Addendum
No. TWO  Date: 04.30.2019

Project:

ALTERATIONS AND ADDITIONS TO PRATTVILLE BOYS & GIRLS CLUB FOR CDI
PRATTVILLE, ALABAMA

MCKEE PROJECT NO. 19-108

The following changes and/or substitutions to the plans and specifications are hereby made a part of same and are incorporated in full force as part of the contract.

Bidders shall acknowledge receipt of this Addendum in writing on his Proposal Form.

A2.1 GENERAL MODIFICATIONS:

A. Refer to the Advertisement for Bids, Change as follows:

The sealed proposals for the above referenced project will be received at the Office of McKee and Associates, Architects, 631 South Hull Street Montgomery, Alabama 36104, until Tuesday, May 14, 2019 at 2:00 PM, then opened and read aloud.

A2.2 SPECIFICATION MODIFICATIONS:

B. See attached Section 07410, Preformed Metal Roofing (Revised 4.30.19), herein.
C. See attached Section 07560, Fluid Applied Roofing, herein.
D. See attached Section 08700, Finish Hardware (Revised 4.30.19), herein.

A2.3 DRAWING MODIFICATIONS:

A. See Attached Revised Drawings as follows:

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</tr>
</tbody>
</table>

END OF ADDENDUM TWO
Report of Geotechnical Subsurface Investigation

PROPOSED BOYS and GIRLS CLUB ADDITION

869 Jensen Road
Prattville, Alabama
Our Job No. G19-5437
Report of Geotechnical Subsurface Investigation

PROPOSED BOYS and GIRLS CLUB ADDITION
869 Jensen Road
Prattville, Alabama
Our Job No. G19-5437

Prepared For:

Mr. Mike Schmidt
Community Development Institute
10065 E. Harvard Avenue, Suite 700
Denver, Colorado 80231

Prepared By:

Carmichael Engineering, Inc.
P. O. Box 241702
Montgomery, Alabama 36124-1702

www.carmichaelengineering.com
334-213-5647

March 9, 2019
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March 9, 2019

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Attachments:
  Boring Plans
  Test Boring Logs
  Laboratory Test Data
  Notes and References
  Investigative Procedures
  Unified Soil Classification Chart
  Exhibit C
1.0 Introduction

Carmichael Engineering, Inc., is pleased to provide this report of our subsurface investigation for the proposed new building addition for the Boys and Girls Club. The scope of this investigation included 2 soil test bores in the proposed building area. The quantity and location of the test bores were taken in accordance with the authorized scope of work. The intent of this investigation was to evaluate the subsurface conditions with respect to the development of the site for support of the proposed building.

This report has been prepared in accordance with generally accepted current standards of geotechnical engineering practices and no other warranties are expressed or implied. The recommendations of this report are based on our professional judgment considering the proposed construction as described by this report and the data available to us. The construction should include follow up geotechnical monitoring and construction materials testing by our firm. It is important that we confirm the expected subsurface conditions based on the soil boring data during the construction phase. This report is presented on the basis that all of our recommendations will be followed.
2.0 Summary

Generally, the subsurface investigation indicated conditions which should be compatible with the proposed development provided the site preparation and construction are completed in accordance with the recommendations which follow in this report. Please note that our recommendations are site specific and may not be suitable for other types of structures or other locations.

A total of 2 test bores were completed to evaluate the subsurface profile. Beneath organic sandy topsoil, the test bores penetrated in-situ earth described as cohesive sandy clay, clayey sand, silty clayey sand, and non-cohesive silty sand with gravel and coarse sand with gravel. The predominate sand earth is of a marginal to good drainage classification. The predominate clay earth is of a poor drainage classification. The test bores indicated low to moderate soil strengths and consolidation characteristics which are expected to be compatible with the planned type of construction.

The test bores did not indicate any groundwater during drilling. One hour following drilling, one of the test bores indicated groundwater at a depth of 12.5’ below ground surface. The groundwater condition at this site is subject to seasonal fluctuation. Shallow “perched” groundwater conditions may develop in the near surface soils during extended periods of wet weather. We do not expect that the groundwater condition will affect the long term performance of this project. Shallow groundwater (if any) encountered during construction can be controlled using shallow drainage ditches, sump pumps and/or permanent underdrains.

Following proper site preparation, the project can use conventional design and construction techniques to develop a shallow spread foundation system for support of the proposed building structure. The building spread foundations can be designed to bear transitional between the firm to stronger in-situ earth and/or new “engineered fill” earth utilizing net allowable soil bearing pressures of up to 2000 pounds per square foot for isolated square foundations and 1500 pounds per square foot for continuous foundations.
3.0 Evaluation

3.1 Site Location
The site subject to this report is located at the Boys and Girls Club at 869 Jensen Road, Prattville, Alabama. Our field personnel utilized the provided instructions and site plan along with a survey grade GPS to locate the test bores and determine the ground elevation at the bore locations. The enclosed test boring plans shows the bore locations. Please note that the original building addition layout was shifted to the east. After the test bores were completed, the planned building location was revised and shifted to the west.

3.2 Site Conditions
The site consisted of a portion of the Boys and Girls Club property. The planned building addition site was clear and open with grass vegetation.

The local terrain was gently sloping. Surface drainage was described as fair to good. Surface water is expected to flow over the site and discharge beyond the areas planned for development.

Site access was described as good. There was no unusual difficulty mobilizing our ATV mounted drilling equipment at the test bore locations.
3.3 Site Geology and Subsurface Stratigraphy

Geologically, the site is located in an area underlain by alluvial deposits placed in the Holocene Epoch of the Quaternary Period. Typically, this formation yields fine to coarse quartz sand with clay lenses and gravel in places.

The test bores penetrated 3 to 5" of organic sandy topsoil. Beneath the topsoil, the test bores penetrated in-situ earth described as cohesive sandy clay, clayey sand, silty clayey sand, and non-cohesive silty sand with gravel and coarse sand with gravel. Laboratory analyses confirmed “SM” and “SC” Unified Soil Classifications of the predominate silty sand and clayey sand with plasticity indices of non-plastic and 16. The penetration resistance values, “N”, ranged from 8 to 23 blows per foot indicating relative densities of loose to very firm in the predominate sand earth and consistencies of stiff in the predominate clay earth. Moisture tests indicated water contents ranging from 8.2 to 20.5%. The test bores were terminated in the in-situ earth at depths of 15’ below existing ground surface.

The test bores did not indicate any groundwater during drilling. One hour following drilling bore B-1 indicated groundwater at a depth of 12.5’ below ground surface. The test bores caved following drilling at depths of 12 and 13’ below ground surface which may have prevented
measurement of a groundwater level in bore B-2.

The enclosed test boring records further describe the subsurface stratigraphy, Unified Soil Classifications, penetration resistance values, moisture contents, water level, and caved depths, and boring termination depths.

3.4 General Construction Information
The following data was extrapolated from the provided construction information and plans. The construction data described in this section was considered in the formulation of our recommendations; therefore, any significant changes, additions or modifications to the planned development may have a significant impact on our recommendations. We ask that we be advised of any significant errors, omissions, or revisions in the construction data to permit further comment as needed.

We understand the proposed development will include a single-story building addition along with related grading and drainage improvements. The proposed building structure will include concrete floor slab on grade, wood or steel frame, and brick, metal or composite siding facade type construction. Specific structural loads for the project were not provided; however, we anticipate that concentrated loads will be less than 50 kips and that wall loads will be less than 1.5 kips per linear foot. We do not anticipate that the proposed building structure will be particularly sensitive to usual settlements.

Based on the existing grades, we anticipate earth cutting / filling thicknesses will be less than 2' to establish subgrade elevation in the building area. Fill earth required to establish subgrade elevation is expected to originate from on-site cuts and/or local off-site borrow sources.
4.0 Recommendations - Site Preparation

4.1 "Controlled Areas"
Define those areas throughout and 5' beyond the proposed building area and throughout significant slopes as "controlled areas".

4.2 Surface Drainage
Maintain the "controlled areas" in a drained condition that will insure the continual removal of surface water that may flow over the construction areas. Temporary site drainage can be enhanced by the installation of the final drainage structures during the early phases of the site development.

4.3 Site Examination
Prior to the placement of fill earth and following removal of cut earth, the "controlled areas" should be examined by Carmichael Engineering, Inc. This examination should include proof rolling with construction equipment, test pits, supplemental test bores, visual examinations, etc., as needed to determine the presence, location, and extent of any below grade structures, and any latent weak, and/or otherwise unsuitable soil conditions which may exist at the site. Areas which exhibit weak soil or otherwise unsuitable conditions should be corrected in accordance with our recommendations. Typically, areas which yield excessively under proof rolling should be undercut to a firm level of soil followed by backfilling with "engineered fill".

4.4 Subgrade Improvements
The exposed subgrade should be processed and thoroughly compacted to 98% of the materials ASTM D 698 standard density prior to placement of any fill earth. At the time of densification, the water content of the material should be within ± 3% of the optimum water content. Prior to placing any required fill, the compacted subgrade should be proof rolled. Any areas which fail to compact or yield excessively under proof rolling should be undercut to firm earth and backfilled with "engineered fill". The clean, non-organic, non-expansive sections of the undercut earth may be stockpiled and reused as "engineered fill". Please note that the site preparation should be performed in the normally drier summer and fall seasons if possible. Site preparation during wet periods will impact the site development, increasing both the time and the costs associated with the site preparation.

4.5 Proof Rolling
Proof rolling should be completed using rubber-tired construction equipment or a partially loaded dump truck weighing 30 tons. Proof rolling should include a minimum of 2 passes in perpendicular directions over the "controlled areas". Areas which yield excessively should be corrected in accordance with the project's geotechnical consultant’s recommendations. Do not proof roll when the subgrade soil is saturated.
4.6 Fill Earth
Fill earth required to establish subgrade elevation in the "controlled areas" can consist of the clean, non-saturated, non-expansive and non-organic sections of the native earth typical of the majority of that penetrated by the test bores.

4.7 "Select Fill"
Fill earth originating from an off-site borrow source should be designated as "select fill". The "select fill" should consist of clayey sand or clayey silty sand that meets the following criteria.

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<th>&quot;Select Fill&quot; Composition</th>
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<td>Maximum Dry Unit Weight</td>
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<tr>
<td>Based on ASTM-698</td>
</tr>
<tr>
<td>Standard Density Test</td>
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4.8 "Engineered Fill"
Unless otherwise specified, all fill earth placed in the "controlled areas" should be designated as "engineered fill". Place fill earth in thin lifts not to exceed 8" loose measure and thoroughly compact each lift of fill to at least 98% of the materials ASTM D-698 standard density. At the time of densification, the moisture content of the "engineered fill" should be within 3% of the materials optimum water content. Following acceptance for moisture and density, any "engineered fill" areas which are disturbed should be corrected and retested prior to the placement of additional fill earth or structures.
5.0 Recommendations - Shallow Foundations
And Ground Supported Floor Slabs

5.1 Maximum Net Allowable Soil Bearing Pressures
2,000 pounds per square foot for isolated square foundations.
1,500 pounds per square foot for continuous foundations.

Note: Foundations may bear transitional between the firm to stronger in-situ earth (compacted as required), and/or new “engineered fill" earth exhibiting "N" values of 8 or greater.

5.2 Minimum Load Bearing Foundation Dimensions
Width: Isolated square foundations - 36"
Continuous wall foundations - 18"
Turned down slab edges - 12"

Depth: Bottom of perimeter foundations below outside finish grades - 18".
Bottom of interior foundations below the top of concrete floor slabs - 18".

Note: All foundations should be sized for total load but should not be less than the minimum dimensions shown above.

5.3 Settlement
The planned building structure will be subjected to total long term settlements of up to 1", with differential settlements of up to 0.5". The building structure should be designed to tolerate these estimated settlements. Control joints should be used at appropriate locations to reduce the effects of differential settlements.

5.4 Seismic Design
The seismic design parameters for the IBC 2015 are as follows for the subject building site in Prattville, Alabama.

\[
\begin{align*}
S_S &= 0.140 \\
S_L &= 0.076 \\
\text{Site Class D} &= S_{DS} = 0.149 \\
&\quad S_{DL} = 0.122 \\
S_{MS} &= 0.223 \\
S_{ML} &= 0.183 \\
S_{DS} &= 0.149 \\
S_{DL} &= 0.122 \\
\end{align*}
\]

Use Seismic Design Category B for Use Group I, II and III and Seismic Design Category C for Use Group IV.
5.5 Foundation Construction
Do not permit the foundation bearing soil to become saturated or dry excessively. The foundation bearing level should be the thoroughly compacted to 98% standard density using a “jumping jack” type compactor. Sections which become saturated or dry excessively should be undercut just prior to placement of the foundation concrete. All foundations should be constructed as expediently as possible following excavation of the foundation trench.

 Foundations should be stepped down as required to extend through weak soil zones which fails to compact or the weak soil may be replaced with non-reinforced lean concrete (mud sill). The reinforced foundation should bear directly on top of the mud sill. All loose soil material or other debris should be removed from the top of the mud sill before placing the foundation concrete.

 Following construction of the foundations, the area adjacent to the foundation should be maintained in a drained condition. Water should not be permitted to pond adjacent to the building foundations during or following construction. Backfill adjacent to the building foundations as soon as possible to provide positive drainage. Backfill with clean soil typical of the material excavated from the foundation trenches. Masonry sand, broken brick and block or other construction debris should not be used to backfill against the foundations.

5.6 Floor Slab Bearing Conditions
Floor slabs should bear over the firm to stronger in-situ earth and/or new "engineered fill" earth. Grade and compact the top 6" of subgrade to 98% of the materials ASTM D-698 standard density for floor slab support. A leveling layer of compactable granular material (compacted as required) may be used to fine grade the subgrade for slab support. A minimum 10 mil vapor barrier should be placed between the subgrade earth and the floor slab.

5.7 Acceptance of Foundations and Floor Slab Bearing Levels
All foundation excavations and floor slab bearing levels should be examined by a qualified geotechnical consultant prior to the installation of the reinforcement and concrete for the foundations and drainage fill or vapor barrier for the floor slabs. All unacceptable conditions should be corrected in accordance with the geotechnical consultant's recommendations.

5.8 Control/Expansion Joints
A liberal amount of control/expansion joints should be used in the floor slabs to reduce the effects of the normal amounts of differential settlement and concrete shrinkage expected. The design and location of the construction joints should be in accordance with the recommendations of the Portland Cement Association.
6.0 General Recommendations

6.1 Utility Trenches
All utility trenches (new and existing) extending through the "controlled areas" should be backfilled with "engineered fill".

6.2 Grading and Drainage Improvements
Incorporate finish grades, pavements abutting the building construction, side drainage ditches, underdrains, roof drains which discharge into storm drains, etc., to reduce the possibility of ponding surface water within 5' of the edges of the building.

6.3 Vertical Cuts
Vertical cuts greater than 4' or cuts required to remain open for extended periods of time should be sloped or braced as required for the protection of workmen entering deep excavations. Heavy construction traffic and stockpiling of excavated earth or other materials should not be permitted near the top of open unsupported excavations. Current OSHA regulations should be adhered to with respect to excavations for this project.

6.4 Cut and Fill Slopes
Cut and fill slopes should perform satisfactorily as steep as 2.5 (H):1(V) in the earth typical of that penetrated in the upper strata at the site. All slopes should be protected from erosion using suitable vegetation or pavements.

6.5 Quality Control
A qualified geotechnical and construction materials testing consultant should provide the following services;
6.5.1 Verify the results of the correction of weak soil conditions, the quality and density of "engineered fill", and the conditions of the foundation trenches and floor slab subgrade bearing levels.

6.5.2 Complete soil particle size, atterberg limit and laboratory compaction tests on each different type of fill earth used in the "controlled areas".

6.5.3 Complete a minimum of 2 field density test in the building addition area per each foot of vertical thickness of fill. Also, a minimum of 1 field density test should be taken for each 50 linear feet per each 2' of vertical thickness of fill placed at utility trenches extending through "controlled areas".

6.5.4 Test all structural concrete in accordance with the guidelines established by the American Concrete Institute.
7.0 General Comments

The scope of this study did not include sampling or testing for an environmental analysis or assessment for this site. If an environmental assessment of this site is desired, we should be contacted for further comment.

The comments of this report do not consider local flood conditions. The local flood condition/elevation (if any) should be determined and considered in the design of this project.

The frost penetration depth in the area of this project is generally taken to be less than 10". Provided our recommendations for the development of foundations and floor slabs are followed, we do not expect that the frost penetration will have any detrimental effects on the performance of these structures.

The comments of this report are based upon our interpretation of the construction information supplied by others, the data collected at the 2 test bores, and our visual examination of the site. The evaluation of subsurface conditions based on the 2 test bores taken with this study requires a significant amount of interpolation. Improper site preparation, extremes in climatic conditions, significant changes in location, grades, time, etc., can each affect ground water, surface, and subsurface conditions. If conditions are encountered as the construction advances which vary significantly from those described by this report, we should be contacted for supplemental comment.

The scope of this investigation is not intended to establish volumetric estimates of the various subsurface materials at the site. Volumetric estimates may require a large number of test bores placed on a close grid to establish reliable cross sections. If volume estimates are required of us for the design/development of this project to advance, please contact us for further comment.

Following your request, we are available to provide a review of the final plans and project specifications with respect to their compatibility with the contents of this report. Furthermore, our firm would appreciate the opportunity to continue to serve as the geotechnical consultant and to provide the construction materials testing and monitoring for this project.
8.0 Signature

Thank you for selecting Carmichael Engineering, Inc., to provide the geotechnical services for this project. We are available to answer any questions concerning our findings and recommendations. If we can be of any further assistance, please contact our office.

Sincerely,

J. Stephen Carmichael, P.E.
Licensed AL No. 15730

Report Distribution: 1 - Mr. Mike Schmidt
1 - Mr. Warwick Woodham, Architect

JSC/lc
ORIGINAL BUILDING LAYOUT
Boring and Sampling Meets ASTM D-1586
Penetration (N) is the Number of Blows of 140 lb. Hammer
Falling 30 in. Required to Drive 1.4 in I.D. Sampler 1 Ft.
Undisturbed Sample
LA Lab Analysis

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TEST BORING LOG

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JOB NO. G19-5437
BORING NO. B-1
DATE DRILLED 3/4/19
TYPE BORING SB
5" OF BROWN SANDY TOPSOIL
BROWN SILTY SAND
FIRM

TAN CLAYEY SAND
"SC"
FIRM

TAN SILTY SAND W/ GRAVEL
VERY FIRM

TAN COARSE SAND W/ GRAVEL
VERY FIRM
BORING TERMINATED

Penetration (N) is the Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in I.D. Sampler 1 Ft. Undisturbed Sample

Boring and Sampling Meets ASTM D-1586

TEST BORING LOG
JOB NO. G19-5437
BORING NO. B-2
DATE DRILLED 3/4/19
TYPE BORING SB

CARMICHAEL ENGINEERING, INC.
## Grain Size Distribution

**Specimen Identification**

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<tr>
<td>28592 B-2 2.5-4'</td>
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**Test Methods:** ASTM D422, ASTM D4318

**Sample Received Date:** 3/4/2019

**Test Date(s):** Grain Size - 3/5/2019, Atterberg Limits - 3/5/19

**Client:** Community Development Institute

10065 E. Harvard Avenue, Suite 700
Denver, Colorado 80231

**Test Methods:** ASTM D422, ASTM D4318

**Sample Received Date:** 3/4/2019

**Test Date(s):** Grain Size - 3/5/2019, Atterberg Limits - 3/5/19

**Report Date:** 3/6/2019

Reviewed By: Brandon M. Rountree, P.E.
INVESTIGATIVE FIELD PROCEDURES

Penetration Testing & Split Barrel Sampling: A standard 2.0" O.D. (1.4" I.D.) split barrel sampler is first seated 6" to penetrate any loose cuttings and then driven an additional 12" with blows of a 140-pound hammer falling 30". The number of blows required to drive the sampler the final foot is recorded and designated the “penetration resistance” (N). (ASTM D-1586)

Soil Boring (SB): The test bore is advanced by a drilling rig utilizing 5-5/8" O.D. (2-1/4" I.D.) hollow stem augers. Soil samples are obtained with a standard split-tube sampler by driving the sampler thru the hollow auger. Collected soil specimens are sealed in air tight containers and delivered to the laboratory to confirm the drillers classifications. (ASTM D-1452 & 1586)

Auger Boring (AB): Steel flight augers are utilized to advance the test bore. The soils are visually classified and sampled from the cuttings which are bought to the surface. (ASTM D-1452)

Undisturbed Sampling (UD): Relatively undisturbed soil samples are obtained by forcing a section of 3" O.D. 16-gauge steel tubing into the soil at the desired sample location. The tube is then sealed from moisture loss and delivered to the laboratory for possible laboratory testing.

Rotary-Wash Boring (RB): The drilling operation is performed by first setting a length of casing and then advancing the test bore by “jetting” a bentonite solution thru drill rods and bit.

Core Drilling (CD): The test bore is advanced thru rock by coring which utilizes a diamond bit and a double tube, swivel type core barrel. (ASTM D-2113)

Monitoring Wells (MW): Temporary or permanent wells may be installed to provide the accurate water table determination and periodic monitoring. The well is constructed with 1.5" to 4" diameter PVC pipe meeting current standards for monitoring well construction.
Soil descriptions are based on the predominate constituent of the material and are further described by appropriate modifiers in reverse order of their importance. For example, a predominate sand soil containing clay would be described as “clayey sand”. Additional modifiers may be used, beginning with the least important constituent such as “silty clayey sand”, etc.

Water levels shown on the test boring logs reflect those levels measured at the specified time and date indicated on the logs. These water levels are subject to seasonal fluctuation and can be effected by local surface drainage and/or rainfall during the monitoring period.

The following table describes soil relative densities and consistencies based on penetration resistance values (N) determined by the Standard Penetration Test. The “N” values are estimated for hand tool bores using a portable dynamic cone penetrometer.

<table>
<thead>
<tr>
<th>N</th>
<th>Relative Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 3</td>
<td>Very Loose</td>
</tr>
<tr>
<td>4 – 9</td>
<td>Loose</td>
</tr>
<tr>
<td>10 – 19</td>
<td>Firm</td>
</tr>
<tr>
<td>20 - 29</td>
<td>Very Firm</td>
</tr>
<tr>
<td>30 - 49</td>
<td>Dense</td>
</tr>
<tr>
<td>50+</td>
<td>Very Dense</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th>Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 2</td>
<td>Very Soft</td>
</tr>
<tr>
<td>3 - 5</td>
<td>Soft</td>
</tr>
<tr>
<td>6 - 11</td>
<td>Firm</td>
</tr>
<tr>
<td>12 - 17</td>
<td>Stiff</td>
</tr>
<tr>
<td>18 - 29</td>
<td>Very Stiff</td>
</tr>
<tr>
<td>30 - 49</td>
<td>Hard</td>
</tr>
<tr>
<td>50+</td>
<td>Very Hard</td>
</tr>
</tbody>
</table>

Laboratory Test References

<table>
<thead>
<tr>
<th>Test</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture Content</td>
<td>ASTM D-854</td>
</tr>
<tr>
<td>Particle Size Analysis</td>
<td>ASTM D-421,422,1140</td>
</tr>
<tr>
<td>Atterberg Limit</td>
<td>ASTM D-423, 424</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>ASTM D-2216</td>
</tr>
<tr>
<td>Compaction Test</td>
<td>ASTM D-698, 1557</td>
</tr>
<tr>
<td>California Bearing Ratio Test</td>
<td>AASHTO T-193</td>
</tr>
<tr>
<td>Triaxial Shear Test</td>
<td>ASTM D-2850</td>
</tr>
<tr>
<td>Unconfined Compression Test</td>
<td>ASTM D-2166</td>
</tr>
<tr>
<td>Consolidation Test</td>
<td>ASTM D-2435</td>
</tr>
<tr>
<td>Soil Permeability Test</td>
<td>ASTM D-2434</td>
</tr>
</tbody>
</table>
## The Unified Soil Classification System

<table>
<thead>
<tr>
<th>Major divisions</th>
<th>Group symbol</th>
<th>Typical names</th>
<th>Classification criteria for coarse-grained soils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse-grained soils (more than half of material is larger than No. 200)</td>
<td>GW</td>
<td>Well-graded gravels, gravel-sand mixtures, little or no fines</td>
<td>$C_U \geq 4$ $1 \leq C_C \leq 3$</td>
</tr>
<tr>
<td></td>
<td>GP</td>
<td>Poorly graded gravels, gravel-sand mixtures, little or no fines</td>
<td>Not meeting all gradation requirements for GW ($C_U &lt; 4$ or $1 &gt; C_C &gt; 3$)</td>
</tr>
<tr>
<td></td>
<td>GM</td>
<td>Silty gravels, gravel-sand-silt mixtures</td>
<td>Atterberg limits below A line or $I_P &lt; 4$</td>
</tr>
<tr>
<td></td>
<td>GC</td>
<td>Clayey gravels, gravel-sand-silt mixtures</td>
<td>Atterberg limits below A line with $I_P &gt; 7$</td>
</tr>
<tr>
<td>Sands (more than half of material is smaller than No. 200)</td>
<td>SW</td>
<td>Well-graded sands, gravelly sands, little or no fines</td>
<td>$C_U \geq 6$ $1 \leq C_C \leq 3$</td>
</tr>
<tr>
<td></td>
<td>SP</td>
<td>Poorly graded sands, gravelly sands, little or no fines</td>
<td>Not meeting all gradation requirements for SW ($C_U &lt; 6$ or $1 &gt; C_C &gt; 3$)</td>
</tr>
<tr>
<td></td>
<td>SM</td>
<td>Silty sands, sand-silt mixtures</td>
<td>Atterberg limits below A line or $I_P &lt; 4$</td>
</tr>
<tr>
<td></td>
<td>SC</td>
<td>Clayey sands, sand-clay mixtures</td>
<td>Atterberg limits above A line with $I_P &gt; 7$</td>
</tr>
<tr>
<td>Fine-grained soils (more than half of material is smaller than No. 200)</td>
<td>ML</td>
<td>Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CL</td>
<td>Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OL</td>
<td>Organic silts and organic silty clays of low plasticity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MH</td>
<td>Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CH</td>
<td>Inorganic clays or high plasticity, fat clays</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OH</td>
<td>Organic clays of medium to high plasticity, organic silts</td>
<td></td>
</tr>
<tr>
<td>Highly organic soils</td>
<td>Pt</td>
<td>Peat and other highly organic soils</td>
<td></td>
</tr>
</tbody>
</table>

### Classification criteria for fine-grained soils

- **$C_U = D_{60}/D_{10}$**
- **$C_C = D_{30}^2/D_{10}D_{60}$**

### Determining percentages of sand and gravel from grain-size curve

1. Determine percentages of sand and gravel from grain-size curve.
2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows:
   - Less than 5%: GW, GP, SW, SP
   - More than 12%: GM, GC, SM, SC
   - 5 to 12%: Borderline cases requiring dual symbols.
1. **PAYMENT TERMS.** CARMICHAEL ENGINEERING, INC. (hereinafter called “CEI”) will submit invoices to client monthly and a final bill upon completion of services. Invoice will show charges for different personnel, unit prices and/or expense classifications unless a lump sum payment is agreed to as part of this agreement. Payment is due upon presentation of invoice and is past due ten (10) days from the invoice date. Client agrees to pay a finance charge of two percent (2%) per month (minimum of $25.00 per month) on the principal amount of any past due account. In the event CEI deems it necessary to refer the account to an attorney for collection, client agrees to pay all costs of collection, including a reasonable attorney’s fee.

2. **INSURANCE.** CEI maintains Worker’s Compensation and Employer’s Liability Insurance in conformance with applicable state law. In addition, we maintain Comprehensive General Liability Insurance and Automobile Liability Insurance with bodily injury limits and property damage limits of, to wit $1,000,000 combined single limit. A certificate of insurance can be supplied evidencing such coverage which contains a clause providing that fifteen (15) days written notice be given prior to cancellation. Cost of the above is included in our quoted fees. If additional coverage, such as additional insured endorsements, waiver of subrogation or increased limits of liability are required, CEI will endeavor to obtain the requested insurance and charge separately for costs associated with additional coverage or increased limits.

3. **STANDARD OF CARE.** The only warranty or guarantee made by CEI in connection with the services performed hereunder is that we will use that degree of care and skill ordinarily exercised under similar conditions by reputable members of our profession practicing in the same or similar locality. No other warranty, expressed or implied, is made or intended by our proposal for geotechnical/environmental services or by our furnishing oral or written reports.

4. **LIMITATION OF LIABILITY.** Client agrees to limit CEI’s liability for any and all types of damage to client, and to all construction contractors and subcontractors on the project, arising from CEI’s professional wrongful acts, errors or omissions, so that the total aggregate liability of CEI to all those named shall not exceed $1,000,000.

5. **RIGHT OF ENTRY.** Unless otherwise agreed in writing, client will provide for the right of entry for CEI, its agents and employees and all equipment necessary for the completion of the work. While CEI will take reasonable precautions to minimize any damage to the site, it is understood by the client that in the normal course of work some damage may occur and that the cost of correction or repairing such damage is not included in the quoted fee and CEI is not responsible unless specifically stated. If client desires CEI to repair or correct the damage, the cost of such repairs or corrections will be paid by client as an additional fee.

6. **EXISTING MAN MADE OBJECTS.** It is the duty of the client to disclose the presence and accurate location of all hidden or obscure man made objects, including utility lines, relative to field test or boring locations. CEI field personnel are trained to recognize clearly identifiable stakes or markings in the field and, without special written instructions to initiate field testing, drilling and/or sampling within a reasonable distance of each designated location. If CEI is notified in writing of the presence or potential presence of underground or above ground obstructions, such as utilities, CEI will give special instructions to its field personnel. Client agrees to indemnify and save harmless CEI from all claims, suits, losses, personal injuries, deaths and property liability resulting from unusual subsurface structures, owned by client or third parties, occurring in the performance of the proposed services, the presence and exact locations of which were not revealed to CEI in writing, and to reimburse CEI for expenses in connection with any such claims or suits, including reasonable attorney’s fees.

7. **SAMPLING OR TESTING LOCATION.** The fees included in the Agreement do not include costs associated with surveying of the site or the accurate horizontal and vertical locations of tests. Field test or boring locations described in CEI’s report or shown on sketches are based on specific information furnished by the client or clients agent or estimates made by CEI technicians. Such dimensions, depths or elevations should be considered as approximations unless otherwise stated in the report or contracted for at the inception of the Agreement.

8. **SAMPLE DISPOSAL AGREEMENT.** CEI will retain soil and rock samples which are not used for testing for forty-five (45) days after submission of our report. After forty-five (45) days the retained samples will be discarded unless the client has made written request for storage or transfer of the samples. Client shall be responsible for the expense of such storage or transfer.

Page 1 of 2
9. **SAFETY.** If CEI’s scope of work includes periodic observations or monitoring services at the job site during construction, Client agrees that, in accordance with generally accepted construction practices, the contractor (i.e. not CEI) will be solely and completely responsible for working conditions on the job site, including safety of all persons and property during the performance of the work, and compliance with OSHA regulations, and that these requirements will apply continuously and not be limited to normal working hours. Any monitoring of the contractor’s procedures conducted by CEI is not intended to include review of the adequacy of the contractor’s safety measures in, on, adjacent to, or near the construction site.

10. **ENGINEERING, EQUIPMENT AND TECHNICAL SERVICES.** Fees for such services are based on all time spent on the project by engineering or technical personnel at the hourly or unit rates of the Fee Schedules. The quoted fee may not cover the cost of conferences, site visits, review of foundation plans and specifications, or other services subsequent to submission of our report. Such additional services will be invoiced at the applicable rates. All engineering and technical work is generally done by CEI’s regular employees; however, special services by other firms or consultants may be needed on occasion and will be invoiced at the applicable rates but no “outside” services will be contracted for without clients prior permission.

11. **ASSIGNMENT.** Neither client or CEI may delegate, assign, sublet or transfer its duties or interest in this agreement without the prior written consent of the other party.

12. **OWNERSHIP OF DOCUMENTS.** All reports, boring logs, field data, field notes, laboratory test data, calculations, estimates and other documents prepared by CEI, as instruments of service, shall remain the property of CEI. Client agrees that under no circumstances shall any documents or reports produced by CEI pursuant to this Agreement be used at any location or for any project not expressly provided for in this agreement without the written permission of CEI. Client agrees that all reports and other work furnished to client or its agents, which are not paid for, will be returned upon demand and will not be used by client for any purpose whatsoever. CEI will retain all pertinent written records relating to the services performed for a period of five (5) years following submission of the report, during which period the records will be made available to client at all reasonable times. During this five (5) year period, CEI will provide client with copies of documents created in the performance of the work, at the expense of client.

13. **TERMINATION.** This agreement may be terminated by either party upon fourteen (14) days written notice in the event of material failure by the other party to perform in accordance with the terms hereof. Such termination shall not be effective if the material failure has been remedied before the expiration of the period specified in the written notice. In the event of termination, CEI shall be paid for all services performed and expenses incurred up to the termination notice date plus reasonable termination expenses. The expenses of termination or suspension shall include all direct costs of CEI in completing such analysis, records and reports.

14. **GOVERNING LAW.** This agreement shall be governed and construed in accordance with the laws of the State of Alabama, United States of America.

15. **SEPARABILITY.** The provisions of this agreement are separate and divisible, and, if any court of competent jurisdiction shall determine that any provision hereof is void and/or unenforceable, the remaining provisions shall be construed and shall be valid as if the void and/or unenforceable provisions were not included in this Agreement.

16. **WAIVER.** Except as otherwise especially provided in this Agreement, no failure on the part of either party to exercise, and/or delay in exercising, any rights, privilege or power under this Agreement shall operate as a waiver or relinquishment thereof, nor shall any single partial exercise by either party or any right, privilege or power under this Agreement preclude any other or further exercise thereof, or the exercise of any right, privilege or power. Waiver by any party of any breach of any provisions of the Agreement shall not constitute or be construed as a continuing waiver, or a waiver of any other breach of any provision of this Agreement.

17. **BINDING.** This agreement shall be binding upon all of the parties and their respective estates, heirs, administrators, executors, successors and assigns.

18. **STIPULATION.** Each of the parties to this Agreement as set forth herein and in the Work Order furnished by CEI stipulates that they have read, understand and agree to be bound by all of the terms set forth pursuant to the documents which are the basis of this agreement.

(Revised 1/1/15)

_____________ Client Initials

_____________ Date
SECTION 07410 - PREFORMED METAL ROOFING (Revised 4.30.19)

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract including General and Supplementary Conditions and Division 1 Specification sections apply to work of this section.

DESCRIPTION OF WORK:

Extent of each type of preformed roofing is indicated on the drawings and by provisions of this section. Preformed roofing is hereby defined to include panels which are structurally capable of spanning between supports spaced as indicated.

Types of material required include the following:

1. Formed Roof Panels for Standing Seam Installation
2. Workmanship
3. Inspection of Surfaces
4. Protection
5. Delivery, Samples and Shop Drawings

QUALITY ASSURANCE:

The Contractor shall engage and pay a Certified Roofing Consultant, approved by Architect, will attend the pre-roofing conference and provide a certificate of compliance in a start-up, in progress and final inspection mode, certifying that the roof system will be approved to receive a 20 Year manufacturer’s warranty.

Recognized approved independent firm will consist of:

1. Hixson Consultants, Inc.,
   947 1st Avenue West,
   Alabaster, AL 35007
   (205) 663-2220, attention Mr. Tyler Hixson

or

2. Roof Asset Management, Inc.
   4950 Woodfield Drive
   Millbrook, Alabama 36054
   (334) 590-7999

Performance Test Standards: Provide preformed panel systems which have been pretested and certified by manufacturer to provide specified resistance to air and water infiltration and structural deflection and failure when installed as indicated and when tested in accordance with AAMA 501, "Methods of Test for Metal Curtain Walls".
**Field Measurements:** Where possible, prior to fabrication of prefabricated panels, take field measurements of structure or substrates to receive panel system. Allow for trimming panel units where final dimensions cannot be established prior to fabrication.

**Impact Resistance:** Roof coverings installed on low-slope roofs (roof slope <2:12) shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the “Resistance to Foot Traffic Test “FM 4470.

**ROOFERS QUALIFICATIONS**

Installation of the metal roofing and roof related accessories shall be performed by **Certified / Preferred Roofers** authorized by the manufacturer as trained and qualified to erect the manufacturer's product.

The Contractor shall submit a letter from the manufacturer of the metal roofing system, certifying the date of certification from the Manufacturer and the dates and year the Roofing Contractor attended school, prior to full certification that this Roofing Contractor is a certified roofer.

**SUBMITTALS:**

**Product Data:** Submit manufacturer's product specifications, standard details, certified product test results, installation instructions and general recommendations, as applicable to materials and finishes for each component and for total system of preformed panels.

**Samples:** Submit 2 samples 12" square, of each exposed finish material.

**Shop Drawings:** Submit small-scale layouts of panels on roofs, and large-scale details of edge conditions, joints, corners, custom profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory and field assembly work.

**WARRANTY:**

**Roof Panels:** Durability of the metallic coated and unpainted roof panels due to rupture, structural failure or perforation shall be warranted for a period of **twenty (20) years** by the manufacturer.

**Color Finish:** The exterior color finish for painted panels shall be warranted by the Manufacturer for twenty-five (25) years against blistering, peeling, cracking, flaking, chalking and shipping. Excessive color change and chalking shall be warranted for twenty five (25) years. Color change shall not exceed 5 NBS units per ASTM D2244.68T, chalking shall not be less than a rating of 6 (white) or 8 (other colors) per ASTM D-659.

**Compatibility:** Provide products which are recommended by manufacturers to be fully compatible with indicated substrates or provide separation materials as required to eliminate contact between incompatible materials.

All roof warranties shall be provided to the Owner, by the Contractor at the Final Inspection to obtain the Substantial Completion.
Standard manufacturer’s roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees.

**SPECIAL PROJECT WARRANTY:**

Contractor shall furnish Contractors 5 Year Alabama Building Commission Roofing Guarantee.

**GENERAL WARRANTY REQUIREMENTS:**

**WEATHER TIGHTNESS:** The entire installation (sub-framing, clips, panels, fasteners, rakes, eave, ridge, valley flashing conditions, roof to wall conditions as-well-as all materials specified as supplied by the manufacturer) shall be guaranteed weather tight for a minimum of twenty 20 years **(NO Dollar Limit NDL).** Provide written warranty, signed by metal roofing manufacturer and his authorized installer, agreeing to replace/repair defective materials and workmanship during the warranty period, certified by the third party inspection firm as stated under QUALITY ASSURANCE. This warranty shall be identified as neither Non-Depreciating, Non-Pro-Rated, nor have exclusions that identify, valleys, curbs, and flashings. The warranty shall be signed by the Manufacture of the roofing materials and the authorized installer.

All roof warranty’s shall be provided to the Owner, by the Contractor at the Final Inspection to obtain the Substantial Completion.

Standard manufacturer's roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees.

The roofing manufacture shall be required to provide documentation certifying that the roof design provided complies with the performance requirements as set forth in IBC Chapter 15, Section 1504. The documentation shall be attached to the roof warranty at the close out of the project.

**Roof Panels:** Durability of the metallic coated and unpainted roof panels due to rupture, structural failure or perforation shall be warranted for a period of twenty (20) years by the manufacturer.

The exterior color finish for painted panels shall be warranted by the Manufacturer for twenty-five (25) years against blistering, peeling, cracking, flaking, chalking and shipping. Excessive color change and chalking shall be warranted for twenty-five (25) years. Color change shall not exceed 5 NBS units per ASTM D2244.68T, chalking shall not be less than a rating of 6 (white) or 8 (other colors) per ASTM D-659.

**Compatibility:** Provide products which are recommended by manufacturers to be fully compatible with indicated substrates or provide separation materials as required to eliminate contact between incompatible materials.
DELIVERY, STORAGE AND HANDLING:

Deliver and store prefabricated components, sheets, panels and other manufactured items so they will not be damaged or deformed.

Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight ventilated covering. Store metal sheets or panels so that water accumulations will drain freely. Do not store sheets or panels in contact with other materials which might cause staining.

PRE-ROOFING CONFERENCE:

A pre-roofing conference is required before any roofing materials are installed. This conference shall be conducted by a representative of the Architect and attended by representatives of the Owner, Building Commission Inspector, General Contractor, Roofing Contractor, Sheet Metal Contractor, Roof Deck Manufacturer (if applicable), and the Roofing Materials Manufacturer (if warranty is required of this manufacturer). If equipment of substantial size is to be placed on the roof, the Mechanical Contractor must also attend this meeting. Provide at least 72 hours advance notice to participants prior to convening pre-roofing conference.

The pre-roofing conference is intended to clarify demolition and application requirements for work to be completed before roofing operations can begin. This would include a detailed review of the specifications, roof plans, roof deck information, flashing details, and approved shop drawings, submittal data, and samples. If conflict exists between the specifications and the Manufacturer’s requirements, this shall be resolved. If this pre-roofing conference cannot be satisfactorily concluded without further inspection and investigation by any of the parties present, it shall be reconvened at the earliest possible time to avoid delay of the work. In no case should the work proceed without inspection of all roof deck areas and substantial agreement on all points.

The following are to be accomplished during the conference:

1. To review all Factory Mutual and Underwriters Laboratories requirements listed in the specifications and resolve any questions or conflicts that may arise.
2. To establish trade-related job schedules, including the installation of roof-mounted mechanical equipment.
3. To establish roofing schedule and work methods that will prevent roof damage.
4. Require that all roof penetrations and walls be in place prior to installing the roof.
5. To establish those areas on the job site that will be designated as work and storage areas for roofing operations.
6. To establish weather and working temperature conditions to which all parties must agree.
7. To establish acceptable methods of protecting the finished roof if any trades must travel across or work on or above any areas of the finished roof.

The Architect shall prepare a written report indicating actions taken and decisions made at this pre-roofing conference. This report shall be made a part of the project record and copies furnished the General Contractor, the Owner, the Building Commission, and the Building Commission Inspector.”
PART 2 – PRODUCTS

Manufacturer: The following manufacturers’ products have been used to establish minimum standard for materials, workmanship and function:

1. American Buildings Company/A Nucor Company; (Basis of Design and Quality); www.americanbuildings.com; 1150 State Docks Road, Eufaula, Alabama 36027; Phone: 334.687.2032

2. Butler Manufacturing; www.butlermfg.com; 1540 Genessee St., Kansas City, MO. 64102; Phone: 816.968.3000

3. MBCI Manufacturing; www.mbci.com; 2280 Monier Avenue, Lithia Springs, Georgia, 30122; Phone: 844.2506 or 770.729.4772.

4. Varco Pruden; www.vp.com; 3200 Players Club Circle, Memphis, TN 38125; Phone: 1.901.748.8000


6. ACI Building Systems, LLC.; www.acibuildingsystems.com; 10125 Highway 6 West, Batesville, MS 38606; Phone: 662.563.4574

MATERIALS:

1. All materials shall be from a single source.


   a. Standing seam roof panel shall have a configuration consisting of 2 inch high vertical rib spaced on 16 inch centers. The panel shall have flush horizontal and vertical surfaces to facilitate sealing at terminations. Panel configurations which create voids requiring supple metal closure devices shall not be considered acceptable. Panels shall be joined at the sideland with an interlocking seam mechanically locked by a seaming machine after installation. The female panel seam shall have a factory applied sealant, in compliance with UL90.

   b. The panel shall be **24 gauge (minimum)** commercially pure aluminum coated steel meeting military specification MIL-C-4174A Type II, Galvalume or G90 galvanized. Minimum yield strength shall be 80,000 PSI.

   c. Deviations in appearance from the quality standard manufacturer’s panel must be approved by the owner before acceptance.

   d. Changes in framing or variations in loading to the existing structure caused by alternate roof systems shall be subject to review and all costs for any modifications
shall be the responsibility of the General Contractor.

e. System Description: The roof system is a concealed fastener interlocking standing seam system. **Panel must not be roll formed on site, nor use a portable roll former whereby the contractor manufactures the panel versus a single sourced manufacture providing the finished materials with a single sourced warranty.**

f. Roof panels shall be standing seam interlocking design and secured to the supports with a concealed structural fastening system. UL certification must appear on the panel if so requested.

g. The concealed attachment system shall eliminate all through penetration of the exposed roofing surface into structural supports and allow the roof covering to move independently of any differential thermal movement by the framing system.

h. The panel to structural clip shall be designed to provide +/- one inch of thermal movement. It shall incorporate a self centered feature to assure one inch of movement in both directions.

i. The standing seam shall have integral male and female interlocking ribs with a factory applied, non-hardening sealant, and the seams shall be continuously locked or crimped together by mechanical means during installation.

j. Roof panels shall be fastened to the support framing members with a concealed clip or backing device of steel having a protective metallic coating. Through penetration of the roofing surface by exposed fasteners shall occur only for non-structural connection at panel termination and roof perimeter flashing location.

k. Panel termination and perimeter flashing (attached to roof panels) shall be sealed with sealants recommended by the manufacturer.

l. Required closures shall be metal. Non-metal closures shall not be acceptable.

METAL FINISHES:

**General:** Apply coating either before or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability. Protect coating promptly after application and cure, by application of strippable film or removable adhesive cover and retain until installation has been completed.

**Color Finish on Roof Panels and Trim:**

a. Panels shall have a factory color finish on the exposed side. The exposed finish shall consist of a 70% KYNAR 500® resin base coating applied to a cleaned, pretreated and primed surface. The dry film thickness of the exterior coating shall not be less than .90 mil minimum, inclusive primer. The interior color finish shall consist of a backer coat with a dry film thickness of 0.5 mil. A low gloss finish is required to minimize the appearance of oil canning.
b. Color of the exterior roof panels and trim shall be selected from manufacturers standard color pallet.

c. The exterior color finish shall meet or exceed the performance requirements specified below.

Paint Color Test:

Test: Film Thickness; Test Method: ASTM D-1005; Performance: 0.2 mil primer 0.8-0.9 mil topcoat
Test: 60° @ under 10 low gloss; Test Method: ASTM D-523; Performance: 25-35
Test: IR Reflectivity; Test Method: ASTM D-4803-97; Performance: Must meet 25% Minimum (exceeds)
Test: Pencil Hardness; Test Method: ASTM D-3363; Performance: HB-H
Test: Flexibility, T-Bend; Test Method: ASTM D-4145; Performance: 2-T Galvalume Steel
Test: Adhesion; Test Method: ASTM D-3359; Performance: No adhesion Loss
Test: Reverse Impact; Test Method: ASTM D-2794; Performance: No cracking or loss of adhesion
Test: Abrasion, Falling Sand; Test Method: ASTM D-968; Performance: 65-85 1/mil
Test: Mortar Resistance; Test Method: ASTM C-267; Performance: No effect
Test: Detergent Resistance; Test Method: ASTM D-2248 3% 72 hrs. @ 100°F; Performance: No effect
Test: Acid Pollutants; Test Method: ASTM D-1308 10% Muriatic Acid (15 min) 20% Muriatic Acid (15 min); Performance: No effect, AAMA 605.2 <5units color change
Test: Acid Rain Test; Test Method: Kesternich; Performance: 15 cycles minimum, no objectionable color change
Test: Alkali Resistance; Test Method: 20% Sodium Hydroxide (1hr); Performance: No effect
Test: Salt Spray Resistance 5% @ 95° F; Test Method: ASTM B-117; Performance: 1000 hrs Galvalume steel
Test: Humidity Resistance 100% @ 100° F; Test Method: ASTM D-2247; Performance: Passes 1000 hrs Galvalume Steel
Test: South Florida exposure; Test Method: ASTM D-2244; Performance: <5 units color change
Test: UVB (313 bulbs); Test Method: ASTM G-53; Performance: Passes 3000 hrs
Test: Chalk Resistance; Test Method: ASTM D-4214; Performance: Rating of 8 min

Colors must meet the following: The solar reflectance for a steep-sloped roof must be a minimum of 25%, dropping no less than to 15% after three years. Low sloped roofs (below 2:12) must be a minimum of 65% dropping to no less than 50% after three years.

ROOF PANELS:

General: Provide roofing sheets formed to the general profile or configuration indicated. All roof panels shall be full length, no end laps allowed.

Zinc-Coated Steel Sheets: Provide structural quality hot-dip galvanized steel sheets, complying with requirements of ASTM A446, Grade C, with G90 coating complying with ASTM A525.

Aluminum Coated Steel Sheets: Provide drawing quality aluminum coated steel sheets, complying with requirements of ASTM A463, with T1-40 coating.

1. Metal thickness not less than 24 ga. (0.0179”).

Accessories: Provide the following sheet metal accessories factory formed of the same material and finish as the roofing and siding.
1. Flashings.
2. Fillers.
3. Metal expansion joints.
4. Facias
5. Ridge covers.
6. Cover exposed structural and secondary members at exterior.

**Fasteners:**

1. Provide self-tapping screws, bolts, nuts, self-locking rivets, self-locking bolts, end welded studs, and other suitable fasteners as standard with the manufacturer designed to withstand design loads.
2. Provide metal-backed neoprene washers under heads of fasteners bearing on weather side of panels.
3. Use stainless steel fasteners for exterior application and galvanized or cadmium plated fasteners for interior applications.
4. Locate and space fastenings in true vertical and horizontal alignment. Use proper type fastening tools to obtain controlled uniform compression for positive seal without rupture of neoprene washer.
5. Provide fasteners with heads matching color of roofing sheets by means of plastic caps or factory-applied coating.

**Flexible Closure Strips:** Provide closed-cell, expanded cellular rubber, self-extinguishing flexible closure strips. Cut or premold closure strips to match corrugation configuration of roofing and siding sheets. Provide closure strips where indicated or necessary to ensure weathertight construction.

**Sealing Tape:** Provide pressure sensitive 100 percent solids isobutylene tripolymer compound sealing tape with release paper backing. Provide permanently elastic, non-sag, non-toxic, non-staining tape not less than 1/2" wide and 1/8" thick.

**Joint Sealants:** Provide one-part elastomeric polyurethane polysulfide or silicone rubber sealant as recommended by the building manufacturer.

**MISCELLANEOUS MATERIALS:**

**Internal Panel Framing:** Manufacturer's standard.

**Fasteners:** Manufacturer's standard noncorrosive types, with exterior heads gasketed.

**Accessories:** Except as indicated as work of another specification section, provide components required for a complete roofing/siding system, including:

1. Trim
2. Copings
3. Fascias
4. Gravel stops
5. Mullions
6. Sills
7. Corner Units
8. Ridge Closures  
9. Clips  
10. Seam Covers  
11. Battens  
12. Flashings  
13. Gutters  
14. Downspouts  
15. Louvers  
16. Sealants  
17. Gaskets  
18. Fillers  
19. Closure Strips  
20. All similar items.  

**Bituminous Coating:** Cold-applied asphalt mastic, SSPC paint 12, compounded for 15 mil dry film thickness per coat.

**SHEET METAL ACCESSORIES:**

**General:** Provide coated steel sheet metal accessories with coated steel roofing and siding panels.

**Gauges of Materials:**

1. Roof Panels - 24 ga.  
2. Rake Flashing - 26 ga.  
3. Fascia – 26 ga.

**Roof Curbs:** The fully welded roof curb units shall be fabricated to the specifications of the roofing manufacturer, thus assuring its compatibility with the roof constructions framing and covering. Roof curbs shall be of size and design to accommodate the various projecting elements to be retained. The contractor is responsible for verification of the various sizes, configurations, and requirements. It is expected that the contractor use the existing conditions, surfaces, and elements as a source material for these requirements. The roof curb shall be of size and design required for fan, vent or air conditioning equipment. It shall support the specific ventilating device in a nominally horizontal position above the weather surface of the roof and adequately deflect storm drainage around its periphery. All sealants, closures and fasteners, etc. shall be included for proper installation and performance. Roof subframing and/or headers shall be provided for additional rigidity and support of the curb and its ventilating device. Roof vent curb and supporting framing shall provide for expected expansion and contraction of roof panels.

**Roof Jacks:** Openings 8” in diameter or smaller may be flashed and sealed to the roof panel by jacks. Material shall be an EPDM material with an aluminum sealing ring base. Jacks are acceptable providing attachment in flat of panel and no standing seam rib has been altered. If rib must be cut, a curb must be used. Installation of roof jacks must comply with manufacturer’s instructions.
PART 3 - EXECUTION

INSTALLATION:

General: Comply with panel fabricator’s and material manufacturer’s instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal/structural movement.

1. Install panels with concealed fasteners.

Installation Tolerances: Shim and align panel units within installed tolerance of 1/4" in 20'-0" on level/plumb/slope and location/line as indicated, and within 1/8" offset of adjoining faces and of alignment of matching profiles.

Joint Sealers: Install gaskets, joint fillers and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets and sealants/fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer. Refer to other sections of these specifications for product and installation requirements applicable to indicated joint sealers.

Water shall be prevented from entering the building during the work. This shall involve keeping penetrations sealed, planning the work to reroof sections and sealing new to old or other precautionary and effective safeguards.

ROOFING:

General: Arrange and nest sidelpad joints so that prevailing winds blow over, not into, lapped joints. Apply panels and associated items for neat and weathertight enclosure. Avoid “panel creep” or application not true to line. Protect factory finishes from damage.

1. Provide weatherseal under ridge cap. Flash and seal roof panels at eave and rake with rubber, neoprene or other closures to exclude weather.

Standing Seam Roof Panel System: Fasten roof panels to hat channels with concealed clip in accordance with the manufacturer’s instructions.

1. Install clips at each support using self-drilling fasteners.
2. At end laps of panels install two strips of tape caulk between panels.
3. Install factory-caulked cleats at standing seam joints. Machine seam cleats to the panels to provide a weather-tight joint.

Sheet Metal Accessories: Install gutters, downspouts, ventilators, louvers, and other sheet metal accessories in accordance with manufacturer’s recommendations for positive anchorage to building and weathertight mounting. Adjust operating mechanism for precise operation.

CLEANING AND PROTECTION:

Damaged Units: Replace panels and other components of the work which have been damaged.
or have deteriorated beyond successful repair by means of finish touch-up or similar minor repair procedures.

Cleaning: Remove temporary protective coverings and strippable films (if any) as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer and maintain in a clean condition during construction.

END OF SECTION
SECTION 07560 - FLUID APPLIED ROOFING

PART 1 DESCRIPTION

1.1 DESCRIPTION OF EXISTING SUBSTRATES

This specification is only intended for the application of the PremiumCoat system over commercial metal panels. Panels are generally 3ft wide by varying lengths. This specification does not apply to any type of Standing seam metal roofs.

1.2 DESCRIPTION OF FLUID APPLIED ROOFING SYSTEM

The fluid applied roofing system must consist of a reinforced elastomeric system specifically designed for use on a roof. The system must have been approved by FMRC (Factory Mutual Research Corporation) according to Standard 4470 for Class 1 Roof Constructions which includes- Spread of Flame Fire, Windstorm Pressure, Windstorm Pull, Hail Damage, Resistance to Foot Traffic, and Susceptibility to Leakage Classifications.

1.3 SECTION INCLUDES

1. Fluid applied flexible acrylic waterproofing system over existing metal roofing system. This work shall include the preparation of the roof deck, application of the roof system, flashing system, and clean up.

1.4 RELATED WORK

1. The contractor shall review all sections of these specifications to determine items of work that will interface with the application of this roofing system. Coordination and execution of related sections shall be the responsibility of the contractor.

1.5 REFERENCES

5. ASTM G26 - Practice for Operating Light- and Water-Exposure Apparatus (Xenon Arc Type) for Exposure of Nonmetallic Materials.
6. ASTM D-412 - Ultimate Tensile Strength at Break.

8. ASTM C1549- Standard test method for determination of solar reflectance near ambient temperature using a portable solar reflectometer

9. ASTM C1371- Standard test method for determination of emittance of materials near room temperature using portable emissometers


1.6 SUBMITTALS

1. Shop Drawings: Submit a scaled drawing showing the layout of joint reinforcing and all flashing details.

2. Product Data: Provide manufacturer’s technical literature on products that make up the roofing system. This shall include, but is not limited to, coatings, reinforcing fabrics, flashing materials, roof drains, fasteners, etc...

3. Manufacturer’s Installation Instructions: Submit all data sheets available from the manufacturer on the installation of the roofing system applicable to the work.

4. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.7 QUALIFICATIONS

1. Applicator Qualifications: The applicator of the roofing material specified herein shall be an approved applicator (designated by Hydro-Stop LLC). Proof of this qualification shall be provided in written form from the manufacturer of the roofing system.

1.8 QUALITY CONTROL

1. Codes and Standards: The contractor shall make him/ herself thoroughly familiar with all codes, regulations, and standards governing the specified work. Any contradiction between the manufacturer’s requirements and these specifications shall be brought to the attention of the manufacturer and the specifier.

2. Deviations: There shall not be any deviations from these specifications unless the deviation is submitted in writing to the specifier. The request for deviation must have a letter
from the roofing manufacturer’s technical department approving the details of the deviation.

3. An Approved Applicator (as designated by Hydro-Stop LLC) shall be on site during all applications of any Hydro-Stop products.

4. Manufacturer’s Technical Representative: An employee of the roofing material manufacturer shall be on site at least once every 7-calendar days during the work specified herein. Upon request the technical representative shall provide a written inspection report, visit and submit the reports to the owner/owner’s representative. The representative must approve the application process at specific stages before may continue including: Pre-Bid Inspection, Start-Up Inspection, at the completion of the FoundationCoat & fabric components, and completed FinishCoat inspection.

1.9 DELIVERY, STORAGE, AND HANDLING

1. Deliver materials to site in manufacturer's unopened and undamaged containers bearing the following information:
   1. Name of manufacturer.
   2. Name of contents and products code.
   4. Lot or batch number.
   5. VOC content
   7. Shelf life expiration date.
   8. Mixing instructions and proportions of contents.
   9. Safety information and instructions.

2. Store and protect materials from damage and weather in accordance with manufacturer's instructions.

3. Store materials at temperatures between 50-90 degrees F (10.0-32.2 degrees Celsius). Keep out of direct sunlight.

4. Support stored material containers on pallets and cover with tarpaulin tied to bottom of pallets.

1.10 ENVIRONMENTAL REQUIREMENTS

1. Do not apply if ambient temperatures are expected to fall below 40 degrees F (4.5 degrees Celsius) or if rain is expected before the application has time to cure.

1.11 WARRANTY

1. Provide Fifteen-year manufacturer’s Labor and Material warranty.
PART 2 PRODUCTS

2.1 MANUFACTURER

1. Hydro-Stop, LLC
   1465 Pipefitter Street
   North Charleston, SC 29405
   Toll Free: (800) 739-5566
   Phone: (843) 745-9600
   Fax: (843) 745-9602
   Web: www.hydro-stop.com

Or approved equal.

2.2 MEMBRANE COMPOUND MATERIAL

1. Waterproofing Material: PremiumCoat three-stage, fabric reinforced, flexible acrylic coating, fluid applied in successive stages to form one continuous, seamless, watertight membrane; 40 mil (.04 inches / 1.016 millimeters) minimum cured total system thickness; comprised of the following:
   1. Foundation and Saturation Coats: PremiumCoat FoundationCoat (highly flexible water based 100% pure acrylic polymer resin coatings).
   3. Finish Coat: PremiumCoat FinishCoat (ultraviolet light resistant, blend of highly flexible water based 100% pure acrylic polymer resin coating); color as selected from manufacturer's standard colors.

2. Reinforcing Fabric: This material shall be non-woven 100% polyester, stitch bonded, heat set fabric with the following characteristics:

   Weight: 3 oz / per square yard (106.31 grams / square meter)
   Tensile Strength
     Warp 74 lbs. (33.60 kg) per ASTM D 5034
     Fill 45 lbs. (20.43 kg)
   Elongation @ Break
     Warp 21.3% per ASTM D 5034
     Fill 51.3%
   Ball Burst 111 lbs. (50.39 kg) per ASTM D 3787
   Trapezoid
     Warp 13.5 lbs. (6.13 kg) per ASTM D 117
     Fill 24.2 lbs. (10.99 kg)
   Thickness .018 inches (.457 mm) per ASTM D-1777

3. Cured Membrane Characteristics:

   PROPERTY      TEST       RESULT
   Elongation     ASTM D638  >300% elastomeric
   Tensile Strength (cured) ASTM D412  >2000 PSI (13,789 kPA)

 Alterations & Additions to
Prattville Boys & Girls Club for
Community Development Institute Head Start
Prattville, Alabama

MCKEE PROJECT # 19-108
Density: \hspace{2cm} 12.1 lb/gal  
Volume Solids: \hspace{2cm} \geq 53 \%  
Weight Solids: \hspace{2cm} \geq 66\%  
Algae Resistance \hspace{2cm} ASTM G29 \hspace{2cm} No Growth Supported  
Moisture Vapor \hspace{2cm} ASTM E96 \hspace{2cm} 3 Perms  
Weathering \hspace{2cm} ASTM G26 \hspace{2cm} No effect after 3,000 hours.  
Salt Spray Test \hspace{2cm} ASTM B117 \hspace{2cm} No effect.  
Fire Rating \hspace{2cm} ASTM E108 \hspace{2cm} Class A  
VOC (calculated): \hspace{2cm} < 72 g/L  
Susceptibility to Leakage \hspace{2cm} FM 4470 \hspace{2cm} No signs of water leakage.  
Windstorm Pressure \hspace{2cm} FM 4470 \hspace{2cm} Meets Class 1-90  
Windstorm Pull \hspace{2cm} FM 4470 \hspace{2cm} Class 1-225 on Polyisocyanurate \hspace{2cm} Class 1-270 on Expanded Polystyrene \hspace{2cm} Class 1-375 on Lightweight Concrete \hspace{2cm} Class 1-735 on Structural Concrete  
Severe Hail Test \hspace{2cm} FM 4470 \hspace{2cm} No separation or rupture 1-SH  
Resistance to Foot Traffic \hspace{2cm} FM 4470 \hspace{2cm} No sign of tearing or cracking.  
Liquid Applied Acrylic \hspace{2cm} ASTM D6083 \hspace{2cm} Approved  
Solar Reflectance \hspace{2cm} ASTM C1549 \hspace{2cm} \geq 0.90  
Thermal Emittance \hspace{2cm} ASTM C1371 \hspace{2cm} \geq 0.79  
OTC (Ozone Transport Commission) \hspace{2cm} Compliant  
California Title 24 \hspace{2cm} Compliant  
CRRC (Cool Roof Rating Council) \hspace{2cm} Approved  
Energy Star (Dept. of Energy) \hspace{2cm} Approved  
(*White or Cotton Finish Coat Only*)

### 2.3 ACCESSORIES

1. Cant Strips: Approved composition materials are EPS (Expanded Polystyrene), ISO (Polyisocyanurate), and wood (Non-Pressure Treated). Cant strips are to be installed at all internal corners, around curbs, and at all 90 degree angles specified by Hydro-Stop LLC.

2. Hydro-Fiber: Bulking material used in conjunction with Foundation Coat or BarrierGuard slurry (as specified by Hydro-Stop Technical Representative) to fill cracks, voids, or low depressions on various substrates.

3. StableRust Primer: water based surfactant-free primer used in direct metal applications to stabilize and protect metal surfaces.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

Alterations & Additions to  
Prattville Boys & Girls Club for  
Community Development Institute Head Start  
Prattville, Alabama  

FLUID APPLIED ROOFING  
MCKEE PROJECT # 19-108
1. Verify substrate surfaces are durable, free of frozen matter, dampness, loose particles, cracks, pits, projections, or foreign matter detrimental to adhesion or application of waterproofing system.

2. Verify that substrate surfaces are smooth and not detrimental to full contact bond of waterproofing materials.

3. Verify items that penetrate surfaces to receive waterproofing are securely installed.

4. Verify that substrate areas are adequately supported and firmly fastened in place.

5. Verify that roofing panels have a minimum slope of .25 inch / foot (2.083cm/meter)

6. Verify that roof does not have ponding water areas.

7. Verify that all attached vertical walls are properly waterproofed.

3.2 PREPARATION

1. Protect adjacent surfaces not designated to receive waterproofing.

2. As a minimum, clean and prepare surfaces to receive waterproofing by removing all loose and flaking particles, grease and laitance with the use of a stiff bristle push broom and or washing. Care should be taken not to inject water into the substrate during washing. In some cases additional drying time may be required after the cleaning process. Please consult your Hydro-Stop LLC Technical Sales Representative for additional advice on cleaning various roofing substrates.

3. Make all necessary repairs to existing substrate. Contact Hydro-Stop Technical Representative for assistance.

4. Do not apply waterproofing to surfaces unacceptable to manufacturer.

3.3 APPLICATION

1. Rusted Bare Metal or Clean Rusted Metal: Remove all scale and apply StableRust Primer at a rate of 150-200 ft²/ gal (4.755 m²/ liter) to all rusted areas. Allow to dry. Protect from weather until dry. Note: Heavily rusted metal may need 2 coats of StableRust. Consult with your H-S Representative.

2. Aluminized Coated Metal: Remove all coating build up, by mechanical means if necessary, and apply StableRust Primer at a rate of 150-200 ft²/ gal (4.755 m²/ liter) to all suspect metal. Allow to dry. Protect from weather until dry.

3. Foundation Coat & Fabric Components - Consist of one coat of FoundationCoat applied to the substrate, Hydro-Stop PremiumCoat Fabric (sizes vary) laid into the wet
FoundationCoat, and finally a second coat of FoundationCoat saturating the fabric from above. Care should be given to ensure that adjacent runs of fabric are overlapped a minimum of 4 inches (10.16 cm). Foundation Coats are applied at a total rate of 40 ft²/gal (.951 m²/liter). FoundationCoat should only be applied with the use of approved roof brushes. Rolling, and spraying of the FoundationCoat are absolutely forbidden.

A. Roof Penetrations- Using 12 inch (30.48 centimeters) fabric and the Foundation components (described above) seal items projecting through waterproofing material watertight. Waterproof up penetrations a minimum of 6” (15.24 centimeters)

B. Vertical Seams- Using 6 inch (15.24 centimeters) fabric and the Foundation components (described above) seal all vertical seams. Foundation Coat & Fabric components must be centered on the panel seams. Protect from weather until dry.

C. Horizontal Laps- Using 12 inch (30.48 centimeters) fabric and the Foundation components (described above) seal all horizontal laps. Foundation Coat & Fabric components must be centered on the panel laps. Protect from weather until dry.

D. Exposed Mechanical Fasteners- Using either a Hydro-Cap or a 6 in. x 6 in. (15.24 x 15.24 centimeters) piece of fabric and the Foundation components (described above) seal all mechanical fasteners. Protect from weather until dry.

E. Parapet & Vertical Wall Junctions- Using 12 inch (30.48 centimeters) fabric and the Foundation components (described above), waterproof roof/wall junctions. Continue waterproofing up vertical surfaces and onto deck a minimum of 6 inches (15.24 centimeters) in each direction.

F. Existing Fabric Embedded Asphalt Patching: Using appropriate size Fabric and Foundation Component, cover all existing asphalt patchwork lapping fabric off of asphalt approximately 2’s. Must be approved by H-S Representative.

3. Finish Coat Component- Apply 3 coats of FinishCoat at a combined total rate of 47 ft²/gal (2.478 m²/liter) over entire roof area. Minimum millage requirements are 11.5 mils (.0115 inches / .292 millimeters) wet and 6.1 mils (.0061 inches / .155 millimeters) dry per coat. Allow to dry between coats. Total Finish Coat dry thickness should be a minimum of 18.3 mils (.0183 inches / .458 millimeters).

Note: 1st and 3rd FinishCoats must be of the same color with the 2nd FinishCoat an alternate or different color, approved by Hydro-Stop.

4. Completed PremiumCoat System - System must be installed to a minimum 46.1 mil .0461 inches / 1.171 millimeters) total cured thickness at areas detailed with FinishCoat and Fabric & Foundation Components. Total FinishCoat dry thickness should be a minimum of 18.3 mils (.0183 inches / .458 millimeters) not including primer.
3.4 PROTECTION OF FINISHED WORK

1. Monitor finished system for 7 day, sweeping off birdbaths to allow for full cure.

3.5 CLEANING

1. Immediately clean unscheduled surfaces receiving waterproofing in accordance with manufacturer's instructions.

END OF SECTION
SECTION 08700 – FINISH HARDWARE (Revise 4.30.19)

PART 1 – GENERAL

RELATED DOCUMENTS

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

SUMMARY

This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

This Section includes the following:

1. Hinges.
2. Key control system.
3. Lock cylinders and keys.
4. Lock and latch sets.
5. Bolts.
7. Push/pull units.
8. Closers.
10. Miscellaneous door control devices.
11. Door trim units.
12. Protection plates.
14. Sound stripping for interior doors.
15. Automatic Drop Seals (door bottoms)
16. Astragals or meeting seals on pairs of doors.
17. Thresholds.

Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 8 Section "Standard Steel Doors and Frames" for silencers integral with hollow metal frames.
2. Division 8 Section "Flush Wood Doors" for factory pre-fitting and factory pre-machining of doors for door hardware.
3. Division 8 Section "Aluminum Entrances and Storefronts" for aluminum entrance door hardware, except cylinders.

HARDWARE ALLOWANCE

Allowance of $750.00 for Certified AHC (Architectural Hardware Consultant) & FDAI (Fire Door Assembly Inspector – document of certification from DHI must be provided) to visit job site upon substantial completion as directed by Architect. A written report will be required for the Owner,
QUALITY ASSURANCE

Door hardware supplier’s responsibilities shall be as follows:

1. **Submittals:** Submit through Contractor required product data, final hardware schedule; separate keying schedule, and samples as specified in this Section, unless otherwise indicated.

2. **Hardware Review Meeting:** Hardware Supplier shall attend a scheduled “Hardware Review Meeting” with the Contractor, Owner and Architect representative. All Hardware products, hardware installation locations, finishes, color selections, ratings and keying is to be reviewed and discussed. The Hardware Supplier understands the Hardware Submittal is not deemed “Fully Approved” until the Owner has completed their review and given “Approval”.

3. **Construction Schedule:** Inform Contractor promptly of estimated times and dates that will be required to process submittals, to furnish templates, to deliver hardware, and to perform other work associated with furnishing door hardware for purposes of including this data in construction schedule. Comply with this schedule.

4. **Coordination and Templates:** Assist Contractor as required to coordinate hardware with other work in respect to both fabrication and installation. Furnish Contractor with templates and deliver hardware to proper locations.

5. **Product Handling:** Package, identify, deliver, and inventory door hardware specified in this Section.

6. **Discrepancies:** Based on requirements indicated in Contract Documents in effect at time of door hardware selection, furnish types, finishes, and quantities of door hardware, including fasteners, and Owner’s maintenance tools required to comply with specified requirements and as needed to install and maintain hardware. Furnish or replace any items of door hardware resulting from shortages and incorrect items at no cost to the Owner or Contractor. Obtain signed receipts from Contractor for all delivered materials.

Contractor’s responsibilities shall be as follows:

1. **Submittals:** Coordinate and process submittals for door hardware in same manner as submittals for other work.

2. **Hardware Review Meeting:** Contractor is to schedule and attend a “Hardware Review Meeting” with the Owner, Hardware Supplier and Architect Representative. All Hardware products, hardware installation locations, finishes, color selections, ratings and keying is to be reviewed and discussed. The Contractor understands the Hardware Submittal is not deemed “Fully Approved” until the Owner has completed their review and given “Approval”.

3. **Construction Schedule:** Cooperate with door hardware supplier in establishing scheduled dates for submittals and delivery of templates and door hardware. Incorporate in construction schedule the times and dates related to furnishing hardware by door hardware supplier.

4. **Coordination:** Coordinate door hardware with other Work. Furnish hardware supplier or manufacturer with shop drawings of other work where required or requested. Verify completeness and suitability of hardware with supplier.
5. **Product Handling:** Provide secure lock-up for hardware delivered to the site. Inventory hardware jointly with representative of hardware supplier and issue signed receipts for all delivered materials.

6. **Installation Information:** The general types and approximate quantities of hardware required for this Project are indicated at the end of this Section in order to establish Contractor's costs for installation and other work not included in allowance.

7. **No adjustments in Contract sum will be made for costs other than those covered by the allowances for subsequent increases or decreases in quantity of one or more hardware types that do not exceed 5 percent.**

**SUBMITTALS**

**General:** Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.

Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.

Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Upon return of the reviewed finish hardware schedule, arrange for a meeting with the Owner and representatives of Architect. A keying schedule will be established and submitted to the Architect and Owner. After review, the keying schedule will be returned to representatives of Finish Hardware Supplier so that permanent cylinders and keys can be prepared on a timely basis.

**QUALITY ASSURANCE**

**Single Source Responsibility:** Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.

**Supplier Qualifications:** A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for a minimum of 10 years, for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced "Certified "architectural hardware consultant (AHC)" as recognized by the Door and hardware Institute (DHI). All submittals shall be signed by an AHC who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

**Fire-Rated Openings:** Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.
PRODUCT HANDLING

Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.

Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.

Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).

Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

MAINTENANCE

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

PART 2 – PRODUCTS

HINGES:

A. Manufacturers:
   1. Ives
   2. McKinney
   3. Bommer

B. Material:
   1. Provide only template produced units
   2. Provide Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head wood screws for installation of units in to wood. Finish screw heads to match surface of hinges or pivots.
   3. Hinge pins, except as noted, are to be provided as follows:
      a. Steel Hinges: Steel pins
      b. Non-ferrous Hinges: Stainless steel pins
      c. Exterior Doors: Use Non-Removable Pins
      d. Interior Doors: Non-rising pins
      e. Electric Hinges: Non-removable pins
   4. Tips shall be flat button and matching plug, finished to match leaves.
5. Provide number of hinges indicated but not less than three (3) hinges for door leaf of 90" or less in height and one additional hinge for each 30" of additional height.
6. Provide ball bearing hinges of the type and weight suggested by the hinge manufacturer for each type of door application.

**LOCK CYLINERS AND KEYING:**

A. Manufacturers:
   1. Match existing keying system of the school.

B. Material:
   1. Match existing keying system or establish new (Schlage Everest 29R) keying system per owner direction. Except as otherwise indicated, provide new master key system for project.
   2. Equip locksets with Small Format Interchangeable Cores (SFIC) with restricted keys (Schlage Everest 29R) and auxiliary locking pin.
   3. Construct lock cylinder parts from brass or bronze, stainless steel, or nickel silver.
   4. Metals: Construct lock cylinder parts from brass or bronze, stainless steel, or nickel silver.
   5. Comply with Owner's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with a group of related locks.
   6. Permanently inscribe each key with number of lock that identifies cylinder manufacturer's key symbol, and notation, "DO NOT DUPLICATE".
   7. Key Material: Provide keys of nickel silver only.
   8. Key Quantity: Furnish (3) operating keys per cylinder, (8) for keyed alike groups, (5) master keys for each master key group created, (15) construction master keys, (2) construction extractor keys.
   9. Key Cabinet: Provide one wall mount key cabinet, Lunde Deluxe 1200 Series, 2 tag key system. Capacity shall be 150% of keys required for the project. Provide complete with key tags, card, tools, etc. General contractor shall mount the key cabinet in the location to be provided by the architect.

**LOCKSETS AND LATCHSETS**

A. Manufacturers:
   1. Falcon K-Series, "Dane" Lever Design.
   2. Schlage ND-Series
   3. Sargent 11 Series

B. Material:
   1. Locksets and latch-sets of all manufacturers must conform to the requirements of Sub paragraphs 2 and be approved by the Architect.
   2. Mortise Type
      a. Locksets and latch sets must conform to ANSI A115.18, Grade 1.
      b. Locksets and latch-sets must be heavy duty mortise type with 2-3/4 in. backset, or greater as specified, with a ¾ inch throw latch-bolt.
CLOSERS

A. Manufacturers:

1. Falcon SC70A Series
2. LCN 4050 Series
3. Norton 7500 Series

B. Material:

1. Size of units: Except as otherwise specifically indicated, comply with the manufacturer’s recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.
   a. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.
   b. Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units, ANSI opening force and delayed action closing.
2. Closers are to be fully hydraulic, rack and pinion action with high strength cast iron cylinders and one piece forged steel pistons. Closer Piston diameter at exterior doors shall be minimum 1½”. Hydraulic regulation to be controlled by tamper-proof, non-critical screw values, adjustable with a hex by tamper-proof, non-critical screw valves, adjustable with a hex wrench. Separate adjustments for back check, general speed, and latch speed. Where detailed in the door hardware sets, provide delayed action feature to delay closing up to one minute for maximum opening to approximately 75. Back check shall be properly located for protection of the door, frame and applied hardware.
3. All door closers shall comply with ANSI A156.4 Grade 1 and meet the standards of ANSI A117.1 for barrier-free accessibility.
4. Provide closers with full metal covers.

OVERHEAD STOPS AND HOLDERS

A. Manufacturers:

1. Glynn Johnson
2. Sargent
3. Rixson
4. (No other manufacturer to be accepted)

B. Material:

1. Conform to ANSI A156.8 Grade 1.

PUSH/PULLS & PROTECTION PLATES

A. Manufacturers:

1. Ives
2. Trimco
3. Burns
4. (No other manufacturer to be accepted)

B. Material:

1. Provide manufacturers standard exposed fasteners for installation, through bolted for matched pairs, but not of single units.
2. Provide 16 gauge minimum thickness for plates.
3. Where specified in the schedule, push/pulls shall have an antimicrobial coating.

THRESHOLDS, WEATHERSTRIPPING & GASKETING

A. Manufacturers:

1. Zero
2. National Guard
3. Pemko
4. (No other manufacturer to be accepted)

B. Material:

1. Provide continuous weather-stripping at each edge of every exterior door leaf, except as otherwise indicated.
2. Provide type, size and profile shown as scheduled.
3. Provide non-corrosive fasteners as recommended by manufacturer for application indicated. Do not specify adhesive backed weather-strip or gasket material.
4. Where replaceable seal strips are scheduled, provide only those units where resilient or flexible seal strip is easily replaceable from stocks maintained by manufacturer.
5. Proved standard metal threshold unit of type, size and profile shown as scheduled.

FINISHES

Hardware finishes shall conform to ANSI and shall be as listed below for aluminum, FRP, hollow metal and wood doors:

<table>
<thead>
<tr>
<th>But Hinges</th>
<th>652 Satin Chrome Plated Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Geared</td>
<td>US28</td>
</tr>
<tr>
<td>Aluminum Hinges</td>
<td></td>
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<tr>
<td>Locksets</td>
<td>626 Satin Chrome</td>
</tr>
<tr>
<td>Exit Devices</td>
<td>US26D with Stainless Steel Touch Bars</td>
</tr>
<tr>
<td>Door Closers</td>
<td>689</td>
</tr>
<tr>
<td>Thresholds</td>
<td>628</td>
</tr>
<tr>
<td>Miscellaneous Items</td>
<td>626 or 630</td>
</tr>
</tbody>
</table>

PART 3 – EXECUTION

INSTALLATION
Install each hardware item in compliance with manufacturer’s instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, 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.

1. Do not install surface mounted items until finishes have been completed on the substrate.

Conform to ANSI A117.1 for positioning requirements for the handicapped.

**PROTECTION AND CLEANING**

After installation, clean metal surfaces on both interior and exterior of all mortar, paint and other contaminants. After cleaning, protect work against damage.

**FINAL ADJUSTMENT**

Whenever hardware is installed more than one month prior to occupancy or acceptance, return during the week prior to acceptance or occupancy and make a final inspection and adjustment of all hardware items in such space or area.

**SCHEDULE**
## HARDWARE SET: 01

**DOOR NUMBER:**

120  120A

**EACH TO HAVE:**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tr>
<td>1</td>
<td>CONT. HINGE</td>
<td>224XY</td>
</tr>
<tr>
<td>1</td>
<td>PANIC HARDWARE</td>
<td>25-R-NL</td>
</tr>
<tr>
<td>1</td>
<td>SFIC MORTISE CYL.</td>
<td>80-132</td>
</tr>
<tr>
<td>1</td>
<td>SFIC EVEREST CORE</td>
<td>80-037</td>
</tr>
<tr>
<td>1</td>
<td>SURFACE CLOSER</td>
<td>SC71A SS</td>
</tr>
<tr>
<td>1</td>
<td>KICK PLATE</td>
<td>8400 8&quot; X 2&quot; LDW B-CS</td>
</tr>
<tr>
<td>1</td>
<td>GASKETING</td>
<td>8144SBK PSA</td>
</tr>
<tr>
<td>1</td>
<td>DOOR SWEEP</td>
<td>8198AA</td>
</tr>
<tr>
<td>1</td>
<td>THRESHOLD</td>
<td>65A</td>
</tr>
<tr>
<td>1</td>
<td>OVERHEAD DRIP</td>
<td>142A</td>
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</tbody>
</table>

## HARDWARE SET: 02

**DOOR NUMBER:**

103A  123A  126A  129A  102A

**EACH TO HAVE:**

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</thead>
<tbody>
<tr>
<td>1</td>
<td>CONT. HINGE</td>
<td>224XY EPT NOTCH</td>
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<td>POWER TRANSFER</td>
<td>EPT10</td>
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<td>1</td>
<td>ELEC PANIC HARDWARE</td>
<td>RX-EA-25-R-EO</td>
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<tr>
<td>1</td>
<td>SFIC EVEREST CORE</td>
<td>80-037</td>
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<tr>
<td>1</td>
<td>SFIC MORTISE CYL.</td>
<td>80-132</td>
</tr>
<tr>
<td>1</td>
<td>SURFACE CLOSER</td>
<td>SC71A SS</td>
</tr>
<tr>
<td>1</td>
<td>KICK PLATE</td>
<td>8400 8&quot; X 2&quot; LDW B-CS</td>
</tr>
<tr>
<td>1</td>
<td>GASKETING</td>
<td>8144SBK PSA</td>
</tr>
<tr>
<td>1</td>
<td>POWER SUPPLY</td>
<td>PS902</td>
</tr>
<tr>
<td>1</td>
<td>DOOR SWEEP</td>
<td>8198AA</td>
</tr>
<tr>
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<td>THRESHOLD</td>
<td>65A</td>
</tr>
<tr>
<td>1</td>
<td>OVERHEAD DRIP</td>
<td>142A</td>
</tr>
</tbody>
</table>

**EXIT DEVICES EQUIPPED WITH EXIT ALARM. ALARM KITS TO BE HARDWIRED. ALARMS TURNED ON AND OFF VIA KEYED CYLINDER ON EXIT DEVICE. ALARM RESET VIA KEYED CYLINDER.**

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*Alterations & Additions to*  
Prattville Boys & Girls Club for  
Community Development Institute Head Start  
Prattville, Alabama  

**FINISH HARDWARE**  
08700-9  
(Revise 4.30.19)  

**MCKEE PROJECT # 19-108**
## HARDWARE SET: 03

DOOR NUMBER:  
111 \hspace{2cm} 120B

EACH TO HAVE:  
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Notes</th>
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<tbody>
<tr>
<td>1</td>
<td>CONT. HINGE</td>
<td>224XY EPT</td>
<td>IVE</td>
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<tr>
<td>1</td>
<td>ELEC PANIC HARDWARE</td>
<td>RX-MEL-25-R-NL-24VDC</td>
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<tr>
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<td>SFIC MORTISE CYL.</td>
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<td>SCH</td>
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<tr>
<td>1</td>
<td>SFIC EVEREST CORE</td>
<td>80-037</td>
<td>SCH</td>
</tr>
<tr>
<td>1</td>
<td>SURFACE CLOSER</td>
<td>SC71A SS</td>
<td>FAL</td>
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<td>1</td>
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<td>DOOR SWEEP</td>
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<td>ZER</td>
</tr>
<tr>
<td>1</td>
<td>THRESHOLD</td>
<td>65A</td>
<td>ZER</td>
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<tr>
<td>1</td>
<td>OVERHEAD DRIP</td>
<td>142A</td>
<td>ZER</td>
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<tr>
<td>1</td>
<td>CREDENTIAL READER</td>
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<td>DOOR CONTACT</td>
<td>BY SECURITY/ACCESS CTRL SYSTEMS</td>
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<tr>
<td>1</td>
<td>POWER SUPPLY</td>
<td>PS902 900-4RL 120/240VAC</td>
<td>VON</td>
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## HARDWARE SET: 04

DOOR NUMBER:  
122

EACH TO HAVE:  
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<th>Manufacturer</th>
<th>Notes</th>
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<tr>
<td>1</td>
<td>CONT. HINGE</td>
<td>224XY</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>STOREROOM LOCK</td>
<td>K581HD DAN</td>
<td>FAL</td>
</tr>
<tr>
<td>1</td>
<td>OH STOP &amp; HOLDER</td>
<td>90H</td>
<td>GLY</td>
</tr>
<tr>
<td>1</td>
<td>RAIN DRIP</td>
<td>142</td>
<td>ZER</td>
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<td>1</td>
<td>GASKETING</td>
<td>8144SBK PSA</td>
<td>ZER</td>
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<td>1</td>
<td>DOOR SWEEP</td>
<td>8198AA</td>
<td>ZER</td>
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<tr>
<td>1</td>
<td>THRESHOLD</td>
<td>65A</td>
<td>ZER</td>
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## HARDWARE SET: 05

DOOR NUMBER:  
116 \hspace{1cm} 118

EACH TO HAVE:  
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<th>Notes</th>
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<tbody>
<tr>
<td>3</td>
<td>HINGE</td>
<td>5BB1HW 4.5 X 4.5</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>PULL PLATE</td>
<td>8303 8&quot; X 4&quot; X 16&quot;</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>PUSH PLATE</td>
<td>8200 4&quot; X 16&quot;</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>SURFACE CLOSER</td>
<td>SC71A RW/PA</td>
<td>FAL</td>
</tr>
<tr>
<td>1</td>
<td>MOP PLATE</td>
<td>8400 4&quot; X 1&quot; LDW B-CS</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>KICK PLATE</td>
<td>8400 6&quot; X 2&quot; LDW B-CS</td>
<td>IVE</td>
</tr>
<tr>
<td>1</td>
<td>WALL STOP</td>
<td>WS406/407CCV</td>
<td>IVE</td>
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</table>
**HARDWARE SET: 06**

**DOOR NUMBER:**
112

**EACH TO HAVE:**
- 3 HINGE: 5BB1HW 4.5 X 4.5
- 1 SGL CYL X TURN DB: D141HD
- 1 SFIC EVEREST CORE: 80-037
- 1 PULL PLATE: 8303 8" 4" X 16"
- 1 PUSH PLATE: 8200 4" X 16"
- 1 SURFACE CLOSER: SC71A RW/PA
- 1 KICK PLATE: 8400 8" X 2" LDW B-CS
- 1 MOP PLATE: 8400 4" X 1" LDW B-CS
- 1 WALL STOP: 8400/8407 SCV

**HARDWARE SET: 07**

**DOOR NUMBER:**
112A

**EACH TO HAVE:**
- 3 HINGE: 5BB1 4.5 X 4.5
- 1 CLASSROOM LOCK: K561HD DAN
- 1 SFIC EVEREST CORE: 80-037
- 1 WALL STOP: WS406/407CCV

**HARDWARE SET: 08**

**DOOR NUMBER:**
125 128 131 104A

**EACH TO HAVE:**
- 3 HINGE: 5BB1 4.5 X 4.5
- 1 CLASSROOM LOCK: K561HD DAN
- 1 SFIC EVEREST CORE: 80-037
- 1 OH STOP: 450S

**HARDWARE SET: 09**

**DOOR NUMBER:**
102 103 104 106 107 108
110 121 123 126 129

**EACH TO HAVE:**
- 3 HINGE: 5BB1 4.5 X 4.5
- 1 ENTRY LOCK: K501HD DANE
- 1 SFIC EVEREST CORE: 80-037
- 1 WALL STOP: WS406/407CCV

---

Alterations & Additions to Prattville Boys & Girls Club for Community Development Institute Head Start Prattville, Alabama

MCKEE PROJECT # 19-108

FINISH HARDWARE 08700-11

(Revise 4.30.19)
HARDWARE SET: 10

DOOR NUMBER: 
117 119

EACH TO HAVE:
3 HINGE 5BB1 4.5 X 4.5 IVE
1 STOREROOM LOCK K581HD DAN FAL
1 SFIC EVEREST CORE 80-037 SCH
1 FLOOR STOP FS441 IVE

HARDWARE SET: 11

DOOR NUMBER: 
113A 115 121A

EACH TO HAVE:
3 HINGE 5BB1 4.5 X 4.5 IVE
1 STOREROOM LOCK K581HD DAN FAL
1 SFIC EVEREST CORE 80-037 SCH
1 WALL STOP WS406/407CCV IVE

HARDWARE SET: 12

DOOR NUMBER: 
113 124 127

EACH TO HAVE:
3 HINGE 5BB1 4.5 X 4.5 IVE
1 PRIVACY K301S DAN FAL
1 SFIC EVEREST CORE 80-037 SCH
1 OH STOP 90S GLY
1 MOP PLATE 8400 4" X 1" LDW B-CS IVE

HARDWARE SET: 13

DOOR NUMBER: 
114 130

EACH TO HAVE:
3 HINGE 5BB1 4.5 X 4.5 IVE
1 PRIVACY K301S DAN FAL
1 SFIC EVEREST CORE 80-037 SCH
1 SURFACE CLOSER SC71A RW/PA FAL
1 MOP PLATE 8400 4" X 1" LDW B-CS IVE
1 KICK PLATE 8400 8" X 2" LDW B-CS IVE
HARDWARE SET: 14

DOOR NUMBER:
105

EACH TO HAVE:

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<tr>
<th>Item</th>
<th>Quantity</th>
<th>Model</th>
<th>Supplier</th>
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<tr>
<td>Hinge</td>
<td>3</td>
<td>5BB1 4.5 X 4.5 NRP</td>
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<td>Panic Hardware</td>
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<td>SFIC Mortise Cyl.</td>
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<td>80-132</td>
<td>SCH</td>
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<td>SFIC Everest Core</td>
<td>1</td>
<td>80-037</td>
<td>SCH</td>
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<tr>
<td>Surface Closer</td>
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<td>SC71A REG</td>
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<td>Floor Stop</td>
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HARDWARE SET: AL-01 (CARD READR/KEYPAD) (EXISTING ALUMINUM FRAME X PAIR ALUMINUM DOORS)

DOOR NUMBER:
101

EACH TO HAVE:

<table>
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<th>Item</th>
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<tr>
<td>Door Cord</td>
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<td>788-18</td>
<td>SCE</td>
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<tr>
<td>Removable Mullion</td>
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<td>4023</td>
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<tr>
<td>ELEC Panic Hardware</td>
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<td>MEL-24-R-NL-OP 24 VDC</td>
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<td>Panic Hardware</td>
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<td>24-R-EO</td>
<td>FAL</td>
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<td>SFIC Everest Core</td>
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<td>SFIC Rim Cylinder</td>
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<tr>
<td>Power Supply</td>
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<td>PS902 900-4RL 120/240VAC</td>
<td>VON</td>
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</table>

Hardware supplier shall coordinate hardware with electrical, access control and security systems.
Hardware supplier shall field verify and coordinate new hardware with existing door and frame.
General contractor shall repair, patch and fill unused holes and prep. Balance of hardware to remain.

END OF SECTION
### Room Finish Schedule

<table>
<thead>
<tr>
<th>Room</th>
<th>Type</th>
<th>Finish</th>
<th>Location</th>
<th>Material</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Entry</td>
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<td>Wood</td>
<td>Lobby</td>
<td>HDF</td>
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<tr>
<td>Hall</td>
<td>2</td>
<td>Carpet</td>
<td>Hallway</td>
<td>Carpet</td>
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<tr>
<td>Class</td>
<td>3</td>
<td>Tile</td>
<td>Classroom</td>
<td>Ceramic</td>
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<tr>
<td>Office</td>
<td>4</td>
<td>Paint</td>
<td>Office</td>
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<td>5</td>
<td>Tile</td>
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<td>Ceramic</td>
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### Door Schedule

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<th>Notes</th>
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</thead>
<tbody>
<tr>
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<td>1</td>
<td>Wood</td>
<td>Lobby</td>
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</tr>
<tr>
<td>Hall</td>
<td>2</td>
<td>Glass</td>
<td>Hallway</td>
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<td>Classroom</td>
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<tr>
<td>Office</td>
<td>4</td>
<td>Paint</td>
<td>Office</td>
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<tr>
<td>Bathroom</td>
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### Window Schedule

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<th>Notes</th>
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<td>Wood</td>
<td>Lobby</td>
<td></td>
</tr>
<tr>
<td>Hall</td>
<td>2</td>
<td>Glass</td>
<td>Hallway</td>
<td></td>
</tr>
<tr>
<td>Classroom</td>
<td>3</td>
<td>Wood</td>
<td>Classroom</td>
<td></td>
</tr>
<tr>
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<td>4</td>
<td>Paint</td>
<td>Office</td>
<td></td>
</tr>
<tr>
<td>Bathroom</td>
<td>5</td>
<td>Tile</td>
<td>Bathroom</td>
<td></td>
</tr>
</tbody>
</table>

### Signage Notes:

- Signs shall be located at appropriate heights for legibility and visibility. The heights shall be consistent with the signage standards established by local authorities.

- All signs shall be clearly legible and maintained in good condition.

### Labelled Door and Frame Note:

- All doors and frames shall be clearly labelled with their respective types and specifications.

- Doors shall be marked with the correct insulation and fire protection ratings.

### Typical Door Types

- Type A
- Type B
- Type C
- Type D

### Typical Frame Types

- Type E
- Type F
- Type G