similar coverings with plastic sheets until the surface has dried under the sheets.
 - a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.
- 3.09 Field Quality Control
- A. An independent testing agency will perform Special Inspections and field quality control tests as required by

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Chapter 17 of ICC (IBC)-2015. The testing outlined below includes some, but not all, of the testing and observations required to meet the Special Inspection provisions of the building code. Refer to the following parts of the structural drawings for additional Special Inspection requirements:

1. Statement of Special Inspection Notes
 2. Table 1705.3 titled "Required Special Inspections and Tests of Concrete Construction"
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
 - C. Submit approved mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
 - D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
 - E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure four concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed each day.
 - F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
 - G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.
 - H. Air Content: ASTM C173/C173M, one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - I. Concrete Temperature: ASTM C1064/C1064M, one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 - J. Slab Testing: Cooperate with manufacturer of specified moisture vapor reducing admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.
- 3.10 Defective Concrete
- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
 - B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
 - C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

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D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.11 Protection

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

DIVISION 4 - MASONRY

SECTION 04812 - THIN BRICK VENEER

PART 1 - GENERAL

1.01 Related Documents:

- A. Drawings and general provisions of the Contract, including General, Supplementary, and Special Conditions Sections, apply to this Section.
- B. System Description:
 - 1. Thin brick veneer installed over concrete / concrete masonry walls using latex Portland cement mortar and latex Portland cement grout.

1.02 Summary

- A. Section Includes:
 - 1. Thin brick veneer.
 - 2. Installation products: adhesive, mortars, grouts, and sealants.
 - 3. Accessories.

1.03 Related Sections:

- A. Section 05500 - Metal Fabrications (if applicable): Loose steel lintels and fabricated steel items.
- B. Section 07600 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
- C. Section 07900 - Joint Sealers: Backing rod and sealant at control and expansion joints.

1.04 References:

- A. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures; American Concrete Institute International; 2008.
- B. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2008.
- C. ASTM C 67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
- D. ASTM C 91 - Standard Specification for Masonry Cement.
- E. ASTM C 1088 - Standard Specification for Thin Veneer Brick Units Made From Clay or Shale.
- F. ASTM A 82/A 82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2005a.
- G. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2005.
- H. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar; 2004.
- I. ASTM C 150 - Standard Specification for Portland Cement; 2005.
- J. ASTM C 270 - Standard Specification for Mortar for Unit

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Masonry; 2007.

1.05 Submittals:

- A. Product Data: Provide data for masonry units, mortar, and masonry accessories.
- B. Samples: Submit 10 samples of each color of thin brick units to illustrate color, texture, and extremes of color range.
- C. Submit manufacturer's installation instructions.
- D. Submit proof of warranty.
- E. Submit sample of installation system demonstrating compatibility / functional relationships between adhesives, mortars, grouts, and other components. Submit proof from brick manufacturer verifying suitability for the specific application and use including dimensional stability, water absorption, freeze / thaw resistance, resistance to thermal cycling, and other characteristics that the project may require.

1.06 Quality Assurance:

- A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.
- B. Obtain materials from one manufacturer to ensure compatibility.
- C. Veneer Manufacturer shall be a company specializing in thin brick with a minimum of ten (10) years of experience.
- D. Installer shall provide proof of a minimum of five (5) years of experience with related thin masonry installations.
- E. Upon request, submit testing reports completed by an independent laboratory of each type of thin brick specified.
- F. Mock-Up Panel: provide a mock-up of each type/style/finish/size/color of thin brick and trim unit along with respective installation adhesives, mortars, grouts, and other installation materials.
 - 1. Do not start work until approval of sample panel has been received from the Architect.
 - 2. Size: approximately 6'x6'.

1.07 Warranty:

- A. Provide minimum Fifty (50) Year Warranty against manufacturing defects.

1.08 Pre-Installation Meeting:

- A. Convene one week before starting work of this section.

DIVISION 4 - MASONRY

SECTION 04812 - THIN BRICK VENEER

1.09 Delivery, Storage, and Handling:

- A. Deliver, handle, and store masonry materials by means that will prevent mechanical damage and contamination by other materials. Protect materials from dampness, freezing, or overheating in accordance with the manufacturer's instructions.
- B. Store clear of the ground on non-staining pallets or planking.
- C. Store mortar and other moisture-sensitive materials in protected enclosures.

1.10 Project Conditions:

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
- B. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602 or as required by manufacturer.
- C. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602 or as required by manufacturer.

PART 2 - PRODUCTS

2.01 Thin Brick:

- A. Type and Finish: custom cast or Acme ThinBRIK.
- B. Quality: ASTM C-1088, Type TBS.
- C. Size: Actual 1" thick x 2-1/4" high x 7-5/8" long or match existing.
- D. Units shall be uniform in all dimensions and texture, straight and free from cracks, spalls, and other defects.
- E. Color: **match colors at New Office and STEM Additions as directed by Architect which are a part of this project.** Iron oxide pigment colors, ASTM C 979 (if applicable).
- F. Trim Units: Provide matching thin brick.
- G. Minimal Physical Properties: compressive strength shall not be less than 2,000 psi per ASTM C 39.

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- H. Acceptable Manufacturers:
 - 1. Impressions In Stone, 1415 South Joplin Avenue, Tulsa, OK 74112
 - 2. Acme Brick Company, 3024 Acme Brick Plaza, Ft. Worth, TX 76109
 - 3. Or approved equal.
- 2.02 Mortar and Grout Mixes:
 - A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Limit cementitious materials in mortar to portland cement and lime.
 - B. Mortar for Unit Masonry:
 - 1. Type S Masonry Cement, ASTM C 91.
 - 2. Masonry sand, ASTM C 144.
 - 3. Iron oxide pigment colors, ASTM C979.
 - 4. Clean, clear water, free from deleterious substances.
 - 5. **Mortar colors at exterior thin brick locations to be selected by Architect to match New Office and STEM Additions which are a part of this project.**
 - C. Mortar Mixing:
 - 1. All mortars shall be machine mixed in equipment that is free of dirt, oil or grease and which is thoroughly cleaned and rinsed after each day's use. Mix no more mortar than can be used before setting takes place.
 - 2. Mortars shall be mixed placing all dry ingredients in the mixer first and mixing until uniform in color. Then mixed for 3 to 5 minutes with the maximum amount of water to provide workable consistency.
 - 3. No add-mixtures shall be used at any time in the mortar on this project, unless approved in writing by the Architect.
- 2.03 Flashings:
 - A. Metal Flashing Materials: Galvanized Steel or prefinished metal as specified in Section 07600.
 - B. Rubberized-Asphalt Flashing: composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film.
 - C. Elastomeric Thermoplastic Flashing: composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.

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- D. Adhesives, Primers, and Seam Tapes for Flashings: as recommended by flashing manufacturer.
- 2.04 Accessories:
- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
 - B. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35%; formulated from neoprene, urethane or PVC.
 - C. Bond Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type 1 (No. 15 asphalt felt).
 - D. Weeps: Free-draining mesh made from polyethylene strands, impact resistant.
 - E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
 - F. Moisture Barrier: minimum 15 lb. asphalt-saturated felt paper.
 - G. Metal Lath: minimum 2.5 gauge galvanized expanded metal lath.
 - H. Fasteners: galvanized nails, concrete nails or screws, or corrosion-resistant self-tapping metal screws in accordance with manufacturer's instruction relative to project substrate materials.
 - I. Sealer: high-quality, breathable-type masonry sealer.
 - J. Spacers: provide joint spacers at all horizontal and vertical joints, corners, etc. to ensure a consistent mortar dimension of 3/8" as noted below.

PART 3 - EXECUTION

- 3.01 Examination:
- A. Verify that field conditions are acceptable and are ready to receive masonry work.
 - B. Verify that related items provided under other sections are properly sized and located.
 - C. Examine surfaces and adjacent areas in which work under this Section is to be performed. Report in writing to the Project Manager and/or Architect prevailing conditions that may adversely affect satisfactory execution of the work. Do not proceed with work until unsatisfactory conditions have been corrected.
 - D. Starting work constitutes acceptance of the existing conditions. The Contractor shall then be responsible for correcting all unsatisfactory and defective work

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- encountered at Contractor's expense.
- E. Ensure that no other work is performed on the walls being covered with Thin Brick for at least 48 hours following installation.
 - F. Protect surrounding areas from possible damage during installation work.
- 3.02 Mortar Mix:
- A. Type S masonry cement shall be used to attach thin brick to prepared substrate. Either Type S or Type N masonry cement may be used for grout work at Contractor's discretion - **as long as color matches mortar as directed above.**
 - B. Mix materials in accordance with manufacturer's instructions. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C 270.
 - C. Do not use antifreeze compounds.
- 3.03 Installation:
- A. Install thin brick in accordance with manufacturer's printed instructions.
 - B. Surface Preparation:
 - 1. Clean surfaces thoroughly prior to installation. All surfaces must be free of water, snow, dirt, mud, oil, and other foreign materials prior to application.
 - 2. Prepare surfaces using methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 - 3. Install weather barrier as per manufacturer's instructions. Overlap joints 4 inches minimum. Attach membrane with approved anchors at 6 inches o.c. maximum.
 - 4. Install metal lath over weather barrier as per manufacturer's instructions. Overlap at corners 16 inches minimum. Trim lath edges as necessary with wire snips.
 - 5. Apply a scratch coat of masonry mortar to the prepared work surface and allow to set overnight. Score the wet scratch coat with a scarifier or similar tool prior to setting.
 - 6. In hot and/or dry work environments, dampen substrate scratch coat and the back of each stone unit with clean water prior to setting the unit.
 - C. Thin Brick Setting:
 - 1. Plan work to minimize job site cutting of thin brick units. Perform necessary cutting with appropriate

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cutting tools utilizing a masonry diamond blade. Angle cuts to minimize the exposure of the aggregate within the brick unit. Orient cut brick units to minimize the view of the exposed aggregate within the observer's visual field.

2. Apply 3/8 inch of mortar to the back of each brick unit.
3. Press the brick unit firmly into position. "Jiggle" each piece slightly to ensure firm bonding. This action should cause mortar to extrude slightly around the edges of the brick unit.
4. Remove excess mortar from the joint area.
5. Brush away excess mortar from the face of brick units just after the mortar has set. Do not allow mortar to remain on face of units beyond 4 hours of installation.
6. Install outside corner stone units with short and long legs alternated. Avoid using less than half-size units, particularly at corners and jambs.
7. Place units with uniform mortar joints not to exceed 3/8" inch in width (match full size brick joints at building additions). Units shall be running bond with 3 horizontal courses and 3 mortar joints equaling 8 inches. Provide flexible PVC joint spaces to provide level, straight, and uniform mortar joints. Depending on spaces provided, remove prior to installation of mortar.
8. Select and mix units from several pallets or cubes as they are placed.
9. Fill the joints with mortar using a grout bag or other grouting tool to the desired depth. Joint shall be "concave".
10. Point and tool the joints before the mortar has completely set.
11. Verify that built-in items are in proper location and ready for roughing into masonry work.
12. No masonry shall be laid when the ambient temperature is below 40 degrees F. All units shall be laid plumb, true to line and level, with accurately spaced course. Level coursing shall be maintained.
13. The Subcontractor shall be responsible for furnishing all required labor, tools, and equipment as required to complete all areas of masonry work on this project. This shall be inclusive of all scaffolding, walk-

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boards, and bracing as required to support the work until fully completed.

14. The Subcontractor shall furnish all accessories necessary for the execution of the masonry work. These materials include the thin brick, mortar, reinforcing, ties, and other required accessories.

D. Cutting and Fitting:

1. Cut and fit for pipes and conduit. Coordinate other items to provide correct size, shape, and location.

E. Cleaning and Sealing:

1. Clean thin brick surfaces in accordance with manufacturer's instructions.
2. Protect finished work from damage during remainder of construction period.
3. Apply sealer in accordance with manufacturer's recommendations.
4. The thin brick work shall be left in a state exhibiting properly and fully pointed joints and completely clean surfaces.

3.04 Inspection:

- A. Color and Texture Appearance: equal to approved sample when viewed in daylight at 10 feet.
- B. Repair and Imperfection Acceptance: not discernable when viewed in daylight at 20 feet.

End of Section

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SECTION 05120 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 Section Includes

- A. Structural steel framing members.
- B. Base plates, shear stud connectors and anchor rods.
- C. Grouting under base plates.

1.02 Related Requirements

- A. Section 05 2100 - Steel Joist Framing.
- B. Section 05 3100 - Steel Decking: Support framing for small openings in deck.
- C. Section 05 5000 - Metal Fabrications: Steel fabrications affecting structural steel work.

1.03 Reference Standards

- A. For all reference standards listed below, comply with the version year in the governing building code adopted by the Authority Having Jurisdiction. For those reference standards that are not directly referenced by the building code, use the latest edition unless noted otherwise.
- B. AISC (MAN) - Steel Construction Manual.
- C. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges.
- D. AISC 360 - Specification for Structural Steel Buildings.
- E. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
- F. ASTM A29/A29M - Standard Specification for Steel Bars, Carbon Alloy, Hot-Wrought, General Requirements.
- G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- H. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- J. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- K. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- L. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- M. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- N. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
- O. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts (Metric).

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- P. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
 - Q. ASTM A992/A992M - Standard Specification for Structural Steel Shapes.
 - R. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
 - S. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.
 - T. ASTM E94/E94M - Standard Guide for Radiographic Examination Using Industrial Radiographic Film.
 - U. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments.
 - V. ASTM E165/E165M - Standard Test Method for Liquid Penetrant Examination for General Industry.
 - W. ASTM E709 - Standard Guide for Magnetic Particle Testing.
 - X. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions.
 - Y. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
 - Z. ASTM F1852 - Standard Specification for "Twist Off" Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - AA. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
 - AB. AWS D1.1/D1.1M - Structural Welding Code - Steel.
 - AC. ICC (IBC)-2015 - International Building Code.
 - AD. MPI #79 - Primer, Alkyd, Anti-Corrosive for Metal.
 - AE. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections.
 - AF. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").
 - AG. SSPC-SP 3 - Power Tool Cleaning.
 - AH. SSPC-SP 6 - Commercial Blast Cleaning.
- 1.04 Submittals
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
 - B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
 - 2. Indicate cambers and loads.
 - 3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

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- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
 - D. Product Data: For shop primers, include manufacturer's technical information including basic materials analysis and application instructions.
 - E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
- 1.05 Quality Assurance
- A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."
 - B. Fabricator Qualifications:
 - 1. A steel fabricator specializing in performing the work of this section with minimum 10 years of experience.
 - C. Erector Qualifications:
 - 1. An erector specializing in performing the work of this section with minimum 5 years of experience.
- 1.06 Delivery, Storage And Handling
- A. Comply with the requirements of the General Conditions and of ASTM A6/A6M, including the following.
 - B. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
 - C. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F1852 fasteners and for retesting fasteners after lubrication.

PART 2 - PRODUCTS

2.01 Materials

- A. Steel Angles, Plates, and Channels: ASTM A36/A36M.
- B. Steel W Shapes and Tees: ASTM A992/A992M.
- C. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade C.
- D. Pipe: ASTM A53/A53M, Grade B, Finish black.

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- E. Headed Stud Anchors: AWS D1.1 Type B, ASTM A29 Grades 1010 through 1020.
- F. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A and galvanized in compliance with ASTM A153/A153M, Class C.
- G. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade C heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
- H. Tension Control Bolts: Twist-off type: ASTM F1852.
- I. Unheaded Anchor Rods: ASTM F1554, Grade 55, Supplementary Requirement S1, Weldable, plain, with matching ASTM A563 or ASTM A563M nuts and ASTM F436/F436M Type 1 washers.
- J. Deformed Bar Anchors: AWS D1.1/D1.1M Type C, ASTM A1064 Grade 70.
- K. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- L. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Minimum Compressive Strength at 48 Hours: 3000 pounds per square inch.
 - 2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.
 - 3. Height Change, Plastic State; when tested according to ASTM C827/C827M:
 - a. Maximum: Plus 4 percent.
 - b. Minimum: Plus 1 percent.
- M. Shop and Touch-Up Primers: As required below, complying with VOC limitations of authorities having jurisdiction.
 - 1. Steel Exposed to Exterior Weather or an Uncontrolled Environment: Two-component, high performance, zinc-rich, aromatic urethane, compatible with topcoat and complying with SSPC-Paint 20.
 - 2. Interior Steel: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI #79 and compatible with topcoat.
- N. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.

2.02 Fabrication

- A. Shop fabricate to greatest extent possible. Fabricate according to AISC 303 and to AISC 360.
- B. Fabricate connections for bolt, nut, and washer connectors.
- C. Develop required camber for members.
- D. Fabricated uncambered beams with rolling camber up.

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2.03 Finish

- A. Prepare structural component surfaces in accordance with SSPC-SP3 for interior steel or SSPC-SP6 for all steel exposed to exterior weather or an uncontrolled environment.
- B. Shop prime structural steel members:
 - 1. Do not prime surfaces that will be galvanized, fireproofed, field welded, in contact with concrete, or [in slip surfaces of slip-critical connections].
 - 2. All steel exposed to exterior weather or an uncontrolled environment shall be blast cleaned and primed with a submitted and approved zinc-rich primer.
 - 3. Interior steel shall be shop primed with the fabricators standard shop primer.
- C. Galvanize structural steel members to comply with ASTM A123/A123M.

2.04 Source Quality Control & Quality Assurance

- A. Unless the fabricator is designated an AISC-Certified Plant, Category STD, or is accredited by the IAS Fabricator Inspection Program for Structural Steel, an independent testing agency will perform Special Inspections and field quality control and quality assurance tests in the fabricator's shop as required by Chapter 17 of ICC (IBC)-2015 and Chapter N of AISC 360. Refer to the following parts of the structural drawings for additional Special Inspection requirements.
 - 1. Statement of Special Inspection Notes
 - 2. Two tables titled "Required Verification and Inspection of Steel Construction"

PART 3 - EXECUTION

3.01 Examination

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 Erection

- A. Erect structural steel in compliance with AISC 303.
- B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing. Refer to the "Construction Loads and Stability" section of the General Notes in the Project Drawings for additional information and requirements.
- C. Field weld components, deformed bar anchors and shear studs indicated on shop drawings.
- D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on

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SECTION 05120 - STRUCTURAL STEEL FRAMING

drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".

- E. Do not field cut or alter structural members without approval of Structural Engineer.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for non-shrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 Field Quality Control & Quality Assurance

- A. An independent testing agency will perform Special Inspections and field quality control and quality assurance tests as required by Chapter 17 of ICC (IBC)-2015 and Chapter N of AISC 360. Refer to the following parts of the structural drawings for additional Special Inspection requirements:
 - 1. Statement of Special Inspection Notes
 - 2. Two tables titled "Required Verification and Inspection of Steel Construction"

END OF SECTION

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SECTION 05210 - STEEL JOIST FRAMING

PART 1 - GENERAL

1.01 Section Includes

- A. Open web steel joists, with bridging, attached seats and anchors.
- B. Loose bearing members, such as plates or angles, and anchor bolts for site placement.
- C. Supplementary framing for floor and roof openings greater than 8 inches.

1.02 Related Requirements

- A. Section 05 1200 - Structural Steel Framing: Grouting base plates and bearing plates. Superstructure framing.
- B. Section 05 1200 - Structural Steel Framing: Superstructure framing.
- C. Section 05 3100 - Steel Decking: Bearing plates and angles.
- D. Section 05 5000 - Metal Fabrications: Non-framing steel fabrications attached to joists.

1.03 Reference Standards:

- A. For all reference standards listed below, comply with the version year in the governing building code adopted by the Authority Having Jurisdiction. For those reference standards that are not directly referenced by the building code, use the latest edition unless noted otherwise.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- E. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- F. ASTM A436 - Standard Specification for Austenitic Gray Iron Castings.
- G. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
- H. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification.
- I. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- J. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel.
- K. ICC (IBC)-2015 - International Building Code.
- L. SJI JG-10 - Standard Specification for Joist Girders.
- M. SJI K-10 - Standard Specification for Open Web Steel Joists, K-Series.

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- N. SJI LH/DLH-10 - Standard Specification for Longspan Steel Joists, LH-series and Deep Longspan Steel Joists, DLH-series.
 - O. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders.
 - P. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer.
 - Q. SSPC-SP 2 - Hand Tool Cleaning.
- 1.04 Submittals
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
 - B. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, and attachments.
 - C. Welders' Certificates: Submit manufacturer's certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.
 - D. Manufacturer's Qualification Statement.
 - E. Comprehensive engineering analysis of all joists signed and sealed by the qualified professional engineer licensed in the state of the project responsible for its preparation.
 - F. Manufacturer's Certification: At completion of manufacture, the steel joist manufacturer shall submit a certificate of compliance to the owner's authorized agent for submittal to the building official as specified in Section 1704.5 of ICC (IBC)-2015 stating that work was performed in accordance with approved construction documents and with the SJI specifications listed herein.
- 1.05 Quality Assurance
- A. Perform Work, including that for headers and other supplementary framing, in accordance with SJI JG-10, SJI K-10, and SJI LH/DLH-10 and SJI Technical Digest No. 9.
 - B. Manufacturer Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.
- 1.06 Delivery, Storage, And Handling
- A. Transport, handle, store, and protect products to SJI requirements.

PART 2 - PRODUCTS

2.01 Materials

- A. Open Web Joists: Types as indicated on drawings:
 - 1. Minimum End Bearing on Steel Supports: Comply with referenced SJI standard.

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2. Minimum End Bearing on Concrete or Masonry Supports: Comply with referenced SJI standard.
 3. Finish: Shop primed.
 - B. Anchor Bolts, Nuts and Washers: ASTM A307, hot-dip galvanized per ASTM A153/A153M, Class C.
 - C. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325 with matching compatible ASTM A563 nuts and ASTM A436 washers.
 - D. Headed Stud Anchors: [AWS D1.1 Type B, ASTM A29 Grades 1010 through 1020].
 - E. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36/A36M.
 - F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
 - G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- 2.02 Finish
- A. Shop prime joists as specified.
 1. Do not prime surfaces that will be fireproofed.
 - B. Prepare surfaces to be finished in accordance with SSPC-SP2.
- 2.03 Source Quality Control
- A. Welded Connections: Visually inspect all shop-welded connections.

PART 3 - EXECUTION

- 3.01 Examination
- A. Verify existing conditions prior to beginning work.
- 3.02 Erection
- A. Erect joists in compliance with SJI Technical Digest No. 9 and all applicable provisions of OSHA safety standards.
 - B. Erect joists with correct bearing on supports.
 - C. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.
 - D. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.
 - E. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.
 - F. Position and field weld joist chord extensions and wall attachments as detailed.
 - G. Install supplementary framing for floor and roof openings greater than 8 inches.

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SECTION 05210 - STEEL JOIST FRAMING

- H. Do not permit erection of decking until joists are braced, bridged, and secured or until completion of erection and installation of permanent bridging and bracing.
 - I. Do not field cut or alter structural members without approval of joist manufacturer.
 - J. After erection, prime welds, damaged shop primer, and surfaces not shop primed, except surfaces specified not to be primed.
- 3.03 Tolerances
- A. Maximum Variation From Plumb: 1/4 inch.
 - B. Maximum Offset From True Alignment: 1/4 inch.
- 3.04 Field Quality Control
- A. An independent testing agency will perform Special Inspections and field quality control as required by Chapter 17 of ICC (IBC)-2015. Refer to the following parts of the structural drawings for additional Special Inspection requirements.
 - 1. Statement of Special Inspection Notes
 - 2. Table 1705.2.3 titled "Required Special Inspections of Open-Web Steel Joists and Joist Girders"

END OF SECTION

DIVISION 5 - STRUCTURAL STEEL

SECTION 05310 - STEEL DECKING

PART 1 - GENERAL

1.01 Section Includes

- A. Roof deck.
- B. Supplementary framing for openings up to and including 8 inches.
- C. Bearing plates and angles.

1.02 Related Requirements

- A. Section 05 1200 - Structural Steel Framing: Support framing for openings larger than 8 inches and shear stud connectors.
- B. Section 05 2100 - Steel Joist Framing: Support framing for openings larger than 8 inches.
- C. Section 05 5000 - Metal Fabrications: Steel angle concrete stops at deck edges.

1.03 Reference Standards

- A. For all reference standards listed below, comply with the version year in the governing building code adopted by the Authority Having Jurisdiction. For those reference standards that are not directly referenced by the building code, use the latest edition unless noted otherwise.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- F. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel.
- G. ICC (IBC)-2015 - International Building Code.
- H. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks.
- I. SDI (QA/QC) - Standard for Quality Control and Quality Assurance for Installation of Steel Deck.
- J. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").

1.04 Submittals

- A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
- C. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
- D. Submit manufacturer's installation instructions.

DIVISION 5 - STRUCTURAL STEEL

SECTION 05310 - STEEL DECKING

- E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
- 1.05 Quality Assurance
- A. Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck shall be in accordance with the quality assurance inspection requirements of SDI (QA/QC).
 - B. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of experience.
- 1.06 Delivery, Storage, And Handling
- A. Cut plastic wrap to encourage ventilation.
 - B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 - PRODUCTS

- 2.01 Steel Deck
- A. Roof Deck: Non-composite type, fluted steel sheet:
 - 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G60/Z180 galvanized coating.
 - 2. Structural Properties: As indicated in General Notes.
- 2.02 Accessory Materials
- A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.
 - B. Welding Materials: AWS D1.1/D1.1M.
 - C. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.
 - D. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
 - E. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.
- 2.03 Fabricated Deck Accessories
- A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 20 gauge, 0.0359 inch thick sheet steel; of profile and size as indicated; finished same as deck.
 - B. Roof Sump Pans: Formed sheet steel, 14 gauge, 0.0747 inch minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches below roof deck surface, bearing flange 3 inches wide, sealed watertight.

DIVISION 5 - STRUCTURAL STEEL

SECTION 05310 - STEEL DECKING

PART 3 - EXECUTION

3.01 Examination

- A. Verify existing conditions prior to beginning work.

3.02 Installation

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. On concrete and masonry surfaces provide minimum 4 inch bearing.
- C. On steel supports provide minimum 2 inch bearing at discontinuous ends of deck and minimum 3 inch bearing length of continuous roof deck over interior supports.
- D. Fasten deck to steel support members as indicated at spacings indicated on the drawings using methods specified.
- E. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.
- F. Where roof deck changes direction, install 6 inch minimum wide sheet steel cover plates, of same thickness as deck. Attach both sides of cover plate to roof deck below with the same fasteners and spacings as required for deck to supports.
- G. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.
- H. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.

3.03 Field Quality Control

- A. An independent testing agency will perform Special Inspections and field quality control tests as required by Chapter 17 of ICC (IBC)-2015 and SDI (QA/QC). Refer to the following parts of the structural drawings for additional Special Inspection requirements:
 - 1. Statement of Special Inspection Notes
 - 2. Table titled "Required Inspection of Cold-Formed Steel Deck"
- B. Concurrent with the submittal of special inspection reports to the Owner's Representative, the special inspector shall submit to the Owner's Representative and the Installer a list of nonconforming items.

END OF SECTION

DIVISION 5 - METALS

SECTION 05400 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.01 Related Documents

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

1.02 Summary

- A. This Section includes the following:
 - 1. Exterior and interior non-load-bearing wall framing.
 - 2. Soffit joist framing.
- B. Related Sections include the following:
 - 1. Division 5 Section "Metal Fabrications" for masonry shelf angles and connections.
 - 2. Division 9 Section "Gypsum Board Assemblies" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.

1.03 Performance Requirements

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: Design loads shall be calculated components and cladding load per ASCE/SEI 7 edition indicated on the drawings.
 - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/600 of wall height at areas backing up brick veneer, and 1/240 of wall height at areas backing up other materials.
 - b. Soffit Joist Framing: Vertical deflection of 1/240 of the span.
 - 3. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 1 inch.
- B. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."
 - 1. Headers: Design according to AISI's "Standard for Cold-Formed Steel Framing - Header Design."
 - 2. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

DIVISION 5 - METALS

SECTION 05400 - COLD-FORMED METAL FRAMING

1.04 Submittals

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
 - 1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Welding certificates.
- D. Research/Evaluation Reports: For cold-formed metal framing.

1.05 Quality Assurance

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
- C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- D. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."
 - 1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Truss Design."
 - 2. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."

1.06 Delivery, Storage, And Handling

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

DIVISION 5 - METALS

SECTION 05400 - COLD-FORMED METAL FRAMING

PART 2 - PRODUCTS

2.01 Manufacturers

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:
1. Allied Studco.
 2. AllSteel Products, Inc.
 3. California Expanded Metal Products Company.
 4. Clark Steel Framing.
 5. Consolidated Fabricators Corp.; Building Products Division.
 6. Craco Metals Manufacturing, LLC.
 7. Custom Stud, Inc.
 8. Dale/Incor.
 9. Design Shapes in Steel.
 10. Dietrich Metal Framing; a Worthington Industries Company.
 11. Formetal Co. Inc. (The).
 12. Innovative Steel Systems.
 13. MarinoWare; a division of Ware Industries.
 14. Quail Run Building Materials, Inc.
 15. SCAFCO Corporation.
 16. Southeastern Stud & Components, Inc.
 17. Steel Construction Systems.
 18. Steeler, Inc.
 19. Super Stud Building Products, Inc.
 20. United Metal Products, Inc.

2.02 Materials

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
1. Grade: ST33H (ST230H).
 2. Coating: G60 (Z180).
- B. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: 50 (340), Class 1 or 2.
 2. Coating: G90 (Z275).

2.03 Exterior Non-Load-Bearing Wall Framing

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0428 inches (1.09 mm).
 2. Flange Width: 1-5/8 inches (41 mm).

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SECTION 05400 - COLD-FORMED METAL FRAMING

- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0538 inches (1.37 mm)
 - 2. Flange Width: 1-1/2 inches.
- C. Vertical Deflection Clip Option: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dietrich Metal Framing; a Worthington Industries Company.
 - b. MarinoWare, a division of Ware Industries.
 - c. SCAFCO Corporation
 - d. The Steel Network, Inc.
- D. Single Deflection Track Option: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).
 - 2. Flange Width: 1 inch (25 mm) plus the design gap for 1-story structures and 1 inch (25 mm) plus twice the design gap for other applications.
- E. Double Deflection Track Option: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
 - 1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:
 - a. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).
 - b. Flange Width: 1 inch (25 mm) plus the design gap for 1-story structures and 1 inch (25 mm) plus twice the design gap for other applications.
 - 2. Inner Track: Of web depth indicated, and as follows:
 - a. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
 - b. Flange Width: Equal to sum of outer deflection track flange width plus 1 inch.

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SECTION 05400 - COLD-FORMED METAL FRAMING

2.04 Soffit Joist Framing

- A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depth indicated, unpunched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: As indicated on drawings.
 - 2. Flange Width: 1-5/8 inches (41 mm) minimum.

2.05 Framing Accessories

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Anchor clips.
 - 5. End clips.
 - 6. Foundation clips.
 - 7. Gusset plates.
 - 8. Stud kickers, knee braces, and girts.
 - 9. Joist hangers and end closures.
 - 10. Hole reinforcing plates.
 - 11. Backer plates.

2.06 Anchors, Clips, And Fasteners

- A. Anchor Bolts: ASTM F 1554, Grade 55, threaded carbon-steel headless bolts, with encased end threaded, and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C or mechanically deposition according to ASTM B 695, Class 50.
- B. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- C. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- D. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- E. Welding Electrodes: Comply with AWS standards.

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SECTION 05400 - COLD-FORMED METAL FRAMING

2.07 Miscellaneous Materials

- A. Galvanizing Repair Paint: ASTM A 780.
- B. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.
- C. Shims: Load bearing, high-density multimonomer plastic, nonleaching.
- D. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.08 Fabrication

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
 - 4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening

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requirements of sheathing or other finishing materials.

2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 - EXECUTION

3.01 Examination

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 Installation, General

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).
- D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
 1. Cut framing members by sawing or shearing; do not torch cut.
 2. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for

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which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

- G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- H. Install insulation, specified in Division 7 Section "Building Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.03 Exterior Non-Load-Bearing Wall Installation

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to bottom track, unless otherwise indicated. Fast both flanges to top track if required by deflection option selected. Space studs as follows:
 - 1. Stud Spacing: 16 inches (406 mm).
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Single Deflection Track Option: Install single-leg deflection tracks and anchor to building structure.
 - 2. Double Deflection Track Option: Install double deep-leg deflection tracks and anchor outer track to building structure.
 - 3. Deflection Clip Option: Connect vertical deflection clips to infill studs and anchor to building structure.

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- E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
 - 1. Top Bridging for Single Deflection Track Option:
Install row of horizontal bridging within 12 inches (305 mm) of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - a. Install solid blocking at maximum 96-inch (2440-mm) centers and as shown on approved Shop Drawings.
 - 2. Bridging Options:
 - a. Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 - b. Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - c. Proprietary bridging bars installed according to manufacturer's written instructions.
 - F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.
- #### 3.04 Joist Installation
- A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Shop Drawings.
 - B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.
 - 1. Unless shown otherwise in drawings, install joists over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm).
 - 2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on drawings.
 - C. Space joists not more than 2 inches (51 mm) from abutting walls, and as follows:
 - 1. Joist Spacing: As indicated.

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SECTION 05400 - COLD-FORMED METAL FRAMING

- D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.
 - E. Install bridging at intervals indicated. Fasten bridging at each joist intersection as follows:
 - 1. Bridging: Joist-track solid blocking of width and thickness indicated, secured to joist webs.
 - F. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.
- 3.05 Field Quality Control
- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
 - B. Field and shop welds will be subject to testing and inspecting.
 - C. Testing agency will report test results promptly and in writing to Contractor and Architect.
 - D. Remove and replace work where test results indicate that it does not comply with specified requirements.
 - E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 3.06 Repairs And Protection
- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
 - B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer that ensures the cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

DIVISION 5 - STRUCTURAL STEEL

SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

1.01 Section Includes

- A. Shop fabricated steel items.

1.02 Related Requirements

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 05 1200 - Structural Steel Framing: Structural steel column anchor bolts.
- D. Section 05 2100 - Steel Joist Framing: Structural joist bearing plates, including anchorage.
- E. Section 05 3100 - Steel Decking: Bearing plates for metal deck bearing, including anchorage.
- F. Section 05 5100 - Metal Stairs.

1.03 Reference Standards

- A. For all reference standards listed below, comply with the version year in the governing building code adopted by the Authority Having Jurisdiction. For those reference standards that are not directly referenced by the building code, use the latest edition unless noted otherwise.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- H. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.
- I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
- J. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- K. MPI #79 - Primer, Alkyd, Anti-Corrosive for Metal.
- L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic").

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SECTION 05500 - METAL FABRICATIONS

1.04 Submittals

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Design data: Submit drawings and supporting calculations, signed and sealed by a qualified professional structural engineer.
 - a. Include the following, as applicable:
 - 1) Design criteria.
 - 2) Engineering analysis depicting stresses and deflections.
 - 3) Member sizes and gauges.
 - 4) Details of connections.
 - 5) Support reactions.
 - 6) Bracing requirements.

PART 2 - PRODUCTS

2.01 Materials - Steel

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
- F. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
- G. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
- H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- I. Shop and Touch-Up Primer: As required below, complying with VOC limitations of authorities having jurisdiction.
 - 1. Steel Exposed to Exterior Weather or an Uncontrolled Environment: Two-component, high performance, zinc-rich, aromatic urethane, compatible with topcoat and complying with SSPC-Paint 20.
 - 2. Interior Steel: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI #79 and compatible with topcoat.

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SECTION 05500 - METAL FABRICATIONS

- J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
- 2.02 Fabrication
- A. Fit and shop assemble items in largest practical sections, for delivery to site.
 - B. Fabricate items with joints tightly fitted and secured.
 - 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. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- 2.03 Fabricated Items
- A. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking and joists; prime paint finish.
 - B. Lintels: As detailed; prime paint finish.
 - C. Door Frames for Overhead Door Openings and Wall Openings: Channel sections; prime paint finish.
 - D. Elevator Hoistway Divider Beams: Beam sections; prime paint finish.
 - E. Toilet Partition Suspension Members: Steel channel sections; prime paint finish.
- 2.04 Finishes - Steel
- A. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
 - B. Prepare surfaces to be primed in accordance with SSPC-SP3 for interior steel or SSPC-SP6 for all steel exposed to exterior weather or an uncontrolled environment.
 - C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
 - D. Prime Painting: One coat.
 - E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
 - F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.
- 2.05 Fabrication Tolerances
- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
 - B. Maximum Offset Between Faces: 1/16 inch.

DIVISION 5 - STRUCTURAL STEEL

SECTION 05500 - METAL FABRICATIONS

- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 - EXECUTION

3.01 Examination

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

3.02 Preparation

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 Installation

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.04 Tolerances

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

DIVISION 6 - WOOD & PLASTIC

SECTION 06100 - ROUGH CARPENTRY

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Wood Treatment - Section 06300

1.03 Quality Assurance:

- A. Grades specified shall conform to the most recent grading rules as established by the following bureaus and associations.
 - 1. PS 20 - American Softwood Lumber Standard.
 - 2. Western Wood Products Association
 - 3. Southern Pine Inspection Bureau
- B. Grade and trade mark each piece of lumber or bundle on bundled stock. Use only the recognized official marks of association under whose rules it is graded. Grade and trade marks will not be required if each shipment is accompanied by certificate of inspection issued by grading association.

1.04 Submittals:

- A. Product Data: for each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing and finishing treated material.
 - 2. As requested by authorities having jurisdiction include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials both before and after exposure to elevated temperatures when tested according to ASTM D5516 and ASTM D 5664.
 - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

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SECTION 06100 - ROUGH CARPENTRY

4. Research / evaluation reports - for the following, showing compliance with building code in effect for Project:
 - a. Fire-retardant treated wood.
 - b. Power-driven fasteners.
 - c. Power-actuated fasteners.
 - d. Expansion anchors.
 - e. Metal framing anchors.

1.05 Delivery, Storage and Handling:

- A. Stack lumber, plywood, sheathing, and other materials: provide spacers between each bundle to provide air circulation around bundled material. Provide proper air circulation between stacks and under coverings.

Part 2 - Products

2.01 General:

- A. Provide best quality of respective grades and kinds. Lumber and plywood shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship". Factory mark each piece of lumber with grade stamp of grading agency.
- B. Maximum moisture content of lumber 19%.
- C. Provide dressed lumber (S4S) unless otherwise indicated.
- D. Where nominal sizes are indicated, provide actual sized required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

2.02 Grades and Applications of Lumber:

- A. Framing lumber for the following shall be "Standard" grade Douglas Fir (WCLIB or WWPA).
 1. Concealed blocking/nailers, cants, grounds, and miscellaneous wood items used in conjunction with the roofing work and as indicated on the Drawings.
 2. Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the Grading Agency indicated.

2.03 Fire-retardant Treated Materials:

- A. General - where fire-retardant treated materials are required by authorities having jurisdiction, provide materials that comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood). Identify fire-retardant treated wood with appropriate classification

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SECTION 06100 - ROUGH CARPENTRY

marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

2.04 Panel Products:

- A. Miscellaneous Concealed Plywood: shear wall sheathing, span rating to suit framing in each location, and thickness indicated. Refer to Structural Drawings.
- B. Telephone and Electrical Equipment Backing Panels: DOC PS 1, C-D Plugged, fire-retardant treated, in thickness indicated, or if not indicated, not less than ½ inch thick.

2.05 Fasteners:

- A. All nails, spikes, bolts, connectors and other fasteners used in connections with this work shall be galvanized.
 - 1. Nails, wire, brads and staples - FS-FF-N-105.
 - 2. Power-driven Fasteners - CABO NER-272.
 - 3. Wood screws - ASME B18.6.1.
 - 4. Screws for fastening to cold formed metal framing: ASTM C954 length as recommended by screw manufacturer for material to be fastened.
 - 5. Lag bolts - ASME B18.2.1.
 - 6. Bolts - steel bolts complying with ASTM A 307, Grade A with ASTM C563 hex nuts and, where indicated, flat washers.
 - 7. Expansion anchors - anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - a. Material for interior applications: carbon steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - b. Material for exterior applications: stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, alloy group 1 or 2.

2.06 Metal Framing Anchors:

- A. General: provide galvanized steel framing anchors of structural capacity, type, and size indicated and acceptable to authorities having jurisdiction.
- B. Galvanized Steel Sheet: hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

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SECTION 06100 - ROUGH CARPENTRY

Part 3 - Execution

3.01 Sizes and Applications (General Framing):

- A. Members shall be accurately cut and fitted, true to line and level, avoiding shims and wedges as much as possible. Discard material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Where applicable, apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- C. At wood ground, blocking and nailer installation: install where indicated and required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- D. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless noted otherwise.

3.02 Rough Hardware:

- A. Provide all sufficient nails, screws, etc. to insure rigidity and structural soundness. Provide hot-dipped galvanized fasteners at all weather exposed locations.
- B. Spiking and nailing shall be done using largest size spikes and nails practicable and as indicated on the drawings. Securely attach carpentry according to applicable codes and recognized standards.
- C. Bolt nailers and blocking to steel or concrete members with bolts of proportionate strength of members attached, length required, spaced 4'-0" o.c. maximum and 4" from each end, except as otherwise indicated. Countersink fastener heads on exposed carpentry work and fill holes with wood fiber.
- D. Pre-drill members when necessary to avoid splitting of wood.

3.03 Panel Product Installation:

- A. Wood structural panels: comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential and Commercial", for types of structural-use panels and applications indicated. Comply with "Code Plus" provisions in above referenced guide.

End of Section

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SECTION 06200 - FINISH CARPENTRY

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.
- B. The erection of wall and partition wood finish materials, installation of door and hardware, and shelving incidentals necessary to finish the carpentry.

1.02 Related Work Specified Elsewhere:

- A. Wood Doors - Section 08200
- B. Hardware and Specialties - Section 08700

1.03 Quality Assurance:

- A. Standards:
 - 1. Architectural Woodwork Institute:
 - a. Architectural Woodwork Quality Standards.
 - 2. National Electrical Manufacturers Association:
 - a. NEMA Publication LD-1.
 - 3. Western Wood Products Association:
 - a. Standard Grading Rules for Western Lumber.
 - 4. American Plywood Association:

1.05 Product Delivery, Storage and Handling:

- A. All finish materials, trim, etc. shall be inspected to insure that no sub-grade, defective, or machine-marked pieces are installed.

Part 2 - Products

2.01 General:

- A. Grades specified shall conform to the most recent grading rules of the association or bureau under whose rules the lumber is produced.
- B. Quality standards specified shall conform to the latest edition of the Architectural Woodwork Institute's "Quality Standards".
- C. Lumber shall be kiln-dried to 10% to 12% moisture content which shall be maintained during the fabrication of millwork and cabinetry.

Part 3 - Execution

3.01 Miscellaneous Trim and Frames:

- A. Install all trim in longest possible lengths. Stagger joints in adjacent member. Cope at returns and miter at corners. Attach securely in place with fine finishing nails where exposed; set for filling.

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SECTION 06200 - FINISH CARPENTRY

- B. Immediately prior to final inspection of building, the contractor shall repair or replace all millwork or cabinetry items which have been damaged in any way.

End of Section

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SECTION 06300 - WOOD TREATMENT

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. American Wood Preservers Association:
 - a. AWPA Standard P-5 (Preservative)
 - b. AWPA Standard Commodity Standards (Treating Process).
 - 2. Federal Specifications:
 - a. TT-W-550 (Preservative).
 - b. TT-W-571 (Treating Process).
- B. All lumber and plywood receiving wood treatment shall bear the trademark of the process used.
- C. Submit certificate and guarantee of the lumber treated.

Part 2 - Products

2.01 Materials:

- A. Description: Waterborne chemical salts intended for pressure impregnation as a wood preservative. Preservatives with a petroleum vehicle are not permitted.

Part 3 - Execution

3.01 Installation:

- A. Location of treated lumber:
 - 1. All blocking, plates, nailers and curbs used in conjunction with gravel guards, roof edges and all other wood components used in the roofing project.
- B. Materials shall be pressure treated in accordance with the standards of the American Wood Preservers Institute and the chemical manufacturer's specifications.
- C. Treated material shall conform to AWPB LD-2 and treated to a maximum retention of 0.23 pound of oxide per cubic foot.
- D. Moisture content of finish products shall not exceed 19%.

End of Section

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SECTION 06410 - CUSTOM CASEWORK

Part 1 - General

1.01 Section Includes:

- A. Special fabricated cabinet units as indicated on drawings.
- B. Countertops.
- C. Hardware
- D. Preparation for site finishing.
- E. Preparation for installing utilities.
- F. Related Documents: The Contract Documents apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.
- G. **NOTE: FRAMELESS CABINETS / EUROPEAN CONSTRUCTION STYLE CABINETS ARE ACCEPTABLE. Provide proposed details, etc. during shop drawing submittal phase for approval by Architect.**

1.02 Related Sections:

- A. Section 06100-Rough Carpentry: Grounds and support framing.
- B. Section 06200-Finish Carpentry: Related trim not specified in this section.
- C. Section 09900- Paints and Coatings: Finishing cabinet exterior and interior where applicable.

1.03 References:

- A. ANSI/BHMA A156.9-Cabinet Hardware.
- B. AWI-Quality Standards
- C. FS L-F 508-Plastic Sheet, Laminated, Decorative and non-Decorative.
- D. FS MM-L-736-Lumber, Hardware.
- E. FS MMM-A- 130-Adhesive, Contact.
- F. NEMA LD-3-High Pressure Decorative laminates.
- G. PS 1-Construction and Industrial Plywood.
- H. PS 20-American Softwood Lumber Standard.
- I. PS 51-Hardwood and Decorative Ply.

1.04 Submittals:

- A. Shop Drawings: Indicated materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location, and schedule of finishes.

1.05 Quality Assurance: Perform work in accordance with AWI Custom quality.

1.06 Qualifications: Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years of experience.

1.07 Delivery, Storage, and Handling:

- A. Protect units from moisture damage.

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SECTION 06410 - CUSTOM CASEWORK

- B. Store materials in ventilated, interior locations under constant, minimum temperatures of 60 degrees F. And maximum relative humidity of 55 percent.
- 1.08 Field Measurements: Verify that field measurements are as indicated on shop drawings.
- 1.09 Coordination: coordinate work with plumbing and electrical rough-in.

Part 2 - Products

2.01 Wood Materials:

- A. Softwood Lumber:PS20; graded in accordance with AWI Custom; average moisture content of 6 percent; species and grades as follows:

<u>Item</u>	<u>Species</u>	<u>Cut</u>
Cabinet Frame	Douglas Fir	Economy
Internal Construction	Douglas Fir	Economy
Miscellaneous framing	Douglas Fir	Economy
Sub-Tops	Douglas Fir	Economy

- B. Hardwood Lumber FS MM-L-736; graded in accordance with AWI Custom; average moisture content of 6 percent; species and grade as follows:

<u>Item</u>	<u>Species</u>	<u>Cut</u>
Exposed Stiles and Rails	Red Oak	Economy
Miscellaneous Trim	Red Oak	Economy

2.02 Sheet Materials:

- A. Softwood Plywood: PS 1; graded in accordance with; core material of veneer or lumber, species and cut as follows:

<u>Item</u>	<u>Face</u>	<u>Cut</u>
Drawer Construction	Douglas Fir	Economy
Gables and Backs	Douglas Fir	Custom
Sub-tops	Douglas Fir	Economy
Non-sight exposed shelving	Douglas Fir	Custom
Miscellaneous	Douglas Fir	Custom

- B. Hardwood Plywood: PS 51; AM graded in accordance with AWI; core material for veneer or lumber; type of glue recommended for application; face veneer and cuts as follows:

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<u>Item</u>	<u>Face Species</u>	<u>Cut</u>
Door and Drawer Fronts	Red Oak	Economy
Drawer Construction	Red Oak	Economy
Gable and Backs	Red Oak	Economy

- C. Wood Particles-PS 1;AM standard, composed of wood= chips, medium density, made with high waterproof resin binders; of grade to suit application; sanded faces, located as follows:

Item
Drawer Construction

- D. Hardboard: Pressed wood fiber with resin binder, tempered grade, 1/4 inch thick, smooth one side, located as follows:

Item
Drawer Bottoms

2.03 Laminated Materials: Plastic Laminated: NEW LD-T; 00550 inch General Purpose Grade; suede surface finish, color and pattern as selected by Architect. All sight exposed surfaces (excluding countertops and backsplash) for cabinets to be laminate finished.

2.04 Accessories:

- A. Adhesive: FS MMM-A-130 contact adhesive, water base type, recommended by laminate manufacturer to suit application.
- B. Fasteners: Size and type to suit application.
- C. Bolts, Nuts, Washers, Lags, Pins and Screws: Of size and type to suit application; galvanized finish in concealed locations and cadmium plated finish in exposed locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Lumber for Shimming, Blocking, and Miscellaneous Applications: Softwood lumber of Douglas Fir species.
- F. Primer. Alkyd primer sealer type.
- G. Wood filler: Solvent base, tinted to match surface finish color.
- H. Plastic Grommets: provide at openings in countertop as indicated on the Drawings. Color to be "black".

2.05 Architectural Cabinet Solid Surface Tops (Countertops):

- A. Design Load: deflection limited to 1/360.
- B. Type of Top: homogeneous solid sheets of filled plastic resin complying with the following:
 - 1. Colors and Patterns: as selected by Architect from manufacturer's full range.
 - 2. Special Features: eased edge treatment.
 - 3. Accessories:

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- a. Adhesives: for seams and drop edges, Formica Solid Surfacing Seaming Cartridges, 9 ounce, color to blend with sheet material.
 4. Fabrication: assemble work at shop and deliver to job ready for installation. Manufacture in largest practical pieces for handling and shipping without seams.
 - a. Fabricate work square and to required lines.
 - b. Recess and conceal fasteners connections and reinforcing.
 - c. Design, construction, and installation: details to allow for expansion and contraction of materials. Properly install material with hairline joints held rigidly in place.
 - d. Fabricate countertops and vanities with back splash and side splash pieces to profiles and sizes indicated.
 - e. Fabricate items to profiles shown with connections and supports as indicated or as required for complete installation in accordance with manufacturer's written instruction and approved submittals.
 - f. Provide cut-outs for plumbing fixtures and trim, washroom accessories, appliances, and related items: confirm layout with manufacturer's cut-out templates before beginning work. Round corners of cut-outs and sand edges smooth.
 - g. Do not exceed manufacturer's recommended unsupported overhang distances.
 - h. Finish exposed surfaces smooth and polish to low sheen.
 - i. Radius corners and edges.
 - j. Tolerances: variations in size or openings shall not exceed +/-1/4".
 5. Acceptable manufacturer: Formica Solid Surfacing as manufactured by Formica Group / Fabrications, Cincinnati, Ohio **or approved equal.**
- 2.06 Factory Finishing of Interior Architectural Woodwork:
- A. Quality Standard: Comply with AWI Section 1500 unless otherwise indicated.
 - B. The finish of custom casework is included under this Section, regardless of whether factory applied or applied after installation.
 - C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces and similar preparations for finishing of

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- custom casework, as applicable to each unit of work.
- D. Factory Finishing: The extent to which the final finish is applied to architectural woodwork a factory is Contractor's option, except factor apply at least prime/base coat to the greatest extent possible before delivery.
 - E. Transparent finish for Open-Grain Woods: Comply with requirements indicated below for grade Finish system, staining, effect, and sheen, with sheen measured on 60 degree gloss meter per ASTM D 523.
 - 1. Grade: Custom
 - 2. AWI Finish System No. 5: Catalyzed polyurethane.
 - 3. Staining: Match Architect=s sample.
 - 4. Effect: Closed grain (filled finish).
 - 5. Sheen: Medium-gross ribbed effect 35-45 deg.
 - F. Transparent Finish for Closed-grain Woods: Comply with requirements indicated below for grade, finish system staining, effect, and sheen.
 - 1. Grade: Custom
 - 2. AWI Finish System No. 5: Catalyzed polyurethane.
 - 3. Staining: Match Architect's sample.
 - 4. Effect: Closed grain.
 - 5. Sheen: Medium-gloss rubbed effect 35-45 deg.
- 2.07 Fabrication:
- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
 - B. Fit shelves, doors and exposed edges with 3/8 inch matching hardwood edging. Use full length pieces only.
 - C. Cap exposed plastic laminate finish edges with material of same finish and pattern.
 - D. Door and Drawer Fronts: 3/4 inch thick; overlay style.
 - E. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
 - F. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
 - G. Mechanically fasten back splash to countertops with sleet brackets at 16 inches on center.
 - H. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes; and fixtures and fitting. Verify locations of cutouts from on-site dimensions. Prime paint contact surfaces of cut edgy.

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2.08 Finishing:

- A. Sand work smooth and set exposed nails and screw.
- B. Apply wood filler in exposed nail (and screw) indentations.
- C. On items to receive transparent finishes, use wood filler which matches surrounding surfaces and of types recommended for applied finishes.
- D. Seal, stain and varnish exposed to view surfaces. Brush apply only.
- E. Seal and varnish internal exposed to view and semi-concealed surfaces. Brush apply only.
- F. Seal internal surfaces of cabinets with one coat of shellac. Brush apply only.
- G. Seal surfaces in contact with cementitious materials.

2.09 Hardware:

- A. Shelf Standard and Supports: KV-256 and KV-255.
- B. Drawer and Door Pulls: Chrome, U-shaped wire pulls.
- C. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed.
- D. Catches: Magnetic, Stanley SF-45 and SP-46. Provide other types required for special conditions.
- E. Drawer Slides: Knappe and Vogt: KV1284 typical with KV1485 full extension ball bearing tracks.
- F. Hinges: Blum Model 170-concealed hinges with 170 degree opening or Grass System 1200 (176 degree opening) self-closing with 1000-80 base plate. Two hinges per door up to 36" and 3 hinges per door up to 48" and 4 per door up to 60" high.
- G. Grommets: Provide plastic grommets at all penetrations through countertop for cabling, power cords, etc. as indicated on the Drawings.

Part 3 - Execution

3.01 Examination: Verify adequacy of backing and support framing.

3.02 Installation:

- A. Install woodwork to comply with AWI Section 1700 for same grade specified above for type of casework involved.
- B. Set and secure casework in place; rigid, plumb, and level.
- C. Use fixture attachments in concealed locations for waif mounted components.
- D. Use concealed joint fasteners to align and secure adjoining cabinet units and counter tops.
- E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- F. Secure cabinet and counter bases to floor using appropriate

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- angles and anchorages.
 - G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
 - H. Install without distortion so that doors and drawers fit openings properly and are accurately aligned.
 - I. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the finishing work specified in this section to whatever extent not completed at shop or before installation of woodwork.
 - J. Complete the finishing work specified in this section to whatever extent not completed at shop or before installation of woodwork,
- 3.03 Adjusting:
- A. Adjust moving or operating parts to function smoothly and correctly.
- 3.04 Cleaning:
- A. Clean casework, counters, shelves, hardware, fittings and fixtures.
- 3.05 Schedules:
- A. Furnish and install all items listed in this schedule at location indicated on the Drawings, complete as to function intended.
 - B. Casework indicated on the Drawings; custom grade construction.
 - 1. Counter Tops.
 - 2. Base Cabinets.
 - 3. Overhead Cabinets.
 - 4. Wall Cabinets.
 - 5. Shelving-adjustable and fixed.
 - 6. Other items such as shims and fillers as indicated on the Drawings or as required for a complete cabinetwork installation.

END OF SECTION

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SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Fixed modular laminate clad casework and components.
- B. Flexible rail mounted laminate clad casework and components.
- C. Solid Surface countertops and backsplash.

1.02 RELATED SECTIONS

- A. Blocking within walls where indicated: Section 06100 Rough Carpentry.
- B. Millwork, trim, etc.: Section 06200 Finish Carpentry.
- C. Hardware: Section 06410 Custom Casework.
- D. Glass: not applicable.
- E. Base molding: Division 9.
- F. Appliances: Division 11 and drawings.
- G. Sinks and service fixtures, service waste lines, connections, and vents: Division 15.
- H. Electrical service fixtures: Division 16.

1.03 DEFINITIONS

- A. Identification of casework components and related products by surface visibility.
 - 1. Open Interiors: Any open storage unit without solid door or drawer fronts, units with full glass insert doors and/or acrylic doors, and units with sliding solid doors.
 - 2. Closed Interiors: Any closed storage unit behind solid door or drawer fronts.
 - 3. Exposed Ends: Any storage unit exterior side surface that is visible after installation.
 - 4. Other Exposed Surfaces: Faces of doors and drawers when closed, and tops of cabinets less than 72 inches above furnished floor.
 - 5. Semi-Exposed Surfaces: Interior surfaces which are exposed to view when doors or drawers are opened, bottoms of wall cabinets and tops of cabinets 72 inches or more above finished floor.
 - 6. Concealed Surfaces: Any surface not visible after installation.

1.04 QUALITY ASSURANCE

- A. Manufacturer: Minimum of 5 years experience in providing manufactured casework systems for similar types of projects, produce evidence of financial

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stability (if requested), bonding capacity, and adequate facilities and personnel required to perform on this project.

- B. Manufacturer: Provide products certified as meeting or exceeding ANSI-A 161.1-2000 testing standards.
- C. Single Source Manufacturer: Casework, countertops and architectural millwork products must all be engineered and built by a single source manufacturer in order to ensure consistency and quality for these related products. Splitting casework, countertops and/or architectural millwork between multiple manufacturers will not be permitted.
- D. Quality Standard: Unless otherwise indicated, comply with AWI's Architectural Woodwork Quality Standards for grades of interior architectural woodwork, construction, finishes and other requirements.

1.05 SUBMITTALS

- A. Comply with Special Conditions, unless otherwise indicated.
- B. Product Data: Manufacturer's catalog with specifications and construction details.
- C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.
 - 1. Include section drawings of typical and special casework, work surfaces and accessories.
 - 2. Indicate locations of plumbing and electrical service field connection by others.
 - 3. Provide one set of shop drawings which includes all products within this section, engineered and built by a single source manufacturer, with seamless coordination amongst all products.
- D. Casework Samples (To be available upon request):
 - 1. Base cabinet: Cabinet conforming to specifications, with drawer and door.
 - 2. Wall cabinet: Cabinet conforming to specifications, with door.
 - 3. Cabinet samples shall be complete with specified hardware for doors, drawers and shelves.
 - 4. Component samples: Two sets of samples for each of the following:

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SECTION 06420 - CUSTOM LAMINATE CASEWORK (CONTRACTOR OPTION)

- a. Decorative laminate color charts / PVC and ABS edgings.

1.06 PRODUCT HANDLING

- A. Deliver completed laminate clad casework, countertops, and related products only after wet operations in building are completed, store in ventilated place, protected from the weather, with relative humidity range of 25 percent to 55 percent.
- B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

1.07 JOB CONDITIONS

- A. Environmental Requirements: Do not install casework until permanent HVAC systems are operating and temperature and humidity have been stabilized for at least 1 week.
 1. Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
 2. After installation, control temperature and humidity to maintain relative humidity between 25 percent and 55 percent.
- B. Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete.

1.08 WARRANTY

- A. All materials and workmanship covered by this section will carry a five (5) year warranty from date of acceptance.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Manufacturer - Basis for Design:
 1. TMI Systems Corporation.
 - a. Specifications are based on manufacturer's literature from TMI SYSTEMS CORPORATION, 50 South Third Avenue West, Dickinson, North Dakota, 58601, Phone: 800-456-6716, fixed modular, flexible rail mounted, and mobile casework and accessories.

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- b. Other manufacturers shall comply with the minimum levels of material and detailing indicated on the drawings or as specified.

2.02 MATERIALS

- A. Core Materials:
 1. Particleboard up to 7/8 inch thick: Industrial Grade average 45-pound density particleboard, ANSI A 208.1-2009, M-2 requirements.
 2. Particleboard 1 inch thick and thicker: Industrial Grade average 45-pound density particle-board, ANSI A 208.1-2009, M-2 requirements.
 3. Medium Density Fiberboard 1/4 inch thick: Minimum average density 45-50 lbs., ANSI A208.2-2009 requirements.
 4. MR Moisture Resistant Particleboard: Average 45-pound density particleboard, ANSI A208.1 1-2009, M-2 requirements.
 5. Toe Base Plywood: 3/4 inch thickness, CC/CD/CDC grades, of western softwood veneers, with NAUF exterior fully water resistant phenolic glues.
- B. Decorative Laminates: GREENGUARD Indoor Air Quality Certified
 1. High-pressure decorative laminate VGS (.028), NEMA Test LD 3-2005.
 2. High-pressure decorative laminate HGS (.048), NEMA Test LD 3-2005.
 3. High-pressure decorative laminate HGP (.039), NEMA Test LD 3-2005.
 4. High-pressure cabinet liner CLS (.020), NEMA Test LD 3-2005.
 5. High-pressure backer BKH (.048), (.039), (.028), NEMA Test LD3-2005.
 6. Thermally fused melamine TFM laminate, NEMA Test LD 3-2005. (TFM allowed on casework interiors only, as specified below. Utilization of TFM on any exterior casework surfaces, including door and drawer faces and finished ends, will not be permitted.)
- C. Laminate Color Selection: Maximum 1 color per unit face and 5 colors per project. (See Color Selection in section 3.05).
- D. Edging Materials:
 1. 1mm PVC banding, machine applied.

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2. 3mm PVC banding, machine applied and machine profiled to 1/8 inch radius.
- E. Glass:
Not applicable.

2.03 SPECIALTY ITEMS

- A. Support Members:
1. Countertop support brackets: Epoxy powder coated, 11 gauge steel with integral cleat mount opening and wire management opening.
 2. Undercounter support frames: Epoxy powder coated.
 3. Legs: Epoxy powder coated.

2.04 CABINET HARDWARE

- F. Refer to Section 06410 Custom Casework for cabinet hardware.

2.05 FABRICATION:

- A. Fabricate casework, countertops and related products to dimensions, profiles, and details shown.
- B. All casework panel components must go through a supplemental sizing process after cutting, producing a panel precisely finished in size and square to within 0.010 inches, ensuring strict dimensional quality and structural integrity in the final fabricated product.
- C. Cabinet Body Construction:
1. Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24 inch deep cabinets and a minimum of 4 dowels each joint for 12 inch deep cabinets. (Mechanical or metal hardware fasteners joining cabinet top and bottom panels to the sides will not be accepted.)
 - a. Tops, bottoms and sides of all cabinets are particleboard core.
 2. Cabinet backs: 1/4 inch thick medium density fiberboard panel fully captured by the cabinet top, bottom and side panels. Finish to match cabinet interior. 3/4 inch x 4 inch particleboard rails will be placed behind the back panel at the top and bottom, and doweled to the sides utilizing 10mm hardwood fluted dowels. A third intermediate rail will be included on all cabinets taller than 56 inches. Utilize hot melt

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- glue to further secure back and increase overall strength.
- a. Exposed back on fixed or movable cabinets:
3/4 inch thick particleboard with the exterior surface finished in VGS laminate as selected.
 3. Fixed base and tall units have an individual factory-applied base, constructed of 3/4 inch thick plywood. Base is 102mm (nominal 4 inch) high unless otherwise indicated on the drawings.
 4. Base units, except sink base units: Full sub-top glued and doweled to cabinet sides. (Mechanical or metal hardware fasteners joining cabinet sub-top panel to the sides will not be accepted.)
 - a. Sink base units are provided with open top and a stretcher at the front, attached to the sides. Back to be split removable access panel.
 5. Side panels and vertical dividers shall receive adjustable shelf hardware at 32mm line boring centers. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.
 6. Exposed and semi exposed edges.
 - a. Edging: 1mm PVC machine applied.
 7. Adjustable Shelves in Cabinets
 - a. Core: Particleboard.
 - b. Core Thickness: 3/4 inch up to 30 inches wide, 1 inch over 30 inches wide.
 - c. Edge: 1mm PVC on Front Edge Only.
 8. Interior finish, units with open Interiors:
 - a. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with TFM Thermally Fused Melamine laminate.
 9. Interior finish, units with closed Interiors:
 - a. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with TFM Thermally Fused Melamine laminate.
 10. Exposed ends:
 - a. Faced with high-pressure decorative VGS laminate. Use of TFM on exposed ends will not be permitted.
 11. Wall unit bottom:

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- a. Faced with thermally fused melamine laminate.
- 12. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), are not permitted.
- D. Drawers:
 - 1. Sides, back and sub front: Minimum 1/2 inch thick particleboard, laminated with TFM Thermally Fused Melamine doweled and glued into sides. Top edge banded with 1mm PVC.
 - 2. Drawer bottom: Minimum 1/2 inch thick particleboard laminated with TFM Thermally Fused Melamine, screwed directly to the bottom edges of drawer box.
 - 3. Paper storage drawers: Minimum 3/4 inch thick particleboard sides, back, and sub front laminated with TFM Thermally Fused Melamine. Minimum 1/2 inch thick particleboard drawer bottoms screwed directly to the bottom edges of the drawer box. Provide PVC angle retaining bar at the rear of the drawer.
- E. Door/Drawer Fronts:
 - 1. Core: 3/4 inch thick particleboard.
 - 2. High-pressure decorative VGS laminate exterior, balanced with high-pressure cabinet liner CLS. Use of TFM on exterior or interior surfaces of door/drawer fronts will not be permitted.
 - 3. Edges: 3mm PVC, machine applied, external edges and outside corners machine profiled to 1/8 inch radius.
 - 4. Provide double doors in opening in excess of 24 inches wide.
- F. Door Fronts with Glass Insert captured by Retainer Clips (CUSTOM GRADE):
 - 1. Core: 3/4 inch thick particleboard.
 - 2. High-pressure decorative VGS laminate exterior, balanced with high-pressure VGS laminate. Use of TFM on exterior or interior surfaces of door fronts will not be permitted.
 - 3. Edges: 3mm PVC, machine applied, external edges and outside corners machine profiled to 1/8 inch radius.

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4. Provide cutout in door panel resulting in 3-3/8 inch frame. Exposed cutout edge to be finished with 1mm PVC edgebanding.
 5. Notch cutout 3/8 inch x 1/4 inch for glass panel to set into, mounting flush with the back side (interior side) of the door panel. Interior cutout edge to be painted a compatible color to the interior surface.
 6. Glass panel to be captured and held in place utilizing glass retainer clips, screwed in place. Minimum eight clips per glass panel located in the four corners of the cutout.
- G. Miscellaneous Shelving (not in Cabinets):
1. Core material: 1 inch thick particleboard.
 2. High-pressure decorative VGS laminate on both faces.
 3. Edges: 3mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.

2.06 ARCHITECTURAL CABINET SOLID SURFACE TOPS (Countertops):

- A. Design Load: deflection limited to 1/360.
- B. Type of Top: homogeneous solid sheets of filled plastic resin complying with the following:
1. Colors and Patterns: as selected by Architect from manufacturer's full range.
 2. Special Features: eased edge treatment.
 3. Accessories:
 - a. Adhesives: for seams and drop edges, Formica Solid Surfacing Seaming Cartridges, 9 ounce, color to blend with sheet material.
 4. Fabrication: assemble work at shop and deliver to job ready for installation. Manufacture in largest practical pieces for handling and shipping without seams.
 - a. Fabricate work square and to required lines.
 - b. Recess and conceal fasteners connections and reinforcing.

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- c. Design, construction, and installation: details to allow for expansion and contraction of materials. Properly install material with hairline joints held rigidly in place.
 - d. Fabricate countertops and vanities with back splash and side splash pieces to profiles and sizes indicated.
 - e. Fabricate items to profiles shown with connections and supports as indicated or as required for complete installation in accordance with manufacturer's written instruction and approved submittals.
 - f. Provide cut-outs for plumbing fixtures and trim, washroom accessories, appliances, and related items: confirm layout with manufacturer's cut-out templates before beginning work. Round corners of cut-outs and sand edges smooth.
 - g. Do not exceed manufacturer's recommended unsupported overhang distances.
 - h. Finish exposed surfaces smooth and polish to low sheen.
 - i. Radius corners and edges.
 - j. Tolerances: variations in size or openings shall not exceed +/-1/4".
5. Acceptable manufacturer: Formica Solid Surfacing as manufactured by Formica Group / Fabrications, Cincinnati, Ohio **or approved equal.**

PART 3- EXECUTION

3.01 INSPECTION:

- A. The casework contractor must examine the job site and the conditions under which the work under this section is to be performed and notify the building owner in writing of unsatisfactory conditions. Do not proceed with work under this Section until satisfactory conditions have been corrected in a manner acceptable to the installer.

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3.02 PREPARATION:

- A. Condition casework to average prevailing humidity conditions in installation areas prior to installing.

3.03 INSTALLATION:

- A. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.
- B. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.
- C. Repair minor damage per plastic laminate manufacturer's recommendations.

3.04 CLEANING:

- A. Remove and dispose of all packing materials and related construction debris.
- B. Clean cabinets inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building owner.

3.05 COLOR SELECTION:

- A. Laminate Color Selection:
 - 1. Select from the full range of standard Wilsonart® and Formica® stock color charts.
 - 2. Thermally fused melamine laminate matched to White color.
- B. Hardware Color Selection:
 - 1. Hinge: Select from your choice of epoxy powder coating stock colors matched to White, Beige, Gray, Black and Chrome.
 - 2. Pulls: Select from design specific finish options available in the TMI Vendor Stock Pull Program.
 - 3. Miscellaneous Hardware (support brackets, metal components, etc.): Select from your choice of epoxy powder coating stock colors matched to White, Beige, Gray, Black and Chrome.
- C. PVC Edge Banding Color Selection:
 - 1. 3mm PVC: Select from the TMI Vendor Stock PVC Program, including over 200 pattern, woodgrain and solid colors matched to Wilsonart® and Formica® laminates.
 - 2. 1mm PVC: Select from the TMI Vendor Stock PVC Program, including over 200 pattern, woodgrain

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and solid colors matched to Wilsonart® and Formica® laminates.

End of Section

DIVISION 7 -THERMAL & MOISTURE PROTECTION

SECTION 07100 - WATERPROOFING

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. Federal Specifications:
 - a. SS-C-153B, Cement, Bituminous, Plastic.
 - b. SS-A-701B, Asphalt, Weatherproofing.
 - c. LLL-1-535A, Insulation Board, Thermal.

1.03 Submittals:

- A. Provide submittals in the form of samples, and documentation, to the Architect for review.

Part 2 - Products

2.01 Materials:

- A. Solvent Based Asphalt Water Barrier: FS-SS-A-701B.
- B. Flashing Membrane: 20 mil elastomeric modified sheet vinyl.
- C. Asphalt Plastic Cement: SS-C-153B, Type 1.
- D. Accessories: As recommended by manufacturer.
- E. Protection Board: Insulation Board, FS-LLL-1-535A, Class A.
- F. Vapor Barrier under floor slab: refer to Section 07195 - Vapor Retarder.

Part 3 - Execution

3.01 Installation - Wall Waterproofing:

- A. Location: Apply to all exterior concrete and masonry wall surfaces below grade.
- B. General:
 - 1. Repoint all holes cracks and joints and allow to dry before waterproofing.
 - 2. Do not apply until all surfaces are completely dry and clean. Apply only during favorable weather conditions.
- C. Joint Membrane:
 - 1. Location: Apply to all joints in exterior concrete walls below grade.
 - 2. Embed a strip of flashing membrane in plastic cement. Membrane shall be a minimum of 12" wide.
- D. Water Barrier:
 - 1. Hold 4" down from finish grade line so that at no time is the mastic or membrane exposed to view.
 - 2. Apply two (2) coats to form a membrane water barrier, allowing the first coat to dry before applying the second

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coat. Apply in strict accordance with manufacturer's instructions. Do not apply until surfaces are completely dry.

3. Apply in a continuous unbroken film free from pin holes or other surface breaks. Take care to seal around all ties, inserts, anchor slots, conduit, pipes, electrical boxes, etc.

E. Protection:

1. Install protection board over all waterproofing prior to backfilling.
2. All back filling shall be carefully done to protect waterproofing. Repair all damaged areas.

3.02 Under Slab Vapor barrier:

- A. Refer to Section 07260 - Vapor Barrier.

End of Section

DIVISION 7 - THERMAL & MOISTURE PROTECTION

SECTION 07150 - DAMPPROOFING

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Waterproofing - Section 07100
- B. Sealants - Section 07900

1.03 Quality Assurance

- A. Standards:
 - 1. Federal Specifications:
 - a. SS-C-153B, Cement, Bituminous, Plastic.
 - b. SS-A-701B, Asphalt, Weatherproofing.
 - 2. American Society for Testing and Materials:
 - a: ASTM D-250, Asphalt Saturated Asbestos Felts.

Part 2 - Products

2.01 Materials:

- A. Solvent Based Asphalt Water Barrier: FS-SS-A-701B
- B. Flashing Membrane: 20 mil elastomeric modified sheet vinyl.
- C. Asphalt Plastic Cement: SS-C-153B, Type 1.
- D. Asphalt Saturated Felt: ASTM D-250, Un-perforated, #15.
- E. Accessories: As recommended by manufacturer.

Part 3 - Execution

3.01 Installation - Cavity Wall Dampproofing:

- A. General - Masonry and Concrete:
 - 1. Repoint all holes, cracks and mortar joints and allow to dry before waterproofing and dampproofing.
 - 2. Sweep wall base, including concrete slab, clean of dirt and mortar droppings immediately prior to application of waterproofing and dampproofing cavity walls.
 - 3. Do not apply until all surfaces are completely dry and clean.
 - 4. Do not apply until all surfaces are completely dry and clean.
 - 5. Sight exposed mastic and membrane not allowed.
- B. Wall Base Waterproofing:
 - 1. Location: Apply at base of outer face of concrete walls and outer face of inner wythe at all exterior masonry cavity walls.
 - 2. At intersection of outer face of inner wythe with concrete slab, provide a 2" radius cove built up with asphalt plastic cement.

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SECTION 07150 - DAMPPROOFING

3. At wall base, embed a strip of plastic flashing in Plastic Cement. Lap all joints 8" minimum and seal with joint sealant. Seal completely around piping, conduit, etc. provide minimum joints using longest sheets of flashing practicable. Seal all punctures. Top edge of membrane shall be a minimum of 8" above concrete slab, worked into curve of plastic cement cover, down, and outward on concrete slab or steel shelf angle to outer wythe.
- C. Cavity Wall Dampproofing:
1. Apply to outer face of inner wythe masonry cavity walls.
 2. Apply two (2) coats to form a membrane water barrier, allowing the first coat to dry before applying the second coat. Apply in strict accordance with manufacturer's instructions. Do not apply until surfaces are completely dry.
 3. Apply in a continuous unbroken film free from pin holes or other surface breaks. Take care to seal around all masonry ties, inserts, anchor slots, conduit, pipes, electrical boxes, etc.

End of Section

DIVISION 7 - THERMAL & MOISTURE PROTECTION

SECTION 07200 - INSULATION

Part 1 - General

1.01 Work Included:

- A. All materials, labor and services and incidentals necessary for the completion of this section of work.

1.02 Quality Assurance:

A. Standards:

1. Federal Specifications:

- a. HH-I-524C, Type IV, Class C, Rigid Insulation.
- b. ASTM C 665-84, Type 1, Insulation Blankets.
- c. ASTM D1621, Compressive Strength.
- d. ASTM E84, Flame Spread and Smoke Developed.

B. Submittals:

- 1. Provide submittals in the form of samples, and documentation, to the Architect for review.

1.03 Product Delivery, Storage and Handling:

- A. Rigid insulation board is combustible. During storage and insulation, observe good fire safety practice, including job site housekeeping.

1.04 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

A. Rigid Insulation: FS-HH-I-1972/1, Class 2 Rigid Insulation.

- 1. Type: Glass fiber reinforced polyisocyanurate core with foil facing each side (glass fiber facing at roof insulation), and a compressive strength of 25 p.s.i. and a maximum water vapor transmission rate of >.03 perm-inch.
 - a. Application: 2 layers of rigid insulation. First layer shall be 2" thick / second layer shall be 1.5" thick for a total thickness of 3.5" with a minimum total thermal resistance of R-20, for installation above metal roof decking and exterior wall at cavities. Refer to Drawings.
- 2. Type: expanded polystyrene insulation.
 - a. Application: 2" thick with a thermal resistance of R-10.4, **for foundation wall perimeter below grade installation only.**
- 3. Adhesive: as recommended by manufacturer of rigid

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SECTION 07200 - INSULATION

insulation board.

- B. Fibrous Insulation: ASTM C 665-84, Type 1
 - 1. Type:
 - a. 6" thick (approx.) mineral wool or fiberglass fire resistant insulating blanket or batt, with kraft paper facing. Thermal resistance R-19. Refer to Drawings for locations.
- C. Vapor Retarder:
 - 1. Roof Deck Installation:
 - a. Two layers of high strength kraft paper laminated with an adhesive, and reinforced at edges with fiberglass yarns.
 - b. Type Example: Permstop - Owens Corning.

Part 3 - Execution

3.01 Installation - Rigid Insulation:

- A. Install rigid insulation horizontally against back-up wall, or to roof deck, as shown on the Drawings.
- B. **Rigid insulation and other components applied to metal decking at membrane roofing shall be fastened with approved fasteners at the rate of 1 per 2 square feet to meet FM I-90 requirements.**
- C. Install 2 layers of rigid insulation to metal roof deck. Stagger joints of insulation to provide continuous insulation coverage.
- D. Cut insulation by means of a saw, knife, or other sharp tool to fit around obstructions across the wall, such as vents, louvers, pipes and conduit.
- E. If mastic adhesive is used to supplement holding the insulation in place, observe label directions.

End of Section

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07260 - VAPOR BARRIER

PART 1 - GENERAL

1.01 Work Included

- A. Furnish all labor, materials, services and equipment required in conjunction with or properly incidental to the installation of under-slab vapor barriers described herein and/or as shown on the drawings.

1.02 Related Work

- A. Section 03300: Cast-In-Place Concrete.

1.03 Job Conditions

- A. Subbase: Smooth and level, free from damaging protrusions that would puncture vapor barrier.

1.04 References

- A. ASTM E 1643 - Standard Practice for Installation of Water Vapor Barriers Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- B. ASTM E 1745 - Standard Specification for Plastic Water Vapor Barriers Used in Contact with Soil or Granular Fill under Concrete Slabs: Exceeds Class B
- C. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
- D. ASTM E 154 - Standard Test Methods for Water Vapor Barriers Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
- E. ASTM D 1709 - Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
- F. ASTM F 1249 - Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor
- G. ACI 302.1R - Vapor barrier component (plastic membrane) not less than 10 inches thick.

1.05 Submittals

- A. Submit in accordance with Division 1 requirements.
- B. Product Data: Provide manufacturers printed product literature and description, including tests and standards that have been performed on the vapor barrier material.
- C. Samples: Submit two, 8 1/2 x 11 inch in size, illustrating the vapor barrier and two (2) 8-1/2-in long sample strips of the joint tape.
- D. One each of all accessories that will be used in the installation.
- E. Verification by Independent testing labs indicating that materials comply with specified requirements.
- F. Certificates: Certify that products of this section meet or exceed specified requirements.

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SECTION 07260 - VAPOR BARRIER

- G. Manufacturer's Instructions: Indicate complete installation instructions.

PART 2 - PRODUCTS

2.01 Available Products

- A. Stego Wrap 15 mil Vapor Barrier by Stego Industries, L.L.C.
- B. Perminator™ 15 mil by W.R. Meadows .
- C. Vapor Block 15 (mil) by Raven Industries, Inc.
- D. Moistop Ultra 15 (mil) by Fortifiber Building Systems Group
- E. Viper Vaporcheck II 15 mil by Insulation Solutions, Inc.

2.02 Source Quality Control And Testing

- A. Vapor barrier membrane shall have following properties:
 - 1. Water Vapor Barrier: Meets or exceeds Class A according to ASTM E 1745.
 - 2. Water Vapor Transmission Rate: 0.012 grains/ft²/hour or lower according to ASTM E 96.
 - 3. Water Vapor Permeance: 0.01 perms or lower according to ASTM E 154 Sec. 7 or F 1249 (max.).
 - 4. Tensile Strength: 45.0 lbf/in according to ASTM E 154 Sec. 9.
 - 5. Puncture Resistance: 2200 g according to ASTM D 1709, Method B

2.03 Accessories

- A. Tape:
 - 1. High Density Polyethylene Tape with pressure sensitive adhesive. Minimum width 4".
- B. Pipe Boot:
 - 1. Construct pipe boots from vapor barrier material and pressure sensitive tape per manufacturer's instructions.

PART 3 - EXECUTION

3.01 Examination

- A. Verify that conditions are acceptable for the placement of the vapor barrier.

3.02 Preparation

- A. Ensure that subsoil is approved by Geotechnical Engineer.
 - 1. Vapor Barrier shall be installed on top of the aggregate, sand or tamped earth base or carton forms. At carton forms provide a vertical leg down to grade and adhered the vapor barrier to the grade beam at or just below the dirt line. Vapor barrier may be placed either above or beneath any carton form slip sheet.

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SECTION 07260 - VAPOR BARRIER

3.03 Installation

- A. Install vapor barrier per manufacturer's instructions, illustrations and ASTM E 1643 Standard Practice for Installation of Water Vapor Barriers Used in Contact with Earth or Granular Fill Under Concrete Slabs.
 - 1. Level and tamp or roll granular base.
 - 2. Place Vapor Barrier with the longest dimension parallel with the direction of the pour.
 - 3. Lap Vapor Barrier over footings and seal to foundation walls. Seal all penetrations.
 - 4. Lap joints 6 inches and seal with the recommended pressure sensitive tape.
 - 5. Seal pipe penetrations with pipe boot made from vapor barrier and tape.
 - 6. Protect vapor barrier from damage during installation of reinforcing steel and utilities.
 - 7. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6 inches and taping all four sides with pressure sensitive tape.

3.04 Interface With Other Work

- A. Coordinate work of all other trades related to the slab base and utility services.

END OF SECTION

DIVISION 7 - THERMAL & MOISTURE PROTECTION

SECTION 07415 - PREFINISHED METAL SOFFIT PANELS

Part 1 - General

- 1.01 Work Included:
- A. The General Conditions and applicable sections of Division 1 shall apply to this entire section.
 - B. All materials, labor, services and incidentals necessary for the completion of this section of the work.
- 1.02 Related Work Specified Elsewhere:
- A. Metal Fabrications - Section 05500
 - B. Flashing and Sheet metal - Section 07600
- 1.03 Quality Assurance:
- A. Qualifications of Installer: Competent and skilled sheet metal applicator familiar with this type installation with successful completion of projects of familiar scope. Applicator shall have at least two years of experience in prefinished sheet metal applications.
- 1.04 Shop Drawings:
- 1.1 Submit complete shop drawings on all prefinished metal applications, showing layouts of seams, joints, details, and installation methods. Show details of weatherproofing at edges, terminations and penetrations in metal work.
- 1.05 Applicator and Guarantee:
- C. All work shall be done by one contractor with 5 years minimum experience in this type of metal work.
 - B. Provide ten (10) years guarantee written on contractor's letterhead for work of this Section.
- 1.06 Warranty:
- A. Provide a 20-year manufacturer's warranty covering color fade, chalk, and film integrity at no charge.
- 1.07 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

- 2.01 Acceptable Manufacturers:
- A. Quality of Manufacturers: The products, colors and finishes herein are of AEP-Span products to establish standards of quality and appearance. The products of other manufacturers are acceptable subject to meeting or exceeding the requirements of these specifications, and the approval of the Architect.
- 2.02 Materials -
- A. Prefinished Metal Soffits:
 - 1. Flush Panel, (FP 12-2) 24 gauge steel with embossed finish.

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SECTION 07415 - PREFINISHED METAL SOFFIT PANELS

2. Color: to be selected by Architect from Manufacturer's standard colors.
3. Flashings, Closures, and Trim shall be fabricated from same material, gauge, and finish as panels.
4. Finish: Kynar 500.

Part 3 - Execution

3.01 Installation:

- A. Fabricate and install prefinished metal facings in accordance with drawings and recognized sheet metal practices using conventional hand or power tools. Keep cut edges sharp, clean, properly dressed and closely aligned. Exercise care during fabrication and erection to avoid damage.
- B. Structural framing members and fasteners shall be sized and located as recommended by the panel manufacturer. The applicator shall insure that the correct fastener has been chosen for size and length necessary for loading requirements. Special care shall be exercised installing fasteners so as not to overdrive or misdirect fasteners which could cause damage to panels or trim. Use colored pop rivets on trim items and where exposed fasteners are necessary. Keep exposed fasteners to very minimum.
- C. Only minor scratches and abrasions will be allowed to be touched up. Any other damaged material shall be replaced.

End of Section

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SECTION 07424 - COMPOSITE WALL PANELS

PART 1 General

1.1 Work Included:

- A. Aluminum-faced composite panels, attachments, and sealants.

1.2 Related Sections:

- A. Section 05100 - Structural Metal Framing.
- B. Section 06100 - Rough Carpentry.
- C. Section 07200 - Insulation
- D. Section 07600 - Flashing and Sheet Metal.
- E. Section 07900 - Sealants.
- F. Section 09250 - Gypsum Wallboard.

1.3 References:

- A. American Society for Testing and Materials (ASTM)
B209 - Aluminum and Aluminum-Alloy Sheet and Plate.
- B. American Society for Testing and Materials (ASTM)
C481 - Laboratory Aging of Sandwich Constructions.
- C. American Society for Testing and Materials (ASTM)
E72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
- D. American Society for Testing and Materials (ASTM)
E84 - Surface Burning Characteristics of Building Materials.
- E. American Society for Testing and Materials (ASTM)
E283 - Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors.
- F. American Society for Testing and Materials (ASTM)
E289 - Linear Thermal Expansion of Rigid Solids with Interferometry.
- G. American Society for Testing and Materials (ASTM)
E330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors.
- H. American Society for Testing and Materials (ASTM)

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E331 - Water Penetration for Exterior Windows, Curtain Walls, and Doors.

- I. American Society for Testing and Materials (ASTM) D1781 - Climbing Drum Peel for Adhesives.
- J. American Society for Testing and Materials (ASTM) - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- K. American Architectural Manufacturers Association (AAMA) 501 - Water Penetration using Dynamic Pressure.
- L. American Architectural Manufacturers Association (AAMA) 605.2 - Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
- M. American Architectural Manufacturers Association (AAMA) TIR-all - Maximum Allowable Deflection of Framing Systems for Building Cladding Components at Design Wind Loads.

1.4 System Description:

- A. Design Requirements:
 - 1. Design system to accommodate movement of components without buckling, failure of joint seals, undue stress on fasteners, or other detrimental effects when subjected to temperature and humidity ranges reasonably anticipated.
 - 2. Design system to accommodate tolerances of structure.
- B. Performance Requirements:
 - 1. Submit test data witnessed by an independent testing agency for the following requirements:
 - a. Structural tests for wind loads by "Chamber Method" in compliance with ASTM E72.
 - 1) Standard test design loading: 20 psf (960 Pa) positive and negative wind load.
 - 2) Design panel system to withstand code imposed design loads and a deflection limit of L/180 shall apply to positive

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load pressures only.

- 3) Design panel system to withstand code imposed design loads and a deflection limit of $L/175$ shall apply to positive load pressures only.
- b. Air Infiltration: 0.06 cfm per square foot (32 lps per square meter) air leakage under a static pressure of 1.56 psf (7.65 kg per square meter) when tested in accordance with ASTM E283.
- c. Water Penetration: No uncontrolled water penetration through the standard vertical panel and sealed joints at a static pressure of 6.24 psf (30.5 kg per square meter) when tested in accordance with ASTM E331.

1.5 Submittals:

- A. Submit as directed below and as per the Special Conditions.
- B. Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- C. Shop Drawings: Submit shop drawings showing layout, flashings, drainage, ventilation, vapor barriers, vapor retarders, profiles and product components, including anchorage, accessories, finish colors, patterns, and textures.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 3 inches (76 mm) by 5 inches (128 mm) representing actual product, color, and patterns.
- F. Quality Assurance Submittals: Submit the following:
 1. Test reports: Certified test reports showing

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compliance with specified performance characteristics and physical properties.

2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements.

1.6 Quality Assurance:

- A. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction, approving acceptable installer and approving application method.
- B. Installer Qualifications:
 1. Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
 2. Panel Installer shall assume responsibility for all components of the exterior panel system including, but not limited to attachment to sub-construction, panel to panel joinery, panel to dissimilar material joinery, and joint seal associated with the panel system.
- C. Pre-installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

1.7 Delivery, Storage, and Handling:

- A. Store panels horizontally, off-the-ground, in manufacturer's unopened packaging until ready for installation.
- B. Examine delivered materials upon receipt to ensure that no damage has occurred during shipment. Store metal-faced composite wall panels horizontally, covered with a suitable weather tight and ventilated covering. Store metal-faced composite wall panels to ensure dryness, with a positive slope for drainage of water. Do not store metal-faced composite wall panels in contact with other materials that might cause staining, denting, or other surface damage. DO NOT allow storage space

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to exceed 120 degrees F (49 degrees C).

- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 Project Conditions:

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 Warranty:

- A. Finish Warranty: Commencing on Date of Substantial Completion.
 - 1. Provide 20-year written warranty with PVDF/KYNAR 500 finish color coated metal finish covering color fading, chalking, and film integrity.
 - 2. Finish coating shall not peel, blister, chip, crack or check.
 - 3. Chalking, fading or erosion of finish measured by the following tests:
 - a. Finish coating shall not chalk in excess of 8 numerical ratings when measured in accordance with ASTM D659.
 - b. Finish coating shall not change color or fade in excess of 8 NBS units as determined by ASTM D2244.
- B. Material and Installation Warranty: Commencing on Date of Substantial Completion.
 - 1. When installed as directed by Laminators Incorporated, panels covered by this warranty are warranted not to delaminate (separate) at any Laminators produced glue line for a period of five years.

PART 2 PRODUCTS

2.1 Manufacturers:

- A. Acceptable Manufacturer: Laminators Incorporated; 3255 Penn St., Hatfield, PA 19440. ASD. Tel:

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(215)723-8107. Toll Free: (877) OMEGA77. Fax: (215) 721-1239. Web: <http://www.laminatorsinc.com>

- B. Substitutions: as approved by Architect.
- C. Requests for substitutions will be considered in accordance with provisions of the Project Manual.

2.2 Omega-Lite Aluminum-Faced Composite Panels:

- A. Omega-Lite Composite Panels as manufactured by Laminators Incorporated.
 - 1. Panel Construction: Finished aluminum sheet over a corrugated polyallomer (CPA) core with backer sheet.
 - 2. Panel Facing:
 - a. Smooth face, minimum 0.021 inch (0.53 mm) thick, ASTM B209 aluminum sheet
 - 3. Panel Backing:
 - a. Random painted aluminum sheet, minimum 0.013 inch (0.33 mm) thick, ASTM B209 aluminum sheet
 - 4. Panel Thickness: 6 mm (1/4 inch)
 - 5. Fire Test Performance: ASTM E84: Class A.
 - 6. Bond Test Performance: ASTM C481-A Cyclic Aging: Pass.
 - 7. Finish:
 - a. PVDF/Kynar 500 - 20-year warranty paint system meeting AAMA 2605
 - 8. Finish Colors: Refer Room Finish Schedule included in the Drawings.
- B. Aluminum Composite Panel Installation System:
 - 1. Installation:
 - a. 1-Piece Tight-Fit Extrusion (6 mm only)
 - b. Reveal "H"-Molding 4595X
 - c. Provide corner, drip edge, etc. trim as required for complete and watertight installation.

2.3 Accessories:

- A. Manufacturer's Sealants and Accessories: Provide manufacturer's recommended sealants and accessories for product installation.
- B. Flashing: Fabricate flashing materials from 0.030 inch (0.76 mm) minimum thickness aluminum sheet

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painted to match the adjacent curtain wall/panel system where exposed. Provide a 12 inch (305 mm) wide lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.

2.4 Fabrication:

- A. Panels shall be fabricated and finished as required to provide material construction and performance as specified and as required by manufacturer to comply with warranty provisions.
 - 1. Tolerances: Length and Width: plus or minus 1/16 inch (1.6mm). Squareness (Diagonals): equal within 1/8 inch (3.2mm).

PART 3 EXECUTION

3.1 Examination:

- A. Do not begin installation until substrates have been properly prepared.
- B. Examine substrates, areas, and conditions, with substrate installer present, for compliance with requirements for structural soundness, installation tolerances, metal panel supports, and other conditions affecting performance of work.
 - 1. Examine primary and secondary wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances listed below.
 - a. 1/4 inch (6 mm) in any 20 feet (6 m) length vertically or horizontally.
 - b. 1/2 inch (12 mm) in any building elevation.
 - 2. Examine solid wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required.
 - 3. For the record, prepare written report, endorsed by panel installer and substrate installer, listing remedy for conditions detrimental to performance of work.
- C. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal

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panels before metal panel installation.

- D. Proceed with installation only after all unsatisfactory conditions have been corrected.
- E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 Installation:

- A. Comply with manufacturer's installation guides and Product Data, including product technical bulletins, product catalog installation instructions, and product carton instructions for installation type selected.
- B. Work shall be done and completed in a thorough and workmanlike manner by mechanics skilled in their various trades.
- C. Caulk Installation:
 - 1. Use only approved sealants as described in Laminators Incorporated Installation Guidelines.
 - 2. The sealant manufacturer's instructions shall be followed in preparing and installing sealants.
 - 3. Joints to receive sealant shall be clean, dry and free from dust, grit and contaminants.
 - 4. The sealant shall completely fill the glazing pockets.

3.3 Field Quality Control:

- A. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.

3.4 Cleaning and Protection:

- A. Protection: Protect installed product and finish surfaces from damage during construction.
- B. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or

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replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

- C. Protect installed products until completion of project.
- D. Touch-up, repair or replace damaged products before Substantial Completion.

End of Section

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SECTION 07550 - MODIFIED BITUMEN MEMBRANE ROOFING SYSTEM

Part 1 - General

1.01 Section Includes:

- A. Preparation of Substrate to Receive Roofing Materials
- B. Roof Insulation Application to Prepared Substrate
- C. Roof Membrane Application
- D. Roof Flashing Application
- E. Incorporation of Sheet Metal Flashing Components and Roofing Accessories into the Roof System

1.02 Products Installed But Not Furnished Under This Section:

- A. Sheet Metal Flashing and Trim
- B. Sheet Metal Roofing Specialties

1.03 Related Sections:

- A. Roof Decks - Section 05310
- B. Rough Carpentry - Section 06100
- C. Insulation - Section 07200
- D. Flashing & Sheet Metal Section 07600

1.04 Reference Standards:

References in these specifications to standards, test methods and codes, are implied to mean the latest edition of each such standard adopted. The following is an abbreviated list of associations, institutions, and societies which may be used as references throughout these specifications.

ASTM	American Society for Testing and Materials Philadelphia, PA
FM	Factory Mutual Engineering and Research Norwood, MA
NRCA	National Roofing Contractors Association Rosemont, IL
OSHA	Occupational Safety and Health Administration Washington, DC
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Chantilly, VA
UL	Underwriters Laboratories, Northbrook, IL

1.05 Description Of Work:

- A. **Project Type:** New installation.
Deck: Metal Slope: **3/8 inch ±** per foot.
- B. **Rigid Insulation:**
 - 1. Top and Bottom Layers: Polyisocyanurate, having a total thickness of **3.5"** - top layer of 1 1/2" and bottom layer of 2". Refer to Section 07200, Insulation.
 - 2. Crickets: Polyisocyanurate (tapered) providing a roof slope to roof drains (refer to Drawings.)
- C. **Gypsum sheathing panel:** having a thickness of 1/2 inch, mechanically attached, as per FM I-90 requirements.
- D. **Roof System:** Modified Bitumen Base, applied in cold

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adhesive; stripping and Flashing, applied in cold adhesive.
Modified Bitumen Finish Ply, applied in cold adhesive.

- E. **Flashing System:** SBS with continuous metal-foil surfacing, torch applied.

1.06 Submittals:

- A. Submittals Prior to Contract Award:
 - 1. Letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.
 - 2. Letter from the primary roofing manufacturer stating that the proposed application will comply with the manufacturer's requirements in order to qualify the project for the specified guarantee.
- B. Submittals Prior to Project Close-out:
 - 1. Manufacturer's printed recommendations for proper maintenance of the specified roof system including inspection frequencies, penetration addition policies, temporary repairs, and leak call procedures.

1.07 Quality Assurance:

- A. Acceptable Products: Primary roofing products, including each type of sheet, all manufactured in the United States, shall be supplied by a single manufacturer which has been successfully producing the specified types of primary products for not less than 10 years. The primary roofing products shall have maintained a consistent composition for a minimum of five years.
- B. Agency Approvals: The proposed roof system shall conform to the following requirements. No other testing agency approvals will be accepted.
 - 1. Underwriters Laboratories Class A acceptance of the proposed roofing system without additional requirements for coatings.
- C. Acceptable Contractor: Contractor shall have a minimum of 10 years of experience in successfully installing the same or similar roofing materials and be certified in writing by the roofing materials manufacturer to install the primary roofing products for a minimum of 5 years prior to the date of bid opening.
 - 1. Torch Applicators: Contractor shall employ torch applicators who have successfully passed the CERTA (Certified Roofing Torch Applicator) program requirements as provided by the National Roofing Contractors Association (NRCA).
 - 2. The Contractor shall have an office, warehouse with supplies, and permanent roofing crews within a 50 mile radius of Moore, Oklahoma. Contractor shall have had "NDL" (No Dollar Limit) approval for 5 years AT THIS

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AREA OFFICE from manufacturer and shall perform a minimum of ten (10) NDL manufacturer guarantees per year.

3. **Owner's Roofing Contractor (Universal Roofing and Sheet Metal located in Moore, Oklahoma) shall be utilized on this project. The bid shall be based on the provided drawings and specifications, and agreed-to pricing.**

- D. Scope of Work: The work to be performed under this specification shall include but is not limited to the following: Attend necessary job meetings and furnish competent and full-time supervision, experienced roof mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products. In addition, application practice shall comply with requirements and recommendations contained in the latest edition of the Handbook of Accepted Roofing Knowledge (HARK) as published by the National Roofing Contractors Association, amended to include the acceptance of a phased roof system installation.
 - E. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.
 - F. Manufacturer Requirements: Ensure that the primary roofing materials manufacturer provides direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conducts a final inspection upon successful completion of the project.
 - G. Contractor shall have one of the following approved Contractor Certification levels prior to bid opening:
 - Johns Manville - Peak Advantage Contractor
 - Soprema - Soprema Certified Applicator
 - Siplast - Siplast Select Applicator
 - GAF - Master Select Contractor
- 1.08 Product Delivery Storage And Handling:
- A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.
 - B. Storage: Store materials out of direct exposure to the elements. Store roll goods on a clean, flat and dry surface. All material stored on the roof overnight shall be stored on pallets. Rolls of roofing must be stored on ends. Store materials on the roof in a manner so as to preclude overloading of deck and building structure. Store materials such as solvents, adhesives, and asphalt cutback

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products away from open flames, sparks, or excessive heat. Cover all material using a breathable cover such as a canvas. Polyethylene or other non-breathable plastic coverings are not acceptable.

- C. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Handle rolled goods to prevent damage to edges or ends.
- D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected, removed, and replaced at the Contractor's expense.

1.09 Project/Site Conditions:

- A. Requirements Prior to Job Start
 - 1. Notification: Give a minimum of 5 days notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
 - 2. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.
 - 3. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NRCA and other industry or local governmental groups.
- B. Environmental Requirements:
 - 1. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.
 - 2. Temperature Restrictions: At ambient temperatures between 40F and 50F, prepare / warm adhesive as directed by manufacturer.
- C. Protection Requirements:
 - 1. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.
 - 2. Torch Safety: Designate one person on each crew to perform a daily fire watch. The designated crew member shall watch for fires or smoldering materials on all areas of roof construction. Continue the fire watch after roofing material application has been suspended for the day.
 - 3. Limited Access: Prevent access by the public to materials, tools, and equipment during the course of

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the project.

4. Debris Removal: Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials.
5. Site Condition: Complete, to the owner's satisfaction, all job site clean-up including building interior, exterior and landscaping where affected by the construction.

1.10 Guarantee/Warranty:

- A. Roof Membrane Guarantee: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with **the manufacturer's ten year labor and materials membrane guarantee**. The guarantee shall be a term type, without deductibles or limitations on coverage amount, and shall be issued at no additional cost to the Owner. This guarantee shall not exclude random areas of ponding from coverage.

1.11 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Only the four systems listed in 2.02 Description of Systems below will be accepted for installation on this project.**

Part 2 - Products:

2.01 Roofing System Assembly/Products:

- A. Rigid Roof Insulation: Roof insulation shall be UL and FM approved. Insulation shall be approved in writing by the insulation manufacturer for intended use and for use with the specified roof assembly. Refer to Section 07200.
- B. Recover Board Sheathing Panel for Roof Membrane Substrate: A panel composed of high density fiberboard, non-structural water resistant core material integrally bonded having a nominal thickness of 1/2 inch.
 1. Acceptable Manufacturer: Fiberboard Coated High Density Roof Insulation, by Huebert.
- C. Gypsum Sheathing Panel for Wood/Plywood Surfaces to Receive Flashing Coverage: A panel composed of a gypsum based, non-structural water resistant core material integrally bonded with fiberglass mats on both sides having a nominal thickness of 1/2 inch. The panel surface shall be factory primed with a non-asphaltic primer.
 1. Acceptable Manufacturer: DensDeck Prime Gypsum Roof Board, by Georgia Pacific Corporation; Atlanta, GA

2.02 Description Of Systems:

- A. Roofing Membrane Assembly: A roof membrane assembly consisting of two plies of a prefabricated, reinforced, homogeneous Styrene-Butadiene-Styrene (SBS) block copolymer

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modified asphalt membrane, applied over a prepared substrate. Both reinforcement mats shall be impregnated/saturated and coated each side with an SBS modified bitumen blend. The roof system shall pass 500 cycles of ASTM D 5849 Resistance to Cyclic Joint Displacement (fatigue) at 14F - or show evidence of other independent testing indicating resistance fatigue, membrane cracking and delamination. Passing results shall show no signs of membrane cracking or interply delamination after 500 cycles. The roof system shall pass 200 cycles of ASTM D 5849 after heat conditioning performed in accordance with ASTM D 5147. The assembly shall possess waterproofing capability, such that a phased roof application, with only the modified bitumen base ply in place, can be achieved for prolonged periods of time without detriment to the watertight integrity of the entire roof system.

1. Acceptable Manufacturer: Johns Manville roof system:
 - a. Modified Bitumen Base, Stripping, and Flashing Reinforcing Ply.
JM DynaBase
 - b. Modified Bitumen Finish Ply
JM DynaGlas FR
 - c. Stripping Ply and Flashing Reinforcing Sheet
JM DynaPly
- B. Flashing Membrane Assembly: A flashing membrane assembly consisting of a prefabricated, reinforced, Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt membrane with a continuous, channel-embossed metal-foil surfacing. The finish ply shall conform to ASTM D 6298 and the following physical and mechanical property requirements.
 1. Acceptable Manufacturer: Johns Manville flashing system, aluminum finish
 - a. Cant Backing Sheet for Wood/Plywood Surfaces to Receive Flashing Coverage: applicable JM product.
 - b. Metal-Clad Modified Bitumen Flashing Sheet: JM DynaClad Flashing
 - c. Cant Strip: JM FesCant Plus Cant Strips
- C. Catalyzed Acrylic Resin Flashing System: A specialty flashing system consisting of a liquid-applied, fully reinforced, multi-component acrylic membrane installed over a prepared or primed substrate. The flashing system consists of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece. The resin and catalyst are pre-mixed immediately prior to installation. The use of the specialty flashing system shall be specifically approved in advance by the membrane

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manufacturer for each application.

1. Acceptable Manufacturer: Flashing System by Johns Manville; Denver, CO
- D. Additional Roof Systems: The following additional roof systems are acceptable for use in lieu of the specified roof system.
 1. GAF Materials Corp., Wayne, NJ
 - Base Ply - Ruberoid Mop Smooth
 - Finish Ply - Ruberoid Mop FR - cap ply Plus
 - Flashing Sheet - Ruberoid Ultraclad SBS
 - Stripping Ply and Flashing Reinforcing Sheet - Ruberoid Mop Smooth
 2. Soprema, Inc., Wadsworth, OH
 - Base Ply - Elastophene Sanded 2.2
 - Finish Ply - Elastophene LS FR GR
 - Flashing Sheet - Sopralast 50 TV ALU
 - Stripping Ply and Flashing Reinforcing Sheet - Elastophene Sanded 2.2

2.03 Roofing Accessories:

- A. Roofing Adhesives:
 1. Membrane Cold Adhesive: An asphalt, solvent blend conforming to ASTM D 3019, Type III requirements.
 - a. Acceptable Manufacturer: MBR Cold Application Adhesive by Johns Manville; Denver, CO
- B. Bituminous Cutback Materials:
 1. Primer: An asphalt, solvent blend conforming to ASTM D 41 requirements.
 2. Mastics: An asphalt cutback mastic, reinforced with non-asbestos fibers, used as a base for setting metal flanges conforming to ASTM D 4586 Type II requirements.
- C. Sealant: A moisture-curing, non-slump elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials.
- D. Ceramic Granules: No. 11 grade specification ceramic granules of color scheme matching the granule surfacing of the finish ply.
- E. Metallic Powder: A finely graded metal dust as supplied or approved by the membrane manufacturer, used for covering of bitumen overruns over the foil surfaced membrane.
- F. Perlite Cant Strips: A cant strip composed of expanded volcanic minerals combined with waterproofing binders. The top surface shall be pre-treated with an asphalt based coating. The face of the cant shall have a nominal 4 inch dimension.

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G. Fasteners:

1. Gypsum Sheathing Panel Fasteners for Roofing Substrates and Wood/Plywood Flashing Surfaces: Gypsum sheathing panel fasteners and plates shall be FM Approved, and/or approved by the manufacturer of the primary roofing products. The fastening pattern for each panel to be used shall be as recommended by the panel manufacturer and approved by the manufacturer of the primary roofing products. Acceptable panel fastener manufacturers for specific substrate types are listed below.
 - a. Wood/Plywood Flashing Surfaces: Gypsum sheathing panel mechanical fasteners shall be factory coated for corrosion resistance. The fastener shall conform meet or exceed Factory Mutual Standard 4470 and when subjected to 30 Kesternich cycles, show less than 15% red rust. Acceptable fastener types for wood/plywood substrates are listed below.
 - 1) A fluorocarbon coated screw type roofing fastener having a minimum 0.220 inch thread diameter. Plates used in conjunction with the fastener shall be a metal type having a minimum 3 inch diameter, as supplied by the fastener manufacturer.
 - b. Acceptable Manufacturer's:
 - 1) Ultrafast Fastener with UltraFast Round Metal Plates by Johns Manville; Denver, CO
 - 2) Dekfast #12 with Dekfast Steel Hexagonal Plates by Construction Fasteners, Inc.; Wyomissing, PA
 - 3) Standard Roofing Fastener by Olympic Manufacturing Group, Agawam; MA
2. Flashing Reinforcing Sheet Fasteners: Fasteners shall be approved by the manufacturer of the primary roofing products. Acceptable fasteners for specific substrate types are listed below.
 - a. Wood/Plywood Substrates
 - 1) A 12 gauge, spiral or annular threaded shank, zinc coated steel roofing fastener having a minimum 1 inch head.
 - 2) Square Cap by W.H. Maze Co.; Peru, IL
12 Gauge Simplex Nail by the Simplex Nail and Manufacturing Co., Americus, GA
 - 3) Fasteners shall be applied to meet FM-I90 requirements. At crickets, if insulation thickness prohibits satisfactory application

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of fasteners, use adhesive similar to Para-STIK insulation adhesive.

- H. Walktread: A prefabricated, puncture resistant polyester core reinforced, polymer modified bitumen sheet material topped with a ceramic-coated granule wearing surface.
 - 1. Thickness: 0.25 in
 - 2. Width: 32 in
 - 3. Acceptable Manufacturer: DynaTred Roof Walkway Pads by Johns Manville; Denver, CO
- I. Pipe Supports Typical:
 - 1. Roller System: A "roller-bearing" pipe support for roof-mounted gas pipes, RTU condensate lines, and electrical conduit up to 4" I.D. or 5"O.D. Pipes rest on a self-lubricating roller system which is made of a stainless steel or glass-filled nylon rod and a sturdy polycarbonate resin roller. Pipe support base shall be manufactured of polycarbonate resin with a roller rod of glass-filled nylon, and stainless steel metal parts.
 - 2. Load Weight: Maximum load weight may not exceed 125 lbs. per pipestand.
 - 3. Spacing: Not to exceed 10 foot centers. Do not exceed 125 lbs. load weight and adjust pipe stand in height to even load.
 - 4. Acceptable Manufacturer: Pillow Block Pipestand Model 4-R, Miro Industries, Inc., 1780 West 2300 South, Salt Lake City, Utah 84119.
- J. Pipe Supports at Turns In Large Piping:
 - 1. Pipe Support Hangers: A "clevis hanger" pipe support hanger for roof mounted gas pipes at all large (over 4" I.D.) piping corners, bends, and "tees"/pipe intersections. Pipes rest on a clevis hanger with a support base of stainless steel polycarbonate. All other metal parts are hot-dip galvanized steel.
 - 2. Load Weight: Maximum load weight not to exceed 310 lbs. per pipestand or 155 lbs. on each base.
 - 3. Spacing: Locate "clevis" type pipe hangers at all corners, bends, and "tees"/pipe intersections not to exceed 10'-0" o.c. maximum. Do not exceed 310 lbs. load weight (155 lbs. on each base) and make certain each pipestand is adjusted in height to even load at all pipestands.
 - 4. Acceptable Manufacturer: Pillow Block Pipestand Model 6-H, Miro Industries, Inc., 1780 West 2300 South, Salt Lake City, Utah 84119.
- K. Penetration Dam/Sealer Pockets shall be similar to:
ChemCurb System: gray polyester resin exterior forms,

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structural sealant and One (1) part self-leveling moisture cure pourable sealer (gray).

Part 3- Execution

3.01 Preparation:

- A. General: Sweep or vacuum all surfaces, removing all loose aggregate and foreign substances prior to commencement of roofing.

3.02 Substrate Preparation - Metal Deck / Insulation:

- A. Preparation of Wood/Plywood Substrates to Receive Flashing Materials: Mechanically attach the gypsum sheathing panels to all wood/plywood substrates that will be covered with the specified flashing membrane, using the specified screws/plates, at 12 inches o.c. staggered. Cut the cant backing sheet into 12 inch widths and peel the release film from the back of the sheet. Set the sheet into place extending 6 inches onto the field of the roof area and 6 inches up the gypsum sheathing panel surface utilizing minimum 3 inch side laps. Set the cant into place prior to installation of the roof membrane base ply.
- B. Insulation Panel - two layers: Mechanically attach the insulation panels, using the specified fasteners, at a rate of 1 fastener for every 2.7 square feet of panel area (12 per 4' x 8' panel). Increase the fastening frequency by 50% at the perimeter of the roof area and by 75% at the corners. Meet FM I-90 requirements.
- C. Gypsum Sheathing Panels: Install sheathing panels, and any tapered insulation in hot asphalt, with end joints offset; edges of the panels shall be in moderate contact without forcing applied in strict accordance with the insulation manufacturer's requirements and the following instructions.

3.04 Roof Membrane Installation:

- A. Membrane Application: Apply roofing in accordance with roofing system manufacturer's instructions and the following requirements. Application of roofing membrane components shall immediately follow application of base sheet and/or insulation as a continuous operation.
- B. Aesthetic Considerations: An aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this project. Make necessary preparations, utilize recommended application techniques, apply the specified materials including granules and metallic powder, and exercise care in ensuring that the finished application is acceptable to the Owner.
- C. Priming: Prime metal and concrete and masonry surfaces with a uniform coating of the specified primer.

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- D. Membrane Adhesive Application: Membrane adhesive can be applied by roller, squeegee or spray unit. Apply cold adhesive in a smooth, even, continuous layer without breaks or voids. Utilize an application rate of 2 to 2 1/2 gal/sq over irregular or porous substrates. Utilize an application rate of 1 1/2 to 2 gal/sq for interply applications. Double the adhesive application rate at the end laps of granule surfaced sheets. In the areas surrounding details that are to receive the catalyzed acrylic resin primer and flashing system, apply membrane plies in a full coating of the specified elastomeric sealant in lieu of the solvent based adhesive a minimum 8 inches from the base of the penetration or curb.
- E. Bitumen Consistency: Cutting or alterations of bitumen, primer, and sealants will not be permitted.
- F. Roofing Application: Apply all layers of roofing free of wrinkles, creases, or fishmouths. Exert sufficient pressure on the roll during application to ensure prevention of air pockets.
1. Apply all layers of roofing perpendicular to the slope of the deck.
 2. Fully bond the base ply to the prepared substrate, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the asphalt applicator. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger end laps a minimum of 3 feet.
 3. Fully bond the finish ply to the base ply, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the cold adhesive applicator. Stagger end laps of the finish ply a minimum 3 feet. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply top pressure to top seal T-laps immediately following sheet application. Stagger side laps of the finish ply a minimum 12 inches from side laps in the underlying base ply. Stagger end laps of the finish ply a minimum 3 feet from end laps in the underlying base ply.
 4. Maximum sheet lengths and special fastening of the specified roof membrane system may be required at various slope increments where the roof deck slope exceeds 1/2 inch per foot. The manufacturer shall provide acceptable sheet lengths and the required fastening schedule for all roofing sheet applications

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to applicable roof slopes.

- G. Granule Embedment: Broadcast mineral granules over all bitumen overruns on the finish ply surface, while the bitumen is still hot or the adhesive is soft, to ensure a monolithic surface color.
- H. Flashing Application - masonry surfaces: Flash masonry parapet walls and curbs using the reinforcing sheet and the metal foil flashing membrane. After the base ply has been applied to the top of the cant, fully adhere the reinforcing sheet, utilizing minimum 3 inch side laps and extend a minimum of 3 inches onto the base ply surface and 3 inches up the parapet wall above the cant. After the final roofing ply has been applied to the top of the cant, prepare the surface area that is to receive flashing coverage by torch heating granular surfaces or by application of asphalt primer; allowing primer to dry thoroughly. Torch apply the metal foil-faced flashing into place using three foot widths (cut off the end of roll) always lapping the factory selvage edge. Stagger the laps of the metal foil flashing layer from lap seams in the reinforcing layer. Extend the flashing sheet a minimum of 4 inches beyond the toe of the cant onto the prepared surface of the finished roof and up the wall to the desired flashing height. Exert pressure on the flashing sheet during application to ensure complete contact with the wall/roof surfaces, preventing air pockets; this can be accomplished by using a damp sponge or shop rag. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9 inch centers. (See manufacturer's schematic for visual interpretation).
- I. Flashing Application - surfaces sheathed with gypsum sheathing panels: After the gypsum sheathing panel and cant backing sheet have been installed, flash parapet walls and curbs with the specified reinforcing sheet and the metal foil flashing membrane. The reinforcing sheet shall have minimum 3 inch side laps and extend a minimum of 3 inches onto the base ply surface and to the top of the parapet wall or curb. Using the specified fasteners, mechanically attach the reinforcing sheet through the field of the sheet to the vertical flashing surface on 12 inch centers from the top of the cant to the top of the wall or curb. Fully adhere the remainder of the flashing reinforcing sheet that extends over the cant and roof level. Using a Leister Hand Welding Tool, seal the laps between flashing reinforcing sheets. After the final roofing ply has been applied to the top of the cant, prepare the surface area that is to receive flashing

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coverage by torch heating granular surfaces or by application of asphalt primer; allowing primer to dry thoroughly. Torch apply the metal foil-faced flashing into place using three foot widths (cut off the end of roll) always lapping the factory selvage edge. Stagger the laps of the metal foil flashing layer from lap seams in the reinforcing layer. Extend the flashing sheet a minimum of 4 inches beyond the toe of the cant onto the prepared surface of the finished roof and up the wall to the desired flashing height. Exert pressure on the flashing sheet during application to ensure complete contact with the wall/roof surfaces, preventing air pockets; this can be accomplished by using a damp sponge or shop rag. Check and seal all loose laps and edges. Nail the top edge of the flashing on 9 inch centers. (See manufacturer's schematic for visual interpretation).

- J. Catalyzed Acrylic Resin Flashing System: Install the liquid-applied primer and flashing system in accordance with the membrane system manufacturer's printed installer's guidelines and other applicable written recommendations as provided by the manufacturer.
 - K. Use of Metallic Powder: Broadcast metallic powder over all bitumen overruns on the metal foil membrane surface while the bitumen is still hot to ensure a monolithic surface color.
 - L. Water Cut-Off: At end of day's work, or when precipitation is imminent, construct a water cut-off at all open edges. Cut-offs can be built using asphalt or plastic cement and roofing felts, constructed to withstand protracted periods of service. Cut-offs must be completely removed prior to the resumption of roofing.
- 3.05 Roof System Interface With Related Components:
- A. Walktread: Cut the walktread into maximum 5 foot lengths and allow to relax until flat. Adhere the sheet using the specified plastic cement. Apply the specified cement in a 3/8 inch thickness to the back of the product in 5 inch by 5 inch spots in accordance with the pattern as supplied by the walktread manufacturer. Walk-in each sheet after application to ensure proper adhesion. Use a minimum spacing of 2 inches between sheets to allow for proper drainage.
 - B. Sealant: Apply a smooth continuous bead of the specified sealant at the exposed finish ply edge transition to metal flashings incorporated into the roof system.
- 3.06 Field Quality Control And Inspections:
- A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment, and related items

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- after completion of job.
- B. Notification Of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.
 - C. Final Inspection:
 - 1. Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.
 - D. Issuance Of The Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

End of Section

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SECTION 07600 - FLASHING AND SHEET METAL

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Modified Bitumen Membrane Roofing System - Section 07550
- B. Sealants - Section 07900

1.03 Quality Assurance:

- A. Standards:
 - 1. American Society of Testing and Materials
 - a. ASTM A-526, Steel Sheet, Zinc-Coated (Galvanized), Commercial Quality.
 - b. ASTM B-32, Solder Metal
 - 2. Federal Specifications:
 - a. SS-C-153B, Cement, Bituminous, Plastics
 - 3. Sheet Metal and Air Conditioning Contractors National Association:
 - a. Architectural Sheet Metal Manual

- 1.04 Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. Prefinished Sheet Metal overflow scuppers and Prefinished Metal Coping:
 - 1. Galvanized iron, prefinished one side.
 - 2. Gauge: 24 gauge, of design and width as detailed.
 - 3. Acceptable manufacturer: Color Klad - Vincent Brass and Aluminum Co.
 - 4. Finish: Kynar 500 - Refer Color Schedule
- B. Sheet Metal:
 - 1. Galvanized Sheet Steel: ASTM A-526, Commercial Quality.
 - 2. Gauge: 22 Gauge minimum or as required by Drawings or Specifications.
- C. Fasteners: Nails, screws, and other fasteners used in conjunction with this work shall be galvanized or cadmium plated.
- D. Solder: ASTM B-32, alloy grade 58, 50% tin, 50% lead.
- E. Flux: Muriatic acid with zinc.
- F. Sealants: Rubber based compound - refer to Section 07900.
- G. Bituminous Plastic Cement: FS SS-C-153B.

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- H. Accessories: Provide accessories as recommended by manufacturer or as indicated on Drawings.

Part 3 - Execution

3.01 Fabrication:

- A. Shape and install sheet metal as indicated on Drawings. Comply with recommendations of SMACNA "Architectural Sheet Metal Manual."
- B. Form exposed faces flat and free of buckles, excessive wave and tool marks. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
- C. Hem all exposed edges.
- D. Make waterproof corner joints by soldering solidly. Joints shall be full-lapped.
- E. Soldering: Shall be done slowly with well heated coppers to thoroughly heat the sheet and completely sweat the solder through the full width of the seam. Ample solder shall be used and the seam shall show a least one full inch of evenly flowed solder. Soldering coppers: Shall be heavy and blunt design, properly tinned before using. Neutralize all excess flux.
- F. Provide for thermal expansion of running trim, flashing and other items exposed for more than 15'-0" continuous length. Locate expansion seams at 10'-0" intervals and 2'-0" each side of corners and intersections.
- G. Angle bottom edges of exposed vertical surfaces to form drips.

3.02 Installation and Application:

- A. General:
 - 1. Furnish those items to be installed by other trades to proper grade for installation.
 - 2. Cooperate with and coordinate installation of sheet metal with roofing work as specified under Modified Bitumen Membrane Roofing System - Section 07550.
 - 3. Install work watertight, without waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.
 - 4. Embed all flashing in plastic cement. Coat dissimilar metals from contact with bituminous coating.
- B. Metal Coping:
 - 1. Material: 24 gauge, prefinished sheet metal.
 - 2. Fabricate and install in accordance with drawings, and recognized sheet metal practices.
 - 3. Secure coping bedded in plastic cement to blocking.
 - 4. At joints, bed coping in plastic cement and secure on side to backing strip by soldering solid. Do not use screws

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or nails in exposed face to coping.

5. Lower edge of coping to be securely hooked to hook strip. Secure to wood blocking with No. 8 x 1" galvanized sheet metal screws at 8 o.c.

End of Section

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SECTION 07840 - FIRESTOPPING

Part 1 - General

1.01 Related Documents:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Section, apply to work specified in this section.

1.02 Definitions:

- A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in, or construction joints between, fire rated wall and floor assemblies.

1.03 General Description of the Work:

- A. Only tested firestop systems shall be used in specific locations as follows:
 1. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
 2. Safing slot gaps between edge of floor slabs and curtain walls.
 3. Openings between structurally separate sections of wall or floors.
 4. Gaps between the top of walls and ceilings or roof assemblies.
 5. Expansion joints in walls and floors.
 6. Openings and penetrations in fire-rated partitions or walls containing fire doors.
 7. Openings around structural members which penetrate floors or walls.

1.04 Related Work Specified Elsewhere:

- A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:
 1. Section 03300 - Cast-In-Place Concrete
 2. Section 04810 - Masonry
 3. Section 07900 - Sealants
 4. Section 09250 - Gypsum Wallboard
 5. Section ***** - Fire Suppression Piping
 6. Section ***** - Common Work Results for Plumbing
 7. Section ***** - Common Work Results for HVAC
 8. Section ***** - HVAC Insulation
 9. Section ***** - Basic Electrical Materials and Methods

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1.05 References:

- A. Test Requirements: ASTM E 814, "Standard Method of Fire Tests of Through Penetration Fire Stops".
- B. Test Requirements: UL 1479, "Fire Tests of Through-Penetration Firestops".
- C. Test Requirements: UL 2079, "Tests for Fire Resistance of Building Joint Systems".
- D. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.
 - 1. UL Fire Resistance Directory:
 - a. Firestop Devices (XHJI)
 - b. Fire Resistance Ratings (BXRH)
 - c. Through-Penetration Firestop Systems (XHEZ)
 - d. Fill, Voids, or Cavity Material (XHHW)
 - e. Forming Materials (XHKU)
 - f. Joint Systems (XHBN)
 - g. Perimeter Fire Containment Systems (XHDG)
 - 2. Alternate Systems: "Omega Point Laboratories Directory" (updated annually).
- E. Test Requirements: ASTM E 1966, "Standard Test Method for Fire Resistive Joint Systems".
- F. Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Fire Stops".
- H. ASTM E 84, "Standard Test Method for Surface Burning Characteristics of Building Materials".
- I. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments.
- J. All major building codes: ICBO, SBCCI, BOCA, IBC
- K. NFPA 101 - Life Safety Code
- L. NFPA 70 - National Electric Code

THROUGH-PENETRATION UL CLASSIFICATION SYSTEM

Fire Stopping Systems

UL Classification System

		Construction Penetrated	Type Of Construction	System Identification
1	No Penetrating Items:	F, W, C	A, B, J, K, L	0001-0999
2	Metallic Pipes, Conduit or Tubing:	F, W, C	A, B, J, K, L	1001-1999
3	Nonmetallic Pipe, Conduit or Tubing:	F, W, C	A, B, J, K, L	2001-2999
4	Electric Cables:	F, W, C	A, B, J, K, L	3001-3999
5	Cable, Trays with Electric Cables:	F, W, C	A, B, J, K, L	4001-4999
6	Insulated Pipes:	F, W, C	A, B, J, K, L	5001-5999

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7	Electrical Bussduct Penetrations:	F, W, C	A, B, J, K, L	6001-6999
8	Mechanical Ductwork Penetrations:	F, W, C	A, B, J, K, L	7001-7999
9	Multiple Penetrations Through Common Openings:	F, W, C	A, B, J, K, L	8000-8999

Construction Penetration

F	Floor penetration
W	Wall penetration
C	Either floor or wall penetration

Type of Construction

A-	Concrete floors equal to or less than 5-inches thick
B-	Concrete floors greater than 5-inches thick
J-	Concrete or masonry walls equal to or less than 8-inches thick
K-	Concrete or masonry walls greater than 8-inches thick
L-	Framed walls

JOINT UL CLASSIFICATION SYSTEM

Fire-Resistant Joint Systems		UL Classification System		Joint Width
	Joint System	Movement Capability		
1	Floor-to-Floor	FF	D	0000-0999
2	Wall-to-Wall	WW	D	0000-0999
3	Floor-to-Wall:	FW	D	0000-0999
4	Head of Wall:	HW	D	0000-0999

Movement Capability

D-	Has movement capability
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Joint Width

0000-0999 Less than or equal to 2-inches

1.06 Quality Assurance

A. Installer Responsibilities: A firm experienced installing through-penetration firestop systems similar in material, design and extent to that indicated for this Project, whose

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SECTION 07840 - FIRESTOPPING

work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements.

- B. Firestop System installation must meet requirements of ASTM E 814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
- C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.
- D. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- E. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.

1.07 Submittals:

- A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of qualified tested firestop systems to be used and manufacturer's installation instructions.
- B. Submit Manufacturer's engineering judgment identification number and drawing details when no qualified tested system is available for an application. Engineering judgment must include both project name and contractor's name who will install firestop system as described in document.
- C. Submit material safety data sheets provided with product delivered to job-site.

1.08 Installer Qualifications:

- A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements.
- B. The work is to be installed by a contractor with at least one of the following qualifications:
 - 1. FM 4991 Approved Contractor
 - 2. UL Approved Contractor
 - 3. Hilti Accredited Fire Stop Specialty Contractor
- C. Installer shall have not less than 3 years of experience with fire stop installation.

1.09 Delivery, Storage and Handling:

- A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.
- B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at jobsite.
- C. Store materials under cover and protect from weather and

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damage in compliance with manufacturer's requirements, including temperature restrictions.

- D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
- E. Do not use damaged or expired materials.

1.10 Project Conditions:

- A. Do not use materials that contain flammable solvents.
- B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
- C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
- D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.
- E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

1.11 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers, providing they meet or exceed that specified.**

Part 2 - Products

2.01 Firestopping, General:

- A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
- C. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed." Provide cast-in-place firestop devices prior to concrete placement.

2.02 Acceptable Manufacturers:

- A. Subject to compliance with through penetration firestop systems (XHEZ), joint systems (XHBN), and perimeter firestop systems (XHDG) listed in Volume 2 of the UL Fire Resistance Directory; provide products of the following manufacturers

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as identified below:

1. Hilti, Inc., Tulsa, Oklahoma
800-879-8000 / www.us.hilti.com

2.03 Materials:

- A. Use only firestop products that have been UL 1479, ASTM E 814 or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
- B. Pre-installed firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and/or cable bundles penetrating concrete floors and/or gypsum walls, the following products are acceptable:
 1. Hilti CP 680-P Cast-In Place Firestop Device
 - a. Add Aerator adaptor when used in conjunction with aerator ("solvent") system.
 2. Hilti CP 681 Tub Box Kit for use with tub installations.
 3. Hilti CP 680-M Cast-In Place Firestop Device for use with noncombustible penetrants.
 4. Hilti CP 653 Speed Sleeve for use with cable penetrations.
- C. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
 1. Hilti FS-ONE Intumescent Firestop Sealant
 2. Hilti CP 604 Self-leveling Firestop Sealant
 3. Hilti CP 620 Fire Foam
 4. Hilti CP 606 Flexible Firestop Sealant
 5. Hilti CP 601s Elastomeric Firestop Sealant
- D. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
 1. Hilti CP 601s Elastomeric Firestop Sealant
 2. Hilti CP 606 Flexible Firestop Sealant
 3. Hilti FS-ONE Intumescent Firestop Sealant
- E. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
 1. Hilti CP 672 Speed Spray
 2. Hilti CP 601s Elastomeric Firestop Sealant
 3. Hilti CP 606 Flexible Firestop Sealant
 4. Hilti CP 604 Self-leveling Firestop Sealant
- F. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.
 1. Hilti CP 777 Speed Plugs
 2. Hilti CP 767 Speed Strips

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- G. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
 - 1. Hilti FS-ONE Intumescent Firestop Sealant
- H. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:
 - 1. Hilti FS-ONE Intumescent Firestop Sealant
 - 2. Hilti CP 620 Fire Foam
 - 3. Hilti CP 601s Elastomeric Firestop Sealant
 - 4. Hilti CP 606 Flexible Firestop Sealant
- I. Non-curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:
 - 1. Hilti CP 618 Firestop Putty Stick
 - 2. Hilti CP 658T Firestop Plug
- J. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
 - 1. Hilti CP 617 Firestop Putty Pad
 - 2. Hilti Firestop Box Insert
- K. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
 - 1. Hilti CP 643N Firestop Collar
 - 2. Hilti CP 644 Firestop Collar
 - 3. Hilti CP 648E/CP648S Wrap Strips
- L. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
 - 1. Hilti CP 637 Firestop Mortar
 - 3. Hilti FS 657 FIRE BLOCK
 - 4. Hilti CP 620 Fire Foam
 - 5. Hilti CP 675T Firestop Board
- M. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
 - 1. Hilti FS 657 FIRE BLOCK
 - 2. Hilti CP 675T Firestop Board
- N. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:
 - 1. Hilti CP 672 Speed Spray
 - 2. Hilti CP 601s Elastomeric Firestop Sealant

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3. Hilti CP 606 Flexible Firestop Sealant
4. Hilti CP 604 Self-Leveling Firestop Sealant
- O. For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected, the following products are acceptable:
 1. Hilti FS 657 FIRE BLOCK
 2. Hilti CP 658T Firestop Plug
- P. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
- Q. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction joint assembly.

Part 3 - Execution

3.01 Preparation:

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
 1. Verify penetrations are properly sized and in suitable condition for application of materials.
 2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
 3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
 4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
 5. Do not proceed until unsatisfactory conditions have been corrected.

3.02 Coordination:

- A. Coordinate location and proper selection of cast-in-place Firestop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.
- B. Responsible trades to provide adequate spacing of field run pipes to allow for installation of cast-in-place firestop devices without interferences.

3.03 Installation:

- A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.
- B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.
 1. Seal all holes or voids made by penetrations to ensure

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SECTION 07840 - FIRESTOPPING

an air and water resistant seal.

2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
3. Protect materials from damage on surfaces subjected to traffic.

3.04 Field Quality Control:

- A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.
- C. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.
- D. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

3.05 Identification:

- A. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
 1. The words: "Warning -Through Penetration Firestop System-Do Not Disturb. Notify Building Management of Any Damage."
 2. Contractor's Name, address, and phone number.
 3. Through-Penetration firestop system designation of applicable testing and inspecting agency.
 4. Date of Installation.
 5. Through-Penetration firestop system manufacturer's name.
 6. Installer's Name.

3.06 Adjusting and Cleaning:

- A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.
- B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

End of Section

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SECTION 07900 - SEALANTS

Part 1 - General

1.01 Work Included:

- A. All materials, labor services, and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. TT-S-00230C, Sealing Compound, One Component.
 - 2. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.03 Submittals:

- A. Submit manufacturer's specifications and color chart for each type of sealant.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.
- D. Product test reports.
- E. Preconstruction compatibility and adhesion test reports.
- F. Preconstruction field-adhesion test reports.
- G. Field-adhesion test reports.

1.04 Warranty:

- A. All work done under this section of the work shall be guaranteed for a period of two years from date of final acceptance of the building. Guarantee shall include materials and workmanship required to repair any leaks or the repairs thereof.
- B. Special Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section for a period of 10 years from date of final acceptance.

1.05 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. Building Sealant: One part high performance polyurethane waterproofing sealant, FS-TT-S-00230C.
 - 1. Acceptable Manufacturer: Sonneborn NP1 Building Sealant.
 - 2. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall

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SECTION 07900 - SEALANTS

comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

- a. Architectural Sealants: 250 gIL.
 - b. Sealant Primers for Nonporous Substrates: 250 gIL.
 - c. Sealant Primers for Porous Substrates: 775 gIL.
3. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - a. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
 4. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
 5. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- B. Silicone Joint Sealants:
1. Mildew-Resistant Neutral-Curing Silicone Joint Sealant: ASTM C 920.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. BASF Building Systems.
 2. Dow Corning Corporation.
 3. GE Advanced Materials - Silicones.
 4. Pecora Corporation.
 5. Sika Corporation; Construction Products Division.
 6. Tremco Incorporated.
- C. Urethane Joint Sealants: Urethane Joint Sealant: ASTM C 920.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work

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- include, but are not limited to, the following:
- a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Lyntal, International, Inc.
 - d. Pecora Corporation.
 - e. Sika Corporation; Construction Products Division.
 - f. Tremco Incorporated.
- D. Latex Joint Sealants: Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, GradeNF.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Pecora Corporation.
 - d. Tremco Incorporated.
- E. Preformed Joint Sealants: Preformed Foam Joint Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant manufactured from urethane foam with minimum density of 10 lb/cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Specialty Chemicals.
 - b. EM SEAL Joint Systems, Ltd.
 - c. Sandell Manufacturing Co.
 - d. Schul International, Inc.
 - e. Willseal USA, LLC.
- F. Acoustical Joint Sealants: Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Pecora Corporation.
 - b. USG Corporation.

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SECTION 07900 - SEALANTS

- G. Joint Sealant Backing: cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type 0 (open-cell material) or any of the preceding types, as approved in writing by joint sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 1. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.
- H. Miscellaneous Materials: as recommended by sealant manufacturer.
 - 1. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
 - 2. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
 - 3. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
 - 4. Joint Cleaner
 - 5. Joint Primer/Sealer
 - 6. Bond Breaker Tape
 - 7. Joint Backer-Rod: Closed-cell compressible rod stock, size and shape as required by application.
- I. Caulking compound: Watertight, gun consistency, conforming to FS-TT-C-598, Type 1.
- J. Accessories: As recommended by sealant manufacturer.
- K. Color: to be selected from manufacturer's standard colors.

Part 3 - Execution

- 3.01 Preparation:
 - A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
 - B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to

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areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.
- 3.02 Installation: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- A. Do not leave gaps between ends of sealant backings.
 - B. Do not stretch, twist, puncture, or tear sealant backings.
 - C. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
 - D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
 - E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
 - F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
 - G. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.
 - H. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning

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materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

- 3.03 Joint Sealant Schedule:
- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
 - B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
 - C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
 - D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non traffic surfaces.
 - E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.
 - F. Joint-Sealant Application: Interior acoustical joints in vertical surfaces and horizontal non traffic surfaces.
- 3.04 Additional Information:
- A. Application: All sight exposed caulking, and all exterior applications.
 - B. Comply with sealant manufacturer's printed instructions.
 - C. Any surfaces requiring priming, shall be prepared according to manufacturer's recommendations.
 - D. Install sealants to depths as shown or as recommended by sealant manufacturer. Smooth uneven surfaces.
 - F. Do not disturb compound by touching, washing, or otherwise until it has cured tack free.
 - G. Excess compound shall be removed from surfaces after curing.
 - H. Follow manufacturer's recommendations for painting over sealant.

End of Section

DIVISION 8 - DOORS & WINDOWS

SECTION 08100 - METAL DOORS AND FRAMES

Part 1 - General

1.01 Work Included:

- A. All material labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Hardware and Specialties - Section 08700

1.03 Quality Assurance:

A. Standards:

1. American Society for Testing and Materials
 - a. ASTM A-366, Steel Sheets, Carbon, Cold-Rolled, Commercial Quality.
 - b. ASTM A-569, Steel, Carbon, Hot-rolled Sheet and strip, commercial quality.
2. Underwriters' Laboratories, Inc.
3. Steel Door Institute (SDI): Recommended specifications for Steel Doors and Frames.

- B. Installer Qualifications: An employer of workers trained and approved by manufacturer.

- C. Source Limitations: Obtain standard steel doors and frames through one source from a single manufacturer.

- D. Fire-Rated Door Frame Assemblies: Assemblies complying with IBC 2009 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire protection ratings indicated.

1. Test Pressure: Test according to NFPA 252. After 5 minutes into the test, the neutral pressure level in furnace shall be established at 40 inches (1000 mm) or less above the sill.
2. Temperature-Rise Rating: At exit enclosures, provide doors that have a temperature-rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.
3. Smoke-Control Door Assemblies: Comply with NFPA 105.

1.04 Submittals:

- A. Shop Drawings: Product Data: Include construction details, material descriptions, core descriptions, label compliance, and finishes for each type of steel door and frame specified.

1. Submit shop Drawings showing details for each frame and door type, elevations and details of construction. Provide a schedule of doors and frames referenced to detail and openings as shown on the Drawings.
 - a. Elevations of each door design.
 - b. Details of doors, including vertical and horizontal edge details.
 - c. Frame details for each frame type, including dimensioned profiles.
 - d. Details and locations of reinforcement and

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- preparations for hardware.
 - e. Details of each different wall opening condition.
 - f. Details of anchorages, accessories, joints, and connections.
 - g. Details of glazing frames and stops showing glazing.
 - h. Details of conduit and preparations for electrified door hardware and controls.
 - 2. It is the manufacturer's responsibility to obtain templates of finish hardware. The shop Drawings must indicate all hardware applications to the doors and frames.
 - 3. Begin fabrication only after receiving approved shop Drawings.
 - 4. Qualification Data: For Installer.
- 1.05 Product Delivery, Storage and Handling:
- A. All materials shall be protected for shipping so that they may arrive at the job site without undue damage or damage from storage at the job.
 - B. Deliver doors and frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.
 - C. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
 - D. Store doors and frames under cover at Project site. Place units in a vertical position with heads up, spaced by blocking, on minimum 4-inch- high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber.
 - 1. If wrappers on doors become wet, remove cartons immediately. Provide minimum 114-inch space between each stacked door to permit air circulation.
- 1.06 Project Conditions:
- A. Field Measurements: Verify openings by field measurements before fabrication and indicate measurements on Shop Drawings.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating standard steel frames without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.
- 1.07 Coordination:
- A. Coordinate installation of anchorages for standard steel frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves,

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concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in masonry. Deliver such items to Project site in time for installation.

1.08 Warranty: Provide manufacturer's standard warranty.

Part 2 - Products

2.01 Acceptable Manufacturers:

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

1. CURRIES Company; an ASSA ABLOY Group Company.
2. Steelkraft; and Ingersoll-Rand Company.
3. Or Approved Equal.

2.02 Materials:

- A. Cold-Rolled Steel Sheet: ASTM A 100S/A 100SM, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 zinc-iron-alloy (galvannealed) coating designation.
- D. Electrolytic Zinc-Coated Steel Sheet: ASTM A 5911A 59 1M, Commercial Steel (CS), Class B coating; mill phosphatized.
- E. Supports and Anchors: After fabricating, galvanize units to be built into exterior walls according to ASTM A 153/A 153M, Class B.
- F. Inserts, Bolts, and Fasteners: Provide items to be built into exterior walls, hot-dip galvanized according to ASTM A 153/A 153M.
- G. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. density; with maximum flame-spread and smoke-developed indexes of 25 and 50 respectively; passing ASTM E 136 for combustion characteristics.
- H. Glazing: Comply with requirements in Division S Section "Glazing."
- I. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- J. Grout: In masonry construction use grout for masonry as specified in Division 4. In stud walls use cementitious sprayed fire-resistive material manufactured by the following:

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1. Monokote Type MK-6; W.R. Grace Construction Products.
 2. Cafco 300; Isolatek International Corp.
- 2.03 Requirements: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces, unless otherwise indicated. Comply with ANSI A250.8.
- A. Doors - Flush Panel: (SDI Door Type III, Style 2, Seamless):
1. Door, as indicated on the Drawings shall be constructed of 16 gauge cold-rolled, stretcher leveled sheet steel. Doors shall be insulated with foamed urethane, full length and width of doors. Construct doors with smooth, flush surfaces without visible joints or seams on exposed face or vertical edges. Doors shall be 1-3/4" thick unless noted otherwise.
 2. Close top and bottom edges with a recessed channel end closure or a flush end closure treatment.
 3. Vertical Edges for Single-Acting Doors: Square edge unless beveled edge is indicated.
 - a. Beveled Edge: 1/8 inch in 2 inches.
 4. Vertical Edges for Double-Acting Doors: Round vertical edges with 2-1/8-inch radius.
 5. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
 6. Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- B. Frames:
1. Hollow metal frames shall be of 16 gauge cold-rolled, pickled steel, except that all frames for single doors over 3'-0" wide, frames for pairs of doors over 4'-0" wide and frames for doors over 9'-0" high shall be of 14 gauge steel. Frames shall be neatly mitered and continuously welded and ground smooth for invisible joints.
 2. Furnish anchors as shown on Drawings or as recommended by manufacturer, to secure frames to adjacent construction, formed of not less than 18 gauge galvanized steel. Install anchors at a maximum of 24" centers of jamb height.
 3. Frames against masonry or concrete are to be slush filled.
 4. Knock-down frames are not permitted.
 5. Frames against masonry or concrete are to be slush filled.
 6. Jamb Anchors:
 - a. Masonry Type: Adjustable strap-and-stirrup or T - shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated

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- straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
- b. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
 - c. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:
 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.
 - d. Ceiling Struts: Minimum 3/8-inch-thick by 2-inch-wide steel.
 - e. Plaster Guards: Formed from same material as frames, not less than 0.016-inch thick.
7. Sidelight Frames: Provide closed tubular members with no visible face seams or joints; fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
- C. Hardware Reinforcement:
1. Reinforcements for locks shall be 3/16" for fronts, with 14 gauge for roses and escutcheons. Hinge reinforcements shall be at least 10 gauge x 1 2" x 9". Provide steel strike and hinge reinforcement cover for frames.
- D. Jamb Anchors: Provide number and spacing of anchors as follows:
1. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - a. Two anchors per jamb up to 60 inches in height.
 - b. Three anchors per jamb from 60 to 90 inches in height.
 - c. Four anchors per jamb from 90 to 120 inches in height.
 - d. Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof more than 120 inches in height.
 2. Stud-Wall Type: Locate anchors not more than 18 inches

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- from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
- a. Three anchors per jamb up to 60 inches in height.
 - b. Four anchors per jamb from 60 to 90 inches in height.
 - c. Five anchors per jamb from 90 to 96 inches in height.
 - d. Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof more than 96 inches in height.
 - e. Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
- E. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Provide plastic plugs to keep holes clear during construction.
1. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 2. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- F. Stops and Moldings:
1. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, fabricated from same material as door face sheet in which they are installed.
 2. Fixed Frame Moldings: Formed integral with standard steel frames, minimum 5/8 inch high, unless otherwise indicated.
 3. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch thick, fabricated from same material as frames in which they are installed.
- G. Labeled Doors and Frames:
1. Where doors and frames are called for on Drawings as labeled, their construction shall conform to all requirements and bear the appropriate U.L. label.
- H. Steel Finishes
1. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - a. Finish standard steel door and frames after assembly.
 2. Metallic-Coated Steel Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.

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- a. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
3. Steel Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning"; remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel; comply with SSPC-SP 3, "Power Tool Cleaning," or SSPC-SP 6/NACE No.3, "Commercial Blast Cleaning."
4. Factory Priming for Field-Painted Finish: Apply shop primer specified below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mils.
 - a. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.

Part 3 - Execution

3.01 Fabrication:

- A. All doors, and frames shall be cleaned of rust, grease and other impurities, and all welds ground and filled smooth, Metallic filler to conceal defects is not acceptable.
- B. Doors and frames shall be mortised, reinforced, drilled, and tapped for all mortise hardware in accordance with Hardware schedule and templates furnished by the hardware supplier, except that drilling and tapping for surface door closers, door closer brackets, surface panic devices and/or other surface applied hardware shall be done in the field. Frames shall be accurate and done in a neat, workmanlike manner.

3.02 Installation:

- A. Standard Steel Frames: Install standard steel frames for doors sidelights borrowed lights and other openings, of size and profile indicated. Comply with SDI 105.
 1. Bituminous coating and grout: Any material lost, removed or damaged during transportation or installation shall be replaced.
 2. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary

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braces, leaving surfaces smooth and undamaged.

- a. At fire-protection-rated openings, install frames according to NFP A 80.
 - b. Install frames with removable glazing stops located on secure side of opening.
 - c. Install door silencers in frames before grouting.
 - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
3. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with post-installed expansion anchors.
- a. Floor anchors may be set with powder-actuated fasteners instead of post installed expansion anchors if so indicated and approved on Shop Drawings.
4. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar as specified in Division 4 Section "Unit Masonry Assemblies."
6. Ceiling Struts: Extend struts vertically from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb members.
7. Installation Tolerances: Adjust standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
- a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

DIVISION 8 - DOORS & WINDOWS

SECTION 08100 - METAL DOORS AND FRAMES

- B. Standard Steel Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 - 2. Fire-Rated Doors: Install doors with clearances according to NFP A 80.
 - 3. Smoke-Control Doors: Install doors according to NFPA 105.
 - C. Glazing: Comply with installation requirements in Division 8 Section "Glazing" and with standard steel door and frame manufacturer's written instructions.
- 3.03 Adjusting and Cleaning:
- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including standard steel doors or frames that are warped, bowed, or otherwise unacceptable.
 - B. Clean grout and other bonding material off standard steel doors and frames immediately after installation.
 - C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
 - D. Galvannealed Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions. Do not use abrasive, caustic or acid cleaning agents.
 - E. Protect doors and frames from damage until final acceptance by Architect. Replace/repair any damaged items as directed above.

End of Section

DIVISION 8 - DOORS & WINDOWS

SECTION 08200 - WOOD DOORS

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Finish Hardware - Section 08700

1.03 Quality Assurance:

- A. Standards:
 - 1. Architectural Woodwork Institute:
 - a. Architectural Woodwork Quality Standards
 - 2. Underwriter's Laboratories, Inc.
- B. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-Accredited certification body.
- C. Source Limitations: Obtain flush wood doors from single manufacturer.
- D. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Quality Standards Illustrated."
- E. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at according to NFPA 252 and UL 10B.
 - 1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
 - 2. Temperature-Rise Limit: At vertical exit enclosures and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.
 - 3. Fire-Rated Doors must be provided with fire labels.

1.04 Submittals:

- A. Shop Drawings:
 - 1. It is the manufacturer's responsibility to obtain templates of finish hardware. The shop Drawings must indicate all hardware applications to the doors.
 - 2. Begin fabrication only after receiving approved shop Drawings.
 - 3. Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
 - 4. Samples for Initial Selection: Color charts consisting

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SECTION 08200 - WOOD DOORS

of actual materials in small sections.

5. Samples for Verification:
 - a. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
6. Frames for light openings, 6 inches long, for each material, type, and finish required.

1.05 Products Delivery, Storage and Handling:

- A. When doors are delivered to job site, doors shall receive first coat of finish. Store in a protected area.
- B. Comply with requirements of referenced standard and manufacturer's written instructions.
- C. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.
- D. Mark each door on bottom rail with opening number used on Shop Drawings.

1.06 Warranty:

- A. General Warranty: Door manufacturer's warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by manufacturer, Installer, and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span, or do not comply with tolerance limitations in referenced quality standard.
 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 2. Warranty shall be in effect during the following period of time after date of Final Completion.
 - a. Solid Core Interior Doors: Life of installation.

Part 2 - Products

2.01 Doors (non-labeled):

- A. Doors shall be 1 3/4" thick interior grade, veneered, with a particleboard core. Construction shall meet AWI 1300 PC, "Custom" standard. Doors shall have I.S. "Premium" grade

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SECTION 08200 - WOOD DOORS

faces - Plain Sliced Red Oak. Provide hardwood top, bottom, and side edges.

2.02 Doors (labeled):

- A. Doors shall be 1 3/4" thick interior grade, veneered, with a mineral core (refer to Drawings for ratings). Construction shall meet AWI 1300 FD, "Custom" standard. Doors shall have I.S. "Premium grade faces - Plain Sliced Red Oak. Provide hardwood top, bottom, and side edges.
- B. Where doors are called for on drawings as labeled their construction shall conform to all U.L. requirements and bear the appropriate U.L. label.

2.03 Acceptable Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Algoma Hardwoods, Inc.
2. Ampco, Inc.
3. Buell Door Company Inc.
4. Chappell Door Co.
5. Eagle Plywood & Door Manufacturing, Inc.
6. Eggers Industries.
7. Graham; an Assa Abloy Group company.
8. Haley Brothers, Inc.
9. Ideal Architectural Doors & Plywood.
10. Ipik Door Company.
11. Lambton Doors.
12. Marlite.
13. Marshfield Door Systems, Inc.
14. Mohawk Flush Doors, Inc.; a Masonite company.
15. Oshkosh Architectural Door Company.
16. Poncraft Door Company.
17. Vancouver Door Company.
18. VT Industries Inc.

2.04 Door Construction - General:

- A. Particleboard-Core Doors:
 1. Particleboard: ANSI A208.1, Grade 1L-1, made with binder containing no ureaformaldehyde resin.
 2. Blocking - Provide wood blocking in particleboard-core doors as follows:
 - a. 5-inch top-rail blocking, in doors indicated to have closers.
 - b. 5-inch bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
 3. Provide doors with structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.
- B. Fire-Protection-Rated Doors: Provide core specified or

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mineral core as needed to provide fire protection rating indicated.

1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
 2. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
 3. Pairs: Provide formed-steel edges and astragals with intumescent seals.
- C. Factory Finishing: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
 2. Finish doors at factory.
 3. Finish doors at factory that are indicated to receive transparent finish. Field finish doors indicated to receive opaque finish.
4. Transparent Finish:
1. Grade: Premium.
 2. Finish: WDMA TR-6 catalyzed polyurethane.
 3. Staining: Water-based stain with transparent ultraviolet cured catalyzed polyurethane. Color as selected by Architect from manufacturer's full range.
 4. Effect: Open-grain finish.
 5. Sheen: Semigloss.

Part 3 - Execution

3.01 Examination:

- A. Examine doors and installed door frames before hanging doors.
 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 Installation:

- A. Provide clean properly sized and accurately placed mortises

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and drilled holes for all mortise and surface mounted finish hardware, in accordance with Hardware Schedule and templates furnished by the hardware supplier.

- B. Comply with the tolerance requirements of AWI for prefabricating. Install in accordance with the requirements of the NWMA Door Guarantee.
 - C. Repair or replace doors damaged during installation. Repair doors which do not swing or operate properly.
 - D. Hardware: For installation, see Division 08 Section "Door Hardware."
 - E. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
 - F. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
 - a. Comply with NFP A 80 for fire-rated doors.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
 - 3. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.
 - G. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
 - H. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
- 3.03 Adjusting:
- A. Operation: Rehang or replace doors that do not swing or operate freely.
 - B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

End of Section

DIVISION 8 - DOORS AND WINDOWS

SECTION 08400 - ENTRANCES AND STOREFRONTS

PART 1 - General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of all work as shown on the Drawings and specified herein.
- B. All necessary anchors and accessories required for the complete installation of the Storefront units.
- C. Perimeter Sealant.

1.02 Related Work Specified Elsewhere:

- A. Sealants - Section 07900.
- B. Hardware and Specialties - Section 08700.
- C. Glazing - Section 08800.

1.03 Performance And Testing Requirements:

- A. Provision for Thermal Movements:
 1. Storefront framing systems shall be designed to provide for thermal movement of all component materials resulting from a cycling temperature range of 180E F. without causing buckling, stresses on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or other detrimental effects. Operating windows and doors shall function normally over this temperature range.
- B. Test Procedures and Performance:
 1. Air Infiltration Test, Fixed Unit:
 - a. Test Fixed Unit in accordance with ASTM E 283 at static air pressure difference of 6.24 psf.
 - b. Air infiltration shall not exceed .06 cfm per square foot of fixed wall area.
 2. Air Infiltration Test, Doors:
 - a. Test Doors in accordance with ASTM E 283 at static air pressure difference of 1.57 psf.
 - b. Air infiltration shall not exceed .10 cfm per foot of perimeter crack length for pair of doors.
 3. Water Resistance Test:
 - a. Test unit in accordance with ASTM E 331.
 - b. There shall be no uncontrollable water leakage at a static test pressure of 6.24 psf. (12.00 psf at doors)
 4. Uniform Load Deflection Test:
 - a. Test in accordance with ASTM E 330.
 - b. Design and size members to withstand dead loads and live loads caused by pressure and suction of wind as calculated in accordance with 2009 International Building Code.

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SECTION 08400 - ENTRANCES AND STOREFRONTS

- c. Deflection under design load shall not exceed $L/175$ of the clear span.
 - 5. Uniform Load Structural Test:
 - a. Test in accordance with ASTM 330 at a pressure 1.5 times the design wind pressure in 1.03.3.b.
 - b. At conclusion of the test, there shall be no glass breakage, permanent damage to fasteners, storefront parts, or any other damage which would cause the storefront to be defective.
 - 6. Condensation Resistance Test (CRF):
 - a. Test unit in accordance with ASTM 1502.7.
 - b. Condensation Resistance Factor (CRF) shall be not less than 70.
 - 7. Thermal Transmittance Test (Conductive U Value):
 - a. Test in accordance with ASTM 1503.1.
 - b. Conductive thermal transmittance (U Value) shall be not more than .44 BTU/HR/degree F/sf. Unless otherwise specified, units tested for condensation resistance and thermal transmittance shall be glazed with no more than two lites of clear, uncoated, annealed glass. Sealed insulating glass shall be of standard construction.
- 1.04 Quality Assurance:
 - A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in 1.05.
 - B. Test reports shall be accompanied by the storefront manufacturer=s letter of certification stating that the tested storefront meets or exceeds the referenced criteria for the appropriate storefront type.
- 1.05 Submittals:
 - A. Contractor shall submit shop drawings to the Architect for his approval. Drawings shall show scale elevations and sections. Full size sections shall be shown only when needed for clarity. Drawings shall show construction of all parts of the work, including metal and glass thickness, methods of joining, details of all field connections and anchorage, fastening and sealing methods, metal finishes and all pertinent information. Relationship to other work should be clearly indicated. No work shall be fabricated until shop drawings for that work have been finally approved for fabrication.
- 1.06 Delivery, Storage And Handling:
 - A. Deliver, handle, store and protect system components in accordance with manufacturer's instructions.
 - B. After erection, the Contractor shall adequately protect all

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SECTION 08400 - ENTRANCES AND STOREFRONTS

exposed portions of the grid framing metal work from damage by grinding and polishing machines, plaster, lime, acid, cement, or other harmful compounds.

- C. Immediately prior to final acceptance of building, inspect all aluminum framing for weather tightness and make all necessary repairs and adjustment.

1.07 Warranties:

A. Total Storefront System

- 1. The responsible contractor shall assume full responsibility and warrant for one year the satisfactory performance of the total storefront installation. This includes the framing, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc. as it relates to air, water and structural adequacy as called for in the specifications and approved shop drawings. A manufacturer's material warranty shall be provided for a minimum of 5 years from substantial completion.
- 2. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible contractor during the warranty period.

- 1.08 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

PART 2 - PRODUCTS

2.01 Entrance and Storefront System:

- A. EFCO Corporation S-403 Wall Thermal Storefront System, with Series D318 DuraStyle Medium Style aluminum entrance doors.
- B. Kynar 500 - color to be selected by Architect from manufacturer's standard colors to match 2015 Gymnasium.

2.02 Material:

A. Aluminum:

- 1. Extruded aluminum shall be 6063-T5 or T6 alloy and temper.

B. Glass:

- 1. Glass for Fixed Units shall be according to Glazing Schedule.
Glass for Entrance Doors shall be 1 inch insulated tempered glass units factory glazed.

C. Thermal Barrier:

- 1. The thermal barrier shall be internally connected and locked celcon insulator clips.

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SECTION 08400 - ENTRANCES AND STOREFRONTS

- D. Dissimilar Metals:
 - 1. All dissimilar metals must be properly insulated to prevent galvanic action.
 - E. Fasteners:
 - 1. All exposed fasteners shall be aluminum or stainless steel.
- 2.03 Fabrication - Fixed Units:
- A. General:
 - 1. All aluminum frame extrusions shall have a minimum wall thickness of .180 inches.
 - 2. All exposed work shall be carefully matched to produce continuity of line and design with all joints. System design shall be such that raw edges will not be visible at joints.
 - B. Frames - for 1" glazing:
 - 1. Depth of frame shall not be less than 4 inches.
 - 2. Face dimension shall not be less than 2 inches
 - 3. Covers shall connect to frame back members with internally connected and locked celcon insulator clips.
 - 4. Frame components shall be screw spline construction.
 - C. Glazing
 - 1. All units shall be Adry@ glazed with E. P. D. M. gasket on both exterior and interior.
- 2.04 Fabrication - Entrance Doors:
- A. General:
 - 1. Major portions of the door sections shall have .188" wall thickness.
 - 2. Glazing stop sections shall have .050" wall thickness.
 - B. Entrance Doors:
 - 1. Door stiles shall be no less than 3 ½" wide (not including glass stops).
 - 2. Door stiles and rails shall have hairline joints at corners. Heavy concealed reinforcement brackets shall be secured with screws and shall be deep penetration and fillet welded.
 - 3. All doors shall have an adjusting mechanism in the top rail to provide for minor clearance adjustments.
 - 4. Weather-stripping shall be wool pile and shall be installed and shall be installed in one stile of pairs of doors and in jamb stiles of center pivoted doors.
 - 5. Door stops shall include wool pile weather-stripping.
 - C. Glazing:
 - 1. All units shall be dry glazed with extruded pressure fitting aluminum glazing stops, and E.P.D.M. gasket.

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SECTION 08400 - ENTRANCES AND STOREFRONTS

Glazing shall be as per Glazing Schedule, Sheet A601.

- D. Door Frame:
 - 1. Depth of frame shall not be less than 4".
 - 2. Face dimension shall not be less than 2".
 - 3. Shear block construction shall be utilized throughout. System design shall be such that raw edges will not be visible at joints.

2.05 Finish:

- A. Kynar 500 - color to be selected by Architect from manufacturer's standard colors to match 2015 Gymnasium.

PART 3 EXECUTION

3.01 Inspection:

- A. Job Conditions:
 - 1. All openings shall be prepared to the proper size and shall be plumb, level and in the proper location and alignment as shown on the Drawings.

3.02 Installation:

- A. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- B. Storefront system shall be erected plumb and true, in proper alignment and relation to established lines and grades.
- C. Entrance doors shall be securely anchored in place to a straight, plumb and level condition, without distortion. Weather-stripping contact and hardware movement shall be checked and final adjustment made for proper operation and performance of units.
- D. Furnish and apply sealing materials to provide a weather tight installation at all joints and intersections and at opening perimeters.
- E. Sealing materials specified shall be used in strict accordance with the manufacturer's printed instructions and shall be applied only by mechanics specially trained and experienced in their use. All surfaces must be clean and free of foreign matter before applying sealing materials. Sealing compounds shall be tooled to fill the joint and provide a smooth finished surface.

3.03 Anchorage:

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.

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SECTION 08400 - ENTRANCES AND STOREFRONTS

3.04 Protection and Cleaning:

- A. The general contractor shall protect the aluminum materials and finish against damage from construction activities and harmful substances. The contractor shall remove any protective coatings as directed by the Architect and shall clean the aluminum surfaces as recommended for the type of finish applied.

End of Section

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Part 1 - General

1.01 Work Included:

- A. All materials, labor services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Finish Carpentry - Section 06200
- B. Custom Casework - Section 06410
- C. Metal Doors and Frames - Section 08100
- D. Wood Doors - Section 08200

1.03 Quality Assurance:

- A. This material shall be procured from a source of supply approved by the Architect as having a member of their firm registered by the American Society of Contracting Architectural Hardware Consultants, and with a proven record of several years of satisfactory experience in contract builder's hardware, both in furnishing material and properly servicing jobs. The supplier also must be an established contract builder's hardware firm who meets all the above requirements, and who maintains and operates an office, display room and stock.

1.04 Submittals:

- A. Prepare a complete schedule including all items processed for each opening and other miscellaneous items and submit four copies to the Architect for approval within 30 days submitted within that time, the supplier shall furnish the hardware specified by catalog number.
- B. Indicate on schedule name of manufacturer after each item.
- C. Upon receiving the approved schedule, the hardware supplier shall immediately forward a copy to the metal frame suppliers, when applicable; and as soon as they receive approved shop drawings, they will immediately forward a complete set to the hardware supplier who can then check the applications and make any necessary minor revisions. If revisions are necessary, notify Architect immediately.
- D. Mark each item of hardware for opening on which it is to be used and deliver a complete schedule to the contractor when hardware is delivered.

1.05 Schedule:

- A. This specification describes the quality, character and function that is required of items of hardware; however, it is not intended to mention each particular item.
- B. It is the responsibility of the supplier to thoroughly detail the entire project to assure that the items specified will properly function in the indicated locations.
- C. Quantities shall be determined by the bidder. Part 2, following, indicates the type and function of material applicable to the typical opening. Should an unlisted opening require different type of function of hardware than that specified, for similar opening, notify the Architect, and provide hardware for unlisted openings within the bid.

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Part 2 - Products

2.01 Finish Hardware:

A. Standards of Quality:

1. Codes, specifications and published recommendations, latest editions of the following are hereby made part of this section of the specifications in so far as they apply to the material or work called for.
 - a. National Builders Hardware Association (NBHA)
 - b. American Society for Testing Materials (ASTM)
 - c. Underwriters Laboratories (UL)
 - d. National Fire Protection Association (NFPA)
 - e. Code of Ethics of ASAHC & NBHA
 - f. Federal Emergency Management Agency (FEMA)
2. Federal Specification, (ANSI Specifications):
 - a. Hinges: FF-H-116C (ANSI A156.1)
 - b. Locks and Door Trim: FF-H-106A (ANSI A 156.2)
 - c. Auxiliary Locks: FF-H-106A (ANSI A 156.5)
 - d. Exit Devices: FF-H-106A, FF-H-111B, FF-L486 (ANSI A156.3).
 - e. Door Closers: FF-H-121C (ANSI A 156.4)
 - f. Shelf and Miscellaneous Hardware: FF-H-00116 (ANSI A156.6).
 - g. All Door hardware: Comply with ADAAG where applicable.

B. General:

1. All hardware relating to hollow metal doors and frames shall be to standard templates of each respective hardware manufacturer for items furnished.
 - a. The related suppliers such as hollow metal doors and frames and such others as may be required will furnish the hardware supplier one copy of each of their approved shop drawings for proper coordination of their work and the finish hardware.

C. Manufacturers and Requirements:

1. Hardware manufacturers and brand names are for a guide as to type and standard required and all such hardware furnished must meet these standards as far as quality, weight, finish and design.

D. Keying:

1. All locks and cylinders to be masterkeyed as directed by the Architect/Owner.
2. Keys: Furnish the following keys:
 - a. 2 change keys each lock or cylinder
 - b. 6 masterkeys
 - c. **all EXTERIOR locks and cylinders shall be Primus Schlage Key System and keyed to Owner's Primus Master Key system. All remaining interior locks and cylinders shall be Classic Schlage and keyed to the Owner's Primus Master Key System.**

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SECTION 08700 - FINISH HARDWARE

2.02 Hardware Sets:

Hardware Group No. 001: Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA PIVOT SET	7215	626	IVE
2	EA PIVOT	7215 INT	626	IVE
1	EA MULLION	KR4954 HEIGHT AS REQUIRED	689	VON
1	EA PANIC HARDWARE	QEL99EO LENGTH AS REQUIRED	626	VON
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED	626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
3	EA MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA PRIMUS CORE ONLY	20-740	626	SCH
2	EA OFFSET DOOR PULL	8190-0-0	630	IVE
2	EA SURFACE CLOSER	4041 SCUSH MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA DOOR SWEEP	C627A LENGTH AS REQUIRED	AL	NGP
1	EA THRESHOLD	896V LENGTH AS REQUIRED	AL	NGP
1	MEETING STYLE SEAL BY DOOR MANUFACTURER			
1	PERIMETER SEAL BY DOOR MANUFACTURER			
	REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.			

Hardware Group No. 002: Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA PIVOT SET	7215	626	IVE
2	EA PIVOT	7215 INT	626	IVE
1	EA MULLION	KR4954 HEIGHT AS REQUIRED	689	VON
1	EA PANIC HARDWARE	QEL99EO LENGTH AS REQUIRED	626	VON
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED	626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
3	EA MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA PRIMUS CORE ONLY	20-740	626	SCH
2	EA OFFSET DOOR PULL	8190-0-0	630	IVE
2	EA SURFACE CLOSER	4041 SCUSH MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
1	MEETING STYLE SEAL BY DOOR MANUFACTURER			
1	PERIMETER SEAL BY DOOR MANUFACTURER			
	REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.			

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Hardware Group No. 003: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA STOREROOM LOCK	L9080T 03N	626	SCH
1	EA CLASSIC CORE	30-001	626	SCH
1	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS,	SPCRS & PLATES AS REQ	
			689	LCN
1	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED		
			628	IVE
1	SET SEALS	5050BR H & J (USE SILENCERS @	NON-RATED DOORS)	
			CLR	NGP

Hardware Group No. 004: Provide each SGL door with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA PASSAGE SET	L9010T 03N	626	SCH
1	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED		
			628	IVE
3	EA SILENCER	SR64	GRY	IVE

Hardware Group No. 005: Provide each SGL door with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA STOREROOM LOCK	L9466T 03N	626	SCH
1	EA CLASSIC CORE	30-001	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED		
			628	IVE
1	SET SEALS	5050BR H & J (USE SILENCERS @	NON-RATED DOORS)	
			CLR	NGP

Hardware Group No. 006: Provide each SGL door set in the same frame with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA FIRE EXIT HARDWARE	99L-F-BE 996L-BE-03		
		LENGTH AS REQUIRED	626	VON
1	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS,	SPCRS & PLATES AS REQ	
			689	LCN
1	EA KICKPLATE	8400 10" X 2" LDW	630	IVE
1	EA OVERHEAD STOP	900S SERIES X SIZE & MOUNTING AS REQ		
			630	GLY
1	SET SEALS	5050B H & J	BLK	NGP

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Hardware Group No. 007: Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
6	EA HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	SET AUTO FLUSH BOLT	FB31P OR FB41P AS REQUIRED	630	IVE
1	EA COORDINATOR	COR X FL X MTG BRKTS X HW PREPS X LENGTH AS REQ	628	IVE
1	SET ASTRAGAL	9605A HEIGHT AS REQ	AL	NGP
2	EA FIRE EXIT HARDWARE	99L-BE-F 996L-14 499F LENGTH AS REQ'D	626	VON
2	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
2	EA STOP	WS407CCV OR FS436 AS REQ	628	IVE
1	SET SEALS	5050B H & J	BLK	NGP
2	EA MAGNETIC HOLD OPEN DEVICES	SEM 7800 AL x VOLTAGE & TRANSFORMER REQ'D	AL	LCN

Provide ALL connections required to the fire alarm and electrical systems necessary for a fully functioning device meeting all applicable codes.

Hardware Group No. 008: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA CLASSROOM LOCK	L9070T 03N	626	SCH
1	EA CLASSIC CORE	30-001	626	SCH
1	EA SURFACE CLOSER	4041H OR P4041H MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
1	EA KICK PLATE	8400 10" X 1" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
1	SET SILENCER	SR64	GRY	IVE

Hardware Group No. 009: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA PUSH PLATE	8200 4" X 16"	630	IVE
1	EA PULL PLATE W/ PULL	8303EZ-0 4" X 16"	630	IVE
1	EA SURFACE CLOSER	4041H OR P4041H MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
1	EA KICK PLATE	8400 10" X 1" LDW	630	IVE
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
1	EA SILENCER	SR64	GRY	IVE

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SECTION 08700 - FINISH HARDWARE

Hardware Group No. 010: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA OFFICE LOCK	L9050T 03N	626	SCH
1	EA CLASSIC CORE	30-001	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE

Hardware Group No. 011: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA PRIVACY SET	L9444 03N	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE

Hardware Group No. 012: Provide each PR door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
2	EA CONTINUOUS HINGE	224HD HEIGHT AS REQ	628	IVE
1	EA MULLION	KR4954 HEIGHT AS REQ	689	VON
1	EA PANIC HARDWARE	CD99EO LENGTH AS REQUIRED	626	VON
1	EA PANIC HARDWARE	CD99NL-OP LENGTH AS REQUIRED	626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
3	EA MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA PRIMUS CORE ONLY	20-740	626	SCH
2	EA SURFACE CLOSER	4040XP SHCUSH MTG BKTS, SPCRS & PLATES AS REQ	689	LCN
2	EA OFFSET DOOR PULL	8190-0-0	630	IVE
2	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET SEALS	700SA H & J (INSTALL PRIOR TO OTHER HARDWARE)	AL	NGP
2	EA DOOR SWEEP	C627A LENGTH AS REQ	AL	NGP
1	EA OVERHEAD RAIN DRIP	16A DW + 4"	AL	NGP
1	EA THRESHOLD	896V LENGTH AS REQ	AL	NGP

REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION, ETC.

Hardware Group No. 013: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA OFFICE LOCK	L9050T 03N	626	SCH
1	EA CLASSIC CORE	30-001	626	SCH
1	EA STOP	WS407CCV OR FS436 AS REQUIRED	628	IVE
3	EA SILENCER	SR64	GRY	IVE
1	EA SURFACE CLOSER	4041 OR P4041 MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN

AT DOOR #06 - REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.

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SECTION 08700 - FINISH HARDWARE

Hardware Group No. 014: Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
1	EA PIVOT SET	7215	626	IVE
1	EA PIVOT	7215 INT	626	IVE
1	EA PANIC HARDWARE	QEL99EO LENGTH AS REQUIRED	626	VON
1	EA RIM CYLINDER	20-057 ICX	626	SCH
2	EA MORTISE CYLINDER	20-061 ICX	626	SCH
2	EA PRIMUS CORE ONLY	20-740	626	SCH
1	EA OFFSET DOOR PULL	8190-0-0	630	IVE
1	EA SURFACE CLOSER	4041 SCUSH MTG BRKTS, SPCRS & PLATES AS REQ	689	LCN
1	MEETING STYLE SEAL BY DOOR MANUFACTURER			
1	PERIMETER SEAL BY DOOR MANUFACTURER			
	REFER TO ELECTRICAL FOR ACCESS, CARD READER, ETC. INFORMATION.			

The following list of products and manufactures are acceptable for this project.

<u>Product</u>	<u>Manufacture and Approved Equals</u>
1. Hinges	A. Ives B. Hager C. Bommer
2. Continuous Hinges	A. Pemko B. Roton C. Select
3. Key System	A. Schlage (No substitutions)
4. Lock/Latch	A. Schlage (No substitutions)
5. Closers	A. LCN (No substitutions)
6. Exit Devices	A. Von Duprin (No substitutions)
7. Push/Pull/Plates	A. Ives B. Rockwood C. Trimco
8. Misc. Stop, Bolts, etc.	A. Ives B. Glynn-Johnson C. Rockwood
9. Door Seal/Thresholds	A. National Guard B. Pemko C. Reese

DIVISION 8 - DOORS & WINDOWS

SECTION 08700 - FINISH HARDWARE

Each Product, by category, shall be the product of one manufacturer. Complete lockset, including keyed lock cylinder, shall be the product of one manufacturer unless noted otherwise.

Part 3 - Execution

3.01 Installation:

- A. Install all finish hardware in strict accordance with the manufacturer's recommendations and printed instructions. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, reinstall each item. Do not install surface mounted items until finishes have been completed on the substrate.
- B. All hardware relating to hollow metal and aluminum doors and frames shall be to standard templates of each respective hardware manufacturer for items furnished.
- C. Mounting Heights: Mount Hardware units at heights recommended by the National Builders Hardware Association, except as specifically indicated or required to comply with governing regulations, or as may be otherwise directed by the Architect.

3.02 Prior to the Final Inspection:

- A. The supplier shall check all closers for proper operation after they have been installed and adjusted by the Contractor. He shall verify the keying to ensure proper location of locksets and shall assist the Contractor in correcting faulty operation of any locks.
- B. Within 30 days after the acceptance of the entire project, the Contractor shall be responsible for this supplier meeting with the maintenance custodian at the job site for the purpose of instructing him thoroughly in the proper repair and adjustment of all finish hardware items, and items, and shall present to the custodian a full complement of tools to be used.

End of Section

DIVISION 8 - DOORS AND WINDOWS

SECTION 08800 - GLAZING

Part 1 - General

1.01 Work Included:

- A. The General Conditions and applicable sections of Division 1 shall apply to this entire section.
- B. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. Federal Specifications
 - a. DD-G-451d, Glass, Plate, Sheet (for glazing and other uses).
 - 2. Flat Glass Jobber Association: Glazing Manual.
- B. Comply with UBC 2406, and ANSI 97.1 with testing requirements of 16 CFR 1201, Cat II.

1.03 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. Glass Types and Examples:
 - 1. 1/4" Tempered Glass:
 - a. Type example: 1/4" Clear Herculite - PPG.
 - 2. 1" Nominal Thickness Insulating Tempered Glass - 1/4" tinted glass @ exterior side and 1/4" 100 Low E glass @ interior side of 2" air space - **both sides tempered.** Low Emissivity coating on 3rd glass surface from building exterior.
 - a. Type Example: Versalux Green 2000 Insulated with Low-E, Visteon (Ford). **Note: Color will be a factor in approval.**
 - 3. Fire-Protection Rated Tempered Glazing Types:
 - a. 20-minute fire-rated glazing, monolithic ceramic glazing.
 - b. Provide safety glazing labeling.
 - c. Fire-Protection-Rated Glazing, General: listed and labeled by a testing agency acceptable to authority Having Jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252 for door assemblies and NFPA 257 for window assemblies.
 - d. Fire-Protection-Rated Tempered Glass: 1/4 inch thick, fire protection rated tempered, complying

DIVISION 8 - DOORS AND WINDOWS

SECTION 08800 - GLAZING

with testing requirements in 16 CFR 1201 for Category II materials:

- e. Products: subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to, the following:
 - 1. TPG - Technical Glass Products, Fireglass 20.
 - 2. InterEdge, Inc., a subsidiary of AFG Industries, Inc.; PyroEdge 20.
 - 3. Safti First, SuperLite 20.
- f. Vetrotech Saint-Gobain, SSG Pyroswiss.
- 4. Impact Resistant Glass:
 - a. Type Example: 6mm clear Lexan 9034 polycarbonate transparent panels.
- B. Glazing Compounds and Preformed Glaze Sealants: Suitable type as approved for the installation, in accordance with Glazing Materials section of the FGJA Glazing Manual.
- C. Glazing Accessories: Provide miscellaneous materials such as cleaners, primers, setting blocks, spacers, filler rods, beads, etc., as required for complete installation.

Part 3 - Execution

3.01 Installation:

- A. Glazing-General:
 - 1. Items to be glazed may be field-or shop-glazed, using glass of the quality and thickness specified or indicated. Preparation of surrounds and glazing, unless otherwise specified, shall be in conformance with the details and general conditions governing glazing in the FGMA Glazing Manual, beads or stops which are furnished with the items to be glazed shall be used to secure the glass in place.
 - 2. All glass shall be set with the waves parallel to the sill. Glass that has been misordered, i.e. with the width and height dimensions not properly correlated with the Drawing process in manufacturing, resulting in pronounced waviness at right angles to the sill, will be rejected.
 - 3. Install plastic glass edging strips where indicated. Joints shall be as tight and imperceptible as possible.
- B. Breakage: Replace all glass broken during or after setting. Breakage due to accident or carelessness or other will be charged to trade at fault.

DIVISION 8 - DOORS AND WINDOWS

SECTION 08800 - GLAZING

- C. Inspection: Prior to final acceptance of project, inspect all work done under this section and make all necessary adjustments, repairs or replacements of defective work, and clean all glass surfaces.
- D. Clean-up: Remove all glass cuttings, scraps, packaging and rubbish upon completion of the work.

End of Section

DIVISION 9 - FINISHES

SECTION 09120 - CEILING SUSPENSION SYSTEMS

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Gypsum Wallboard - Section 09250
- B. Acoustical Treatment - Section 09500

1.03 Quality Assurance:

A. Standards:

1. American Society for Testing and Materials
 - a. ASTM C-635, Metal Suspension Systems for Acoustical Tile and Lay-In-Panel Ceilings.
 - b. ASTM C-636, Recommended Practice of Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In-Panels.
2. All materials to comply with NFPA 101, 16-3.3.2, where applicable.

B. Submittals:

1. Provide submittals in the form of samples, and documentation, to the Architect for review.

1.04 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

2.01 Materials:

- A. Suspended Acoustical Ceiling - Exposed Grid: ASTM C-635, intermediate structural classification.
 1. Main Beams, Cross Tees and Concealed Members: .015 cold rolled zinc coated steel.
 2. Wall Angle: .020 cold rolled zinc coated steel.
 3. Special Members: Provide special shaped members as shown on the Drawings.
 4. Member Finish: Exposed surfaces shall be flat white low-gloss grid.
 5. Hanger Wire: No. 12 gauge cold drawn, annealed, galvanized.
 6. Accessories: Provide wall clips, hold-down clips (shall be removable without damage to boards; two each panels opposite sides), beam clamps leveling splines, hanger clips, splice plates), (keep to a minimum), for a complete installation.

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SECTION 09120 - CEILING SUSPENSION SYSTEMS

7. Acceptable Manufacturer: 200 Snap-Grid System, Chicago Metallic Corporation
- B. Suspended Gypsum Board Ceilings:
 1. Structural Channels: Cold-rolled, 16 gauge, galvanized steel.
 2. Furring Channels: Roll-formed, hat sections, 20 gauge.

Part 3 - Execution

3.01 General:

- A. Coordinate with electrical and mechanical contractors in placement of light fixtures, grilles, etc. to conform with ceiling pattern.
- B. Construct necessary scaffolding, adequate and safe, in accordance with applicable laws and ordinances. Maintain during this work and remove after completion.
- C. Provide thorough and competent foreman and skilled mechanics.

3.02 Installation:

- A. Suspended Acoustical Ceiling:
 1. Deflection of any component shall not exceed 1/360 of the span.
 2. Main tees shall be suspended on 48" centers by 12 gauge wire spaced not more than 48" o.c. along main tee.
 3. Cross tees shall be placed at 24" o.c. or as required by the Drawings.
 4. Install wall angles at intersection of suspended ceiling and all vertical surfaces. Miter corners where wall molding intersects.
 5. Install grid system and ceiling panels with faces in a plane.
 6. Provide intersection clips at intersection of all tees.
 7. Provide additional hangar wire at four corners of light fixtures.
 8. Provide additional hangar wires to insure proper placement and alignment of grid system.
 9. Prior to the final acceptance of the building, examine and adjust water level to be certain that all planes and lines are plumb, square and smooth. Replace all marked, marred or otherwise damaged materials.
- B. Suspended Gypsum Board Ceilings:
 1. Coordinate location of hangars with other work.
 2. Install ceiling framing independent of walls, columns and above ceiling work.
 3. Install ceiling framing system in accordance with manufacturer's recommendations.
 4. Reinforce openings in ceilings in accordance with

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SECTION 09120 - CEILING SUSPENSION SYSTEMS

manufacturer's recommendations.

5. Laterally brace entire suspension system where required.

3.03 Clean-Up:

A. Completely remove from the job site, at the completion of the work, all cartons, packaging, etc., and all other scraps and waste caused by this trade.

End of Section

DIVISION 9 - FINISHES

SECTION 09250 - GYPSUM WALLBOARD

Part 1 - General

- 1.01 Work Included:
 - A. All materials, labor, services and incidentals necessary for the completion of this section of the work.
- 1.02 Quality Assurance:
 - A. Standards:
 - 1. American Society for Testing and Materials:
 - a. ASTM C-36, Gypsum Wallboard
 - b. ASTM C-475, Joint Treatment for Gypsum Wallboard Construction.
 - B. Federal Specifications:
 - 1. FS-SS-L-30D, Type III, Grade X, Class 1, Gypsum Wallboard.
- 1.03 Submittals:
 - A. Provide submittals in the form of samples, and documentation, to the Architect for review.
- 1.04 Product Delivery, Storage and Handling:
 - A. All materials shall be delivered to the job site with manufacturer's labels intact and stored in an enclosed shelter providing protection from damage and exposure to the elements.

Part 2 - Products

- 2.01 Gypsum Wallboard:
 - A. Type: Fire-rated, ASTM C-36.
 - B. Size: 5/8" thick x 48" wide x 96" or as required.
 - C. Edges: Tapered.
 - D. Location: All gypsum board.
- 2.02 Fasteners:
 - A. Screws: Self-drilling, self-tapping, bugle head, Type S.
 - B. Nails: Annular ring: GWB-54.
- 2.03 Joint Treatment Materials:
 - A. Joint Tape: Perforated Tape, ASTM C-475.
 - B. Joint Compound: ASTM C-475.
- 2.04 Accessories:
 - A. Metal Edge: Similar to United States Gypsum Trim No. 402.

Part 3 - Execution

- 3.01 Installation:
 - A. Apply gypsum board to horizontal surfaces first, then to vertical.
 - B. Install gypsum board parallel to studs at vertical surfaces.
 - C. To minimize joints, use panels of maximum practical lengths.
 - D. Position all ends and edges of gypsum board over nailing or fastening members. Fit ends and edges closely; do not force

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SECTION 09250 - GYPSUM WALLBOARD

- together. Stagger end joints.
- E. Cut ends, edges, scribe or make cutouts within field of panel in a workmanlike manner.
 - F. Install trim at all intersections of gypsum board and other surfaces. Provide corner bead at all vertical or horizontal corners.
 - G. Fasteners:
 - 1. Drive fasteners in field of panel first, work toward ends and edges.
 - 2. Perimeter fasteners shall be a least 3/8" from ends and edges.
 - 3. Attach panels to wood framing members with specified nails spaced out 8" for ceiling, and 8" o.c. at ends and 12" o.c. at each support.
 - 4. Drive nail head slightly below surface of panel in a uniform dimple without breaking face paper.
 - 5. Screw fasteners shall be spaced 12" o.c. at each support in the field of the board and 8" o.c. at all edges and ends.
 - 6. Screws shall be power-driven with an electric screwdriver and screw heads shall provide a slight depression below surface of panel without breaking face paper.
- 3.02 Joint Treatment:
- A. Treat all exposed joints and trim with a three-coat approved system applied in strict accordance with manufacturer's recommendations.
- 3.03 Clean-Up:
- A. Use all necessary care during execution of the Work of this Section to prevent undue scattering of drywall scraps and dust and to prevent tracking of joint and finishing compounds onto floor surfaces. On completion of each installation segment in a room or space, promptly pick up and remove from the working area all scraps, debris and surplus material.

End of Section

DIVISION 9 - FINISHES

SECTION 09300 - TILE

Part 1 - General

1.01 Work Included:

- A. All materials, labor services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

A. Standards:

- 1. Tile Council of America:
 - a. Handbook for Ceramic Tile Installation.
- 2. American National Standards Institute:
 - a. ANSI A108.6, Ceramic Tile installed with Epoxy Mortar.
 - b. ANSI A108.4, Ceramic Tile installed water-resistant organic adhesive.
 - c. ANSI A108.5, Ceramic Tile installed with latex Portland Cement.
 - d. ANSI A118.4, Latex Portland Cement Mortar.
 - e. ANSI A118.3, Epoxy Mortar and Grout.
 - f. ANSI A136.1, Type 1 Organic Adhesive.
 - g. ANSI A137.1, Ceramic Tile.
- 3. American Society for Testing and Materials:
 - a. ASTM C-144, Aggregate.
 - b. ASTM C-150, Portland Cement, Type 1.
 - c. ASTM C-206, Special Finish Hydrated Lime.

B. All materials shall meet IBC 2009, where applicable.

C. Floor surfaces and elevation changes shall comply with ADAABAAG 302 and 303.

D. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

- 1. Level Surfaces: Minimum.
- 2. Step Treads: Minimum.
- 3. Ramp Surfaces: Minimum.

E. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.

- 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

F. Source Limitations for Setting and Grouting Materials:

Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.

G. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:

- 1. Stone thresholds.
- 2. Joint sealants.

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SECTION 09300 - TILE

3. Cementitious backer units.
4. Metal edge strips.

1.03 Submittals:

- A. Submit samples of all tile and grout specified under this section for approval and color selection prior to installation.
- B. Submit a "Master Grade Certificate" bearing signatures of both manufacturer and contractor.
- C. Submit tile manufacturer's maintenance guides for owner's use in maintaining all tile work specified in this section.
- D. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- F. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- G. Samples for Verification:
 1. Full-size units of each type and composition of tile and for each color and finish required.
 2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 24 inches square, but not fewer than 4 tiles. Use grout of type and in color or colors approved for completed Work.
 3. Full-size units of each type of trim and accessory for each color and finish required.
 4. Stone thresholds in 6-inch lengths.
 5. Metal edge strips in 6-inch lengths.
- H. Qualification Data: For qualified Installer.
- I. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- J. Product Certificates: For each type of product, signed by product manufacturer.
 1. Material Test Reports: For each tile-setting and -grouting product and special purpose tile.

1.04 Product Delivery, Storage and Handling:

- A. Deliver all materials to job site in manufacturer's unopened containers with grade seal unbroken and labels intact. Keep containers dry. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be

DIVISION 9 - FINISHES

SECTION 09300 - TILE

- avoided.
 - D. Store liquid materials in unopened containers and protected from freezing.
 - E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.
- 1.05 Project Conditions:
- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.
- 1.05 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

- 2.01 General:
- A. All tile shall be standard grades conforming to ANSI 137.1
 - B. Both glazed and unglazed ceramic tile shall be manufactured by the same manufacturer.
 - C. **Refer to Color Schedule for tile color. Colors will a determining factor in tile approval.**
 - D. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.
 - E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
 - F. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.
 - G. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Olean; Division of Dal-Tile International Inc.
 - 2. Crossville, Inc.
 - 3. Daltile; Division of Dal-Tile International Inc.

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SECTION 09300 - TILE

2.02 Ceramic Tile:

- A. Wall Tile and Floor Tile:
 - 1. Type: Polished porcelain at walls and unpolished porcelain at floors.
 - 2. Nominal Face Size: 12" x 24" - orient as per Drawings.
 - 3. Edge: All-purpose cushion.
 - 4. Acceptable Manufacturer: American Olean - Ultra Modern.
- B. Trim Shapes and Bases:
 - 1. Type: Same as floor tile.
 - 2. Includes bases, caps, stops, returns, trimmers and other shapes to finish installation.
 - a. Cove Base for Thin-Set Mortar Installations: Straight, module size 6 by 12 inches.
 - b. External Corners for Portland Cement Mortar Installations: radius stainless steel metal trim pieces at all outside corners.
 - c. External Corners for Thin-Set Mortar Installations: radius stainless steel metal trim pieces at all outside corners.
 - d. Internal Corners: Field-buttet square corners. For coved base and cap use angle pieces designed to fit with stretcher shapes.
- C. Setting Materials:
 - 1. Epoxy Mortar: ANSI A118.3
 - 2. Organic Adhesive: ANSI A136.1
 - 3. Latex Portland Cement Mortar: ANSI A118.4
 - 4. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Boiardi Products; a QEP company.
 - b. Bonsai American; an Oldcastle company.
 - c. Bostik, Inc.
 - d. C-Cure.
 - e. Custom Building Products.
 - f. Jamo Inc.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.
 - i. Southern Grouts & Mortars, Inc.
 - j. Summitville Tiles, Inc.
 - k. TEC; a subsidiary of H. B. Fuller Company.
- D. Grouting Materials:
 - 1. Floor Tile: Epoxy Grout.
 - 2. Wall Tile: Portland Cement Type.
 - 3. Manufacturers: Subject to compliance with requirements,

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available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Boiardi Products; a QEP company.
- b. Bonsai American; an Oldcastle company.
- c. Bostik, Inc.
- d. C-Cure.
- e. Custom Building Products.
- f. Jamo Inc.
- g. Laticrete International, Inc.
- h. MAPEL Corporation.
- i. Southern Grouts & Mortars, Inc.
- j. Summitville Tiles, Inc.
- k. TEC; a subsidiary of H. B. Fuller Company.

E. Granite Thresholds:

1. Type: Polished granite.
2. Size: 1 1/4" wide x 1/2" high, double-beveled.
3. Location: Provide marble threshold at centerline of doors at transition between ceramic tile flooring and carpet tile / exposed concrete.

F. Accessories: Provide vitreous china accessories of type and size indicated, suitable for installing by same method as adjoining wall tile.

1. Color and Finish: Match adjoining glazed wall tile.

G. Elastomeric Sealants:

1. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 07 Section "Joint Sealants."
 - a. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - b. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
2. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
3. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, 0; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the

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following:

1. DAP Inc.; 100 percent Silicone Kitchen and Bath Sealant.
2. Dow Corning Corporation; Dow Corning 786.
3. GE Silicones; a division of GE Specialty Materials; Sanitary 1700.
4. Laticrete International, Inc.; Latasil Tile & Stone Sealant.
5. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
6. Tremco Incorporated; Tremsil 600 White.

H. Miscellaneous Materials:

1. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
2. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for required applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
3. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
 - a. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F per ASTM D 87.
 - b. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
4. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
5. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.
 - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 1. Bonsai American; an Oldcastle company; Grout Sealer.

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2. Bostik, Inc.; CeramaSeal Grout & Tile Sealer.
3. C-Cure; Penetrating Sealer 978.
4. Custom Building Products; Grout Sealer.
5. Jamo Inc.; Penetrating Sealer.
6. MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout and 004, Keraseal Penetrating Sealer for Unglazed Grout and Tile.
7. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
8. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
9. TEC; a subsidiary of H. B. Fuller Company; TA-256 Penetrating Silicone Grout Sealer.

Part 3 - Execution

3.01 Examination:

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 1. Verify that substrates for setting tile are firm, dry, clean, and free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.0 for installations indicated.
 2. Verify that concrete substrates for tile floors installed with adhesives or thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 Preparation:

- A. Fill cracks, holes, and depressions in concrete substrates

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for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tilesetting material manufacturer.

- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.02 Installation:

- A. All workmanship and materials shall conform in all respects to specifications and requirements and in accordance with the standard practice of the Tile Council of America.
- B. All ceramic floor tile shall be installed using the following Tile Council of America specifications.
 - 1. Floor Tile, TCA F131-2K (Concrete).
- C. Provide all required trim shapes such as cove, bullnose, angles, etc., to module with field tile, unless otherwise noted on Drawings. All corners bullnosed.
- D. Layout all tile work as to minimize cuts less than one-half tile in size. Align all joints to give straight uniform grout lines, plumb and level or parallel with walls. Strike all joints with a rounded, non-staining tool.
 - 1. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
 - 2. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
 - 3. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Layout tile work and center tile fields in both directions in each space or on each wall area. Layout tile work to minimize the use of pieces

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- that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
- a. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - b. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
4. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 - a. Wall Tile: 1/16 inch.
 - b. Decorative Thin Wall Tile: 1/16 inch.
 5. Layout tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
 6. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - a. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
 - b. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
 7. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
 - a. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in latex-portland cement mortar (thin set).
 - b. Do not extend cleavage membrane waterproofing or crack isolation membrane under thresholds set in dry-set portland cement mortar. Fill joints between such thresholds and adjoining tile set on crack isolation membrane with elastomeric sealant.
 1. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.
 8. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- E. Slope entire room or area to floor drains.

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3.03 Tile Backing Panel Installation:

- A. Install cementitious backer units and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.

3.04 Waterproofing Installation:

- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.05 Cleaning and Protecting:

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove epoxy and latex-portland cement grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 - 3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.
- E. Immediately prior to final inspection, replace all damaged tile.

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- F. Contractor will supply 2% of the total quantity of each tile used. Contractor will supply 3% of the total quantity of each grout used. Place materials in clean marked containers for future use at building.

End of Section

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SECTION 09500 - ACOUSTICAL TREATMENT

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Related Work Specified Elsewhere:

- A. Ceiling Suspension Systems - Section 09120

1.03 Quality Assurance:

A. Standards:

1. American Society for Testing and Materials:
 - a. ASTM C-636 Recommended Practice of Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
 - b. ASTM E-84 Surface Burning Characteristics of Building Materials.
2. Federal Specifications:
 - a. SS-S-118B, Sound Controlling Blocks and Boards. Underwriter's Laboratories, Inc.

B. Submittals:

1. Provide submittals in the form of samples, and documentation, to the Architect for review.

1.04 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers**

Part 2 - Products

2.01 Acoustical Ceiling Panels:

A. 2x2 Tile - Square Edge:

1. Type: FS-SS-S-118B, Class 25
2. Size: 24" x 24" x 5/8". Provide special sizes as indicated on Drawings or as required by others.
3. Finish: Board finish shall be a factory-applied white latex paint, medium textured non-direction fissured surface with a minimum light reflection of 80%.
4. Noncombustibility: Board shall meet class 25-Federal Specification SS-S-118B, ASTM E-84; and, classified by Underwriter's Laboratories for Flame Spread Index 0-25.
5. Type Example and Manufacturer:
 - a. Armstrong Fine Fissured No. 1728, square (2x2)

B. 2x2 Tile - Tegular Edge:

1. Type: FS-SS-S-118B, Class 25
2. Size: 24" x 24" x 5/8". Provide special sizes as indicated on Drawings or as required by others.

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3. Finish: Board finish shall be a factory-applied white latex paint, medium textured non-direction fissured surface with a minimum light reflection of 80%.
4. Noncombustibility: Board shall meet class 25-Federal Specification SS-S-118B, ASTM E-84; and, classified by Underwriter's Laboratories for Flame Spread Index 0-25.
5. Type Example and Manufacturer:
 - a. Armstrong Fine Fissured No. 1732, beveled tegular 2x2).

Part 3 - Execution

3.01 Installation:

- A. Install in specified grid system per ASTM C-636 and manufacturer's recommendations, as shown on the Drawings.
- B. Provide ten (10) pieces of ceiling panels in cartons for future use. Panels shall be in perfect condition.

End of Section

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SECTION 09650 - RESILIENT FLOORING

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Installation Qualification: contractors for floor covering installation shall be experienced in managing commercial flooring projects and provide professional installers, qualified to install the various flooring materials specified with a minimum of three years of documented experience. Installer shall be trained by flooring manufacturer and - if applicable - certified to install the specified flooring by the manufacturer.
- B. Manufacturer Qualifications: company specializing in manufacturing the specified flooring with minimum three years documented experience.

1.03 Submittals:

- A. Submit product data for each type of product indicated.
- B. Submit samples for color selection / verification.
- C. Maintenance Data and Instructions Furnish manufacturer's recommended maintenance methods and procedures.

1.04 Delivery, Storage, and Handling:

- A. Store resilient products and installation materials in dry spaces protected from the weather, at temperatures required by the product manufacturer. Store tiles on flat surfaces.

Part 2 - Products

2.01 General:

- A. Refer to color schedule - available tile colors WILL be a factor in product acceptance.

2.02 Materials:

- A. Resilient Floor Tile:
 - 1. Type Example: Luxury Vinyl Composition Tile (LVT-1 and LVT-2) as manufactured by Armstrong World Industries, Inc.
 - 2. Size: 18" x 36".
 - 3. Thickness: 0.125 inch.
 - 4. Pattern: Natural Creations Mystix.
 - 5. Location: as shown on the Drawings.
 - 6. Colors: refer to Drawings.
- B. Rubber Cove Base: ASTM F 1861, Type TP-Rubber as manufactured by Armstrong Cork Company or approved equal.
 - 1. Size: 4" high x .018 gauge.
 - 2. Provide preformed inside and outside corners.

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- C. Edging Strips and Tile Reducers: size and length as required.
- D. Primer and Adhesive: As recommended by manufacturer of resilient floor tile for this particular project. All wall base and reducer strips shall be applied with epoxy adhesive.
- E. Cleaner or other finishing material: As recommended by flooring manufacturer for the particular type of floor material.

Part 3 - Execution

3.01 Installation:

- A. Comply with manufacturer's written instructions for installing specified tile flooring.
- B. The Contractor shall be responsible for the manufacturer's representative making mat moisture and PH tests and reporting condition of concrete slab to the Architect in writing prior to placing floor materials.
- C. Carefully examine the surfaces on which the above materials are to be applied, report to Architect in writing any unsatisfactory surface and do not begin work until all defective surfaces have been corrected. Otherwise, the Contractor shall assume responsibility for all failures and defects resulting from such defective surfaces.
- D. Installation shall not begin until the work of all other trades, including painting, has been completed. The Contractor shall maintain all rooms and sub-floors at a minimum of 70 degrees F. for several days before and after application of tile.
- E. The floor shall be thoroughly cleaned and any pockets or cracks shall be filled in accordance with manufacturer's instructions flush with floor surface.
- F. The material shall be applied in a first class, workmanlike manner by skilled mechanics experienced in this type of work.
- G. Primer and adhesive shall be as recommended by the manufacturer of the flooring for this particular project. The adhesive for applying all materials shall be waterproof and shall be furnished and guaranteed by the flooring manufacturer.
- H. Lay tile from center of room or space, working toward perimeter, so that tile at opposite edges of room are of equal width. Adjust as necessary to avoid cut widths of less than 3 inches at room perimeter. Lay tile square to room axis.

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- I. Fit floor material neatly and tightly into breaks and recesses, against bases, around pipes and penetrations, under saddles or thresholds, and around permanent cabinets and equipment.
 - J. Install reducer at each transition from tile to concrete floor.
 - K. After the flooring has been installed and before the waterproof adhesive has thoroughly set, the surface shall be rolled both ways with rollers made for this purpose, and all excess adhesive on the surface or in the joints shall be removed and the entire surface shall be left perfectly clean.
- 3.02 Cleaning and Waxing:
- A. When, in the opinion of the Contractor, the flooring has sufficiently sealed itself to permit cleaning, the floors shall be thoroughly cleaned with a neutral cleaner as recommended by the manufacturer of the flooring used. After the floors have been cleaned, the Contractor shall protect the floors either with building paper or by keeping traffic off the floors until the building is ready for occupancy.
- 3.03 Replacement Tile and Base:
- A. Provide enough spare floor tile, of each major color, in cartons to cover 50 square feet for future use. Provide 20 linear feet of spare rubber wall base. Resilient floor tile and wall base shall be in perfect condition.

End of Section

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SECTION 09681 - CARPET TILE

Part 1 - General

1.01 Work Included:

- A. Work includes but is not limited to providing carpet tile and installation.

1.02 Quality Assurance:

A. Standards:

- 1. The carpet manufacturer shall have no less than fifteen years of production experience with modular carpet similar to type specified. Published product literature of carpet manufacturer must clearly indicate compliance of products with requirements of this section.

B. Installer Qualifications:

- 1. The installation provider must be directly responsible for the quality of the completed floor covering installation, including both the quality of the materials and labor used in the installation. The installation provider must directly warrant to owner that all products, materials and services related to the floor covering installation (including any floor covering(s), adhesive(s) and/or other products or materials used in the installation) will meet specifications set forth herein. The product warranty required herein must be provided directly by the carpet manufacturer.
- 2. The installation provider must have successful carpet installation experience similar to the work of this Section and be recommended, trained and approved by the carpet manufacturer.

1.03 Submittals:

- A. Manufacturer's Data - copies, as required, of carpet manufacturer's specifications and installation instructions for carpet and related items specified.
- B. Fiber Verification - Certification from the fiber producer verifying use of the premium branded, Post-Consumer Content Type 6 fiber in the submitted carpet product.
- C. All applicable product warranties provided by manufacturer.

1.04 Delivery and Storage:

- A. Deliver all materials to the installation site in the manufacturer's original packaging. Packaging to contain

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- manufacturers name, identification number and related information.
- B. Product to be delivered as required by manufacturer. Store in pallet form as supplied by manufacturer. Do not stack pallets.
 - C. Store materials in area of installation for a minimum period of 48 hours prior to installation.
- 1.05 Installation Quality Assurance:
- A. Flooring contractor to be specialty contractor normally engaged in this type of work and shall have three (3) years minimum documented experience in the installation of these materials.
 - B. Flooring contractor and sub-contractors must be approved by the architect and/or the carpet manufacturer.
 - C. Flooring contractor will be responsible for the proper product installation, including floor preparation in all the areas indicated in the drawings to receive carpet. The carpet installation standard will be as listed in The Carpet and Rug Institute's **Standard for Installation of Commercial Carpet CRI-104**.
 - D. Flooring contractor to provide owner a written warranty that guarantees the completed installation to be free from defects in materials and workmanship for a period of no less than one (1) year after job completion.
 - F. Qualifications of Installers: All work shall be done by installation firms specializing in commercial carpet installation. It is required, that the firm shall be a member of the Floor Covering Installation Contractors Association (FCICA) and/or certified by the Floor Covering Installation Board (FCIB).
 - G. Floor temperatures must be a minimum of 65° for 24 hours prior to installation. Floor temperature can usually vary 5-10° lower than room temperature. Modules must be conditioned to room temperature for 24 hours prior to installation. Relative humidity must be between 10%-65% maximum for 24 hours prior to installation. These conditions must also be maintained for 48 hours after completion of installation.
 - H. All carpet modules must be installed in the order they were manufactured. Select pallets in sequential order and follow the numbers located on each carton of tiles. Typically, an installation will begin with the lowest

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carton numbers and progress through the highest numbers until project is complete.

- I. Full Spread Adhesive System: Requires a full spread adhesive system for the most trouble free installation. Fully spread adhesive using a 1/32 x 1/16 x 1/16 "U" or "V" notch trowel. Allow to completely dry so adhesive does not transfer when touched. The proper amount of adhesive is mandatory to prevent the modules from shifting or moving.

1.06 Job Conditions:

- A. Sub-floor preparation is to include all required work to prepare the existing floor for installation of the product as specified in this document.
- B. Carpet installation shall not commence until painting and finishing work is complete and ceiling and overhead work is tested, approved, and completed.
- C. Site conditions shall include those specified in the carpet manufacturer's installation manual and shall also include sufficient heat, light, and power required for effective and efficient working conditions.

1.07 Extra Materials:

- A. Provide five percent (5%) extra material for shelf stock of carpet for each color and type specified.

1.08 Warranty - Carpet:

- A. Warranties must be the standard, printed warranties on the carpet manufacturer's letterhead. All warranty items to be full term, not pro-rated for the indicated period. All warranties must be issued by the manufacturer as standard published warranties on all types of carpet within this document. If the product fails to perform as warranted when properly installed and maintained according to procedures, the affected area will be repaired or replaced at the expense of the manufacturer. The carpet manufacturer, will provide standard published written performance warranties for the following:
 1. **Lifetime against excessive surface wear.** Excessive wear means no more than 10% loss of pile fiber weight measured before and after use as tested under ASTM D-3936.
 2. **Lifetime static protection,** meaning built-in protection below 3.0 kv as tested under AATCC-134.
- B. Carpet manufacturer shall warrant carpet manufactured with secondary backing for the useful life of the original installation against product failure from:

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1. Tuft Bind (edge ravel, yarn pulls, zippering)
 2. Delamination
 3. Moisture Penetration
 4. Dimensional Stability
- C. All warranties to be sole source responsibility of the carpet manufacturer. Second source warranties that involve parties other than the carpet manufacturer are unacceptable.
- D. Warranties shall not be written only for this purchase or purchaser. All warranties shall be standard issue nationally of official documents.
- 1.09 Performance Insurance General:
- A. Flammability Requirements:
1. Pill Test / DOC-FF-1-70 (ASTM D-2589)
Requirement: Pass
 2. Flooring Radiant Panel / ASTM E-648
Requirement: Class 1 (Above .45 w/cm)
 3. Optical Smoke Density Test / NFPA-258 NBS Smoke Chamber (ASTM E-662)
Requirement: Less than 450, Flaming Mode
 4. Comply with the Carpet and Rug Institute (CRI) VOC Chamber Test/Indoor Air Quality test (CRI-IAQ) Green Label Test
- B. Face Fiber Characteristics for **all** Carpets
1. Bulked Continuous Filament (BCF),
 2. Acceptable Fiber Systems: as manufactured by Aquafil.
- C. Sustainable Carpet Assessment Standard:
1. NSF - 140 Gold.
 2. Carpet manufacturer and/or fiber producer must be a signatory of the National Carpet Recycling Agreement memorandum of understanding.
- 1.10 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

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Part 2 - Products

2.01 General:

- A. Certified test reports shall be submitted by the carpet manufacturer, for all performance assurance specifications listed below.
- B. Requirements listed below must be met by all products being submitted for approval.
- C. All submitted test numbers should represent average for standard production goods.

2.02 Product Specification - Modular carpet tile shall meet the following specifications:

- A. Style: InterfaceFLOR
 - 1) Color "A" - Field: Open Air Neutrals 410 Colorline.
 - 2) Color "B" - Accent: Aerial Flying Colors AE317.
- B. Yarn: 100% Nylon (with minimum 4% post-consumer content and +/- 60% total recycled content)
- C. Dye Method: 100% Solution / Yarn Dyed
- D. Pile Thickness: 0.093 inch
- E. Density: 6,968
- F. Backing System: CQuest GB
- G. Color: refer to Room Finish Schedule.
- H. Special Treatments: ProTekt

2.03 Minimum Construction Standards:

- A. Nylon Specification - All nylon fiber shall be branded (premium) type 6 nylon from Aquafil with performance certification from the fiber manufacturer.
- B. Antimicrobial, registered by the EPA for use in carpeting with broad spectrum efficacy against the growth of bacteria and fungi for a minimum of 15 years, assuming proper maintenance. The antimicrobial ingredient shall meet standards set by the U.S. General Services Administration (GSA) for Antimicrobial Carpet as supported by independent lab testing less than six months old.
 - 1. Intersept (AATCC 138 Washed).
 - 2. The preservative should be incorporated into the primary latex coating of the product during the manufacturing process, not topically applied to the carpet fibers.

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3. The antimicrobial treated carpet when new must pass GSA parameters for treated carpets via AATCC method 174 parts II and III. Initial performance must be 90% reduction of the microorganisms (Staphylococcus aureus 6538 and Klebsiella pneumoniae 4352) and no fungal growth on either the primary backing or fibers both on washed (AATCC method 174) and non-washed samples.
4. The antimicrobial treated carpet must maintain, for the warranted life of the carpet, a minimum of 90% reduction of the microorganisms (Staphylococcus aureus 6538 and Klebsiella pneumoniae 4352) listed in AATCC method 171 part II, provided the carpet is maintained as specified. Additionally, the antimicrobial treated carpet must maintain a "no macroscopic growth" rating against Aspergillus niger 6275 at the primary backing in accordance with AATCC 171 part III.
5. The preservative must be environmentally responsible i.e. (biodegradable and not toxic to non-target species).
6. Efficacy of the preservative should be documented in professional peer reviewed scientific publications.

2.04 Related Carpet Materials:

- A. Leveling compound - Latex type as recommended by carpet manufacturer. Must be compatible with carpet adhesive and curing/sealing compound on concrete.
- B. Releasable pressure sensitive type adhesive - Adhesive must be water-based and allow for removal of carpet tile at any time without damage to carpet or substrate. Adhesive must contain antimicrobial preservative and have "zero" calculated VOC's.
- C. Carpet edge guard, non-metallic - Extruded or molded heavy duty vinyl or rubber carpet edge guard of size and profile indicated, and with minimum two inch wide anchorage flange; colors selected by architect/designer from among standard colors available within the industry.
- D. Miscellaneous materials - As recommended by manufacturer of carpet. Other carpeting products to be selected by installation provider to meet project requirements.
- E. Electrostatic (Dissipation low-generation):
 1. < 3.0 KV (AATCC 16-E).
- F. Lightfastness:
 1. ≥ 4.0 @ 60 AFU's.

DIVISION 9 - FINISHES

SECTION 09681 - CARPET TILE

Part 3 - Execution

3.01 Installation:

A. General

1. Comply with manufacturer's instructions and recommendations for uniformity of direction.
2. Install carpet under open-bottom obstructions and under removable flanges and furnishings, and into alcoves and closets of each space.
3. Provide cut outs where required. Conceal cut edges with protective edge guards or overlapping flanges.
4. Run carpet under open bottom items such as heating convectors and install tight against walls, columns and cabinets so that the entire floor area is covered with carpet. Cover over all floor type door closures.
5. Install edging guard at all openings and doors wherever carpet terminates, unless indicated otherwise.
6. Cutting shall be done in accordance with the manufacturer's recommendation, using the tools designed for the carpet being installed.
7. Use leveling compound where necessary. Any floor filling or leveling shall have a minimum of 4'0" of feather.
8. Expansion joints - Do not bridge building expansion joints with continuous carpeting.

B. Installation

1. Install carpet according to carpet manufacturer's printed instructions and in accordance with the Carpet and Rug Institute's Installation Standard.

3.03 Cleaning and Protection:

- A. On completion of the installation in each area, all dirt, carpet scraps, etc. must be removed from the surface of the carpet.
- B. Remove debris, and sort pieces to be saved from scraps to be redirected and recycled.
- C. Construction manager shall protect carpeting against damage during construction.

3.04 Inspection:

- A. Upon completion of the installation, verify that work is complete, properly installed and acceptable.

End of Section

DIVISION 9 - FINISHES

SECTION 09900 - PAINTING

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this entire section of the work.
- B. Consult Drawings, finish schedules, details and specification section.

1.02 Quality Assurance:

- A. All painted surfaces shall be uniform in color, texture and finish to the satisfaction of the Architect.

1.03 Submittals:

- A. Submit manufacturer's specifications, including paint label analysis and application instructions for each material specified.
- B. Submit color samples for review of color and texture.
- C. Provide samples of all natural and stained wood finishes.
- D. Final samples: Prepare samples of finishes on the job to the satisfaction of the Architect. If required, a 4' x 8' portion of wall surface finished as final sample.

1.04 Product Deliver, Storage and Handling:

- A. Materials shall be delivered to the project site in strong, undamaged, waterproof containers with manufacturer's label intact. Materials in previously opened or unsealed containers, are not acceptable.
- B. Include on label of container: Manufacturer's name, type of paint, number and application instructions.
- C. Immediately upon delivery to the project site, all painter materials shall be stored and locked in a watertight shed with floor well off the ground. The shed shall remain locked at all times except for adding or removing materials.
- D. No materials of any manufacturer will be allowed on the project site any time during construction except those of the manufacturers specified or approved by the Architect.

1.05 Job Conditions:

- A. Comply with manufacturer's recommendations as to environmental conditions under which coating and coating systems can be applied.
- B. Do not apply finishes in areas where dust is being generated or where work in progress may affect finish quality.
- C. Protect finished work of other trades, and all surfaces not being painted concurrently, or not to be painted.

Part 2 - Products

2.01 General:

- A. The following specifications for Finishes is not intended to mention every particular item which will receive painter finish, but is intended to establish type and quality of finish which shall be required on various materials.
- B. **Products of Sherwin-Williams are specified herein to simplify descriptions of types and qualities of finishes required only.**

DIVISION 9 - FINISHES

SECTION 09900 - PAINTING

Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.

- C. Wherever the abbreviation "SW" appears in the following detailed specification, it shall be understood to mean Sherwin-Williams.
 - D. Primers shall be as specified by manufacturers of finish paint used and as approved by the Architect.
- 2.02 Acceptable Manufacturers:
- A. Sherwin-Williams.
 - B. PPG Industries.
 - C. Cook Paint and Varnish Co.
 - D. Pratt and Lambert.
 - E. Kelly-Moore.
- 2.02 Exterior Finishes:
- A. Enamel on Ferrous Metals:
 - 1. One coat SW Kem Kromik Primer, (Alkyd primer).
 - 2. Two coats SW Industrial Enamel, (Alkyd gloss enamel).
 - B. Enamel on Exterior Door Frames and Doors:
 - 1. Shop coat by others-touch up as required.
 - 2. Two coats SW Industrial Enamel, (Alkyd gloss enamel).
 - C. Enamel on Galvanized Metal:
 - 1. One Coat SW Galvite primer.
 - 2. 2 Coats SW Industrial Enamel, (Alkyd gloss enamel).
 - D. Enamel on Exterior Concrete Block:
 - 1. One coat SW Promar Latex Block Filler B25W25.
 - 2. Two coats SW A-100 Semi-Gloss Latex Enamel.
- 2.03 Interior Finishes:
- A. Enamel on Metal: All miscellaneous and ornamental metal items which are left exposed, hollow metal doors and frames.
 - 1. Shop coat by others - touch up as required.
 - 2. Two coats SW Promar 200 Semi-Gloss. Enamel, (Alkyd semi-gloss enamel).
 - B. Enamel on Concrete Block:
 - 1. One coat SW Promar 200 Block Filler (vinyl acrylic latex).
 - 2. Two coats SW Promar 200 Semi-Gloss Enamel.
 - C. Enamel on Gypsum Board Ceilings/Facias/Walls
 - 1. One coat SW Promar 200 Wall Primer with Medium Texture. (Vinyl Acrylic Latex Wall Primer.)
 - 2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.
 - D. Tape and Float: Joints on Gypsum Board.
 - 1. As per manufacturer's instructions.
 - 2. All joints shall be sanded ready for primer's finish.
 - E. Interior Millwork and Cabinetry:
 - 1. One coat SW Promar 200 Alkyd Enamel Primer/Undercoat.
 - 2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.
 - F. Enamel on Wood Trim:
 - 1. One coat SW Promar 200 Alkyd Enamel Primer/Undercoat.
 - 2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.
 - G. Back-Painting, Interior Work:
 - 1. Two coats SW Promar 200 Alkyd Enamel Primer/Undercoat.

DIVISION 9 - FINISHES

SECTION 09900 - PAINTING

- H. Enamel on Exposed Metal Piping:
 - 1. One coat SW Galvite primer.
 - 2. Two coats SW Promar 200 Semi-Gloss Latex Enamel.

Part 3 - Execution

3.01 Inspection:

- A. Notify Contractor of any surface not in proper condition to be finished before proceeding with the work. Starting work will constitute the painter's acceptance of preceding work, and conditions under which finish will be applied and his assumption of responsibility for results to be obtained.

3.02 Preparation of Surfaces:

- A. Wood:
 - 1. Sand to a smooth even surface, then dust off.
 - 2. Touch-up knots, resinous spots, etc., on all surfaces with shellac 18 hours before applying prime coat.
 - 3. Fill nail holes, cracks and blemishes flush after priming coat has dried.
- B. Concrete Block and Concrete:
 - 1. Repair cracks and irregularities to provide uniform surface texture.
- C. Ferrous Metal Surfaces:
 - 1. Remove rust and scale, clean grease or oil surfaces with turpentine or benzine before painting.

3.03 Application:

- A. Number of coats and quality of finish shall be in accordance with these specifications, which requires the use of material which will product first quality finish if properly applied.
- B. Apply coats of material in strict accordance with manufacturer's currently published specifications, except where requirements of these specifications are in excess or manufacturer's requirements.
- C. Except as otherwise approved by the Architect, the first two coats of painter's finish shall be applied by roller or brush application. Finish coats may be applied by spray application.
- D. Comply with recommendation of product manufacturer for drying time between succeeding coats allow additional as required until finish is dry.
- E. All work where a coat of material has been applied must be inspected and approved before application of succeeding coat, otherwise, no credit for the coat well be given. Notify Architect when a particular coat has been completed for inspection and approval.
- F. Shellacs, oils, turpentine, etc., shall be of the highest quality and subject to approval of Architect. Materials shall be mixed in and applied directly from containers which they are purchased except when use of other containers is approved.
- G. First Coat of all finishes, except of varnish and stains, shall be white.
- H. Sand lightly between coats where shellac, varnish or enamel

DIVISION 9 - FINISHES

SECTION 09900 - PAINTING

is used.

- I. Remove all hardware, accessories, machined surfaces, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations.

3.04 Clean-up:

- A. Clean and paint spots from work and touch-up or otherwise repair any defective or damaged work.
- B. Remove all surplus materials and equipment after work is completed.
- C. Leave entire job clean and acceptable to the Architect.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10100 - CHALKBOARDS AND TACKBOARDS

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. American Society for Testing and Materials:
 - a. ASTM A-424, Steel Sheets for Porcelain Enameling.
 - 2. Federal Specifications:
 - a. LL-B-810B, Hardboard.
 - 3. Military Specifications:
 - a. MIL-C-15116C, Cork Sheet.

1.03 Submittals:

- A. Shop Drawings: Submit dimensioned shop Drawings indicating location, type, size, arrangement, adhesive, backing, anchor or mounting details, trim, and accessories.
- B. Submit samples showing the full range of colors available for each unit.

Part 2 - Products

2.01 Materials:

- A. Porcelain Enamel Steel Markerboards:
 - 1. Type: Factory-built aluminum framed unit.
 - 2. Construction: Factory LCS face on 24 gauge steel laminated to 3/8" hardboard with .015 aluminum back-up.
 - 3. Color: LCS faces shall be white.
 - 4. Trim: Provide "H" bar joint cover at adjacent panels, color to match narrow leg showing, map rail with cork inserts and chalk trough.
 - 5. Accessories: Provide two map hooks with paper clips at each chalkboard unit.
 - 6. Mounting System: Concealed metal spline system. **At exterior walls provide "stand-off" mounting brackets to prevent condensation behind boards.**
- B. Tackboard:
 - 1. Type: Factory-built aluminum framed unit.
 - 2. Construction: Vinyl covered surface bonded to a 2" thick insulation board core, with a 7/8" x 5/8" aluminum frame. Refer to Color Schedule.
 - 3. Mount System: Manufacturer's standard.
 - 4. Acceptable manufacturer: Best-Rite Vin-Tak tackboards.

DIVISION 10 - SPECIALTIES

SECTION 10100 - CHALKBOARDS AND TACKBOARDS

Part 3 - Execution

3.01 Installation:

- A. Install units straight, plumb, and level with metal splice system. Refer to Drawings.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10400 - INTERIOR SIGNAGE

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services and incidentals necessary for the completion of this entire section of the work.

1.02 Quality Assurance:

- A. Standards:
 - 1. UFAS Fed. Std. 795-Requirements for the physically handicapped.
 - 2. MIL Spec. L-P-387a, type NDP, rated self-extinguishing, for sign materials.

1.03 Submittals:

- A. Provide manufacturer's catalog cut and data sheets, complete parts list and installation requirements for each item specified.
- B. Schedules: Indicate location and placement for all graphic items.

1.04 Product Delivery, Storage and Handling:

- A. Handle and store all items with care to prevent damage and injury to finish surfaces.

Part 2 - Products

2.01 Products of the manufacturers listed below have been specified herein to simplify descriptions of design, construction, and materials only. All items have been selected for visual and performance design quality which shall serve as a basis for acceptance of equivalent products by other manufacturers.

2.02 Signage System:

- A. Material: 1/8 inch thick, type ES melamine plastic.
- B. Size: 8" x 8" x 1/8", with 1/2" radius corners. Custom design - refer to 2.04 for text and symbols.
- C. Mounting: All graphics shall be permanently mounted to wall or door surface with tamper resistant screws.
- D. Color: refer to Color Schedule, submit color samples with submittals, prior to approval. **Colors will be a factor in product acceptance.**
- E. Letter Style: Helvetica Medium.
- F. Standard Grade 2 braille shall be below all copy, all signs.
- G. All graphic material shall meet the requirements of UFAS Fed. Std. 795, and MIL spec L-P-387a.
- H. Acceptable Manufacturer: Series 200A, Type D format, Mohawk Sign systems.

DIVISION 10 - SPECIALTIES

SECTION 10400 - INTERIOR SIGNAGE

2.03 Plaque Groupings Required (letter designation refers to 2.04):

Quantity Plaque Mounting Location

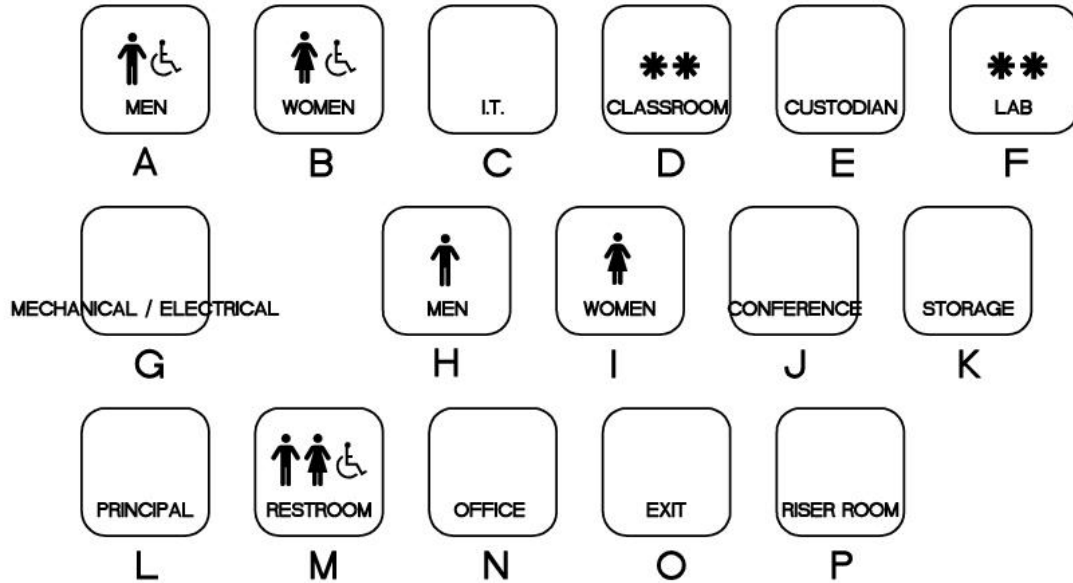
**Coordinate location with Architect

Plaque	Quantity	Location
A	2	@ room no. 11f & @ door no. 012
B	2	@ room no. 11e & @ door no. 010
C	1	@ door no. 21
D	6	@ doors no. 7, 8, 10, 11, 12, & 13
E	1	@ door no. 18
F	6	@ doors no. 14, 17, 24, 27, 28, & 31
G	1	@ door no. 21
H	4	@ rooms no. 11g, 11h, 11j, & 11k
I	4	@ rooms no. 11d, 11c, 11b, & 11a
J	1	@ door no. 013
K	1	@ door no. 017
L	1	@ door no. 016
M	1	@ door no. 015
N	2	@ door no. 09 & 011
O	4	@ doors no. 2, 4, 6, & 04
P	1	@ door no. 18

DIVISION 10 - SPECIALTIES

SECTION 10400 - INTERIOR SIGNAGE

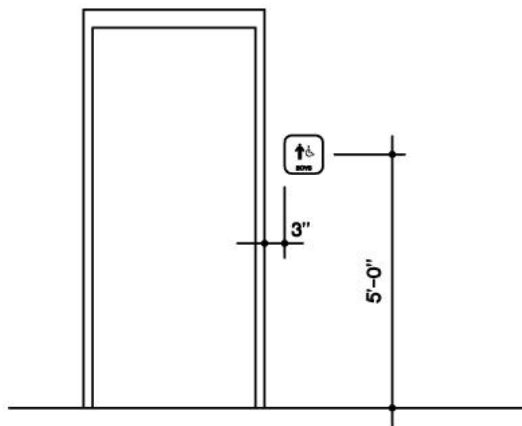
2.04 Signage Plaques Required:



** INDICATES ROOM NUMBER TO BE COORDINATED WITH ARCHITECT AND OWNER

Note: all signage plaques shall have grade 2 braille translations under text.

2.05 Typical Mounting:



Mounting Height

Typical Wall Location

Verify location with architect.

DIVISION 10 - SPECIALTIES

SECTION 10400 - INTERIOR SIGNAGE

Part 3 - Execution

3.01 Installation:

- A. Comply with manufacturer's installation instructions and details on the Drawings. Set all units plumb and level in location indicated on the Drawings or as directed.
- B. Provide all necessary accessories: Items to support or attach Identifying Devices to result in a complete installation.
- C. Protect all signage plaques to prevent damage after installation.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10420 - LETTERS AND PLAQUES

Part 1 General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of this entire section of the work.

1.02 Submittals:

- A. Shop Drawings: Indicate details and dimensions of fabrication and installation including layouts and assemblies. Begin fabrication only after receiving approved shop Drawings.
- B. Manufacturer's Literature: Descriptive literature and installation instructions.

1.03 Product Delivery, Storage, and Handling:

- A. Handle and store all items with care to prevent damage and injury to finish surfaces.

Part 2 - Products

2.01 Cast Letters at exterior locations:

- A. Finish: painted finish.
- B. Color: **DARK BRONZE**.
- C. Letter Style: **OPTIMA FONT**.
- D. Size: height - **24"**.
- E. Mounting: coordinate with Architect.
- F. Quantity: Sufficient letters to spell out the following (quantities in parentheses):

- 1. **HIGHLAND WEST JUNIOR HIGH** (X 1)

- G. Verify exact spelling/punctuation with Architect.
- H. Location: refer to the Drawings.
- I. Acceptable Manufacturer: A.R.K. Ramos, Oklahoma City.

2.02 Cast Metal Plaque at interior location:

- A. Castings shall be free from pits, scale, sand holes, or other defects. Comply with requirements specified for metal, border style, background texture, and finish, and with requirements shown for thickness, size, shape, and copy. Hand-tool and buff borders and raised copy to produce the manufacturer's standard satin polished finish. Coordinate final design with Architect.
 - 1. Metal: aluminum.
 - 2. Border Style: Type 504.

DIVISION 10 - SPECIALTIES

SECTION 10420 - LETTERS AND PLAQUES

3. Background Texture: manufacturer's standard No. 2 black pebble texture.
4. Letter Style: Helvetica upper case - raised satin aluminum finish.
5. Mounting Method: No. 4 concealed fasteners.
6. Finish: manufacturer's satin aluminum finish.
7. Size: 20 inches x 24 inches.
8. Content:

HIGHLAND WEST JUNIOR HIGH SCHOOL
STEM CLASSROOM ADDITION
MOORE PUBLIC SCHOOLS

SUPERINTENDENT OF SCHOOLS:
DR. ROBERT ROMINES

BOARD OF EDUCATION:

ALLISON RICHEY	PRESIDENT
STACI PRUETT	VICE PRESIDENT
MANDY KINCANNON	MEMBER
ERIN MORRISON	MEMBER
JENNY NGUYEN-STATLER	MEMBER

ASSISTANT SUPERINTENDENT – OPERATIONS:
JEFF HORN

ARCHITECT:
AGP – THE ABLA GRIFFIN PARTNERSHIP LLC
MOORE, OKLAHOMA

CONTRACTOR:
OMNI CONSTRUCTION LLC
MOORE, OKLAHOMA

9. Type Example: ARK-Ramos Manufacturing Company, Inc.

Part 3 - Execution

3.01 Installation:

- A. Install units plumb and level in locations indicated on the Drawings, following manufacturer's recommendations.
- B. Provide all necessary accessories: Items to support or attach metal letters to result in a complete installation.

DIVISION 10 - SPECIALTIES

SECTION 10420 - LETTERS AND PLAQUES

- C. Protect all finishes to prevent damage before, during and after installation.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10520 - FIRE PROTECTION SPECIALTIES

Part 1 General

- 1.01 Work Included:
- A. All materials, labor, services and incidentals necessary for the completion of this entire section of the work.
- 1.02 Submittals:
- A. Submit Manufacturer's Literature: Descriptive literature, product data and installation instructions.
- 1.03 Product Delivery, Storage and Handling:
- A. Handle and store all items with care to prevent damage to equipment. Damaged equipment shall be rejected.
- 1.04 Quality Assurance:
- A. Standards:
 1. Conform to NFPA 10 requirements for portable fire extinguishers.
 - B. Provide fire extinguishers, cabinets and accessories by a single manufacturer.
- 1.05 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

- 2.01 Materials:
- A. Fire Extinguishers:
 1. Model No. 10E - Cosmic multi-purpose dry chemical fire extinguisher. UL, 4A-60-BC.
 - B. Fire Extinguisher Cabinets:
 1. Model No.: Academy 1026V10 with return trim as required with rolled edge.
 2. Door Style: Contemporary V, with flat trim.
 3. Glazing: 1/4" clear acrylic.
 4. Finish: Aluminum, mill finish, clear anodized.
 5. Fire Rated Enclosure: provide fire stopping material to protect integrity of fire rated partition as required by applicable codes and standards.

Part 3 - Execution

- 3.01 Installation:
- A. Install equipment as located on the Drawings and comply with manufacturer's written instructions for equipment provided.
 - B. Prepare recesses in walls for fire extinguisher cabinets as required for type and size of cabinet and style of trim, and

DIVISION 10 - SPECIALTIES

SECTION 10520 - FIRE PROTECTION SPECIALTIES

- to comply with manufacturer's instructions.
- C. Securely fasten mounting brackets and fire extinguisher cabinets to the structure, square and plumb, to comply with manufacturer's instructions.
 - D. Check extinguishers for proper charge operation.
 - E. Remove and replace damaged, defective or under charged units.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10731 - PREFINISHED METAL CANOPIES

Part 1 - General

1.01 Work Included:

- A. Work in this section includes the furnishing and installation of roll-formed aluminum overhead hanger rod style canopies.
- B. Metal trim, accessories, fasteners, and sealants related to the canopy system.

1.02 Quality Assurance:

- A. Manufacturer shall demonstrate a minimum of five years of experience in the specified products and applications.
- B. Products must meet the minimum standards established by this specification. Materials, accessories, testing, and processes specified shall establish the minimum level of quality, performance, dimension, and appearance required of any substitution.
- C. Proposed substitutions shall include a complete description of the proposed substitution including testing, samples, and other information necessary to demonstrate the equivalency of the substitute.

1.03 Related Items and Considerations:

- A. Flashing of various designs may be required. Generic flashing shall be supplied by canopy manufacturer and installed by canopy installer.
- B. Determine wall construction, make-up, and thickness.
- C. Ensure adequate wall condition to carry canopy loads where required.

1.04 Field Measurements and Submittals:

- A. Confirm dimensions prior to preparation of shop drawings prior to fabrication of canopies.
- B. Provide manufacturer's product data and specifications for canopies.
- C. Provide shop drawings indicating structural component locations / positions, material dimensions, and details of construction and assembly.

1.05 Performance Requirements:

- A. Canopy must conform to all applicable / local building codes.
- B. Confirm specific load requirements have been established for canopies and provide stamped calculations if required by the Jurisdiction Having Authority.

1.06 Warranty:

- A. Manufacturer shall warrant for a minimum period of one year that the canopies, trim, and accessories furnished by the manufacturer will be free from defects in materials and factory workmanship.

DIVISION 10 - SPECIALTIES

SECTION 10731 - PREFINISHED METAL CANOPIES

- 1.07 Delivery, Storage, and Handling:
 - A. Deliver and store all canopy components in protected areas.
- 1.08 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

- 2.01 Acceptable Manufacturer:
 - A. Lumishade Canopy or Sunshade Canopy with prefinished Hanger Rods w/ turnbuckles as manufactured by:
Mapes Canopies
Lincoln, Nebraska
Phone: 888-273-1132
Fax: 877-455-6572
- 2.02 Materials:
 - A. Decking shall consist of LumiShade interlocking roll-formed (minimum 0.032" aluminum) 2 ½ W-style pan or SuperShade Louvers roll-formed (minimum 0.110" aluminum) as applicable.
 - B. Intermediate framing members shall be extruded aluminum, alloy 6063-T6, in profile and thickness required by specified unit.
 - C. Hanger rods and attachment hardware shall be powder coated.
 - D. Provide compression sleeves at thru bolts as necessary. Round escutcheon plates shall be provided.
 - E. Fascia shall be standard 8" extruded "J" style (minimum 0.125 aluminum).
- 2.03 Finishes:
 - A. Match existing 2019 Field House building. Final color to be selected by Architect.
- 2.04 Fabrication:
 - A. Canopies shall be shipped in preassembled sections for ease of installation.
 - B. All connections shall be mechanically assembled utilizing 3/16 inch fasteners with a minimum shear stress of 350 pounds. Pre-welded or factory-welded connections are not acceptable.
 - C. Decking shall be designed with interlocking roll-formed aluminum members.
 - D. Where applicable, provide concealed drainage - water shall drain from covered surfaces into intermediate

DIVISION 10 - SPECIALTIES

SECTION 10731 - PREFINISHED METAL CANOPIES

trough and be directed to the rear for ground level discharge via designated downspouts at each end of canopy.

Part 3 - Execution

3.01 Inspection:

- A. Confirm that surrounding area is ready for the canopy installation.
- B. Installer shall confirm dimensions and elevations to be as shown on drawings provided by the manufacturer.
- C. Erection shall be performed by an approved installer and scheduled after all concrete, masonry, and roofing in the area is completed.

3.02 Installation:

- A. Installation shall be in strict accordance with the manufacturer's approved shop drawings. Particular attention shall be given to protecting the finish during handling and installation.
- B. Canopy installer shall demonstrate at least five years of experience installing similar products and applications.
- C. After installation is complete, entire system shall be wiped-down and left in a clean condition.

End of Section

DIVISION 10 - SPECIALTIES

SECTION 10800 - TOILET AND BATH ACCESSORIES

Part 1 - General

1.01 Work Included:

- A. All materials, labor, services, and incidentals necessary for the completion of this section of the work.

1.02 Submittals:

- A. Provide manufacturer's catalog cut and data sheets, complete parts list and installation requirements for each accessory item specified.
- B. Where applicable, submit maintenance data, operating instructions and keys required for each type of equipment and lock.

- 1.03 **Products of certain manufacturers are specified herein to simplify descriptions of design, construction, and/or materials only. Proprietary names are not intended to imply that products of named manufacturer are required to the exclusion of equivalent products of other manufacturers.**

Part 2 - Products

- 2.01 The following model numbers refer to products of Bradley Corporation (except where noted otherwise).

2.02 Accessories:

- A. Grab Bars:
 - 1. Model No. 8120-001360-36".
 - 2. Quantity: 1 each @ rooms 11e and 11f
- B. Grab Bars:
 - 1. Model No. 8120-001420-42".
 - 2. Quantity: 1 each @ rooms 11e and 11f
- C. Grab Bars:
 - 1. Model No. 8120-001180-18".
 - 2. Quantity: 1 each @ rooms 11e and 11f
- D. Tilted Stainless Steel Mirror (Frame and Surface):
 - 1. Model No. 740-1830.
 - 2. Quantity: 2 total with 1 each side of room 11 (above washfountains)
- E. Stainless Steel Mirror (Frame and Surface):
 - 1. Model No. 781-1830
 - 2. Quantity: 2 total with 1 each side room 11 (above washfountains)
- F. Custodian's Utility Shelf/With Mop & Broom Holder:
 - 1. Model No. 9984, 36" long.
 - 2. Quantity: 1 @ room 12
- G. Toilet Paper Dispensers to be provided by Owner and installed by Contractor.
- H. Paper Towel Dispenser to be provided by Owner and installed by Contractor.

DIVISION 10 - SPECIALTIES

SECTION 10800 - TOILET AND BATH ACCESSORIES

- I. Soap Dispenser to be provided by Owner and installed by Contractor.

Part 3 - Execution

3.01 General:

- A. Install where noted on the Drawings and mount as indicated or per manufacturer's recommendations.
- B. Use concealed or tamper-proof fasteners of same material and finish as unit. Provide anchors, bolts, and other mounting devices and attach units securely.

End of Section