****

IFB NO. Y17-718-CC

INVITATION FOR BIDS
FOR
DEPUTY JONATHAN "SCOTT" PINE COMMUNITY PARK

****

PART H
PARK SITE
TECHNICAL SPECIFICATIONS

VOLUME II
PART 1 OF 2

PROJECT MANUAL INCLUDING

SPECIFICATIONS FOR CONSTRUCTION OF:

JONATHAN "SCOTT" PINE COMMUNITY PARK

ORANGE COUNTY, FLORIDA

September 06, 2016

Permit Documents

PART 1 OF 2

SCHENKELSHULTZ
ARCHITECTURE

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COVER SHEET

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DOCUMENT 00 01 15 - LIST OF DRAWING SHEETS

1.1 LIST OF DRAWINGS

A. Drawings: Drawings consist of the Contract Drawings and other drawings listed on the Table of Contents page of the separately bound drawing set titled 60% Submittal, dated 04/06/2016, as modified by subsequent Addenda and Contract modifications.

B. List of Drawings: Drawings consist of the following Contract Drawings and other drawings of type indicated:

G000 COVER SHEET
G001 GENERAL INFORMATION & ABBREVIATIONS
G101 LIFE SAFETY PLAN

S001 STRUCTURAL GENERAL NOTES
S002 STRUCTURAL GENERAL NOTES
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S101 FOUNDATION AND ROOF FRAMING PLANS
S201 FOUNDATION SECTIONS AND DETAILS
S301 ROOF FRAMING SECTIONS, DETAILS AND SCHEDULES
S401 TILT-UP PANEL CONNECTION DETAILS
S402 TILT-UP PANEL ELEVATIONS

AS101 ARCHITECTURAL SITE PLAN
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EL041 SITE PLAN - LIGHTING
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EL401P SITE PLAN - PHOTOMETRICS
EP011 SITE PLAN - POWER
EP101 OVERALL FLOOR PLAN - POWER
ES301 OVERALL FLOOR PLAN - SYSTEM
EY200 OVERALL ROOF PLAN - LIGHTNING PROTECTION
E501 RISER DIAGRAM - POWER
E601 PANEL SCHEDULES - ELECTRICAL
E901 ELECTRICAL DETAILS
E902 ELECTRICAL DETAILS

M001 GENERAL NOTES & LEGENDS - MECHANICAL
M101 OVERALL FLOOR PLAN - MECHANICAL
M501 SCHEMATICS - MECHANICAL
M502 SCHEMATICS - MECHANICAL
M601 SCHEDULES - MECHANICAL
M901 SCHEDULES - MECHANICAL

P001 GENERAL NOTES & LEGENDS - PLUMBING
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C001 OVERALL EXISTING PLAN
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LA100 LANDSCAPE PLAN
LA101 LANDSCAPE PLAN
LA102 LANDSCAPE PLAN
LA103 LANDSCAPE PLAN

END OF DOCUMENT 00 01 15

SECTION 00 04 00 - STATEMENT OF COMPLIANCE

To the best of my knowledge the Plans and Specifications comply with the applicable minimum building codes and the applicable fire-safety standards as determined by the local authority in accordance with this section and 633 Florida Statutes.

END OF SECTION 00 04 00

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SECTION 00 05 00 - NON-ASBESTOS CERTIFICATION

To the best of my knowledge these Contract Documents do not contain any asbestos containing materials intended for use in construction.

END OF SECTION 00 05 00

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SECTION 00 31 19 – PROJECT SIGN

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Requirements for Project Sign.

a. Purpose: Inform public about the Project’s source of funding, provide the name of the Project, Architect and Engineers, Construction Manager or General Contractor, Program Budget, and the completion date for the Project.

B. General Requirements: Comply with the following:

1. Schedule for Sign: Erect Project sign at the beginning of construction and it shall remain in-place until Certificate of Occupancy has been issued.

a. New Construction: Erect Project sign as soon as site work has established minimum grade elevations and rough grading for roadways have been completed.
b. Existing Campuses: Erect Project sign as soon as construction commences.

2. Location of Project Sign: Unless otherwise directed by the Owner, Project sign shall be erected at a location that is visible to the public, which typically is adjacent to the entrance drive of the Project site.

a. Bottom face of the Project sign shall be a minimum of 4 ft. above grade.

3. Other Site Signs: Unless required by Local, state, or Federal Code or safety standards, no other signs will be permitted at the Project site.

1.2 SUBMITTALS

A. Signage Information: The Owner will provide information for the Project sign electronically.

1. Architect will review with the designated Authorized Construction Representative that the indicated information is correct.
2. Sign fabricator shall be responsible for ensuring that the correct information is indicated on the Project sign.

1.3 QUALITY ASSURANCE

A. Code Requirement: Project sign shall comply with all applicable requirements of the 2010 Florida Building Code, including wind load recommendations and requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Construct Project sign of the following:

1. Plywood Sign Faces: 2, 4 ft. x 8 ft. x ¾ inch thick, exterior grade plywood.

a. Plywood faces shall be constructed into a “V” format on a 90 degree angle.

2. Posts: Not less than 2 posts per 4 ft. x 8 ft. sign face.

a. Size of Posts; As required per Florida Building Code wind load requirements.
b. Material: Posts may be fabricated of exterior grade, treated lumber or galvanized steel.

3. Fasteners: Use fasteners that are zinc-coated to inhibit rust.

a. Number of Fasteners: As required by structural requirements.

2.2 FABRICATION

A. Project sign shall be fabricated off-site and brought to the Project site ready for erection in location as directed by Architect and/or Construction Manager.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 31 19

SECTION 00 31 33 - SOIL INVESTIGATION DATA

PART 1 - GENERAL

1.1 DESCRIPTION

A. Subsurface soil investigation to determine the nature of the soil below the natural grade has been made at various locations on the site. Test borings indicate only the soil conditions at the points where samples were taken and are not intended to indicate the soil conditions for the entire site.

1. Soils investigation report entitled, “Geotechnical Engineering Report”
2. Data on indicated subsurface conditions is not intended as representations or warranties of accuracy or continuity of such soil conditions between soil borings. It is expressly understood that the Owner will not be responsible for interpretations or conclusions drawn there from by Bidders.

B. Additional test boring and other exploratory operations may be made by the Contractor at no additional cost to the Owner.

C. The complete soil investigation data report is made available for the convenience of the Contractor only and is included herewith.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 00 31 33

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Revised Geotechnical Engineering Report

Dorman Park
Ficquette Road
Winter Garden, Orange County, Florida

March 4, 2016
PO No. C11903A055
Nodarse / Page One Project No. AK145007

Prepared for:
Orange County Capital Projects Division
Orlando, Florida

Prepared by:
Nodarse / Page One Joint Venture, LLC
Winter Park, Florida

1675 Lee Road, Winter Park, Fl 32789, (407) 740-6110, (407) 740-6112 [fax]

March 4, 2016

Orange County Capital Projects Division
400 East South Street
Orlando, Florida 32801

Attn: Mr. Roan Waterbury
E: Roan.Waterbury@ocfl.net

Re: Revised Geotechnical Engineering Report
Dorman Park - Ficquette Road
Winter Garden, Orange County, Florida
PO No. C11903A055
Nodarse / Page One Project Number: AK145007

Dear Mr. Waterbury:

Nodarse/Page One Joint Venture, LLC (Nodarse/Page One) has completed the geotechnical engineering services for the above-referenced project. This study was performed in general accordance with our proposal number PAK140019 dated August 27, 2014, authorized by Purchase Order C11903A055. This report has been revised since November 20, 2014 to include the proposed concession/restroom building.This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning design and construction of foundations, floor slabs, pavements and stormwater management facilities, at the subject site.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Nodarse/Page One Joint Venture, LLC

SHENNA LUU McMASTER LICENSE No 57537 STATE OF FLORIDA PROFESSIONAL ENGINEER 3/4/16

Shenna McMaster, P.E.
Senior Geotechnical Engineer
Florida PE #57537

Jay W. Casper, P.E.
Senior Associate

This report has been electronically signed and sealed by Shenna McMaster, P.E. on 3/4/16 using a Digital Signature.
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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EXECUTIVE SUMMARY

A geotechnical investigation has been performed for the 19-acre parcel located south of Ficquette Road and west of Overstreet Road in Orange County, Florida. A total of eleven (11) borings, designated as B-1 through B-11, were performed to depths of 5 to 15 feet below the existing ground surface across the site.

Based on the information obtained from our geotechnical exploration, it appears that the site can be developed for the proposed project. The following geotechnical considerations were identified:

- Soil conditions observed generally consisted of fine sand and fine sand with silt to depths of 4 to 10 feet underlain by silty sand and/or clayey sand. Boring B-1, performed in the western portion of the site found silty sand in the upper 2 feet.

- Groundwater levels found during the original field exploration (November of 2014) ranged from about 2 to 3 feet below existing grade. During the recent exploration (February of 2016), groundwater was found at a depth of about 4.5 feet below existing grade in the proposed restroom/concession building area. Normal seasonal high groundwater levels are expected at about 1 foot below existing grade, outside of wetland areas.

- Use of a shallow foundation system is appropriate for support of the proposed building.

- Typical pavement sections appear suitable at this site; although careful consideration of relatively high groundwater conditions is recommended. The depth to the seasonal high groundwater table should be considered in grading and stormwater management system design.

- The proposed track and infield appears to extend into a wetland area on the eastern portion of the site. Removal of surficial organic soils should be anticipated in this area during site preparation and prior to placement of fill. Depending on the groundwater levels at the time of construction, dewatering may be required in this area to verify adequate removal of surficial organic soils and provide adequate compaction of fill soils.

This summary should be used in conjunction with the entire report for geotechnical engineering design purposes. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled **GENERAL COMMENTS** should be read for an understanding of the report limitations.

REVISED GEOTECHNICAL ENGINEERING REPORT
DORMAN PARK
FICQUETTE ROAD
WINTER GARDEN, ORANGE COUNTY, FLORIDA

Nodarse / Page One Project No. AK145007
March 4, 2016

1.0 INTRODUCTION

A geotechnical investigation has been performed for the 19-acre parcel located south of Ficquette Road and west of Overstreet Road in Orange County, Florida as shown on the Topographic Vicinity Map included as Exhibit A-1 in Appendix A. A total of eleven (11) borings, designated as B-1 through B-11, have been performed to depths of 5 to 15 feet below the existing ground surface across the site. Logs of the borings, along with a site location plan, geologic map and boring location plans, are included in Appendix A of this report.

The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- subsurface soil conditions
- groundwater conditions
- earthwork
- pavement design
- stormwater pond design
- foundation design and construction

2.0 PROJECT INFORMATION

2.1 Project Description

Item	Description
Proposed Improvements	Based on the site plan prepared by SK Consortium, Inc., proposed improvements will include a stormwater pond in the southwestern portion of the site, a restroom/concession building, track and playfields, paved driveway and parking areas.

2.2 Site Location and Description

Item	Description
Location	The project is located on the south side of Ficquette Road, west of Overstreet Road in Orange County, Florida.
Current Ground Cover	A wetland is located along the eastern and southeastern portions of the site. The remainder of the site has been cleared and mass graded in the past.
Existing Topography	The USGS topographic quadrangle map "Windermere, Florida" depicts the site and surrounding area with a ground surface elevation near +100 feet referencing the National Geodetic Vertical Datum of 1929 (NGVD29). A large wetland area is located northwest of the site connecting to Lake Speer. Wetland areas are located to the south of the site as well.
Surface Water	The quadrangle map depicts Lake Speer to the northwest of the site with a recorded water level near +99 feet.

3.0 SUBSURFACE CONDITIONS

3.1 Soil Survey

The Soil Survey of Orange County, Florida, as prepared by the United States Department of Agriculture (USDA), Soil Conservation Service (SCS; later renamed the Natural Resource Conservation Service - NRCS) identifies the predevelopment soil types at the subject site as *Samsula-Hontoon-Basinger association, depressional (41), Sanibel Muck (42),* and predominately *Smyrna fine sand (44).* It should be noted that the Soil Survey is not intended as a substitute for site-specific geotechnical exploration; rather it is a useful tool in planning a project scope in that it provides information on soil types likely to be encountered. Current conditions may have been altered from the Soil Survey by mass grading for prior development. Boundaries between adjacent soil types on the Soil Survey maps are approximate (included in Appendix as Exhibit A-2). Descriptions of the mapped soil units are included in Appendix A as Exhibit A-3.

3.2 Typical Profile

Based on the results of the borings, subsurface conditions on the project site can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description	Consistency/ Density
1	4 to 10	Mostly fine sand (SP) and fine sand with silt (SP-SM)[1,2]	Loose to medium dense
2	At least 15	Silty sand (SM) and clayey fine sand (SC)	Medium dense to dense

1. Boring B-1, performed on the western portion of the site found silty sand at the ground surface to a depth of 2 feet.
2. Boring B-11, performed in the proposed restroom/concession building area, found organic silty sand (topsoil) in the upper foot.

Conditions encountered at each boring location are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual. Details for each of the borings can be found on the boring logs in Appendix A of this report. Descriptions of our field exploration are included as Exhibit A-5 in Appendix A. A description of our laboratory testing procedures is included as Exhibit B-1 in Appendix B.

3.3 Groundwater

The boreholes were observed during drilling for the presence and level of groundwater. During the initial exploration (November of 2014), groundwater was observed in the borings between depths of 2 and 3 feet below existing grade. During the recent exploration, borings performed in the proposed structure area found groundwater at depths of about 4.5 feet below existing grade.

It should be recognized that fluctuations of the groundwater table will occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the boring was performed. In addition, perched water can develop within higher permeability soils overlying less permeable (clayey) soils. Therefore, groundwater levels during construction or at other times in the future may be higher or lower than the levels indicated on the boring logs.

We estimate that during the wet season, with rainfall and recharge at a maximum, normal seasonal high groundwater levels will be 1 foot or less below existing grade across the site, outside of wetland areas. Our estimates of the normal seasonal groundwater conditions are based on the USDA Soil Survey, the encountered soil types, and the encountered water levels.

4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

4.1 Geotechnical Considerations

Soil conditions observed indicate the use of a shallow foundation system is appropriate for support of the proposed restroom/concession building, following removal of surficial vegetation and topsoil and site preparation as described in this report.

Due to high groundwater conditions at the site, the use of a wet stormwater pond appears most appropriate.

The proposed track and in-field are may encroach into the wetland area on the eastern portion of the site. Removal of surficial organic soils may be required during earthwork in this area. Dewatering may also be required to provide visual verification of adequate demucking and to facilitate adequate compaction of backfill soils.

To improve surface infiltration and reduce the potential for prolonged periods of soggy, wet conditions following heavy rainfall, we recommend that the upper 12 inches of fill placed in playfield areas consist of well-draining, inorganic, non-cohesive sand with less than 5 percent fines content. Field surfaces should be sloped appropriately for drainage.

Our recommendations regarding design and construction of foundations, pavements, and stormwater management are provided in the following sections.

4.2 Earthwork

4.2.1 Site Preparation

We anticipate construction will be initiated by clearing any surface vegetation and other deleterious material and stripping the topsoil. Once stripping is complete, the exposed subgrade should be observed and proofrolled with a medium or heavy weight roller (minimum 10,000 pounds static weight). When the prevailing groundwater table is high, proofrolling should be performed in static mode. Proofrolling aids in providing a firm base for compaction of new fill and delineating soft or disturbed areas that may exist at or near the exposed subgrade level as well as overall densification of the upper loose sands. Proofrolling should be performed in the presence of a Nodarse/Page One Representative in order to aid in evaluating unstable subgrade areas. Unstable areas observed at this time should be improved as recommended by the engineer based on field conditions and typically includes scarification and recompaction or by undercutting and replacement with suitable compacted fill.

Where fill is placed on existing slopes steeper than 5H:1V, benches should be cut into the existing slopes prior to fill placement. The benches should have a minimum vertical face height of 1 foot and

a maximum vertical face height of 3 feet and should be cut wide enough to accommodate the compaction equipment. This benching will help provide a positive bond between the fill and natural soils and reduce the possibility of failure along the fill/natural soil interface. Furthermore, we recommend that fill slopes be over filled and then cut back to develop an adequately compacted slope face.

4.2.2 Material Requirements

Compacted fill should meet the following material property requirements:

Fill Type [1]	USCS Classification	Acceptable Location for Placement	Maximum Lift Thickness (in.)
General [1]	SP (fines content < 5%)	All locations and elevations. This is the best fill for pavement subgrade and upper lifts of playfield areas.	12[2]
	SP-SM (fines content between 5 and 12%)	Most locations and elevations, except strict moisture control will be required during placement, particularly during the rainy season. This material is not recommended for upper foot of fill placed in playfield areas.	8 to 12[2]
Limited	SM, SC (fines content >12%)	Limited to mass fill greater than 2 feet below final grade; strict moisture control will be required during placement.	6 to 8[2,3]

1. Controlled, compacted fill should consist of approved materials that are free of organic matter and debris.
2. Loose thickness when heavy compaction equipment is used in vibratory mode. Lift thickness should be decreased if static compaction is being used, typically to no more than 8 inches, and the required compaction must still be achieved. Use 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is required.
3. Static equipment should be used.

4.2.3 Compaction Requirements

Item	Description
Fill Lift Thickness	12 inches or less in loose thickness when heavy compaction equipment is used in vibratory mode. Lift thickness should be decreased if static compaction is being used, typically to no more than 8 inches, and the required compaction must still be achieved. 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used.
Compaction Requirements [1]	95% of the material's maximum modified Proctor dry density (ASTM D 1557).

Item	Description
Moisture Content	Within ±2 percent of optimum moisture content as determined by the Modified Proctor test, at the time of placement and compaction. Depending on rainfall at the time and immediately prior to construction, the Contractor may need to add water to bring the moisture content closer to optimum. When adding water, care must be exercised so that erosion is not a concern.

1. We recommend that engineered fill be tested for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.

4.2.4 Grading and Drainage

Final surrounding grades should be sloped away from the structure and playfields on all sides to prevent ponding of water. It is recommended that all exposed earth slopes be seeded to provide protection against erosion. Seeded slopes should be protected with erosion mats until the vegetation is established.

4.2.5 Earthwork Construction Considerations

Although the exposed subgrade is anticipated to be relatively stable upon initial exposure, unstable subgrade conditions could develop during general construction operations, particularly if the soils are wetted and/or subjected to repetitive construction traffic. The use of static compaction and/or light construction equipment would aid in reducing subgrade disturbance.

As a minimum, all temporary excavations should be sloped or braced as required by Occupational Health and Safety Administration (OSHA) regulations to provide stability and safe working conditions. Temporary excavations will probably be required during grading operations. The Grading Contractor, by his contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope or bench the sides of the excavations as required, to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, state and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards.

Depending on groundwater levels at the time of construction, temporary lowering of the groundwater level (dewatering) at the site may be necessary. The purposes of dewatering are to facilitate compaction of the subgrade soils during proofrolling and to provide dry, stable excavations. Dewatering can probably be accomplished at this site by a system of temporary drainage ditches graded to drain to sumps which can be pumped sufficiently to maintain water levels at the ditch bottoms. However, dewatering methods should be determined by the contractor.

4.3 Foundations

In our opinion, the proposed restroom/concession building can be supported by a shallow foundation system bearing on compacted native soil (following removal of surficial organic sands and vegetation) or newly placed engineered fill extending to native soil. Design recommendations for shallow foundations for the proposed structure are presented in the following sections.

4.3.1 Foundation Design Recommendations

Description	Column Footing	Wall Footing	Monolithic Slab Foundation [4]
Net allowable bearing pressure [1]	2,500 psf	2,500 psf	2,500 psf
Minimum width	30 inches	18 inches	12 inches
Minimum embedment below finished grade [2]	18 inches	18 inches	12 inches
Compaction requirements	95 percent of the materials maximum Modified Proctor dry density for a depth of 12 inches below footing.		
Minimum Testing Frequency	One field density test per footing for a minimum depth of 1 foot below the footing subgrade.	One field density test per 50 linear feet for a minimum depth of 1 foot below the footing subgrade.	One field density test per 50 linear feet for a minimum depth of 1 foot below the footing subgrade.
Approximate total settlement [3]	<1 inch	<1 inch	<1 inch
Estimated differential settlement [3]	<¾ inch between columns	<¾ inch over 40 feet	<¾ inch over 40 feet

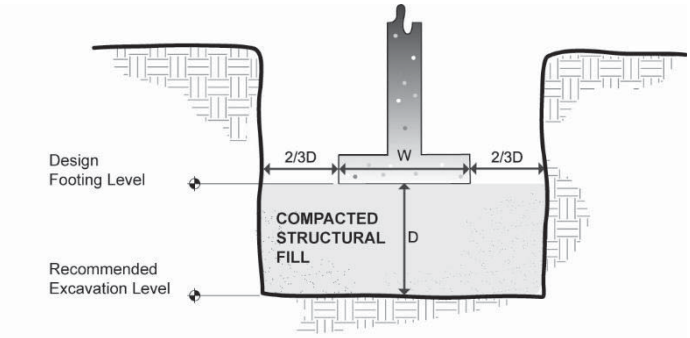
1. The recommended net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. Assumes any unsuitable fill or soft soils, if encountered, will be undercut and replaced with engineered fill.
2. For erosion protection and to reduce effects of seasonal moisture variations in subgrade soils.
3. The foundation settlement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of compacted fill, and the quality of the earthwork operations. The above settlement estimates have assumed that the maximum footing width is 5 feet for column footings and 2 feet for continuous footings.
4. Turned-down portion of slab. For slab requirements see Section 4.4.1.

4.3.2 Foundation Construction Considerations

The base of all foundation excavations should be free of water and loose soil and debris prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Should the soils at bearing level become excessively dry, disturbed or saturated, the affected soil should be removed or moisture conditioned and re-compacted prior to placing

concrete. It is recommended that Terracon be retained to observe and test the soil foundation bearing materials.

If unsuitable bearing soils are encountered in footing excavations, the excavations should be extended deeper to suitable soils and the footings could bear directly on these soils at the lower level. The footings could also bear on properly compacted backfill extending down to the suitable soils. Overexcavation for compacted backfill placement below footings should extend laterally beyond all edges of the footings at least 8 inches per foot of overexcavation depth below footing base elevation. The overexcavation should then be backfilled up to the footing base elevation with granular material placed in lifts of 6 inches or less in loose thickness and compacted to at least 95 percent of the material's modified effort maximum dry density (ASTM D-1557). The overexcavation and backfill procedures are described in the figures below. Compaction tests should be performed at a frequency of 1 test per footing per 1-foot lift for square footings, and 1 test per 50 linear feet per 1-foot lift for wall or continuous footings.



Overexcavation / Backfill

Note: Excavation in sketch shown vertical for convenience. Excavations should be sloped as necessary for safety.

4.4 Floor Slabs

4.4.1 Floor Slab Design Recommendations

Item	Description
Floor slab support	Free draining granular material meeting the general fill specification [1]
Modulus of subgrade reaction	100 pounds per square inch per inch (psi/in) for point loading conditions
Compaction requirements	95 percent of the materials maximum Modified Proctor dry density
Minimum Testing Frequency	One field density test per 2,500 square feet or fraction thereof for a depth of 12 inches. [2]

1. We recommend subgrades be maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become desiccated prior to construction of floor slabs, the affected material should be removed or the materials scarified, moistened, and recompacted. Upon completion of grading operations in the building areas, care should be taken to maintain the recommended subgrade moisture content and density prior to construction of the building floor slabs.
2. Density should be re-checked after utility construction.

Where appropriate, saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual.

The use of a vapor retarder should be considered beneath concrete slabs-on-grade that will be covered with wood, tile, carpet or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer and slab contractor should refer to ACI and Florida Building Code (FBC) regarding moisture and radon for procedures and cautions regarding the use and placement of a vapor retarder. We note that FBC requires a minimum of 6-mil polyethylene, which is typically used in Florida. However, local requirements that might affect what moisture barrier may use should also be consulted.

4.4.2 Floor Slab Construction Considerations

On most project sites, the site grading is generally accomplished early in the construction phase. We recommend the area underlying the floor slab be rough graded and then thoroughly proofrolled prior to final grading. However as construction proceeds, the subgrade may be disturbed due to utility excavations, construction traffic, desiccation, rainfall, etc. As a result, the floor slab subgrade may not be suitable for placement of concrete and corrective action will be required.

Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the affected material with properly compacted fill. All floor slab subgrade areas should be moisture conditioned and properly compacted to the recommendations in this report immediately prior to placement of concrete.

4.5 Pavements

The near surface soil throughout most of the site consisted of fine sand with varying amounts of silt. Stabilizing material will likely be necessary for the construction of pavement subgrades.

4.5.1 Subgrade Preparation

Site grading is typically accomplished relatively early in the construction phase. Fills are placed and compacted in a uniform manner. However, as construction proceeds, excavations are made into

these areas, rainfall and surface water saturates some areas, heavy traffic from concrete trucks and other delivery vehicles disturbs the subgrade and many surface irregularities are filled in with loose soils to temporarily improve ride comfort. As a result, the pavement subgrades, initially prepared early in the project, should be carefully evaluated as the time for pavement construction approaches.

We recommend the moisture content and density of the top 12 inches of the subgrade be evaluated and the pavement subgrades be proofrolled and tested within two days prior to commencement of actual paving operations. Compaction tests should be performed at a frequency of 1 test per 10,000 square feet or fraction thereof. Areas not in compliance with the required ranges of moisture or density should be moisture conditioned and recompacted. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are found should be repaired by removing and replacing the materials with properly compacted fills.

If a significant precipitation event occurs after the evaluation or if the surface becomes disturbed, the subgrade should be reviewed by qualified personnel immediately prior to paving. The subgrade should be in its finished form at the time of the final review.

4.5.2 Design Considerations

Traffic patterns and anticipated loading conditions were not available at the time that this report was prepared. However, we anticipate that traffic loads will be produced primarily by automobile traffic and occasional delivery and trash removal trucks. The thickness of pavements subjected to heavy truck traffic should be determined using expected traffic volumes, vehicle types, and vehicle loads and should be in accordance with local, city or county ordinances.

Pavement thickness can be determined using AASHTO, Asphalt Institute, PCA, and/or other methods if specific wheel loads, axle configurations, frequencies, and desired pavement life are provided. Nodarse/Page One can provide thickness recommendations for pavements subjected to loads other than personal vehicle and occasional delivery and trash removal truck traffic if this information is provided. However, absent that data, we recommend the following minimum typical sections.

4.5.3 Estimates of Minimum Pavement Thickness

Typical Pavement Section (inches)						
Traffic Area	**Alternative**	**Asphalt Concrete Surface Course**	**Limerock, Soil-Cement or Crushed Concrete Base Course**	**Stabilized Subbase Course[2,3,4]**	**Portland Cement Concrete**	**Free Draining Subgrade**
Car Parking	PCC	--	--		5.0	18.0
	AC	1.5	6.0	12.0	--	--
Truck and Drive Areas	PCC	--	--		6.0	18.0
	AC	2.5	8.0	12.0	--	--
Trash Container Pad [1]	PCC	--	--		6.0	18.0

1. The trash container pad should be large enough to support the container and the tipping axle of the collection truck.
2. Often referred to as Stabilized Subgrade. Subbase should be stabilized to a minimum Limerock Bearing Ratio (LBR) of 40.
3. Use coarse granular materials such as recycled crushed concrete, shell, or gravel due to relatively high groundwater conditions. Some municipalities do not require stabilized subbase beneath soil-cement base.

4.5.4 Asphalt Concrete Design Recommendations

The following items are applicable to asphalt concrete pavement sections.

- Nodarse/Page One recommends a minimum separation of 12 inches between the bottom of the base course and the seasonal high water table, if a soil cement or crushed concrete base is used. If a limerock base is used, a minimum separation of 18 inches between the bottom of the base course and the estimated seasonal high groundwater table is recommended.

- Natural or fill subgrade soils to a depth of 18 inches below the base should be clean, free draining sands with a fines content passing a No. 200 sieve of 10 percent or less.

- The stabilized subgrade course should be compacted to at least 98 percent of the Modified Proctor maximum dry density (AASHTO T-180 or ASTM D-1557). Any underlying, newly-placed subgrade fill need only be compacted to a minimum of 95 percent of the Modified Proctor maximum dry density. Compaction tests should be performed at a frequency of 1 test per 10,000 square feet or fraction thereof.

- Limerock base courses from an approved FDOT source should have a minimum LBR value of 100, and be compacted to a minimum of 98 percent of the maximum dry density as determined by the Modified Proctor test. Limerock should be placed in uniform lifts not to exceed 6 inches loose thickness. Recycled limerock is not a suitable substitute for virgin limerock for base courses but may be used as a granular stabilizing admixture.

- Soil cement base courses typically experience shrinkage cracking due to hydration curing of the cement. This shrinkage cracking typically propagates through the overlying asphalt course and reflects in the pavement surface. This reflective cracking is not necessarily indicative of a pavement structural failure, though it is sometimes considered to be aesthetically undesirable.

- Soil cement bases should have 7-day design strength of 300 psi. Soil cement base should be compacted to a minimum of 98 percent of the material's maximum dry density as determined by the Standard Proctor Test for Soil Cement (AASHTO T-134). Higher design strengths may result in increased cracking.

- Crushed (recycled) concrete base should meet the current FDOT specification 204 for recycled materials.

- Asphalt should be compacted to a minimum of 95 percent of the design mix density. Asphalt surface courses should be Type SP, Type S, or other suitable mix design according to FDOT and local requirements.

4.5.5 Portland Cement Concrete Design Recommendations

The following items are applicable to rigid concrete pavement sections.

- At least 18 inches of free-draining material should be included directly beneath rigid concrete pavement. Fill meeting the requirements of "General Fill" presented in Section 4.2 (Earthwork) of this report may be considered free-draining for this purpose. Limerock should not be considered free draining for this purpose.

- The PCC should be a minimum of 4,000 psi at 28 days. PCC pavements are recommended for trash container pads and in any other areas subjected to heavy wheel loads and/or turning traffic.

- The upper 1 foot of rigid pavement subgrade soils should be compacted to at least 98 percent of the Modified Proctor maximum dry density (AASHTO T-180 or ASTM D-1557). Compaction tests should be performed at a frequency of 1 test per 10,000 square feet or fraction thereof.

- An adequate number of longitudinal and transverse control joints should be placed in the rigid pavement in accordance with ACI and/or AASHTO requirements. Expansion (isolation) joints must be full depth and should only be used to isolate fixed objects abutting or within the paved area.

- Adequate separation should be provided between the bottom of the concrete and the seasonal high water table. Nodarse/Page One recommends that in no case should less than 1 foot of separation be provided.

4.6 Stormwater Ponds

Design of the stormwater management system has not been completed yet. However, we understand a wet bottom stormwater pond will be constructed in the southwestern portion of the site.

Bulk samples of subgrade soils (Boring Locations B-1 and B-4, 2 to 4 feet below existing grade) had measured permeability rates of 2 and 22 feet/day. We consider this permeability rate to be indicative of a saturated vertical permeability. Past experience and published references have indicated that unsaturated vertical permeability as used in some locally available groundwater models is typically 2/3 the saturated value. Experience with the observed soil types has shown that horizontal permeability may be on the order of 1.5 to 2 times the saturated vertical permeability in undisturbed materials. Fill soils placed in the proposed dry pond/swale areas should consist of relatively clean sands. Permeability rates used in recovery analyses should consider any fill placed in the swale areas during construction.

The silty and clayey sand found deeper in the borings (about 4 to 10 feet) should be considered a confining layer in stormwater recovery analyses. A fillable porosity of 25 percent is recommended for near surface sands. The table below summarizes our recommended stormwater design parameters:

Parameter	Boring Location B-1	Boring Location B-4
Estimated Confining Layer Depth, B	4 feet	10 feet
Estimated Seasonal High Water Table Depth, WT	1 foot	1 foot
Average Wet Season Water Table Depth	2 feet	2 feet
Estimated Seasonal Low Water Table Depth	4 feet	5 feet
Unsaturated Vertical Infiltration Rate, k_V	1 feet/day	15 feet/day
Horizontal Saturated Hydraulic Conductivity, k_H	2 feet/day	22 feet/day
Fillable Porosity, η	25 percent	25 percent

5.0 GENERAL COMMENTS

The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction.

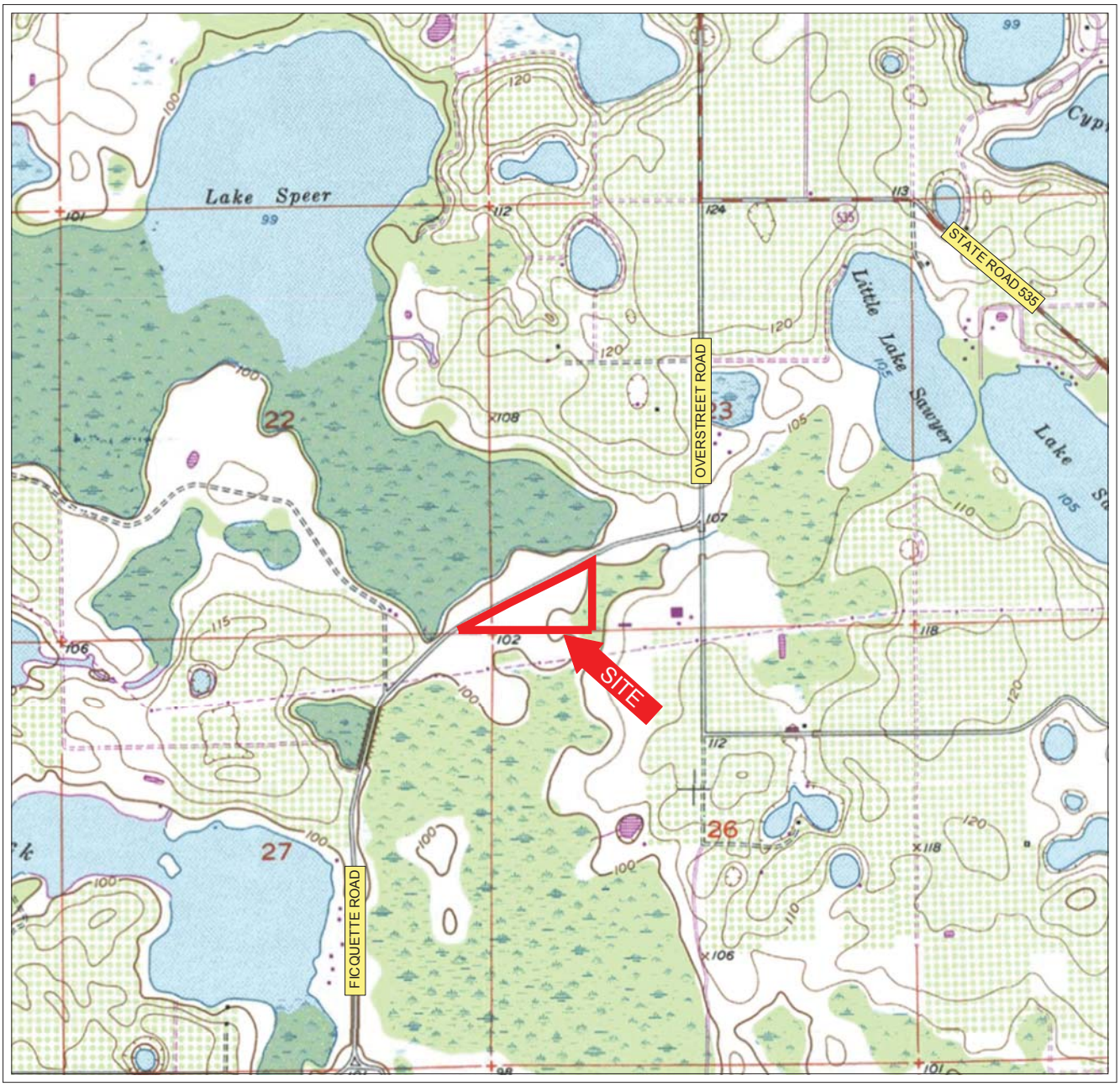
The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either expressed or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Nodarse/Page One reviews the changes and either verifies or modifies the conclusions of this report in writing.

APPENDIX A

FIELD EXPLORATION

UNITED STATES – DEPARTMENT OF THE INTERIOR – GEOLOGICAL SURVEY



SCALE 1:24 000

1 .5 0 KILOMETERS 1 2

1000 0 1000 2000

MILES

1 .5 0 1

FEET

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

SECTION: 19
TOWNSHIP: 14 SOUTH
RANGE: 32 EAST

WINDERMERE, FLORIDA
1953; PHOTOREVISED 1980
7.5 MINUTE SERIES (QUADRANGLE)

N:\Projects\2014\AK145007\PROJECT DOCUMENTS (Reports–Letters–Drafts to Clients)\Cad\AK145007–Exhibit–A–1.dwg

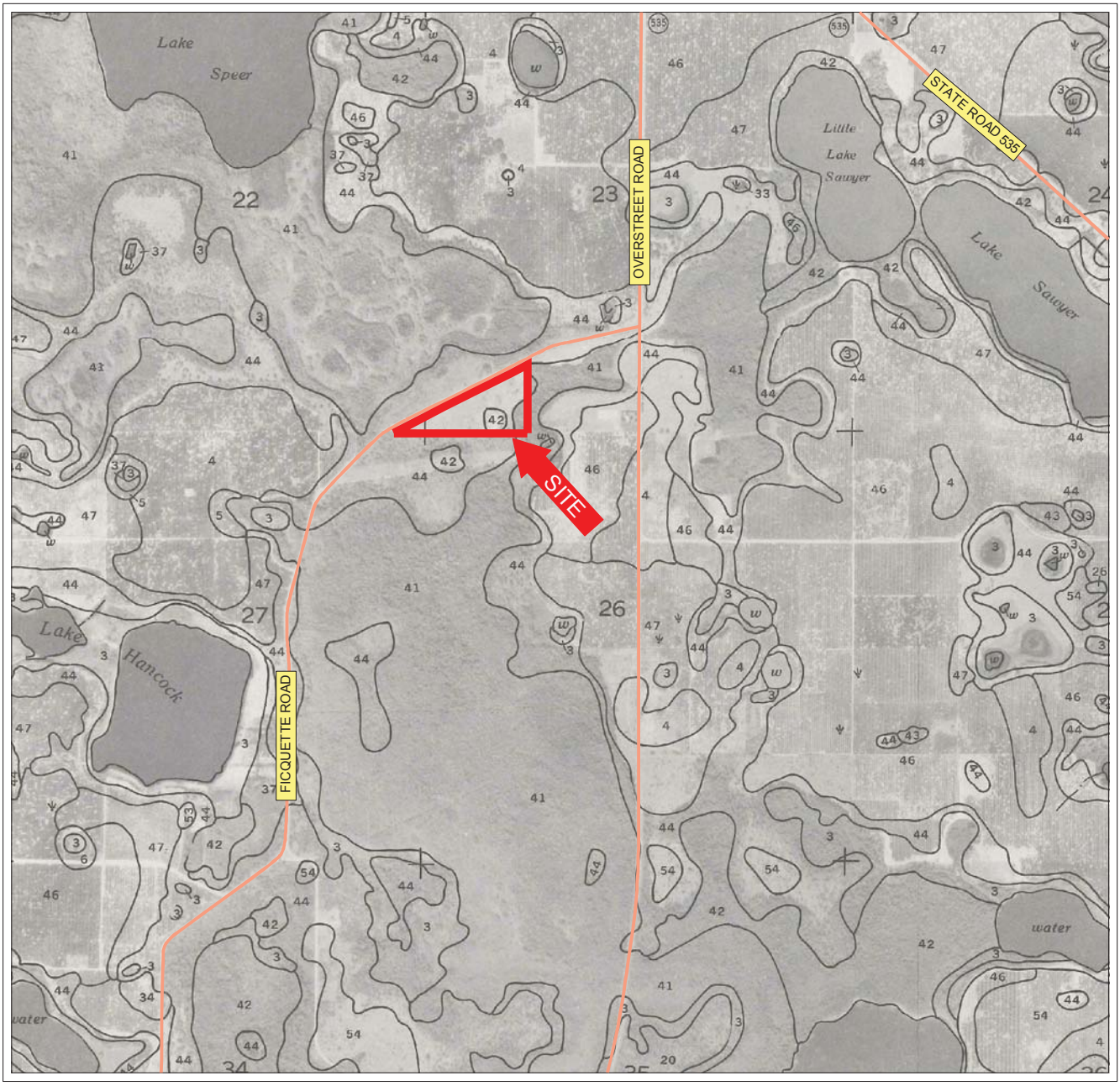
Project Mngr:	SM
Drawn By:	MG
Checked By:	SM
Approved By:	JWC

Project No.	AK145007
Scale:	AS SHOWN
File No.	AK145007
Date:	2-22-16

Nodarse / Page One
Joint Venture

TOPOGRAPHIC VICINITY MAP
GEOTECHNICAL ENGINEERING REPORT
DORMAN PARK
FICQUETTE ROAD
WINTER GARDEN, ORANGE COUNTY, FLORIDA

EXHIBIT
A-1



SCALE 1" = 2000'

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

U.S.D.A. SOIL SURVEY FOR ORANGE COUNTY, FLORIDA
ISSUED: AUGUST 1989

N

SECTION: 19
TOWNSHIP: 14 SOUTH
RANGE: 32 EAST

SOIL LEGEND

42	SANIBEL MUCK
44	SMYRNA FINE SAND
41	SAMSULA HONTOON BASINGER ASSOCIATION DEPRESSIONAL

Project Mngr: SM	Project No. AK145007	Nodarse / Page One Joint Venture	SOILS MAP GEOTECHNICAL ENGINEERING REPORT DORMAN PARK FICQUETTE ROAD WINTER GARDEN, ORANGE COUNTY, FLORIDA	EXHIBIT A-2
Drawn By: MG	Scale: AS SHOWN			
Checked By: SM	File No. AK145007			
Approved By: JWC	Date: 2-22-16			

N:\Projects\2014\AK145007\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\Cad\AK145007-Exhibit-A-2.dwg

Soil Survey Descriptions

41 – Samsula-Hontoon-Basinger association, depressional. This soil type is nearly level and very poorly drained. It is typically found in freshwater swamps, depressions, sloughs, and broad, poorly defined drainageways. In its natural state and during years of normal rainfall, groundwater is ponded atop this soil type for 6 to 9 months or more, except during extended dry periods. The groundwater table fluctuates between the surface and a depth of 10 inches (0.8 feet) for the remainder of the year. A surficial organic layer is normally associated with this soil type, ranging in thickness from 6 inches (0.5 feet; Basinger soils) to 34 inches (2.8 feet; Samsula soils) to the entire defined profile of 80 inches (6.7 feet; Hontoon soils). Typical organic contents of the organic layer range from 1 to 8 percent (Basinger soils) to greater than 20 percent (Samsula soils) to between 75 and 85 percent (Hontoon soils). Beneath the surficial organic layer, Basinger and Samsula soils are predominantly sandy to the maximum defined depth of 80 inches (6.7 feet).

42 –Sanibel muck. This soil type is nearly level and very poorly drained. It is typically found in depressions, freshwater swamps and marshes, and poorly defined drainageways. In its natural state, groundwater is ponded atop this soil type for 6 to 9 months of years with normal rainfall; the groundwater table fluctuates between the surface and a depth of 10 inches (0.8 feet) for 2 to 6 months. A surficial organic layer is normally associated with this soil type, approximately 11 inches (0.9 feet) thick. Typical organic contents of the organic layer range from 20 to 50 percent. Beneath the surficial organic layer, Sanibel soils are predominantly sandy to the maximum defined depth of 80 inches (6.7 feet).

44 – Smyrna fine sand. This soil type is nearly level and poorly drained. It is typically found on broad flatwoods. In its natural state and during years of normal rainfall, this soil type has a seasonal high water table within 10 inches (0.8 feet) of the surface, receding to a depth of 10 to 40 inches (0.8 to 3.3 feet) for more than six months.

LEGEND

APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

N:\Projects\2014\AK145007\PROJECT DOCUMENTS (Reports-Letters-Drafts to Clients)\Cad\AK145007-Exhibit-A-4.dwg

Feb22, 2016-3:58pm

Project Mngr:	SM
Drawn By:	MG
Checked By:	SM
Approved By:	JWC

Project No.	AK145007
Scale:	AS SHOWN
File No.	AK145007
Date:	2-22-16

Nodarse / Page One
Joint Venture

BORING LOCATION PLAN

GEOTECHNICAL ENGINEERING REPORT
DORMAN PARK
FICQUETTE ROAD
WINTER GARDEN, ORANGE COUNTY, FLORIDA

EXHIBIT
A-4

Field Exploration Description

The boring locations were laid out at the project site by Nodarse/Page One personnel. The borings were located with a hand held GPS device using longitude and latitude coordinates obtained from on-line Google Earth imagery. The locations of the borings should be considered accurate only to the degree implied by the means and methods used to define them.

The SPT soil borings were drilled with a truck-mounted, rotary drilling rig equipped with an automatic or rope and cathead safety hammer. The boreholes were advanced with a cutting head and stabilized with the use of bentonite (drillers' mud). Soil samples were obtained by the split spoon sampling procedure in general accordance with the Standard Penetration Test (SPT) procedure. In the split spoon sampling procedure, the number of blows required to advance the sampling spoon the last 12 inches of an 18-inch penetration or the middle 12 inches of a 24-inch penetration by means of a 140-pound hammer with a free fall of 30 inches, is the standard penetration resistance value (N). This value is used to estimate the in-situ relative density of cohesionless soils and the consistency of cohesive soils. The sampling depths and penetration distance, plus the standard penetration resistance values, are shown on the boring logs.

A CME automatic SPT hammer was used to advance the split-barrel sampler in some of the borings performed on this site. A significantly greater efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an appreciable effect on the SPT-N value. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

Portions of the samples from the borings were sealed in glass jars to reduce moisture loss, and then the jars were taken to our laboratory for further observation and classification. Upon completion, the boreholes were backfilled with the site soil.

Field logs of each boring were prepared by the drill crew. These logs included visual classifications of the materials encountered during drilling as well as the driller's interpretation of the subsurface conditions between samples. The boring logs included with this report represent an interpretation of the field logs and include modifications based on laboratory observation of the samples.

BORING LOG NO. B-1

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 / DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SILTY SAND (SM), fine grained, dark brown, loose		▽		3-3-2-3 N=5				
	2.0								
	SAND WITH SILT (SP-SM), fine grained, dark brown, medium dense				3-4-4-6 N=8	2	10		9
	4.0								
	CLAYEY SAND (SC), fine grained, light gray, loose to medium dense	5			4-3-4-6 N=7				
					4-10-14-16 N=24		16	42-15-27	31
		10			9-13-16-16 N=29				
	13.5								
	SILTY SAND (SM), trace clay, fine grained, light gray, medium dense				10-13-20 N=33				
	15.0	15							
	Boring Terminated at 15 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 2.0'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 11/3/2014 | Boring Completed: 11/3/2014

Drill Rig: D-50 | Driller: JB

Project No.: AK145007 | Exhibit: A-6

BORING LOG NO. B-2

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SAND (SP), fine grained, light gray to brown		▽						
	4.0								
	CLAYEY SAND (SC), mottled, fine grained, light gray to orange-brown								
	5.0								
	Boring Terminated at 5 Feet	5							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 2.0'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 11/3/2014 | Boring Completed: 11/3/2014

Drill Rig: D-50 | Driller: JB

Project No.: AK145007 | Exhibit: A-7

BORING LOG NO. B-3

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 / DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SAND (SP), fine grained, light gray 1.0								
	SAND WITH SILT (SP-SM), fine grained, dark brown 2.0								
	SAND (SP), fine grained, light brown 4.0		▽						
	SAND WITH SILT (SP-SM), fine grained, brown 5.0								
	Boring Terminated at 5 Feet	5							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 3.0'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 11/3/2014 | Boring Completed: 11/3/2014

Drill Rig: D-50 | Driller: JB

Project No.: AK145007 | Exhibit: A-8

BORING LOG NO. B-4

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 / DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SAND (SP), fine grained, light gray to light brown, loose		▽		2-2-3-3 N=5				
	2.0 **SAND WITH SILT (SP-SM)**, fine grained, light gray to light brown				2-3-4-5 N=7	22	10		8
		5			5-3-3-4 N=6				
					2-2-2-4 N=4				
	10.0				5-5-6-9 N=11				
	SILTY SAND (SM), fine grained, brown	10							
	13.5 **SAND (SP)**, fine grained, dark brown, medium dense				7-10-12 N=22				
	15.0 ***Boring Terminated at 15 Feet***	15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 2.0'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 11/3/2014 | Boring Completed: 11/3/2014

Drill Rig: D-50 | Driller: JB

Project No.: AK145007 | Exhibit: A-9

BORING LOG NO. B-5

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 / DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SAND (SP), fine grained, gray to brown to light brown								
	3.0		▽						
	SAND WITH SILT (SP-SM), fine grained, light brown								
	5.0						18		12
	Boring Terminated at 5 Feet	5							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 3.0'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 11/3/2014 | Boring Completed: 11/3/2014

Drill Rig: D-50 | Driller: JB

Project No.: AK145007 | Exhibit: A-10

BORING LOG NO. B-6

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SAND (SP), fine grained, light brown 1.0								
	SAND WITH SILT (SP-SM), fine grained, dark brown 2.0								
	SAND (SP), fine grained, light brown 5.0		▽						
	Boring Terminated at 5 Feet	5							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 3.0'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 11/3/2014 | Boring Completed: 11/3/2014

Drill Rig: D-50 | Driller: JB

Project No.: AK145007 | Exhibit: A-11

BORING LOG NO. B-7

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SAND (SP), fine grained, light gray								
			▽						
							21		5
	5.0								
	Boring Terminated at 5 Feet	5							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 2.0'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 11/3/2014 | Boring Completed: 11/3/2014

Drill Rig: D-50 | Driller: JB

Project No.: AK145007 | Exhibit: A-12

BORING LOG NO. B-8

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SAND (SP), fine grained, light gray		▽						
	4.0								
	SAND WITH SILT (SP-SM), fine grained, dark brown								
	5.0	5							
	Boring Terminated at 5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 2.0'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 11/3/2014 | Boring Completed: 11/3/2014

Drill Rig: D-50 | Driller: JB

Project No.: AK145007 | Exhibit: A-13

BORING LOG NO. B-9

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SAND WITH SILT (SP-SM), fine grained, light brown, gray brown to gray, loose								
			▽				23		7
	5.0	5							
	Boring Terminated at 5 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 2.0'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 11/3/2014 | Boring Completed: 11/3/2014

Drill Rig: D-50 | Driller: JB

Project No.: AK145007 | Exhibit: A-14

BORING LOG NO. B-10

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	SAND (SP), fine grained, light gray to brown, loose to medium dense				4-3-5-4 N=8				
					5-5-5-5 N=10				
		5	▽		8-8-7-9 N=15				
	6.0 **SAND WITH SILT (SP-SM)**, fine grained, light brown, medium dense				8-8-9-9 N=17		18		9
					6-6-9-7 N=15				
		10							
	13.5 **SILTY SAND (SM)**, fine grained, brown, medium dense				7-7-10 N=17				
	15.0 ***Boring Terminated at 15 Feet***	15							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 4.5'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 2/9/2016	Boring Completed: 2/9/2016
Drill Rig: BR-2500	Driller: MC
Project No.: AK145007	Exhibit: A-15

BORING LOG NO. B-11

PROJECT: Dorman Park

CLIENT: Orange County Capital Projects

SITE: Ficquette Road
Winter Garden, Orange County, Florida

GRAPHIC LOG	LOCATION See Exhibit A-4 / DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	VERTICAL PERMEABILITY (FT/DAY)	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	ORGANIC SILTY SAND (SM), (topsoil), fine grained, dark brown, medium dense								
	1.0				4-4-6-4 N=10				
	SAND (SP), fine grained, light gray to gray, medium dense				7-6-7-5 N=13				
		5	▽		7-7-7-4 N=14				
	5.5								
	SAND WITH SILT (SP-SM), fine grained, dark brown, medium dense				5-5-8-8 N=13		19		10
	7.5								
	SAND (SP), fine grained, dark brown to brown, medium dense				6-5-5-5 N=10				
		10							
	13.5								
	SILTY SAND (SM), fine grained, brown, medium dense				7-7-9 N=16				
	15.0	15							
	Boring Terminated at 15 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-5 for description of field procedures
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *Water Initially Observed at 4.3'*

Terracon
1675 Lee Rd.
Winter Park, FL

Boring Started: 2/9/169 | Boring Completed: 2/9/2016

Drill Rig: BR-2500 | Driller: MC

Project No.: AK145007 | Exhibit: A-16

APPENDIX B

LABORATORY TESTING

Laboratory Testing

During the field exploration, a portion of each recovered sample was sealed in a glass jar and transported to our laboratory for further visual observation and laboratory testing. Selected samples retrieved from the borings were tested for moisture (water) content, fines content (soil passing a US standard #200 sieve), Atterberg Limits, and permeability. Those results are included in this report on the respective boring logs. The visual-manual classifications were modified as appropriate based upon the laboratory testing results.

Permeability testing was performed on bulk samples obtained from adjacent to Borings B-1 and Boring B-4, between depths of 2 to 4 feet below existing grade, the presumed subgrade soils for the proposed stormwater systems. The bulk samples were remolded in a permeameter to subjectively approximate in-place relative density of the sampled soil. Water was allowed to flow into the soil sample until the sample was apparently saturated. Once saturated, the water flow rate was measured to evaluate the permeability rate.

The soil samples were classified in general accordance with the appended General Notes and the Unified Soil Classification System based on the material's texture and plasticity. The estimated group symbol for the Unified Soil Classification System is shown on the boring logs and a brief description of the Unified Soil Classification System is included in Appendix C. The results of our laboratory testing are presented on the corresponding borings logs.

APPENDIX C

SUPPORTING DOCUMENTS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING

- Auger Cuttings
- Rock Core
- Grab Sample
- No Recovery
- Shelby Tube
- Standard Penetration Test

WATER LEVEL

- **Water Initially Encountered**
- **Water Level After a Specified Period of Time**
- **Water Level After a Specified Period of Time**

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	**Hand Penetrometer**
(T)	**Torvane**
(DCP)	**Dynamic Cone Penetrometer**
(PID)	**Photo-Ionization Detector**
(OVA)	**Organic Vapor Analyzer**

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance			**CONSISTENCY OF FINE-GRAINED SOILS** (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance			
Descriptive Term (Density)	**Safety Hammer SPT N-Value (Blows/Ft.)**	**Automatic Hammer SPT N-Value (Blows/Ft.)**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (psf)**	**Safety Hammer SPT N-Value (Blows/Ft.)**	**Automatic Hammer SPT N-Value (Blows/Ft.)**
Very Loose	0 - 3	< 3	Very Soft	less than 500	0 - 1	< 1
Loose	4 - 9	3 - 8	Soft	500 to 1,000	2 - 4	1 - 3
Medium Dense	10 - 29	8 - 24	Medium-Stiff	1,000 to 2,000	4 - 8	3 - 6
Dense	30 - 50	24 - 40	Stiff	2,000 to 4,000	8 - 15	6 - 12
Very Dense	> 50	> 40	Very Stiff	4,000 to 8,000	15 - 30	12 - 24
			Hard	> 8,000	> 30	> 24

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

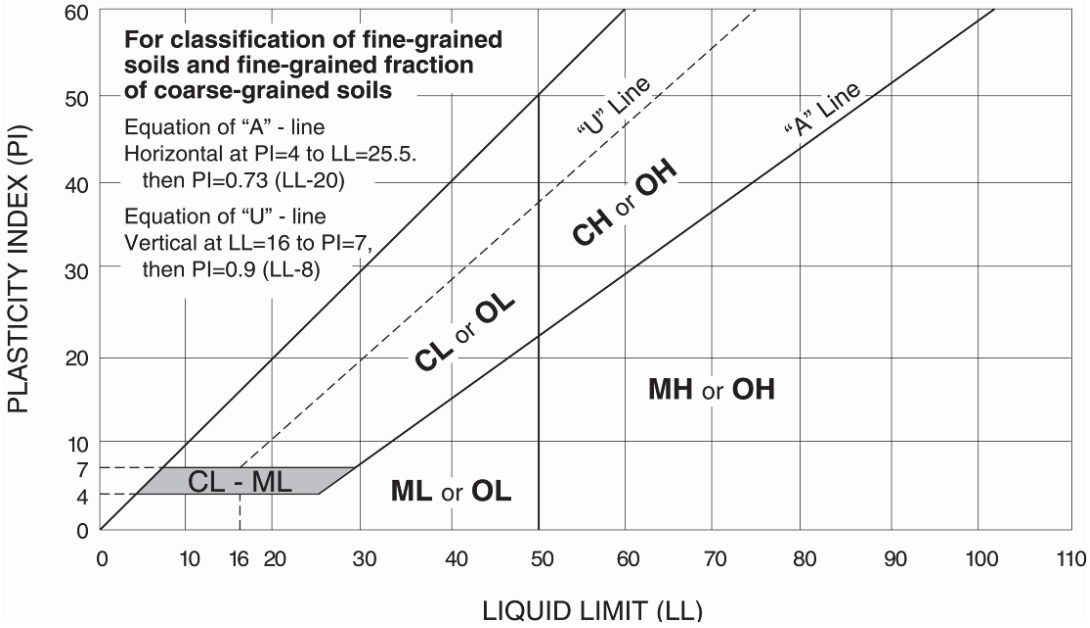
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Division 01

General Requirements

SECTION 01 10 00-SUMMARY OF WORK

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 PROJECT DESCRIPTION

B. Performance of all tasks specified in the contract documents shall be the responsibility of the contractor unless specified otherwise. The description of the project is as follows: Community park with multipurpose athletic field, athletic track, stadium seating, soccer field, support field house with restrooms and showers, and required parking, water retention ponds, and landscaping.

1.03 WORK UNDER OTHER CONTRACTS

A. Separate contracts may be issued to perform certain construction operations at the site.

1.04 BUILDING/SITE SECURITY

A. The site shall be secured by the General Contractor from unwarranted entry at the end of each day.

B. The construction site shall be secured by means of a construction fence, located around the entire perimeter of the construction site. This construction fence shall be required to be secure from unwarranted entry at the end of each day.

1.05 CONTRACTOR USE OF PREMISES

A. General: During the construction period the Contractor shall have full use of the premises for construction operations, including use of the site. The Contractor’s use of the premises is limited only by the Owners right to perform construction operations with the own forces or to employ separate contractors on portions of the project.

B. General: Limit use of the premises to construction activities in areas indicated within the limit of the premises the Contractor may use any portion of the site for storage or work areas or any legal purpose.

1. Confine operations to areas within Contract limits indicated on the Drawings. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.

2. Keep driveways and entrances serving the premises clear and available to the Owner and the Owners employees at all times. Do not use these areas for parking or storage of materials.

3. Burial of Waste Materials: Do not dispose of construction debris, vegetation and hazardous material on site, either by burial or by burning.

1.06 DISTRIBUTION OF RELATED DOCUMENTS

A. The Contractor is solely responsible for the distribution of ALL related documents/drawings/specifications to ALL appropriate vendors/subcontractors to insure proper coordination of all aspects of the project and its related parts during bidding and construction.

1.07 CONTRACT DOCUMENT FILE

A. Copies of the Contract Documents, Plans, Specifications, Addenda, Change Orders, Architects Supplemental Instructions, approved Shop Drawings, Substitution Approvals, etc. shall be placed and maintained in the Contractors field office at the project site by the Contractor throughout the entire contract period. Said these documents shall be filed in a manner that allows for ease of retrieval. Documents shall be made available to the Architect/Engineer and the County’s representatives throughout this same period.

PART 2 PRODUCTS

2.01 ASBESTOS FREE MATERIAL

A. Contractor shall provide a written and notarized statement on company letterhead(s) to certify and warrant that ONLY ASBESTOS FREE MATERIALS AND PRODUCTS were provided as required in this section. Such statement shall be submitted with the final payment request. Final payment shall not be made until such statement is submitted. Contractor agrees that if materials containing asbestos are subsequently discovered at any future time to have been included in the construction, the contractor shall be liable for all costs related to the redesign or modification on the construction of the project so that materials containing asbestos are removed from the facility. If construction has begun or has been completed pursuant to a design that includes asbestos containing materials, the Contractor shall also be liable for all costs related to the abatement of such asbestos.

PART 3 EXECUTION (Not applicable).

END OF SECTION 01 10 00

Jonathan “Scott” Pine Community Park
Orange County, FL

SECTION 01 10 01 - PROJECT DIRECTORY

ARCHITECT	Schenkel Shultz Architecture 200 East Robinson St. Suite 300, Orlando, FL. 32801. Phone (407) 872-3322
CIVIL ENGINEER	S.K. Consortium, Inc. 1053 North Orlando Avenue Suite 3 Maitland, Florida 32751 Phone (407) 629-4288
LANDSCAPE ARCHITECT	Community Solutions Group 318 E. South Street Suite 700 Orlando, Florida 32801 Phone (407) 423-8398
STRUCTURAL ENGINEER	BBM Structural Engineers, Inc. 1912 Boothe Circle, Suite 100 Longwood, FL 32750 Phone (407) 645-3423
MECHANICAL/ELECTRICAL/ PLUMBING/FIRE PROTECTION ENGINEERS	Matern Engineering Professionals 130 Candace Drive Maitland, Florida 32751 Phone (407) 740-5020

END OF SECTION 00 01 15

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SECTION 01 25 00 - PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

B. The Contractors Construction Schedule and the Schedule of Submittals are included under Section Submittals.

C. Standards: Refer to Section Definitions and Standards for applicability of industry standards to products specified.

D. Procedural requirements governing the Contractors selection of products and product options are included under Section Materials and Equipment.

1.03 DEFINITIONS

A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.

B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for substitutions. The following are not considered substitutions:

1. Only these substitutions requested by Bidders during the bidding period, and accepted prior to award of Contract, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.

2. Revisions to Contract Documents requested by the Owner or Architect.

3. Specified options of products and construction methods included in Contract Documents.

4. The Contractors determination of and compliance with governing regulations and orders issued by governing authorities.

1.04 SUBMITTALS

A. Substitution Request Submittal: Request for substitution will be considered if received within ninety (90) days after commencement of the Work. As long as this time allowance will not impact the construction schedule.

1. Submit three (3) copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.

2. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitution, and the following information, as appropriate:

   a. Product Data, including Drawings, and descriptions of products, fabrication and installation procedures.
   b. Samples, where applicable or requested.
   c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
   d. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will become necessary to accommodate the proposed substitution.
   e. A statement indicating the substitutions effect on the Contractors Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
   f. Cost information, including a proposal of the net change, if any in the Contract Sum.

   g. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractors waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.

3. Architects Action: Within two weeks of receipt of the request for substitution, the Architect will request additional information or documentation necessary for evaluation of the request if needed. Within two (2) weeks of receipt of the request, or one week of receipt of the additional information or documentation, which ever is later, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the project specified by name. Decision on the use of a product substitution or its rejection by the Architect is considered final. Acceptance will be in the form of a Change Order.

PART 2 PRODUCTS

2.01 SUBSTITUTIONS

A. Conditions: The Contractors substitution request will be received and considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect; otherwise requests will be returned without action except to record noncompliance with these requirements.

   1. Extensive revisions to Contract Documents are not required.

   2. Proposed changes are in keeping with the general intent of Contract Documents.

   3. The request is timely, fully documented and properly submitted.

4. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.

5. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

6. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar consideration.

7. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.

8. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.

9. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.

B. The Contractors submittal and Project Managers acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

C. Substitution request constitutes a representation that Contractor:

1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.

2. Will provide the same warranty for substitution as for specified product.

3. Will coordinate installation and make other changes which may be required for work to be complete in all respects.

4. Waives claims for additional costs which may subsequently become apparent. All costs associated with the substitution will be paid by the Contractor regardless of approvals given, and regardless of subsequent difficulties experienced as a result of substitutions.

END OF SECTION 01 25 00

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SECTION 01 29 00 - APPLICATION FOR PAYMENT

PART I GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractors Applications for Payment.

B. The Contractors Construction Schedule and Submittal Schedule are included in Section 01 33 00 - SUBMITTALS.

1.03 SCHEDULE OF VALUES

A. Coordinate preparation of the Schedule of Values with preparation of Contractors Construction Schedule.

1. Submit the Schedule of Values to the Owner at the earliest feasible date, but in no case later than Preconstruction Meeting. Refer to Section 01 31 19.

2. Sub-Schedules: Where the Work is separated into phases that require separately phased payments, provide sub-schedules showing values correlated with each phase of payment.

B. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of the Architect
c. Project Number
d. Contractors Name and Address
e. Date of Submittal

2. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:

a. Generic Name
b. Related Specification Section
c. Change Orders (numbers) that have affected value
d. Dollar Value
e. Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent

3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items:

   a. A value will be given for at least every major specification section (subsections can logically be grouped together).
   b. A single material subcontractor (i.e. sod, window blinds) will not be required to be broken down into labor and material unless it is anticipated the materials will be stored and invoiced prior to installation.
   c. All multiple item subcontracts or work items (i.e. concrete, roofing, painting, mechanical, electrical items, etc.) will be shown broken down at least in labor and material (all taxes, burden and overhead and profit included).
   d. Mobilization (move-on, bond, insurance, temporary office and sanitary service installation) shall not exceed 2 1/2% of contract price.
   f. Concrete broken down at least into foundation, slab on grade, columns, beams and suspended slabs.
   g. Masonry divided into C.M.U. stem walls, exterior walls, interior walls.
   h. Plumbing broken down at least into underslab rough-in, vents and stacks, supply piping, equipment items (each listed separately), fixtures and trim.
   I. HVAC: Typically shown per specification section, labor and material, per floor.
   j. Electrical: same as HVAC.
   k. Fire protection broken down at least into underground, rough-in and trim. Labor and material.
   l. Logical grouping of specification subsections are permitted.

4. Round amounts off the nearest whole dollar; the total shall equal the Contract Sum.

5. For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of

   Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

6. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.

   a. At the Contractors option, temporary facilities and other major cost items that are not direct cost of actual work-in place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.

7. Schedule Updating: Update and resubmit the Schedule of Values when Change Orders or Construction Change Directives result in a change in the

contract sum.

1.04 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as reviewed by the Owners Representative and paid for by the Owner.

1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the Final Application for Payment involve additional requirements. See items G, I, J and K of this section.

B. Payment Application Times: The period of construction Work covered by each Application of Payment is the period indicated in the Agreement.

C. Payment Application Forms: Use the County’s most updated Form as the form for Application for Payment. Form given at the Preconstruction Conference.

D. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.

1. Entries shall match data on the Schedule of Values and Contractors Construction Schedule. Use updated schedules if revisions have been made.

2. Include amounts of Change Orders and Construction Change Directives issued to the last day of the construction period covered by the application.

E. Transmittal: Submit six (6) original executed copies of each Application for Payment to the Project Manager by means ensuring receipt within 24 hours; one copy shall be complete, including waivers of lien and similar attachments, when required.

1. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Project Manager.

F. Waivers of Mechanics Lien: With each Application for Payment submit waivers of mechanics liens from subcontractors of sub-subcontractors and suppliers for the construction period covered by the previous application.

1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. The Owner reserves the right to designate which entitles involved in the work must submit waivers.
4. List all Subcontractor start and finish dates to substantiate any Notice to Owner received by the Project Manager.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:

1. List of principal subcontractors
2. List of principal suppliers and fabricators
3. Schedule of Values
4. Approved Contractors Construction Schedule (preliminary if not final)
5. Schedule of principal products
6. Schedule of unit prices (if applicable)
7. Submittal schedule (preliminary if not final)
8. List of Contractors staff assignments
9, List of Contractors principal consultants
10. Copies of building permits for trades requiring separate permits
11. Copies of authorizations and licenses from governing authorities for performance of the Work
12. Initial progress report
13. Report of Pre-Construction Meeting
14. Initial settlement survey and damage report, if required
15. Listing of all long lead procurement items monthly applications for payment will be accompanied with updated schedule and review of as-built drawings.

H. Interim Application for Payment: Payment will be processed once a month. No applications will be processed without receipt of previous months waiver of lien described in subsection F above. Payment for item will be based on percentage completed as determined and approved by the County Project Manager or invoice for stored materials. Retainage (10%) will be held for all interim applications.

I. Applications for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Certificates of partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work. Application shall also include all items listed in Part H above.

J. Administrative actions and submittals that shall proceed or coincide with Substantial Completion Payment. Substantial Completion as defined per General Conditions Section F application include:

1. Occupancy permits and similar approvals
2. Warranties (guarantees) and maintenance agreements
3. Test/adjust/balance records
4. Maintenance instructions
5. Start-up performance reports
6. Change-over information related to Owners occupancy, use, operation and maintenance
7. Final cleaning
8. Application for reduction of retainage, and consent of surety
9. List of incomplete Work, recognized as exceptions to Project Managers Certificate of Substantial Completion

K. Final Payment Application: Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:

1. Completion of Project Close-out requirements
2. Completion of items specified for completion after Substantial Completion
3. Assurance that unsettled claims will be settled
4. Assurance that all work has been completed and accepted
5. Proof that taxes, fees and similar obligations have been paid
6. Removal of temporary facilities and services
7. Removal of surplus materials, rubbish and similar elements
8. Change of door locks to Owners access

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 29 00

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SECTION 01 30 00 - ADMINISTRATIVE PROVISIONS

PART I - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Contractor is responsible to perform all tasks specified in the contract documents. The description of the project is as follows: Community park with multipurpose athletic field, athletic track, stadium seating, soccer field, support field house with restrooms and showers, and required parking, water retention ponds, and landscaping.

1.02 CONTRACT METHOD

A. Construct the work under a single lump sum contract (or as otherwise defined in bid documents).

1.03 COORDINATION

A. Coordinate work of the various Sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.

B. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various Sections having interdependent responsibilities for installing, connecting to and placing in service such equipment. Differences shall be brought to the Owner’s attention during bid process or remain the responsibility of the Contractor.

C. Coordinate space requirements and installation of items, such as but not limited to, mechanical, plumbing, systems and electrical work, which are indicated diagrammatically or otherwise on drawings. Follow routing shown for pipes, ducts and conduits, as closely as practicable; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for facility maintenance and for future repairs.

D. In finished areas (except as otherwise shown), conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Execute cutting and patching to integrate elements of work, uncover ill timed, defective and nonconforming work, provide openings for penetrations of existing surfaces and provide samples as specified in individual sections for testing. Seal penetrations through floors, walls and ceilings, and fire safe where necessary as part of the lump sum price.

1.04 FIELD ENGINEERING SURVEYING

A. Provide field engineering surveying services; establish grades, lines and levels, by use of engineering survey practices recognized as standard by the survey industry. Said work shall be required to be provided by a Professional Land Surveyor, registered as such in the State of Florida.

B. Any U.S.C. and G.S. monument within limits of construction are to be protected. If monuments are in danger of damage, the Contractor shall contact the Project Manager and the Orange County Surveyor prior to the commencing of construction.

C. Payment for all necessary survey work shall be included in the bid as part of other items of work.”

1.05 REFERENCE STANDARDS

A. For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. The date of the standard is that in effect when a specified date is specified and if no date is specified, use the latest edition.

C. Obtain copies of referenced standards listed in individual specification sections. Maintain copy at job site during progress of the specific work.

END OF SECTION 01 30 00

SECTION 01 31 13 - PROJECT COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:

1. Coordination
2. Administrative and supervisory personnel
3. General installation provisions
4. Cleaning and protection

B. Progress meetings, coordination meetings and pre-installation conferences are included in Section 01 31 19 Project Meetings.

C. Requirements for the Contractors Construction Schedule are included in Section 01 33 00 Submittals.

1.03 COORDINATION

A. Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.

1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.

2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Schedules
2. Installation and removal of temporary facilities
3. Delivery and processing of submittals
4. Progress meetings
5. Project Close-out activities

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment (if any) involved in performance of, but not actually incorporated in, the Work.

E. Lack of coordination as specified if this and other sections of the contract documents in grounds for assessment of back charges and/or termination in order to remediate the situation.

1.04 SUBMITTALS

A. Coordination Drawings: Prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.

1. Show the interrelationship of components shown on separate Shop Drawings.

2. Indicate required installation sequences.

3. Comply with requirements contained in Section 01 33 00 Submittals.

4. Refer to Division 23 and Division 26 Section for specific coordination Drawing requirements for mechanical and electrical installations.

B. Staff Names: At the Preconstruction Conference submit a list of the Contractors principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturers Instructions: Comply with manufacturer’s installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.

E. Visual Effects: Provide uniform joint widths in exposed work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to Project Manager for final decision.

F. Recheck measurements and dimensions, before starting each installation.

G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect/Project Manager for final decision.

3.02 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

B. Clean and maintain completed construction as directed by the Project Manager and as frequently as necessary to insure its integrity and safety through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where the applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading
2. Excessively high or low temperatures
3. Excessively high or low humidity
4. Air contamination or pollution
5. Water
6. Solvents
7. Chemicals
8. Soiling, staining and corrosion
9. Rodent and insect infestation
10. Combustion
11. Destructive testing
12. Misalignment
13. Excessive weathering
14. Unprotected storage
15. Improper shipping or handling
16. Theft
17. Vandalism

END OF SECTION 01 31 13

SECTION 01 31 19 - PROJECT MEETINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:

1. Pre-Construction Conference
2. Pre-Installation Conference
3. Coordination Meetings
4. Progress Meetings

B. Construction schedules are specified Section 01 33 00 Submittals.

1.03 PRE-CONSTRUCTION CONFERENCE

A. Schedule a pre-construction Conference and organizational meeting at the project site or other convenient location no later than 20 days after execution of the agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.

B. Attends: The OWNERS, Representative, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress including such topics as:

1. Tentative construction schedule
2. Critical Work sequencing and/coordinating
3. Designation of responsible personnel
4. Procedures for processing field decisions and Change Orders
5. Procedures for processing Applications for Payment
6. Distribution of Contract Documents
7. Submittal of Shop Drawings, Product Data and Samples.
8. Preparation of record documents
9. Use of the Premises
10. Office, Work and storage areas.
11. Equipment deliveries and priorities
12. Safety procedures
13. First aid
14. Security
15. Housekeeping
16. Working hours

D. Contractor must submit at the time of the meeting at least the following items:

1. Schedule of Values
2. Listing of key personnel including project superintendent and subcontractors with their addresses, telephone numbers, and emergency telephone numbers.
3. Preliminary Construction Schedule
4. Submittal Schedule

1.04 PRE-INSTALLATION CONFERENCE

A. Conduct a Pre-installation conference at the site before each construction activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise at least 48 hours in advance the Project Manager of scheduled meeting dates.

1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:

a. Contract Documents
b. Options
c. Related Change Orders
d. Purchases
e. Deliveries
f. Shop Drawings, Product Data and Quality Control Samples
g. Possible conflicts
h. Compatibility problems
I. Time schedules
j. Weather limitations
k. Manufacturers recommendations
l. Comparability of materials
m. Acceptability of substrates
n. Temporary facilities
o. Space and access limitations
p. Governing regulations
q. Safety
r. Inspection and testing requirements
s. Required performance results
t. Recording requirements
u. Protection

2. Record significant discussions and agreements and disagreements of each conference along with and approved schedule. Distribute the record of the meeting to everyone. Concerned, promptly, including the Owner and Architect.

3. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

1.05 PROGRESS MEETINGS

A. Conduct progress meetings at the Project site at weekly intervals or more frequently if

necessary as directed by the Project Manager. Notify the Owner at least 48 hours in advance of scheduled meeting time and dates. Coordinate dates of meetings with preparation of the payment request.

B. Attendees: In addition to representatives of the Owner and Architect, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities with the Project and authorized to conclude matters relation to progress.

C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

1. Contractors Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractors Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

2. Review the present and future needs of each entity present, including such items as:

a. Interface requirements
b. Time
c. Sequences
d. Deliveries
e. Off-site fabrication problems
f. Access
g. Site utilization
h. Temporary facilities and services
i. Hours of work
j. Hazards and risks
k. Housekeeping
l. Quality and work standards
m. Change Orders
n. Documentation of information for payment requests.

D. Reporting: No later than 3 days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, or progress since the previous meeting and report.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 31 19

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SECTION 01 33 00 - SUBMITTALS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including:

1. Contractors construction schedule
2. Submittal schedule
3. Daily construction reports
4. Shop Drawings
5. Product Data
6. Samples

B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Permits
2. Applications for payment
3. Performance and payment bonds
4. Insurance certificates
5. List of Subcontractors with start and finish dates update as necessary
6. Schedule of Values
7. Construction Schedule

C. The Schedule of Values submittal is included in Section 01 29 00 Application for Payment.

D. Inspection and test reports are included in Section 01 45 29 “Testing Laboratory Services”.

1.03 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

    a. The Project Manager reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

    a. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Project Manager will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
    b. If an intermediate submittal is necessary, process the same as the initial submittal.
    c. Allow two weeks for reprocessing each submittal.
    d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractors review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken.

    a. Project name
    b. Date
    c. Name and address of architect
    d. Name and address of contractor
    e. Name and address of subcontractor
    f. Name and address of supplier
    g. Name of manufacturer
    h. Number and title of appropriate Specification Section
    I. Drawing number and detail references, as appropriate.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Project Manager using transmittal form as provided by the Project Manager. Submittals received from sources other than the Contractor will be returned without action.

1. On the transmittal Record relevant information and requests for data. On the form, or separate sheet, record deviations from
   Contract Document requirements, including minor variations and limitations. Include Contractors certification that information complies with Contract Document requirements.
2. Transmittal Form: As provide by the Project Manager

D. Contractor shall be responsible for cost of re-review of rejected submittals, shop drawing, etc. Costs for re-review shall be reimbursed to the County by deducting the cost from the Contractors monthly progress payments. Costs to be determined by applying the consultants standard billing rates, plus 10% handling by the County.

E. Substitution request to specified products will be made within 45 days of Notice to Proceed. After the 45 day period, no requests for substitution from the Contractor will be considered.

1. Substitution submitted within the first 45 days will have product data from specified and requested substitute submitted together and demonstrate better quality, cost savings if of equal quality, or show benefit to the County for excepting the substitute. The Contractor shall include in their bid the cost of using the specified listed products or those approved by pre-bid addenda. The county will not guarantee it will approve any request for substitution.

1.04 CONTRACTORS CONSTRUCTION SCHEDULE

A. Critical Path Method (CPM) Schedule: Prepare a fully developed, horizontal bar-chart type Contractors construction schedule. Submit in accordance with Section 01 31 19 project Meetings.

1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the Schedule of Values.

2. Within each time bar indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.

3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.

4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.

5. Coordinate the Contractors construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment request and other schedules.

6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architects procedures necessary for certification of Substantial Completion.

B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by requirements for phased completion to permit Work by separate contractors and partial occupancy by the Owner prior to Substantial Completion.

C. Work Stages: Indicate important stages of construction for each major portion of the

Work, including testing and installation.

D. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.

E. Cost Correlation: At the head of the schedule, provide a two item cost correlation line, indicating pre-calculated and actual costs. On the line show dollar-volume of Work performed as the dates used for preparation of payment requests.

1. Refer to Section Applications for Payment for cost reporting and payment procedures.

F. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with schedule dates. Post copies in the Project meeting room and temporary field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

G. Schedule Updating: Revise the schedule monthly or activity, where revisions have been recognized or made. Issue the updated schedule concurrently monthly pay request.

1.05 SUBMITTAL LOG

A. After development and acceptance of the Contractors construction schedule, prepare a complete log of submittals.

1. Coordinate submittals log with the list of subcontracts, schedule of values and the list of products as well as the Contractors construction schedule.

2. Prepare the log in chronological order; include all submittals required. Provide the following information:

a. Scheduled date for the first submittal
b. Related Section number
c. Submittal category
d. Name of subcontractor
e. Description of the part of the Work covered
f. Scheduled date for resubmittal
g. Scheduled date the Architects final release or approval.

3. All submittals must be received within the first 25% of contract time.

B. Distribution: Following response to initial submittal, print and distribute copies to the Project Manager, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

1. When revisions are made, distribute to the same parties and post I the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

C. Log Updating: Revise the log after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.06 DAILY CONSTRUCTION REPORTS

A. Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Project Manager at weekly intervals:

1. List of subcontractors at the site
2. Approximate count of personnel at the site
3. High and low temperatures, general weather conditions
4. Accidents and unusual events
5. Meetings and significant decisions
6. Stoppages, delays, shortages, losses
7. Meter readings and similar recordings
8. Emergency procedures
9. Orders and requests of governing authorities
10. Change Orders received, implemented
11. Services connected, disconnected
12. Equipment or system tests and start-ups
13. Partial completion, occupancies
14. Substantial Completion authorized

1.07 SHOP DRAWINGS

A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered a Shop Drawing and will be rejected.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

1. All required dimensions
2. Identification of products and materials included
3. Compliance with specified standards
4. Notation of coordination requirements
5. Notation of dimensions established by field measurement
6. Sheet Size: Except for templates, patterns and similar full-size Drawings on sheets at least 8" x 11" but no larger than 24" x 36".
7. Initial Submittal: Submit one correctable translucent reproducible print and one blue-or black-line print for the Project Managers review; the reproducible print will be returned.
8. Initial Submittal: Submit 2 blue-or black-line prints for the Architects review; one will be returned.
9. Final Submittal: Submit 2 blue-or black-line prints; submit 2 prints where required for maintenance manuals. 2 prints will be retained; the remainder will be returned.
10. Final Submittal: Submit 3 blue-or black-line prints; submit 2 prints where required for maintenance manuals. 2 prints will be retained; the remainder will be returned.

11. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connections with construction.

C. Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.

1. Preparation of coordination Drawings is specified in section Project Coordination and may include components previously shown in detail on Shop Drawings or Product Data.

2. Submit coordination Drawings for integration of different construction elements. Show sequence and relationships of separate components to avoid any conflict including conflicts in use of space.

3. Contractor is not entitled to additional payments due to lack of compliance with this Section.

1.08 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturers installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as Shop Drawing.

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

a. Manufacturers printed recommendations
b. Compliance with recognized trade association standards
c. Compliance with recognized testing agency standards
d. Application of testing agency labels and seals
e. Notation of dimensions verified by field measurement
f. Notation of coordination requirements
g. Manufacturers local representative and phone number.

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

3. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.

4. Submittals: Submit 6 copies of each required submittal. The Project Manager will return two (2) sets to the Contractor marked with action taken and corrections or modifications required.

a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

   a. Do not proceed with installation until an applicable copy of Product Data applicable is in the Installers possession.
   b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.09 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of materials, color range sets, and swatches showing color, texture and pattern.

1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architects/Owners Sample. Include the following:

   a. Generic description of the Sample
   b Sample source
   c. Product name or name of manufacturer
   d. Compliance with recognized standards
   e. Availability and delivery time

2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

   a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.

   b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.

3. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

   a. Preliminary submittals will be reviewed and returned with the Architects/Owners mark indicating selection and other action.

4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.

5. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

   a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

   b. Sample sets may be used to obtain final acceptance of the construction associated with each set.

B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

1. Field Samples specified in individual sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.

1.10 ARCHITECTS / ENGINEERS ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect/Engineer/Project Manager will review each submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is the Contractors responsibility.

B. Action Stamp: The Architect/Engineer/Project Manager will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, similarly as follows, to indicate the action taken:

1. Final Unrestricted Release: Where submittals are marked No Exceptions Taken, that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.

2. Final-But-Restricted Release: When submittals are marked Make Corrections Noted that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

3. Returned for Resubmittal: When submittal is marked Revise and Resubmit, do not proceed with that part of the Work covered by
the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.

   a. Do not permit submittals marked Revise and Resubmit to be used at the Project site, or elsewhere where Work is in progress.

4. Rejected: Submittal does not comply with requirements of the Contract Documents. Submittal must be discarded and entirely new submittal shall be forward to the Project Manager without delay.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

PART 4 - SCHEDULE

4.1 SCHEDULE OF SUBMITTALS DESCRIPTION (SD) AND SUBMITTAL REGISTER

A. General: The following is a description of each submittal type, specified in other Sections, required for the Project. Include each submittal description (SD) in the Submittal Register included as part of this Section.

1. SD-01: Product Data; submittals which provide calculations, descriptions or other documentation regarding the work.

2. SD-02: Manufacturer’s Catalog Data (Product Data); data composed of information sheets, brochures, circulars, specifications and product data, and printed information in sufficient detail and scope to verify compliance with requirements of the Contract Documents.

3. SD-03: Manufacturer’s Standard Color Charts (Product Data); preprinted illustrations displaying choices of color and finish for a material or product. A type of product data.

4. SD-04: Shop Drawings; graphic representations which illustrate relationship of various components of the work, schematic diagrams of systems, details of fabrications, layout of particular elements, connections, and other relational aspects of the work.

5. SD-05: Design Data (Shop Drawings); design calculations, mix designs, analyses, or other data written and pertaining to a part of the work.

6. SD-06: Instructions (Product Data); preprinted material describing installation of a product, system, or material, including special notices and Material Safety Data Sheets, if any, concerning impedance, hazards, and safety precautions.

7. SD-07: Schedules (Shop Drawings); a tabular list of data or a tabular listing of locations, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

8. SD-08: Statements (Shop Drawings); a document, required of the Contractor, or through the Contractor by way of a supplier, installer, manufacturer, or other lower tier contractor, the purpose of which is to further the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verification of quality.

9. SD-09: Reports (Product Data); reports of inspection and laboratory tests, including analysis, an interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

10. SD-10: Test Reports (Product Data); a report signed by an authorized official of a testing laboratory that a material, product, or system identical to the material, product or system to be provided has been tested in accordance with requirements specified by naming the test method and material. The test report must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test. Testing must have been within three years of the date of award of this Contract.

11. SD-11: Factory Test Reports (Shop Drawings); a written report which includes the findings of a test required to be performed by the Contractor or an actual portion of the work or prototype prepared for this project before it is shipped to the job site. The report must be signed by an authorized official of a testing laboratory and must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test.

12. SD-12: Field Test Reports (Shop Drawings); a written report which includes the findings of a test made at the job site, in the vicinity of the job site, or on a sample taken from the job site, on a portion of the work, during or after installation. The report must be signed by an authorized official of a testing laboratory or agency and must state the test was performed in accordance with the test requirements; state the test results; and indicate whether the material, product, or system has passed or failed the test.

13. SD-13: Certificates (Shop Drawings); statements signed by responsible officials of a manufacturer of a product, system, or material attesting that the product, system, or material meet specified requirements. The statements must be dated after the award of this contract, name the project, and list the specific requirements which it is intended to address.

14. SD-14: Warranties (Product Data); statements signed by responsible officials of a manufacturer of a product, system, or material attesting that the product, system, or material will perform its specific function over a specified duration of time. The statement must be dated, and include the name of the project, the Owner’s name, and other pertinent data relating to the warranty.

15. SD-15: Samples; samples, including both fabricated and non-fabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

16. SD-16: Color Selection Samples (Samples); samples of the available choice of colors, textures, and finishes of a product or material, presented over substrates identical in texture to that proposed for the work.

17. SD-17: Sample Panels (Samples); an assembly constructed at the project site in a location acceptable to the Owner’s Representative and using materials and methods to be employed in the work; completely finished; maintained during construction; and removed at the conclusion of the work or when authorized by the Owner’s Authorized Representative.

18. SD-18: Sample Installations (Samples); a portion of an assembly or material constructed where directed and, if approved, retained as a part of the work.

19. SD-19: Records; documentation to ensure compliance with an administrative requirement or to establish an administrative mechanism.

20. SD-20: Operation and Maintenance Manuals (Records); data intended to be incorporated in an Operations and Maintenance Manual

21. SD-21: Test Reports of Existing Conditions; a document describing existing conditions and operations of systems and components prior to the start of any work. Testing shall be held in the presence of the Owner’s Authorized Representative. Provide copies of the test reports to the Owner’s Authorized Representative.

22. SD-22: Demonstrations; physical operation of equipment and systems by factory authorized representatives to demonstrate to the Owner’s facility personnel proper operation of systems. Provide all required documentation that certified completed demonstration.

23. SD-23: Record Drawings; delineated documentation accurately depicting final installation location of components and systems of the building.

24. SD-24: Shop Drawings in Magnetic Medium; when drawings are required. All materials shall be provided in AUTOCAD Release 2000 or 2002.

B. Submittal Register: The Contractor is to maintain an accurate updated submittal register and will bring this register to each scheduled progress meeting with the Owner and the Designer. This register should include the following items:

1. Submittal-Description and Number assigned.
2. Date to Designer.
3. Date returned to Contractor (from Designer).
4. Status of Submittal (Accepted/Resubmit/Rejected).
5. Date of Resubmittal and Return (as applicable).
6. Date material released (for fabrication).
7. Projected date of fabrication.
8. Projected date of delivery to site.
9. Status of submittal.

SUBMITTAL REGISTER (PART A)

Contract Number: Project Title:

Spec. Section Number	Submittal Description (SD) Number	Spec. Paragraph Number	Designer Reviewer	Trans Control Number	Planned Submittal Date
(A)	(B)	(C)	(D)	(E)	(F)
03 11 00	SD-01, SD-02, SD-05	1.3			
03 21 00	SD-01,SD-04, SD-09	1.3			
03 30 00	SD-01, SD-02, SD-05, SD-06, SD-09	1.2			
03 47 14	SD-02, SD-04, SD-05	1.3			
04 20 00	SD-09, SD-08, SD-17, SD-01, SD-19, SD-13,	1.2			
05 12 00	SD-04, SD-05	1.3			
05 21 00	SD-01, SD-04, SD-05, SD-07	1.3			
05 31 00	SD-02, SD04	1.3			
05 44 00	SD-01, SD-02, SD-04, SD-05	1.4			
05 50 00	SD-01, SD-04, SD-15, SD-13, SD-08	1.4			
06 10 00	SD-01, SD-13	1.4			

07 21 00	SD-01	1.3			
07 21 19	SD-05, SD-11	1.3			
07 24 11	SD-01, SD-04, SD-15, SD-20	1.3			
07 24 30	SD-01, SD-04	1.2			
07 26 10	SD-01, SD-15, SD-19	1.3			
07 41 13	SD-01, SD-04, SD-13, SD-19, SD-15	1.3			
07 54 00	SD-01, SD-04, SD-13, SD-20, SD-19	1.5			
07 62 00	SD-01, SD-04, SD-15, SD-19	1.4			
07 72 33	SD-01, SD-04, SD-15	1.3			
07 92 00	SD-01, SD-15, SD-13	1.4			
08 11 13	SD-01, SD-04, SD-15, SD-13	1.3			
08 31 13	SD-01, SD-04	1.3			
08 33 13	SD-01, SD-04, SD-15, SD-08SD-23	1.3			
08 71 00	SD-01, SD-13, SD-1502, SD-06	1.3			
08 84 00	SD-01, SD-15, SD-06	1.4			
08 91 19	SD-01, SD-04, SD-15, SD-11	1.3			
09 21 16	SD-01, SD-15	1.3			
09 26 13	SD-01, SD-13, SD-17	1.3			
09 30 00	SD-01, SD-04	1.4			
09 90 00	SD-01 ,SD-15, SD-08, SD-19	1.3			
10 14 00	SD-01, SD-04, SD-19, SD-15	1.3			
10 21 13	SD-01, SD-04, SD-15	1.3			
10 28 13	SD-01, SD-15, SD-13, SD-04	1.3			
10 41 16	SD-01, SD-04, SD-19	1.3			
10 44 00	SD-01, SD-19	1.4			
10 51 13	SD-01, SD-04, SD-15, SD-20	1.3			
10 71 36	SD-01, SD-15, SD-04, SD-13	1.3			
10 75 00	SD-01, SD-04, SD-15	1.4			
11 31 00	SD-201, SD-13, SD-20, SD-19	1.3			
11 66 00	SD-01, SD-04, SD-19, SD-04	1.3			
11 68 43	SD-01, SD-04, SD-19	1.3			
12 36 16	SD-01, SD-0	1.3			
12 93 13	SD-01, SD-20	1.3			
13 34 17	SD-04, SD-08	1.3			

22 05 10	SD-01, SD-04, SD-20	1.4			
22 05 19	SD-01, SD-07, SD-20	1.3			
22 05 23	SD-01, SD-07, SD-20	1.4			
22 05 29	SD-01, SD-07, SD-20	1.5			
22 05 53	SD-07	1.3			
22 05 76	SD-04	1.3			
22 05 77	SD-04	1.3			
22 07 00	SD-01, SD-07, SD-20	1.4			
22 11 16	SD-01, SD-04	1.5			
22 11 17	SD-09, SD-10, SD-13	1.6			
22 13 16	SD-01, SD-04	1.5			
22 33 00	SD-01, SD-04, SD-07, SD-14, SD-20	1.2			
22 42 00	SD-01, SD-04, SD-07, SD-20	1.3			
23 05 10	SD-01, SD-04	1.5			
23 05 17	SD-01, SD-04, SD-11, SD-20	1.4			
23 05 19	SD-01, SD-07, SD-20	1.3			
23 05 23	SD-01, SD-07, SD-20	1.4			
23 05 29	SD-01, SD-07, SD-20	1.5			
23 05 48	SD-01, SD-04, SD-07, SD-13, SD-20	1.4			
23 05 53	SD-01, SD-04, SD-20	1.3			
23 05 80	SD-01, SD-04, SD-20	1.4			
23 05 93	SD-10, SD-12, SD-13, SD-20	1.4			
23 07 00	SD-01, SD-04, SD-07, SD-20	1.4			
23 08 00					
23 09 23	SD-01, SD-04, SD-07, SD-10, SD-12, SD-14, SD-20	1.5, 1.8			
23 21 13	SD-01, SD-04, SD-07, SD-13	1.6			
23 23 00	SD-07, Sd-13	1.5			
23 25 00	SD-01, SD-04, SD-07, SD-13, SD-14	1.5			
23 31 00	SD-01, SD-04, SD-07, SD-20	1.4			
23 31 01	SD-01, SD-04, SD-07, SD-20	1.4			
23 33 00	SD-01, SD-04, SD-07, SD-20	1.5			
23 34 00	SD-01, SD-04, SD-07, SD-14, SD-20	1.4, 1.5			
23 36 00	SD-01, SD-04, SD-07, SD-20	1.7			
23 37 13	SD-01, SD-04, SD-07, SD-20	1.4			
23 41 00	SD-01, SD-04, SD-07, SD-20	1.4			
23 66 00	SD-01, SD-04, SD-07, SD-13, SD-14, SD-20	1.5, 1.7			
23 73 00	SD-01, SD-04, SD-07, SD-13, SD-14, SD-20	1.4, 1.5			
23 81 43	SD-01, SD-04, SD-07, SD-14, SD-20	1.4, 1.5			
23 82 16	SD-01, SD-04, SD-07, SD-20	1.4			

26 05 19	SD-1, 6, 20	1.5			
26 05 33	SD-1, 6, 13	1.6			
26 05 34	SD-1, 6	1.5			
26 05 35	SD-4	1.5			
26 05 73	SD-10	1.5			
26 09 23	SD-1, 4, 6, 10, 20	1.6			
26 22 13	SD-1, 4, 6, 10, 14	1.5			
26 24 16	SD-1, 4, 6, 14	1.6, 1.8			
26 24 17	SD-1, 2, 4, 6, 10	1.5			
26 27 13	SD-1, 6,	1.6			
26 27 16	SD-1, 4, 6	1.4			
26 27 26	SD-1, 2, 6	1.2, 1.4			
26 28 19	SD-1, 6	1.5			
26 29 13	SD-1, 4, 6	1.5			
26 41 13	SD-1, 2, 4, 6	1.5			
26 43 00	SD-4, 10, 13, 14, 15	1.7			
26 51 13	SD-1, 4, 6, 20	1.2			
26 52 13	SD-1, 4, 6, 20	1.6			
26 56 00	SD-1, 4, 6, 20	1.5			
26 56 20	SD-1, 6, 14	1.6, 1.8			
27 41 31	SD-1, 2, 4, 6, 10, 13, 19, 20	1.7			
28 31 00	SD-1, 2, 4, 6, 10, 13, 19, 20	1.7			

31 21 10					
31 22 00	SD-01, SD-08, SD-12	1.4			
31 22 10					
31 22 70	SD-01, SD-07	1.3			
31 25 10					
31 25 11	SD-13	1.03			
31 25 12	SD-13	1.03			
31 25 13	SD-13	1.03			
31 25 20	SD-15	1.4			
31 25 77	SD-08, SD-01	1.3			
31 25 80					
31 26 66	SD-01, SD-04, SD-19, SD-20	1.4			
31 26 88	SD-01, SD-04, SD-19, SD-20	1.4			
31 27 20	SD-01, SD-04, SD-19, SD-20	1.4			
31 27 30	SD-01, SD-04, SD-19, SD-20	1.4			
31 28 31	SD-01	1.4			
31 29 20	SD-04, SD-01, SD-13,	1.4			
31 31 00	SD-01, SD-13, SD-19	1.3			
31 31 18	SD-01, SD-19	1.3			
32 18 01	SD-19, SD-04, SD-01, SD-15, SD-13,	1.4			
32 18 22	SD-01, SD-04, SD-15, SD-20	1.4			
32 31 19	SD-01, SD-04	1.3			
32 84 00	SD-01, SD-02, SD-14, SD-20, SD-23	1.4			
32 92 00	SD-09, SD-13	1.2, 1.3			
32 92 01	SD-09	1.3			
32 93 00	SD-09, SD-13, SD-15	1.3			

SUBMITTAL REGISTER (PART B)

Location: Contractor:

Action Code	Date of Action	Date Rec'd from Contr.	Date FWD to other Reviewer	Date Rec'd from other Reviewer	Action Code	Date of Action	Mailed to Cont.	Remarks
(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)

END SECTION 01 33 00

SECTION - 01 42 13 ABBREVIATIONS

PART 1 GENERAL

A. General:

A	Area Square Feet; Ampere
AAMA	Architectural Minimum Manufacturer's Association
ABS	Acrylonitrile Butadiene Styrene
A.C.	Alternating Current; Air conditioning; Plywood Grade A & C
A.B.	Anchor Belt
A.C.I.	American Concrete Institute
Acous.	Acoustical
AD	Plywood, Grade A & D
A.D.	Area Drain
Adh.	Adhesive
Addit	Additional
Adj.	Adjustable
af	Audio-frequency
Aff	Above Finished Floor
Afg	Above Finished Grade
A.G.A.	American Gas Association
Agg.	Aggregate
A.H.	Ampere Hours
A hr.	Ampere-hour
A.H.U.	Air Handing Unit
A.I.A.	American Institute of Architects
A.I.C.	Alternating Interrupting Capacity
AIC	Ampere Interrupting Capacity
AISC	American Institute of Steel Construction
Allow.	Allowance
ALT.	Alternate
Alt.	Altitude
Alum.	Aluminum
a.m.	Ante Meridiem
Amp.	Ampere
Anc.	Anchor
Anod.	Anodized
ANSCI	American National Standards Institute
A.P.	Access Panel
Appd.	Approved
Approx.	Approximately
Apt.	Apartment
Arch.	Architectural
Asb.	Asbestos
A.S.B.C.	American Standard Building Code
A.S.H.R.A.E.	American Society of Heating, Refrig. & AC Engineers
A.S.M.E.	American Society of Mechanical Engineers
A.S.T.M.	American Society for Testing and Materials
Attchmt.	Attachment
Auto.	Automatic
Avg.	Average

A.W.G.	American Wire Gauge
AWI	American Wood Institute
AWS	American Welding Society
Bbl.	Barrel
B.C.	Bare Copper
B.& B.	Grade B. and Better;Balled and Burlapped
B.& S.	Bell and Spigot
B.& W.	Black and White
b.c.c.	Body-centered Cubic
Bd	Board
BE	Bevel End
B.F.	Board Feet
BF.	Bottom Face
Bg. Cem	Bag of Cement
BHP	Boiler Horsepower, Brake Horsepower
B.I.	Black Iron
Bit. ;Bitum	Bituminous
Bk.	Backed
Bkrs.	Breakers
Bldg.	Building
Blk.	Block
Blkg.	Blocking
Bm.	Beam
B.M.	Benchmark
B.O.C.	Bottom of Curb
BOT.	Bottom
Boil.	Boilermaker
B.P.M.	Blows Per Minute
BR	Bedroom
Brg.	Bearing
Brhe.	Bricklayer Helper
Bric.	Bricklayer
Brk.	Brick
Brkt.	Bracket
Brng.	Bearing
Brs.	Brass
Brz.	Bronze
Bsmt.	Basement
Bsn.	Basin
Btr.	Better
BTU	British Thermal Unit
BTUH	BTU per hour
Btwn.	Between
B.U.R.	Built up Roofing
BX	Interlocked Armored Cable
c	Conductivity
C	Hundred; Centigrade
C.	Course
C/C	Center to Center
Cab.	Cabinet
Cair.	Air Tool Laborer
Calc.	Calculated
Cap.	Capacity
Carp.	Carpenter

C.B.	Circuit Breaker
C.BD.	Chalk Board
C.C.A.	Chromate Copper Arsenate
C.C.F.	Hundred Cubic Feet
cd	Candela
cd/sf	Candela per Square Feet
CD	Grade of Plywood Face & Back
CDX	Plywood, grade C & D, exterior glue
Cefi.	Cement Finisher
Cem.	Cement
Cer.	Ceramic
CF	Hundred Feet
C.F.	Cubic Feet
CFM	Cubic Feet per Minute
c.g.	Center of Gravity
CG	Corner Guard
CHW	Chilled Water
C.I.	Cast Iron
C.I.P.	Cast in Place
Circ.	Circuit
C.J.	Control Unit
C.L.	Carload Lot
Clab.	Common Laborer
Clec.	Clock Equipment Cabinet
C.L.F.	Hundred Linear Feet
CLF	Current Limiting Fuse
Clg.	Ceiling
Clkg.	Caulking
Clo.	Closed
CLP	Cross Linked Polyethylene
Clr.	Clear
cm	Centimeter
CMP	Corr. Metal Pipe
C.M.U.	Concrete Masonry Unit
Cntr.	Counter
C.O.	Cleanout
Col.	Column
Conn.	Connection
Cont.	Continuous
Cont.	Contractor
C.Opng.	Cased Opening
CO2	Carbon Dioxide
Comb.	Combination
Compr.	Compressor
Conc.	Continuous; Continued
Cond.	Conductor
Corr.	Corrugated
Cos	Cosine
Cot	Cotangent
Cov.	Cover
CPA	Control Point Adjustment
Cplg.	Coupling
C.P.M.	Critical Path Method
CPVC	Chlorinated Polyvinyl Chloride

C.Pr.	Hundred Pair
CRC	Cold Rolled Channel
Creos.	Creosote
Crpt.	Carpet & Linoleum Layer
CRT	Cathode Ray Tube
CS	Carbon Steel
Csc	Cosecant
C.S.F.	Hundred Square Feet
CSI	Construction Specifications Institute
C.T.	Current Transformer
CTS	Copper Tube Size
Cu	Cubic
Cu. Ft.	Cubic Foot
cw	Continuous Wave
C.W.	Cool White; Cold Water
C. Wall	Curtain Wall
Cwt.	100 Pounds
C.W.X.	Cool White Deluxe
C.Y.	Cubic Yard (27 cubic feet)
C.Y./Hr.	Cubic Yard per Hour
Cyl.	Cylinder
d	Penny (nail size)
D	Deep; Depth; Discharge
Dis; Disch	Discharge
Db.	Decibel
Dbl.	Double
DC	Direct Current
Demob.	Demobilization
d.f.u.	Drainage Fixture Units
D.H.	Double Hang
DHU	Domestic Hot Water
Diag.	Diagonal
Diam.	Diameter
Distrib.	Distribution
Dk.	Deck
D.L.	Deck Load
Do.	Ditto
Dp.	Depth
D.P.S.T.	Double Pole, Single Throw
Dr.	Driver
Drink.	Drinking
D.S.	Double Strength
D.S.A.	Double Strength A Grade
D.S.B.	Double Strength B Grade
Dty.	Duty
DWV	Drain Waste Vent
DX	Deluxe White, Direct Expansion
dyn	Dynbe
e	Eccentricity
E	Equipment only; East
Ea	Each
E.B.	Encased Burial
Econ.	Economy
EDP	Electronic Data Processing

E.D.R.	Equiv. Direct Radiation
Eq.	Equation
Elec.	Electrician; Electrical
Elev.	Elevator; Elevating
EMT	Electrical Metallic Conduit; Thin Wall Conduit
Eng.	Engine
EPDM	Ethylene Propylene Diene Monomer
Eqhv.	Equip. Oper., heavy
Eqlt.	Equip. Oper., light
Eqmd.	Equip. Oper., medium
Eqmm.	Equip. Oper., Master Mechanic
Equol.	Equip. Oper., Oilers
ERW	Electric Resistance Welded
Est.	Estimated
esu	Electrostatic Units
E.W.	Each Way
EWT	Entering Water Temperature
Excav.	Excavation
Exp.	Expansion, Exposure
Ext.	Exterior
Extru.	Extrusion
f.	Fiber Stress
F	Fahrenheit; Female; Fill
Fab.	Fabricated
F.B.C.	Florida Building Code
FBGS	Fiberglass
F.C.	Foot candles
f.c.c.	Face Centered Cubic
f'c	Compressive Stress in Concrete; Extreme Compressive Stress
F.E.	Front End
FRP	Fluorinated Ethylene Propylene (Teflon)
F.G.	Flat Grain
F.H.A.	Federal Housing Administration
Fig.	Figure
Fin	Finished
Fixt.	Fixture
Fl. Oz.	Fluid Ounces
Flr.	Floor
F.M.	Frequency Modulation; Factory Mutual
Fmg.	Framing
Fndtn.	Foundation
Fori.	Foreman; Inside
Fount.	Fountain
FPM	Feet Per Minute
Fr.	Frame
F.R.	Fire Rating
FRK	Foil Reinforced Kraft
FRP	Fiberglass Reinforced Plastic
FS	Forged Steel
FSC	Cast Body; Cast Switch Box
Ft.	Foot; Feet
Ftng.	Fitting
Ftg.	Footing
Ft.Lb.	Foot Pound

Furn.	Furniture
FVNR	Full Voltage Non-Reversing
FXM	Female by Male
Fy.	Minimum Yield Stress of Steel
g	Gram
G	Gauss
Ga.	Gauge
Gal.	Gallon
Gal./Min.	Gallon Per Minute
Galv.	Galvanized
Gen.	General
G.F.I.	Ground Fault Interrupter
Glaz.	Glazier
GPD	Gallons per Day
GPH	Gallons per Hour
GPM	Gallons per Minute
GR	Grade
Gran.	Granular
Grnd.	Ground
H	High; High Strength Bar Joist; Henry
H.C.	High Capacity
H.D.	Heavy Duty; High Density
H.D.O.	High Density Overlaid
Hdr.	Header
Hdwe.	Hardware
Help.	Helper Average
HEPA	High Efficiency Particular Air Filter
Hg.	Mercury
HIC	High Interrupting Capacity
H.O.	High Output
Horiz.	Horizontal
H.P.	Horsepower; High Pressure
H.P.F.	High Power Factor
Hr.	Hour
Hrs./Day	Hours per Day
HSC	High Short Circuit
Ht.	Height
Htg.	Heating
Htrs.	Heaters
HVAC	Heating, Ventilating & Air Conditioning
Hvy.	Heavy
HW	Hot Water
Hyd.;Hydr.	Hydraulic
Hz.	Hertz (cycles)
I.	Moment of Inertia
I.C.	Interrupting Capacity
ID	Inside Diameter
I.D.	Inside Dimension; Identification
I.F.	Inside Frosted
I.M.C.	Intermediate Metal Conduit
In.	Inch
Incan.	Incandescent
Incl.	Included; Including
Int.	Interior

Inst.	Installation
Insul.	Insulation
I.P.	Iron Pipe
I.P.S.	Iron Pipe Size
I.P.T.	Iron Pipe Threaded
I.W.	Indirect Waste
J	Joule
J.I.C.	Joint Industrial Council
K	Thousand; Thousand Pounds; Heavy Wall Copper Tubing
K.A.H.	Thousand Amp. Hours
KCMIL	Thousand Circular Mils
KD	Knock Down
K.D.A.T.	Kiln Dried After Treatment
Kg	Kilogram
kG	Kilogauss
kgf	Kilogram force
kHz	Kilohertz
Kip	1000 Pounds
KJ	Kiljoule
K.L.	Effective Length Factor
Km	Kilometer
K.L.F.	Kips per Linear Foot
K.S.F.	Kips per Square Feet
K.S.I.	Kips per Square Inch
K.V.	Kilovolt
K.V.A	Kilovolt Ampere
K.V.A.R.	Kilovolt (Reactance)
KW	Kilowatt
KWh	Kilowatt-hour
L	Labor only; Length; Long; Medium Wall Copper Tubing
La.	Labor
lat	Latitude
Lath.	Lather
Lav.	Lavatory
lb,;#	Pound
L.B.	Load Bearing; L Conduit Body
L. & E.	Labor & Equipment
lb./hr.	Pounds per Hour
lb./L.F.	Pounds Per Linear Foot
L.C.L.	Less than Carload Lot
Ld.	Load
LE	Lead Equivalent
L.F.	Linear Foot
Lg.	Long; Length; Large
L. & H.	Light and Heat
L.H.	Long Span high Strength Bar Joist
L.J.	Long Span Standard Strength Bar Joist
L.L.	Live Load
L.L.D.	Lamp Lumen Depreciation
lm	Lumen
lm/sf	Lumen per Square Feet
lm/W	Lumen per Wall
L.O.A.	Length Over All
log	Logarithm

L.P.	Liquified Petroleum; Low Pressure
L.P.F.	Low Power Factor
L.R.	Long Radius
L.S.	Lump Sum
Lt.	Light
Lt.Ga	Light Gauge
L.T.L.	Less than Truckload Lot
Lt. Wt.	Lightweight
L.V.	Low Voltage
M	Thousand; Material; Male; Light Wall Copper Tubing
m/hr; M.H.	Man Hour
mA	Milliampere
Mach	Machine
Mag. Str.	Magnetic Starter
Maint.	Maintenance
Marb.	Marble Setter
Mat. Mat'l	Material
Max	Maximum
MBF	Thousand Board Feet
MBH	Thousand BTU's per hr.
MC	Metal Clad Cable
M.C.F.	Thousand Cubic Feet
M.C.F.M.	Thousand Cubic Feet per Minute
M.C.M.	Thousand Circular Mils
M.C.P.	Motor Circuit Protector
MD	Medium Duty
M.D.O.	Medium Density Overlaid
Med.	Medium
MF	Thousand Feet
M.F.B.M.	Thousand Feet Board Measure
Mfg.	Manufacturing
Mfrs.	Manufacturers
mg	Milligram
MGD	Million Gallons per Day
MGPH	Thousand Gallons per Hour
MH:M.H.	Manhole; Metal Halide; Man-Hour
MHz	Megahertz
Mi.	Mile
Ml	Malleable Iron; Mineral Insulated
mm	Millimeter
Mill.	Millwright
Min.;min.	Minimum; minute
Misc.	Miscellaneous
mi	Millimeter
M.L.F.	Thousand Linear Feet
Mo.	Month
Mobil.	Mobilization
Mog.	Mogul Base
MPH	Miles Per Hour
MPT	Male Pipe Thread
MRT	Mile Round Trip
ms	Millisecond
M.S.F.	Thousand Square Feet
Mstz.	Mosaic & Terrazzo Worker

M.S.Y.	Thousand Square Yards
Mtd.	Mounted
Mthe.	Mosaic & Terrazzo Helper
Mult.	Multi; Multiply
M.V.A.	Million Volt Amperes
M.V.A.R.	Million Volt Amperes Reactance
MV	Megavolt
MW	Megawatt
MXM	Male by Male
MYD	Thousand Yards
N	Natural; North
nA	Nanoampere
NA	Not Available; Not applicable
N.B.C.	National Building Code
NC	Normally Closed
N.F.M.A.	National Electrical Manufacturers Association
NEHB	Bolted Circuit Breaker to 600V
N.L.B.	Non-Load-Bearing
NM	Non-Metallic Cable
nm	Nanometer
No.	Number
N.O.C.	Not Otherwise Classified
Nose.	Nosing
N.P.T.	National Pipe Thread
NQOB	Bolted Circuit Breaker to 240V
N.R.C.	Noise Reduction Coefficient
N.R.S.	Non Rising Stem
ns	Nanosecond
nW	Nanowatt
OB	Opposing Blade
OC	On Center
OD	Outside Diameter
O.D.	Outside Dimension
ODS	Overhead Distribution System
O & P	Overhead and Profits
Oper.	Operator
Opng.	Opening
Orna.	Ornamental
O.S. & Y.	Outside Screw and Yoke
Ovhd.	Overhead
OWG	Oil, Water or Gas
Oz.	Ounce
P.	Pole; Applied Load; Projection
p.	Page
Pape.	Paperhanger
P.A.P.R.	Powered Air Purifying Respirator
PAR	Weatherproof Reflector
Pc.	Piece
P.C.	Portland Cement; Power Connector
P.C.M.	Phase Contract Microscopy
P.C.F.	Pounds Per Cubic Feet
P.E.	Professional Engineer; Porcelain Enamel; Polyethylene; Plain End
Perf.	Perforated

Ph.	Phase
P.I.	Pressure Injected
Pile.	Pile Driver
pkg.	Package
Pl.	Plate
Plah.	Plaster Helper
Plas.	Plasterer
Pluh.	Plumbers Helper
Plum.	Plumber
Ply.	Plywood
p.m.	Post Meridiem
Pord.	Painter Ordinary
pp	Pages
PP;PPL	Polypropylene
P.P.M.	Parts per Million
Pr.	Pair
Prefab.	Prefabricated
Prefin.	Prefinished
Prop.	Propelled
PSF;psf	Pounds per Square Foot
PSI;psi	Pounds per Square Inch
PSIG	Pounds per Square Inch Gauge
PSP	Plastic Sever Pipe
Pspr.	Painter, Spray
Psst.	Painter, Structural Steel
P.T.	Potential Transformer
P. & T.	Pressure & Temperature
Ptd.	Painted
Ptns.	Partitions
Pu	Ultimate Load
PVC	Polyvinyl Chloride
Pvmt.	Pavement
Pwr.	Power
Q	Quantity Heat Flow
Quan.; Qty	Quantity
Q.C.	Quick Coupling
r	Radius of Gyration
R	Resistance
R.C.P.	Reinforced Concrete Pipe
Rect.	Rectangle
Reinf.	Reinforced
Req'd	Required
Res.	Resistant
Resi	Residential
Rgh.	Rough
R.H.W.	Rubber, Heat & Water Resistant; Residential Hot Water
rms	Root Mean Square
Rnd.	Round
Rodm.	Rodman
Rofc.	Roofer, Composition
Rofp.	Roofer, Prcast
Rohe.	Roofer Helpers (Composition)
Rots.	Roofer, Tile & Sale
R.O.W.	Right of Way

RPM	Revolutions per Minute
R.R.	Direct Burial Feeder Conduit
R.S.	Rapid Start
R.T.	Round Trip
S.	Suction; Single Entrance; South
Scaf.	Scaffold
Sch.;Sched.	Schedule
S.C.R.	Modular Brick
S.D.	Sound Deadening
S.D.R.	Standard Dimension Ratio
S.E.	Surfaced Edge
Sel.	Select
S.E.R.;S.E.U.	Service Entrance Cable
SF.	Square Foot
S.F.C.A.	Square Foot Contact Area
S.F.F.C.M.U.	Split Face Fluted Concrete Masonry Unit.
S.F.G.	Square Foot of Ground
S.F. Hor.	Square Foot Horizontal
S.R.F.	Square Foot of Radiation
S.F.Shlf.	Square Foot of Shelf
S4S	Surface 4 Sides
Shee.	Sheet Metal Worker
Sin.	Sine
Skwk.	Skilled Worker
S.L.	Saran Lined
S.L.	Slimline
Sldr.	Solder
S.N.	Solid Neutral
S.P.	Static Pressure; Single Pole; Self Propelled
Spri.	Sprinkler Installer
Sq.	Square; 100 Square Feet
S.P.D.T.	Single Pole, Double Throw
S.P.S.T.	Single Pole, Single Throw
SPT	Standard Pipe Thread
Sq.Hd.	Square Head
Sq.In.	Square Inch
S.S.	Single Strength; Stainless Steel
S.S.B.	Single Strength B Grade
Sswk.	Structural Steel Worker
Sswl.	Structural Steel Welder
St.;Stl.	Steel
S.T.C.	Sound Transmission Coefficient
Std.	Standard
STP	Standard Temperature & Pressure
Stpi.	Steamfitter, Pipefitter
Str.	Strength; Starter; Straight
Strd.	Stranded
Struct.	Structural
Sty.	Story
Subj.	Subject
Subs.	Subcontractors
Surf.	Surface
Sw.	Switch
Swbd.	Switchboard

S.Y.	Square Yard
Syn.	Synthetic
Sys.	System
t.	Thickness
T	Temperature; Ton
Tan	Tangent
T.C.	Terra Cotta
T & C	Threaded and Coupled
T.D.	Temperature Difference
T.E.M.	Transmission Electron Microscopy
TFE	Tetrafluoroethylene (teflon)
T.& G.	Tongue & Groove; Tar & Gravel
Th.;Thk.	Thick
Thn.	Thin
Thrded.	Threaded
Tilf.	Tile Layer Floor
Tilh.	Tile Layer Helper
THW	Insulated Strand Wire
THWN;THHN	Nylon Jacketed Wire
T.L.	Truckload
Tot.	Total
T.S.	Trigger Start
Tr.	Trade
Transf.	Transformer
Trhv.	Truck Driver, Heavy
Trir.	Trailer
Trit.	Truck Driver, Light
TV	Television
T.W.	Thermoplastic Water Resistant Wire
UCI	Uniform Construction Index
UF	Underground Feeder
U.H.F.	Ultra High Frequency
U.L.	Underwriters Laboratory
Unfin.	Unfinished
URD	Underground Residential Distribution
V	Volt
V.A.	Volt Amperes
V.C.T.	Vinyl Composition Tile
VAV	Variable Air Volume
VC	Veneer Core
Vent.	Ventilating
Vert.	Vertical
V.F.	Vinyl Faced
V.G.	Vertical Grain
V.H.F.	Very High Frequency
VHO	Very High Output
Vib.	Vibrating
V.L.F.	Vertical Linear Foot
Vol.	Volume
W	Wire; Watt; Wide; West
w/	With
W.C.	Water Column; Water Closet
W.F.	Wide Flange
W.G.	Water Gauge

Wldg.	Welding
W. Mile	Wire Mile
W.R.	Water Resistant
Wrck.	Wrecker
W.S.P.	Water Steam, Petroleum
WT, Wt.	Weight
WWF	Welded Wire Fabric
XRMR	Transformer
XHD	Extra Heavy Duty
XHHW;XLPE	Cross Linked Polyethylene Wire Insulation
Y	Wye
yd	Yard
yr	Year
Δ	Delta
%	Percent
Φ	Phase
@	At
<	Less Than
>	Greater Than

PART 2- PRODUCTS:

Not used.

PART 3- EXECUTION:

Not used.

END SECTION 01 42 13

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SECTION 01 42 19 - REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. Indicated: The term Indicated refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as shown, noted, scheduled and specified are used, it is to help the reader locate the reference; no limitation on location is intended.

C. Directed: Terms such as directed, requested, authorized, selected, approved, required, and permitted mean directed by the Project Manager, requested by the Architect/Project Manager and similar phrases.

D. Accepted: This term; Accepted, where used in conjunction with the Architects action on the Contractors submittals, applications, and requests, is limited to the Architects duties and responsibilities as stated in the Conditions of the Contract.

E. Regulations: The term Regulations includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. Furnish: The term furnish is used to mean supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. Install: The term install is used to describe operations at project site including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. Provide: The term provide means to furnish and install, complete and ready for the intended use.

I. Installer: An Installer is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term experienced, when used with the term Installer, means having a minimum of five previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.
2. Trades: Use of titles such as carpentry is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as carpenter. It also does not imply that requirements specified apply exclusively to trades persons of the corresponding generic name.

J. Project Site is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

K. Testing Laboratories: testing laboratory is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.03 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institutes 40 Division format and MASTER FORMAT numbering system.

B. Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in Specifications and other Contract Documents is the abbreviated type. Words and meaning shall be interpreted as appropriate. Words that are implied, but not stated shall be interpolated as the sense required. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the context of the Contract Documents so indicates.

2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.

a. The words, shall be shall be included by inference wherever a colon (:) is used within a sentence or phrase.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION 01 42 19

SECTION 01 45 29 - TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Selection and payment

B. Contractor submittals

C. Laboratory responsibilities

D. Laboratory reports

E. Limits on testing laboratory authority

F. Contractor responsibilities

G. Schedule of inspections and tests

1.02 RELATED SECTIONS

A. Information Available to Bidders: Soil Investigation Data.

B. General Conditions: Inspections, testing, and approvals required by public authorities.

C. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.03 REFERENCES

A. ANSI/ASTM D3740 or as required in Specifications Divisions 3-32 - Practice for Evaluation of Agencies Engages in testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

B. ANSI/ASTM E329 or as required in Specifications Divisions 3-32 - Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

1.04 SELECTION AND PAYMENT

A. Owner will employ and pay for services of an independent testing laboratory to perform specified inspection and testing.

B. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.05 QUALITY ASSURANCE

A. Comply with requirements of ANSI/ASTM E329 and ANSI/ASTM D3740

B. Laboratory: Authorized to operate in state in which Project is located.

C. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

D. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.

1.06 CONTRACTOR SUBMITTALS

NOT USED

1.07 LABORATORY RESPONSIBILITIES

A. Test samples of mixes.

B. Provide qualified personnel at site when required. Cooperate with Orange County and Contractor in performance of services.

C. Perform specified inspection, sampling, and testing of Products in accordance with specified standards.

D. Ascertain compliance of materials and mixes with requirements of Contract Documents.

E. Promptly notify Orange County and Contractor of observed irregularities or non-conformance of Work or Products.

F. Perform additional inspections and test required by Orange County.

G. Attend preconstruction conferences and progress meetings.

1.08 LABORATORY REPORTS

A. After each inspection and test, promptly submit four copies of laboratory report to Orange County, and to Contractor.

B. Include:

1. Date issued
2. Project title and number
3. Name of inspector
4. Data and time of sampling or inspection
5. Identification of product and specifications section
6. Location in the Project
7. Type of inspection or test
8. Date of test
9. Results of tests
10. Conformance with Contract Documents

C. When requested by Orange County, provide interpretation of test results.

1.09 LIMITS ON TESTING LABORATORY AUTHORITY

A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract

Documents.

B. Laboratory may not approve or accept any portion of the Work.

C. Laboratory may not assume any duties of Contractor

D. Laboratory has no authority to stop the Work.

1.10 CONTRACTOR RESPONSIBILITIES

A. Cooperate with laboratory personnel, and provide access to the Work.

B. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.

C. Notify Orange County and laboratory 48 hours prior to expected time for operations requiring inspection and testing services.

D. Arrange with laboratory and pay for additional samples and tests required by Contractor beyond specified requirements.

1.11 SCHEDULE OF INSPECTIONS AND TESTS

A. Backfilling: Requirements for sampling and testing backfilled materials.

B. Testing required:

1. Modified proctor maximum density determination tests for each soil type.

2. Field in-place density tests at intervals not to exceed 300 ft. on sub-base and base material.

3. Thickness test for asphaltic concrete surfacing and concrete parking. Cores shall be taken at a maximum of 250 ft. The minimum thickness allowed shall be 1/4" less than the required average thickness.

4. Extraction stability and gradation of combine aggregate - one test per 200 tons or part with minimum of one per day. Bitumen content, stability and gradation of aggregate to conform to intent of job mix formula.

5. Provide concrete mix designs as required under Specifications Section 03 30 00.

6. Strength test for each 50 cubic yard of concrete placed per day.

7. Visual inspection of all bar joist bearing ends for compliance with specifications.

8. Visual inspection of all metal roof deck structural welds.

END OF SECTION 01 45 29

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SECTION 01 50 00 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.

B. Temporary utilities required include but are not limited to:

1. Water service and distribution
2. Temporary electric power and lights
3. Telephone service & DSLService
4. Sanitary facilities

C. Temporary construction and support facilities required include but are not limited to:

1. Temporary heat and ventilation as required to facilitate construction process and personnel.
2. Field office and storage sheds.
3. Sanitary facilities, including drinking water.
4. Temporary enclosures.
5. Hoists and temporary elevator use.
6. Temporary Project identification signs and bulletin boards
7. Waste disposal services.
8. Rodent and pest control.
9. Pumps to control water table during construction activities.
9. Construction aids and miscellaneous services and facilities.

D. Security and protection facilities required include but are not limited to:

1. Temporary fire protections
2. Barricades, warning signs, lights
3. Sidewalk bridge or enclosure fence for the site.
4. Environmental protection
5. Fencing, gates
6. Barriers

a. Contractor shall be responsible for providing a temporary 6' high chain link construction fence around the entire perimeter of the construction site. Fence shall be removed upon completion of the job. Limits of construction fence indicate on the site plan drawings or if not indicated as required to maintain site security and safety.

b. Contractor shall be responsible for providing security measures as required to prevent public entry to construction areas and adjacent properties from damage from construction operations.

c. Contractor shall be responsible for providing a protective barrier around trees and plants designated to remain as indicated in plans and as

required in zoning ordinances. Provide and maintain silt fences. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials and puddling or continuous running water.

7. Enclosures

a. Provide temporary weather-tight closures of openings in exterior surfaces to provide acceptable working conditions and protection for materials, to allow for temporary heating, and to prevent entry of an authorized persons. Provide temporary doors with self-closing hardware and locks.

8. Protection of Installed Work

a. Provide temporary protection for installed products. Control work and traffic in immediate area to avoid damage.

b. Provide protective coverings at walls, projections, jambs, sills and soffits of openings. Provide barriers or coverings to protect roof and finished floors from work and traffic, movement of heavy objects and storage.

c. Prohibit work, traffic and storage on waterproofed and roofed surfaces, and on lawn and landscaped areas that is not a part of the work for those surfaces and areas.

9. Security and Maintenance

a. Vehicular and pedestrian gates shall be securely locked at all times when no work is in progress and when not required for construction activities. During all work hours, gates which must be open shall be continuously monitored by the Contractor to prevent unauthorized personnel or vehicles from entering the construction site.

b. Fencing shall be as specified in 1.02 D above and shall prevent pedestrian travel through the site for any reason.

c. Temporary fencing shall be removed only for construction reasons. If temporary fencing removal is required for non-construction reasons, fencing shall be immediately replaced and secured as soon as the activity for which its removal was required is completed, or if the activity cannot be completely by the end of the work day, temporary security measures shall be taken by the Contractor to ensure that there is no breach of security even during off-work periods.

d. No Trespassing and similar signs shall be posted at gates and along fencing adjacent to public areas to inform non-construction personnel of the reason for the fence and potential hazards of entering the construction site. Said signs shall be of a size and spacing to be legible from any point along the entire perimeter of the construction site.

1.03 SUBMITTALS

A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

1.04 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but to limited to:

1. Building Code requirements
2. Health and safety regulations
3. Utility company regulations
4. Police, Fire Department and Rescue Squad rules
5. Environmental Protection regulations

B. Standards: Comply with NFPA Code 241, Building Construction and Demolition Operations, ANSI-A10 Series standards for Safety Requirements for Construction and Demolition, and NECA Electrical Design Library Temporary Electrical Facilities.

1. Refer to Guidelines for Bid Conditions for Temporary Job Utilities and Services, prepared jointly by AGC and ASC, for industry recommendations.

2. Electrical Services: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).

C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use for the permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

C. Water Control: Grade site to drain. Maintain excavations free of water. Provide and operate pumping equipment if necessary. Provide silt barriers required by the Florida Department of Transportation, St. Johns and any other authority having jurisdiction over the Project.

D. Cleaning During Construction: Control accumulation of waste materials and rubbish so as to maintain a neat, clean and orderly and safe project periodically dispose of off-site as needed.

Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

E. Project Identification: Provide a sign size 4’-0” x 8’-0”, shall have 1) County seal, 2) Name of project, 3) Name of County Chairman, 4) Name of County Commissioners, 5) Consultant Team, 6) General Contractor. Locate to provide an unobstructed view from adjoining roadway. Remove project sign upon final completion acceptance.

G. Protection of Adjacent Properties: Locate on site construction operations that will generate noise and/or dust as far as practical from occupied structures on adjacent properties so as to minimize disturbances to the occupants of these structures or properties.

Prevent dust or other contaminants caused by construction operations for this Project from being carried to adjacent properties by installation of protective barriers and/or suspension of construction operations during high winds.

Dispose of all construction debris which may be carried to adjacent properties by winds. Remove debris daily and/or more often as required to prevent contamination of adjacent properties.

H. Removal: Remove temporary materials, equipment and construction facilities prior to Substantial Completion inspection.

Remove temporary utility services prior to Final Completion Inspection.

Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations; grade and complete all work on site as indicated.

I. Conversion to Public Utilities: General Contractor is to coordinate and arrange with the appropriate utility service providing agencies and make arrangements for the installation and connection to final utilities prior to Final Completion inspection.

General Contractor shall provide any and all coordination, scheduling and layouts as may be required by the service utilities.

PART 2 PRODUCTS

2.01 MATERIALS

A. General: Provide new materials; if acceptable to the Project Manager, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

B. Lumber and Plywood: Comply with requirements in Division 6 Section Rough Carpentry.

D. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosure provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.

E. Water: Provide portable water approved by local health authorities.

F. Open-Mesh Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized barbed wire top strand and galvanized steel pipe posts, 2.875-inch I.D. for line posts and 2.875-inch. for corner posts.

PART 3 EXECUTION

3.01 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.02 SECURITY AND PROTECTIONS FACILITIES INSTALLATION

A. Except for use of permanent fire protection as soon as available do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Project Manager.

B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 Standard for Portable Fire Extinguishers, and NFPA 241 Standard for Safeguarding Construction, Alternations and Demolition Operations.

1. Locate fire extinguishers where convenient and effective for their intended purpose.

2. Store combustible materials in containers in fire-safe locations.

3. Maintain unobstructed access in fire extinguishers, fire hydrants, temporary file protection facilities, and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

C. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

D. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

E. Enclosure Fence: When excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs and other animals from easily entering the site, except by the entrance gates.

1. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.

F. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.

1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of materials to minimize the opportunity for theft and vandalism.

G. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibly that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.03 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24 hour day basis where required to achieve indicated results and to avoid possibility of damage.

2. Protection: Prevent water filled piping from freezing. Maintain makers for underground lines. Protect from damage during excavation operations.

C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than substantial completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

END OF SECTION 01 50 00

SECTION 01 60 00 - MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractors selection of products for use in the Project.

1. Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each prime Contractor.

B. The Contractors Construction Schedule and the Schedule of Submittals are included under Section 01 33 00 Submittals.

C. Standards: Refer to Section Definitions and Standards for applicability of industry standards to products specified.

D. Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section 01 25 00 Substitution Procedures.

1.03 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents such as specialties, systems, structure, finishes, accessories, and similar terms. Such terms are self-explanatory and have well recognized meanings in the construction industry.

1. Products are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term product includes the term material, equipment, system and terms of similar intent.

a. Named Products are items identified by manufacturers’ product name, including make or model designation, indicated in the manufacturers published product literature that is current as of the date of the Contract Documents.

b. Foreign Products, as distinguished from domestic products, are items substantially manufactured (50 percent or more of value) outside of the United States and its possessions; or produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens or nor living within the United States and its possessions.

2. Materials are products that are substantially shaped; cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

3. Equipment is a product with operational parts, whether motorized or manually

operated, that requires service connections such as wiring or piping.

1.04 SUBMITTALS

A. Product List Schedule: Prepare a schedule showing products specified in a tabular form acceptable to the Project Manager. Include generic names of products required. Include the manufacturers name and proprietary product names for each item listed.

1. Coordinate the product list schedule with the Contractors Construction Schedule and the Schedule of Submittals.
   a. Related Specification Section Number
   b. Generic name used in Contract Documents
   c. Proprietary name, model number and similar designations.
   d. Manufacturers name and address
   e. Suppliers name and address
   f. Installers name and address
   g. Projected delivery date, or time span of delivery period.

2. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of an initial product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.

   a. At the Contractors option, the initial submittal may be limited to product selections and designations that must be established early in the Contract period.

3. Complete Scheduled: Within 45 days after date of commencement of the Work, submit 3 copies of the completed product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.

4. Architects Action: The Architect will respond in writing to the Contractor within 2 weeks of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers or products, but does not constitute a waiver of the requirement that products comply with Contract Documents. The Architects response will include the following:

   a. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.05 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project; the product selected shall be compatible with products previously selected, even if previously selected products were also options.

C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturers or producers nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.

2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data.

a. Name of product and manufacturer
b. Model and serial number
c. Capacity
d. Speed
e. Ratings
f. Additional pertinent information

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products in accordance with the manufacturers’ recommendations, using means and methods that will prevent damage, deteriorating and loss, including theft.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.

3. Deliver products to the site in the manufacturers original sealed container of other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.

4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

7. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure, with ventilation adequate in prevent condensation. Maintain temperature and humidity within range required by manufacturers instructions.

PART 2 PRODUCTS

2.01 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.

1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situation on other projects.

B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.

a. Where products or manufacturers are specified by name, accompanied by the term or equal or approved equal comply with the Contractor Document provisions concerning substitutions to obtain approval for use of an unnamed product.

2. Non-Proprietary Specifications: When the Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of those products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning substitutions to obtain approval for use of an unnamed product.

3. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

4. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated.

a. Manufacturers recommendations may be contained in published product literature, or by the manufacturers’ certification of performance.

5. Compliance with Standards, Codes and Regulations: Where the Specifications only requires compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.

6. Visual Matching: Where Specifications require matching an established Sample, the Architects decision will be final on whether a proposed product matches satisfactorily.

   a. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning substitutions for selection of a matching product in another product category, or for noncompliance with specified requirements.

7. Visual Selection: Where specified product requirements include the phrase ... as selected from manufacturers standard colors, pattern, textures... or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.

8. Asbestos free materials: No products containing asbestos shall be used for any part of the work for this product. Provide verification.

END OF SECTION 01 60 00

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SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for cutting and patching.

B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1. Requirements of this Section apply to mechanical and electrical installations. Refer to Divisions 22, 23, 26, 27 and 28 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.03 SUBMITTALS

A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.

2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the buildings appearance and other significant visual elements.

3. List products to be used and firms or entities that will perform Work.

4. Indicate dates when cutting and patching is to be performed.

5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

7. Approval by the Architect to proceed with cutting and patching does not waive the Architect’s right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

1.04 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load carrying capacity or load-deflection ratio.

1. Obtain written approval of the cutting and patching proposal before cutting and patching the following structural elements.

a. Foundation construction
b. Bearing and retaining walls
c. Structural concrete
d. Structural steel
e. Lintels
f. Timber and primary wood framing
g. Structural decking
h. Miscellaneous structural metals
i. Exterior curtain wall construction
j. Equipment supports
k. Piping, ductwork, vessels and equipment
l. Structural systems of special construction in Division 13.

B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety. Refer to Divisions 22, 23, 26, 27 and 28 regarding Fire Rated Penetrations.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems.

a. Shoring, bracing and sheeting
b. Primary operational systems and equipment
c. Air or smoke barriers
d. Water, moisture, or vapor barriers
e. Membranes and flashings
f. Fire protection systems
g. Noise and vibration control elements and systems
h. Control systems
I. Communication systems
j. Conveying systems
k. Electrical wiring systems

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architects opinion, reduce the buildings aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

1. If possible retain the original installer or fabricator to cut and patch the following categories or exposed Work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:

    a. Processed concrete finishes
    b. Preformed metal panels
    c. Window wall system
    d. Stucco and ornamental plaster
    e. Acoustical ceilings
    f. Carpeting
    g. Wall covering
    h. HVAC enclosures, cabinets or covers
    I. Roofing systems

PART 2 PRODUCTS

2.01 MATERIALS

A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect unless otherwise indicated by Architect/Owner. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 EXECUTION

3.01 INSPECTION

A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

1. Before proceeding, meet at the site with all parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.02 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas and interruption of free passage to adjoining areas.

D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original, installer; comply with the original installers recommendations.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine such as a Carborundum saw or diamond core drill.

4. Comply with requirements of applicable Sections of Division 2 where cutting and patching requires excavating and backfilling.

5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and text patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials if necessary to achieve uniform color and appearance.

a. Where patching occurs in a smooth painted surfaces, extend final coat over entire unbroken surfaces containing the patch, after the patched area has received primer and second coat.

3.04 CLEANING

A. Thoroughly clean area and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged materials to their original condition.

END OF SECTION 01 73 29

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SECTION 01 77 00 - PROJECT CLOSE-OUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for project close-out, including but not limited to:

1. Inspection procedures
2. Project record document submittal. (Substantial Completion)
3. Operating and maintenance manual submittal (Substantial Completion Requirements).
4. Submittal of warranties (Substantial Completion Requirement).
5. Final cleaning

B. Close-out requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 32.

C. Final payment to be made when the County has received all required close-out documents.

1.03 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following: List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion in claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

    a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

2. Advise Owner of pending insurance change-over requirements.

3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.

5. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, the Project Manager will either proceed with inspection or advise the Contractor of unfilled requirements. The

Project Manager will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. Results of the completed inspection will form the basis of requirements for final acceptance.

2. Should the project fail to meet the standards required for Substantial Completion as defined in the documents the Contractor will pay the expense of a second inspection by the Project Manager/Consultants and the Owner. Cost will be deducted from the Contractors retainage.

1.04 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following List exceptions in the request:

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

2. Submit and updated final statement, accounting for final additional changes to the Contract Sum.

3. Submit a certified copy of the Project Managers final inspection list of item to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Project Manager.

4. Submit final meter readings for utilities, a measured record of stored fuel and similar data as of the date of Substantial Completion, or when the Owner took possession of the responsibility for corresponding elements of the Work.

5. Submit consent of surety to final payment.

6. Submit a final liquidated damages settlement statement

7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: The Project Manager will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Project Manager.

1. Upon completion of reinspection, the Project Manager will prepare a certification of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

1.05 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Project Managers reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contractor Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used,
record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date. Provide for project photographs if deemed necessary by Owners representative.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.

2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.

3. Note related Change Order numbers where applicable.

4. Organize record drawing sheets, an print. suitable titles, dates and other identification on the cover of each set.

5. Provide three (3) additional sets of black line drawing sets of As-Builts Drawings.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Project Data.

1. Upon completion of the Work, submit record Specifications to the Project Manager for the Owners records.

D. Record Project Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variation in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturers installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1. Upon completion of mark-up, submit complete set of record Product Data in the three ring binder (indexed) to the Project Manager for the Owners records.

E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Project Manager and the Owners personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owners Sample storage area.

F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous record and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Project Manager for the Owners records.

G. Maintenance Manuals: Organize operating and maintenance data into five (5) suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inc, 3-ring vinyl covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions
2. Spare parts list
3. Copies of warranties
4. Wiring diagrams
5. Recommended turn around cycles
6. Inspection procedures
7. Shop Drawings and Product Data
8. Fixture lamping schedule

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 CLOSE-OUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance. If installers are not experienced in procedures, provide instruction by manufacturers representatives. All items to be provided or completed prior to certificate of Substantial Completion being issued by the Owner. Include a detailed review of the following items:

1. Maintenance manuals
2. Record documents
3. Spare parts and materials
4. Tools
5. Lubricants
6. Fuels
7. Identification systems
8. Control sequences
9. Hazards
10. Cleaning
11. Warranties and bonds
12. Maintenance agreements and similar continuing commitments
13. On site instructions to County maintenance personnel on major systems operations such as HVAC as per technical specifications.

B. As part of instruction for operating equipment, demonstrate the following procedures, prior to the Owner issuing Certificate of Substantial Completion:

1. Start-up
2. Shutdown
3. Emergency operations
4. Noise and vibration adjustments
5. Safety procedures
6. Economy and efficiency adjustments

3.02 PROJECT CLOSE-OUT MANUALS AT SUBSTANTIAL COMPLETION

A. Submit Project Close-out Manuals prior to issuance of final application for payment. Provide three (3) copies.

B. Bind in commercial quality 8 ½” x 11" three ring binder, indexed with hardback, cleanable, plastic covers.

C. Label cover of each binder with typed title PROJECT CLOSE-OUT MANUAL, with title of project; name, address, and telephone number of Contractor and name of responsible Principal.

D. Provide table of contents: Neatly typed, in the following sequence:

1. Final Certificate of Occupancy
2. Warranty Service Subcontractors Identification List
3. Final Lien Waivers and Releases
4. Warranties and Guarantees
5. Systems Operations and Maintenance Instruction
6. Manufacturers Certificates and Certifications
7. Maintenance Service Contracts
8. Spare Parts Inventory List
9. Special Systems Operating Permits or Approvals
10. Asbestos free materials notarized statement

E. Provide all documents for each section listed. List individual documents in each section in the table of contents, in the sequence of the Table of Contents of the Project Manual.

F. Identify each document listed in the Table of Contents with the number and title of the specification section in which specified, and the name of the Product or Work item.

G. Separate each section with index to sheets that are keyed to the Table of Contents listing.

H. Warranty Service Subcontractors List shall identify subcontractor supplier, and manufacturer for each warranty with name, address and emergency telephone number.

3.03 FINAL CLEANING

A. General: General cleaning during construction is required by the General Conditions and included in Section Temporary Facilities.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturers instructions.

1. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.

a. Remove labels that are not permanent labels.
b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
c. Clean exposed exterior and interior hard-surfaced finished to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces. Apply floor wax to vinyl floors.
d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
e. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface. Remove waste and surplus materials from the site in an appropriate manner.

C. Pest Control: Engage an experienced exterminator to make a final inspection, and rid the Project of rodents, insects and other pests.

D. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owners property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

1. Where extra materials of value remaining after completion of associated Work have become the Owners property, arrange for disposition of these materials as direct.

END OF SECTION 01 77 00

SECTION 01 78 36 - WARRANTIES AND BONDS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties.

1. Refer to the General Conditions for terms of the Contractors special warranty of workmanship and materials.

2. General close-out requirements are included in Section Project Close-Out.

3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of Division 2 through 32 as required.

4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

B. Disclaimers and Limitations: Manufacturers disclaimers and limitations on product warranties to not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required do countersign special warranties with the Contractor.

1.03 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

B. Reinstatement of Warranty. When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents.

D. Owners Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligation, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

E. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.04 WARRANTY PERIOD

A. The Contractor shall participate with the County and the Architects representative, at the beginning of the tenth month of the warranty period, in conducting an on site review and evaluation of all items of equipment, materials and workmanship covered by the warranties and guarantees. Contractor shall act promptly and without cost to the County to correct all defects, problems, or deficiencies determined as such by the Architect/Owner during on the site review.

B. All warranties and guarantees shall commence on the date of Substantial Completion except for items which are determined by the County to be incomplete or a non-comply status at the time of Substantial Completion. The coverage commencement date for warranties and guarantees of such work shall be the date of the Countys acceptance of that work.

C. Warranty period shall be manufacturers standard for product specified except where specific warranty periods are specified in individual sections. But in no case less than one year.

1.05 SUBMITTALS

A. Submit written warranties to the Owner prior to the date certified for Substantial Completion. If the Architects Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Project Manager.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Project Manager within fifteen (15) days of completion of that designated portion of the Work.

B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepared a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.

1. Refer to individual Sections of Division 2 through 16 for specific content requirements, and particular requirements for submittal of special warranties.

C. Form of Submittal: At Final Completion compile two (2) copies of each required warranty and bond properly executed by the Contractor, or by the subcontractor, supplier or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

D. Bind (3) three sets of warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8 -1/2” by 11" paper.

1. Provide heavy paper dividers with Celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.

2. Identify each binder on the front and the spine with the typed or printed title WARRANTIES AND BONDS, the Project title or name, and the name of the Contractor.

3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

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Division 03

Concrete

SECTION 03 11 00 - CONCRETE FORMWORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The extent of formwork is indicated by the cast-in-place concrete structures shown on the Drawings.

B. The Work includes providing formwork, and shoring, for cast-in-place concrete and installation into formwork of items furnished by others, such as anchor bolts, setting plates, bearing plates, anchorages, inserts, frames, nosings, and other items to be embedded in concrete (but not including reinforcing steel).

1.3 SUBMITTALS

A. Product Data; Concrete Formwork: Submit 2 copies of manufacturer's data and installation instructions for proprietary materials including form coatings manufactured form systems, form liners, ties, accessories, and other items specified herein.

B. Concrete Shoring Formwork: Provide shop drawings, catalog cuts, and calculations signed and sealed by a Professional engineer registered in the State of Florida for all elevated formwork that is shored.

1.4 QUALITY ASSURANCE

A. Examine the substrate and the conditions under which concrete formwork is to be performed and notify the Architect in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected. Contractors shall be licensed and exhibit 5 years experience in similar projects.

B. Codes and Standards: Unless otherwise shown or specified, design, construct, erect, maintain, and remove forms and related structures for cast-in-place concrete Work in compliance with the current accepted American Concrete Institute Standard ACI 347, "Guide to Formwork for Concrete."

C. Allowable Tolerances

1. Construct formwork to provide completed cast-in-place concrete surfaces complying with the tolerances specified in ACI 347 and as follows:

a. Variation from plumb in lines and surfaces of columns, piers, walls, and arises;

1/4 inch per 10 feet, but not more than one inch. For exposed corner columns, control joint grooves, and other conspicuous lines, 1/4 inch in a bay or 20 feet maximum; 1/2" maximum in 40 ft. or more.

b. Variation in sizes and locations of sleeves, floor openings, and wall openings, 1/4 inch.

c. Variations in footings plan dimensions, minus 1/2 inch and plus 2 inches; misplacement or eccentricity, 2 percent of the footing width in direction of misplacement but not more than 2 inches; thickness reduction, minus 5 percent.

2. Before concrete placement, check the lines and levels of erected formwork. Make corrections and adjustments to ensure proper size and locations of concrete members and stability of forming systems.

3. During concrete placement, check formwork and related supports to ensure that forms are not displaced and that completed Work will be within specified tolerances.

PART 2 – PRODUCTS

2.1 FORM MATERIALS

A. Forms for Exposed Finish Concrete

1. Unless otherwise shown or specified, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed, plywood-faced, or other panel type materials acceptable to Architect, to provide continuous, straight, smooth as-cast surfaces. Plywood grain indentations are not acceptable. Furnish in largest practicable sizes to minimize number of joints to conform to joint system shown on Drawings. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection.

   a. Plywood: APA grade-trademarked "B-B Plyform Exterior," mill oiled.

2. Provide form coatings on forms for all exposed finished concrete. Plywood grain indentations or patterns left in the concrete as a result of the forms are not acceptable.

B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in the finished structure with plywood, lumber, metal, or other acceptable material. Provide lumber that is dressed on at least 2 edges and one side for tight fit.

C. Form Units

1. Provide factory-fabricated, adjustable-length, removable, or snap-off metal form ties; design to prevent form deflection and to prevent spalling concrete surfaces upon removal.

2. Unless otherwise shown, provide ties so that portion remaining within concrete after removal of exterior parts is at least one inch from outer concrete surface. Unless otherwise indicated, provide form ties which will leave a hole not larger than one inch diameter in concrete surfaces.

3. Form ties fabricated on the project site and wire ties are not acceptable.

D. Form Coatings: Commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces and will not impair subsequent treatment of concrete surfaces bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds.

E. Inserts

1. Provide metal inserts for anchorage of materials or equipment to concrete construction not supplied by other trades and as required for the Work.
2. Provide Fry original reglet as manufactured by Fry Reglet Corporation, Alhambra, California. Reglet shall be made of .050 polyvinylchloride, meeting ASTM Spec. D-1874. Provide steel spacer channel for positive alignment and barrier to grout or equal.
3. Vinyl Chamfer Strips: Shall be Vinylex CSN-1/2 as manufactured by Vinylex Corporation, Knoxville, Tennessee 37921 or equal.

2.2 DESIGN OF FORMWORK

A. Design, erect, support, brace, and maintain formwork so that it will safely support vertical and lateral loads that might be applied, until such loads can be supported by the concrete structure. Carry vertical and lateral loads to ground by formwork system and in-place construction that has attained adequate strength for that purpose. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:

1. Provide Class A tolerances for concrete surfaces exposed to view.
2. Provide Class C tolerances for other concrete surfaces.

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

C. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.

D. Design formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like for easy removal.

E. Provide formwork sufficiently tight to prevent leakage of cement paste during concrete placement. Solidly butt joint and provide backup material at joints as required to prevent leakage and fins.

F. Provide temporary openings for cleanouts and inspections where interior area of formwork is inaccessible before and during concrete placement. Securely brace temporary openings and set tightly to forms to prevent losing concrete mortar. Locate temporary openings in forms at inconspicuous locations.

G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Re-tighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper

alignment.

H. Provisions for other Trades: Coordinate openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

PART 3 – EXECUTION

3.1 FORM CONSTRUCTION

A. Construct forms complying with ACI 347 to the exact sizes, shapes, lines, and plumb work in finish structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required. Use selected materials to obtain required finishes.

B. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where the slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and assure ease of removal.

C. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Brace temporary closures and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms in as inconspicuous location as possible, consistent with project requirements.

1. Form intersecting planes to provide true, clean-cut corners, with edge grain of plywood not exposed as form for concrete.

D. Provide formwork sufficiently tight to prevent leakage of cement paste during concrete placement. Solidly butt joints and provide backup material at joints as required to prevent leakage and fins.

E. Falsework

1. Erect falsework and support, brace and maintain it to safely support vertical, lateral, and asymmetrical loads applied until such loads can be supported by in-place concrete structures. Construct falsework so that adjustments can be made for take-up and settlement.
2. Provide wedges, jacks, or camber strips to facilitate vertical adjustments. Carefully inspect falsework and formwork during and after concrete placement operations to determine abnormal deflection or signs of failure; make necessary adjustments to produce Work or required dimensions.
3. Support form facing materials by members spaced sufficiently close to prevent deflection. Fit forms placed in successive units for continuous surfaces to accurate alignment, free from irregularities and within allowable tolerances.
4. Provide camber in formwork as required for anticipated deflections due to weight and pressures of fresh concrete and construction loads for longspan members without intermediate supports.
5. Carefully inspect falsework and formwork during and after concrete placement operations to determine abnormal deflection or signs of failure; make necessary adjustments to produce Work of required dimension.

F. Forms for Exposed Concrete

1. Drill forms to suit ties used and to prevent leakage of concrete mortar around tie holes. Do not splinter forms by driving ties through improperly prepared holes.
2. Do not use metal cover plates for patching holes or defects in forms.
3. Provide sharp, clean corners at intersecting planes without visible edges or offsets. Back joints with extra studs or girts to maintain true, square intersections.
4. Use extra studs, whalers, and bracing to prevent bowing of forms between studs and to avoid bowed appearance in concrete. Do not use narrow strips of form material which will produce bow.
5. Assemble forms so they may be readily removed without damage to exposed concrete surfaces.
6. Form molding shapes, recesses, and projections with smooth-finish materials and install in forms with sealed joints to prevent displacement.
7. Back-up strips shall be used as continuous support for the unsupported portions of the shiplap form liner. Span the entire length of the form liner.

G. Corner Treatment

1. Form chamfers with ½” round strips, unless otherwise shown, accurately formed and surfaced to produce uniformly straight lines and tight edge joints. Extend terminal edges to required limit and miter chamfer strips at changes in direction.
2. Unexposed corners may be formed either square or chamfered.

H. Provision for Other Trades: Provide openings in concrete formwork to accommodate Work of other trades including those under separate prime contracts. Size and location of openings, recesses, and chases are the responsibility of the trade requiring such items. Accurately place and securely support items to be built into form.

I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is to be placed. Retighten forms immediately after concrete placement as required to eliminate mortar leaks.

J. Construction Joints: Where footings and walls are divided by construction joints, joints shall have keyways formed. Keyways shall be 1/3 of the dimension of the element in both directions and shall be at least 2 inches thick, unless otherwise noted.

3.2 FORM COATINGS

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

B. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

3.3 INSTALLATION OF EMBEDDED ITEMS

A. General: Set and build into the Work anchorage devices and other embedded items required for other Work that is attached to, or supported by, cast-in-place concrete. Use setting Drawings,

diagrams, instructions, and directions provided by suppliers of the items to be attached thereto.

B. Edge Forms and Screed Strips for Slabs: Set edge form or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in the finished slab surface. Provide and secure units to support types of screeds required.

1. Forms for concrete curbs and bases shall be rigidly held straight and tight so that finished concrete will be level and even.

3.4 REMOVAL OF FORMS

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

B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements may not be removed in less than 14 days, and not until concrete has attained design minimum 28 day compressive strength.

C. Form facing material may be removed 24 hours after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

3.5 REUSE OF FORMS

A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to concrete contact surfaces as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to the Architect.

END OF SECTION 03 11 00

SECTION 03 21 00 - CONCRETE REINFORCEMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The extent of concrete reinforcement is shown on the Drawings and in schedules.

B. The Work includes fabrication and placement of reinforcement for cast-in-place concrete including bars, ties, and supports.

1.3 SUBMITTALS

A. Product Data: Submit 2 copies of manufacturer's specifications and installation instructions for proprietary materials and reinforcement accessories.

B. Shop Drawings: For fabrication, bending, and placement of concrete reinforcement. Comply with the current accepted ACI 315 "Details and Detailing of Concrete Reinforcement." Show bar schedules, stirrup spacing, diagrams of bent bars, arrangements, and assemblies as required for the fabrication and placement of concrete reinforcement. Show building plans with bar sizes, spacing, and quantities for all bent and straight reinforcing bars.

C. Shop Drawing packages shall be submitted by building order of Construction Manager’s schedule of construction.

1.4 QUALITY ASSURANCE

A. The Installer must examine the substrate and the conditions under which concrete reinforcement is to be placed and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

B. Codes and Standards: Comply with requirements of the latest edition of the following codes and standards, except as herein modified:

1. American Welding Society, AWS D1.4/D1.4M:2005 - "Structural Welding Code - Reinforcing Steel."
2. Concrete Reinforcing Steel Institute, "Manual of Standard Practice."
3. American Concrete Institute, ACI 318 "Building Code Requirements for Structural Concrete and Commentary."

1.5 DELIVERY, HANDLING, AND STORAGE

A. Deliver reinforcement to the project site bundled, tagged, and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings shown on placement diagrams.

B. Store concrete reinforcement materials at the site to prevent damage and accumulation of dirt or excessive rust.

PART 2 – PRODUCTS

2.1 MATERIAL

A. Reinforcing Bars (ReBar): ASTM A615, and as follows.

1. Provide Grade 60 for bars No. 3 to 11.

B. Steel Wire: ASTM A1064.

C. Welded Wire Fabric (WWF): ASTM A1064.

D. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement in place.

1. Use wire bar type supports complying with CRSI recommendations, unless otherwise indicated. Do not use wood, brick, and other unacceptable materials.
2. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
3. Over waterproof membranes, use precast concrete chairs to prevent penetration of the membrane
4. For footings, trench footings, and grade beams use precast concrete bricks (f'c = 3000 psi min. at 28 days). (Concrete masonry bricks not acceptable).
5. For concrete masonry bond beams use #2 bar laterally, tied to each longitudinal reinforcing bar below to hold bars apart and up from bottom. Space #2 bars at 48 inches o.c.

E. Grouted Anchor Bolts: Refer to Structural drawings.

F. Rebar Ties: Nylon or annealed tie wire as recommended by the ACI.

2.2 FABRICATION

A. Fabricate reinforcing bars to conform to required shapes and dimensions, with fabrication tolerances complying with CRSI "Manual of Standard Practice." In case of fabricating errors, do not re-bend or straighten reinforcement in a manner that will injure or weaken the material.

B. Unacceptable Materials: Reinforcement with any of the following defects will not be permitted in the work.

1. Bar lengths, depths, and bends exceeding specified fabrication tolerances.

2. Bends or kinks not indicated on Drawings or final shop drawings.
3. Bars with reduced cross-section due to excessive rusting or other cause.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine the conditions under which concrete reinforcement is to be placed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

B. Notify Architect when steel placement for a concrete pour is nearing a completion so that the Work may be observed.

3.2 INSTALLATION

A. Comply with the specified codes and standards and Concrete Reinforcing Steel Institute recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports, and as herein specified.

B. Clean reinforcement to remove loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete. Reinforcing Steel should be free of kinks and non-shop bends. Field bends should only be as directed by the architect.

C. Position, support, and secure reinforcement against displacement by formwork construction, or concrete placement operations. Locate and support reinforcing by precast concrete brick, metal chairs, runners, bolsters, spacers, and hangers as required.

D. Place reinforcement to obtain the minimum coverages for concrete protection. Arrange, space, and securely tie bars and bar supports together with 16 gauge wire to hold reinforcement accurately in position during concrete placement operations. Set wire ties so that twisted ends are directed away from exposed concrete surfaces.

E. Install welded wire fabric in as long lengths as practicable. Lab adjoining pieces at least one full mesh and lace splices with 16 gauge wire. Do not make end laps midway between supporting beams or directly over beams of continuous structures. Offset end laps in adjacent widths to prevent continuous laps.

F. Provide sufficient numbers of supports and of strengths to carry reinforcement. Do not place reinforcing bars more than 2 inches beyond the last leg of continuous bar support. Do not use supports as bases for runaways for concrete conveying equipment and similar construction loads.

G. Provide standard reinforcing splices by lapping ends, placing bars in contact, and tightly tying wire. Comply with requirements of ACI 318 for minimum lap of spliced bars.

H. Reinforcing steel installed in continuous footings shall run continuous. This shall include specially shaped components with proper lap where corner reinforcing and step footings occur.

I. Provide additional reinforcing around required openings in footings, and slabs having at least a one foot dimension.

J. Flame cutting of reinforcing steel is prohibited.

END OF SECTION 03 21 00

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes interior and exterior cast-in-place concrete, mix design, placement procedures, and finishes. Work includes, but is not necessarily limited to:

1. Exterior Concrete:

   a. Walks, curbs, ramps, steps, and stoops
   b. Equipment pads and bases

2. Interior Concrete:

   a. Floor slabs on grade, (elevated), (sub-grade)
   b. Footings, pads, piers, columns, beams
   c. Recesses for floor finishes requiring same
   d. Fill for steel pan stairs

3. Other Materials

   a. Concrete admixtures
   b. Waterstops
   c. Expansion joint fillers
   d. Curing materials
   e. Self-leveling underlayment
   f. Bonding agent

B. Provide other cast-in-place concrete and related work as shown on the Drawings and specified herein for complete and finished work, except concrete work specifically designated to be provided under the Work of other Sections of these Specifications.

C. The following is by other Sections, meeting the requirements of this Section (unless indicated otherwise).

1. Posts for chain link fencing
2. Bases for exterior equipment
3. Encasement of underground utilities or connections
4. Specifically excluded items
5. Flagpole base
6. Basketball backstop post base
7. Bollard base

1.2 SUBMITTALS

A. Product Data: Proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, and other

specified items.

1. Include concrete curing materials product data and specification sheets

B. Samples: Include names, sources, and descriptions, as follows:

1. Fiber reinforcement
2. Waterstops

C. Laboratory test reports for concrete materials and mix design tests.

D. Material certificates in lieu of material laboratory test reports when permitted by Architect. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

E. Minutes of pre-installation conference.

F. Proposed mix designs.

G. Statement from ready-mixed plant verifying conformance to specifications and proposed mix designs.

H. Written approval/certification of concrete curing materials as specified herein.

I. ISO 9001/9002 Registration Certificate for companies that are ISO registered.

1.3 QUALITY ASSURANCE

A. Refer to Division 1 for additional requirements.

B. Standards: Comply with the provisions of the following in accordance with the Florida Building Code 5th Edition (2014, except as otherwise shown or specified.

1. ACI 117 "Standard Tolerances for Concrete Construction and Materials"
2. ACI 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete"
3. ACI 301 "Specifications for Structural Concrete for Buildings"
4. ACI 302.1R "Guide for Concrete Floor and Slab Construction"
5. ACI 304R "Guide for Measuring, Mixing, Transporting, and Placing Concrete"
6. ACI 311.4R "Guide for Concrete Inspection"
7. ACI 318-08 "Building Code Requirements for Reinforced Concrete and Commentary"
8. Concrete Reinforcing Steel Institute, "Manual of Standard Practice"
9. Comply with building code requirements which are more stringent than the above.
10. ACI 305 - “Hot Weather Concreting”

C. Materials may require testing and re-testing, as directed by the Architect, at any time during the progress of the Work. Allow free access to material stockpiles and facilities. Tests shall be done at the Contractor's expense.

D. Concrete curing materials shall be approved by the manufacturer of the product for the final finish material on the concrete slabs. Submit written approval/certification if requested by the Architect.

E. Material manufacturers shall be ISO 9001/9002 registered or provide proof of documented quality assurance system. Quality system must be registered by an independent registrar who is accredited by the American National Standards Institute (ANSI-RAB) or by another internationally recognized body. ISO 9001/9002 certification or proof of documented quality assurance system shall be included with the material submittals.

1.4 PROJECT CONDITIONS

A. Coordinate installation of inserts and sleeves for other trades. Time delivery so as note to cause delay in the progress of this Work.

B. Installation requirements within this Section are not intended to be restrictive and the Contractor is allowed, when reviewed with the Architect's field representative, to adjust the means and methods used to meet required tolerances. Compliance with required tolerances is the responsibility of the Contractor and adjustment required to meet these shall not be unduly restricted by the Architect or his representative.

1.5 FIELD QUALITY CONTROL

A. Floor Tolerance Measurements: Floor flatness and levelness tests on floor slabs shall be conducted in accordance with the provisions set forth in ASTM E 1155-96 (Reapproved 2001), with the exception of Subparagraphs 7.2.3 and 7.3.2 which may be waived at the Owner's option, also Zi calculation to be used shall be N min. = A/10. Floor tolerance measurements shall be made by the independent testing laboratory within 24 hours after completion of the final troweling operation, and before forms and shores have been removed, measurement shall be taken using a Dipstick Auto-Read Floor Profiler as manufactured by The Edward W. Face Company, Inc. of Norfolk, VA. Results of floor tolerance tests, including a formal notice of acceptance or rejection of the work, shall be provided to the Contractor within 24 hours after data collection.

B. Remedy for Out-of-Tolerance Work: Slab sections measuring at or above both of the specified minimum local F-numbers shall be accepted for tolerance compliance as constructed. Floor slab sections measuring below either (or both) of the specified minimum local F-numbers shall be removed and replaced (in the case of slabs-on-grade), or ground or re-topped (in the case of elevated slabs). No remedies for sub-minimum local F-number sections other than replacement of slabs-on-grade, and grinding or re-topping of elevated slabs will be permitted. For the purposes of this paragraph, a floor section shall be a rectangular area bound by column or half-column lines (i.e. minimum sections area - approximately 100 sq. ft.).

C. Special Conditions (Exceptions): Where room sizes (areas receiving concrete flooring) are restricted to smaller areas due to bearing walls or existing construction making finishing difficult, the Architect's Field Representative will determine acceptable deviations/exceptions in testing requirements.

1. Architect's Field Representative may at his discretion:

a. Waive entirely testing of small rooms, storage areas, and similar spaces.
b. Reduce the number and select the location of tests.
c. Waive penalties between specified and minimum locals.
d. Require that tolerances exceed minimum locals only.
e. Waive the requirement for removal of concrete not meeting minimum locals if, in his opinion, repairs can bring floors into acceptable/serviceable tolerances.

1.6 CONCRETE TESTING

A. The Contractor for the work of 03 30 00, Cast-In-Place Concrete, shall cooperate and coordinate with the testing laboratory to perform field quality control testing during concrete work under Division 3 in accordance with the Florida Building Code 5th Edition (2014), Section 1905.6.2.3.

B. Quality Control Testing During Construction: Perform sampling and testing for field quality control during the placement of concrete, as follows:

1. Sampling Fresh Concrete: ASTM C172, except modified for slump to comply with ASTM C94.
2. Slump: ASTM C143, one test for each concrete load at point of discharge, and one for each set of compressive strength test specimens.
3. Air Content: ASTM C231, pressure method; one for every other concrete load at point of discharge or when the indication of change requires.
4. Compression Test Specimens: ASTM C31, one set of 6 standard cylinders fir each compressive strength test, unless otherwise directed.

    a. Cast 5 cylinders for laboratory cured specimens. One specimen shall be broken at 7 days. Three specimens shall be broken at 28 days. One specimen shall be held as a spare.

5. Concrete Temperature: Test hourly when air temperature is 40 degrees F. and below and when 80 degrees F. and above; and each time a set of compressive test specimens is made.
6. Compressive Strength Tests: ASTM C39, one set for each 100 cubic yards or fraction thereof, of each mix design placed in a day or for each 5,000 sq. ft. of surface area placed; 2 specimens (one field cured and one lab cured) tested at 7 days, 2 specimens (one field cured and one lab cured) tested at 28 days, and 2 specimens (one field cured and one lab cured) retained in reserve for later testing if required.

    a. When the frequency of testing will provide less than 5 strength tests for a given mix design, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.

    b. When the total quantity of a given mix design of concrete is less than 50 cu.yds., the strength tests may be waived by the Architect if, in his judgment, adequate evidence of satisfactory strength is provided.
    c. When the strength of field cured cylinders is less than 85 percent of companion laboratory cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

C. Report test results in writing to the Architect, Contractor, and ready-mix supplier on the same day that test are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of Contractor, name of concrete supplier and truck number, name of concrete testing service, concrete type and class, location of concrete batch in the structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength and type and amount of fibrous reinforcement, compressive breaking strength, and type of break for both 7 day tests and 28 day tests.

D. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate the specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Architect. The testing service shall conduct tests to determine the strength and other characteristics of the in-place concrete by compression tests on cored cylinders complying with ASTM C42 or by load testing specified in ACI 318 or other acceptable nondestructive testing methods, as directed. The Contractor shall pay for such tests conducted and other additional testing as may be required, when unacceptable concrete is verified.

E. Evaluation of Quality Control Tests: Do not use concrete delivered to the final point of placement which has slump or total air content outside the specified values.

1. Compressive strength tests for laboratory-cured cylinders will be considered satisfactory if the averages of all sets of 3 consecutive compressive strength tests results equal or exceed the 28 day design compressive strength of the type or class of concrete; and no individual strength test falls below the required compressive strength by more than 500 psi.
2. Strength tests of specimens cured under field conditions may be required by the Architect to check the adequacy of curing and protecting of the concrete placed. Specimens shall be molded by the field quality control laboratory at the same time and from the same samples as the laboratory cured specimens.

    a. Provide improved means and procedures for protecting concrete when the 28 day compressive strength of field cured cylinders is less than 85 percent of companion laboratory cured cylinders.
    b. When laboratory cured cylinder strengths are appreciably higher than the minimum required compressive strength, field cured cylinder strengths need not exceed the minimum required compressive strength by more than 500 psi even though the 85 percent criterion is not met.
    c. If individual tests of laboratory cured specimen produce strengths more than 500 psi below the required minimum compressive strength or if tests of field cured cylinders indicates deficiencies in protection and curing, provide additional measures to assure that the load-bearing capacity of the structure is not jeopardized. If the likelihood of low-strength concrete is confirmed and computations indicate the load-bearing capacity may have been significantly reduced, tests of cores drilled from the area in question may be required.

3. If the compressive strength tests fail to meet the minimum requirements specified, the concrete represented by such tests will be considered deficient in strength.

F. Deficient concrete shall be removed as directed by the Architect and replaced by the

Contractor without additional cost to the Owner.

1.7 CONCRETE MATERIALS AND MIX DESIGN

A. Concrete Materials and Mix Design:

1. Ready-mixed concrete shall be mixed and delivered in accordance with ASTM C94.
2. Product Data: Submit 2 copies of manufacturer's specifications with application an installation instructions for proprietary materials and items, including admixtures, bonding agents, waterstops, joint systems, chemical floor hardeners, and dry shake finish materials.
3. Laboratory Test Reports: Submit 2 copies of laboratory test reports for concrete materials and mix design tests. The Architect's review will be for general information only. Production of concrete to comply with specified requirements is the Contractor's responsibility.

B. Tests for Concrete Materials

1. Normal Weight Concrete: Test aggregates by the methods of sampling and testing of ASTM C33
2. Portland Cement: Sample cement and determine the properties by the methods of test ASTM C33.
3. Submit written reports for each material sampled and tested, prior to the start of Work. Provide the project identification name and number, date of report, name of Contractor, name of concrete testing service, source of concrete aggregates material manufacturer and brand name for manufactured materials, values specified in the referenced specification for each material, and test results. Indicate whether or not material is acceptable for intended use.

C. Submit signed statement form ready-mix plant that concrete furnished for the Project will exactly conform to the approved design mixes.

1.8 PREINSTALLATION CONFERENCE

A. At least 35 days prior to the start of the concrete construction schedule, conduct a preinstallation conference at the project site to review the proposed mix designs and to discuss the required methods and procedures to achieve the required concrete construction.

B. Require representatives of every party who is concerned with the concrete work to attend the conference, including, but not limited to, the following:

1. Contractor’s superintendent.
2. Testing laboratory.
3. Concrete subcontractor.
4. Ready-mix concrete producer.
5. Admixture manufacturer(s).
6. Owner.
7. Architect.

C. Meeting Minutes: Record, type and distribute within three (3) days of the meeting.

PART 2 – PRODUCTS

2.1 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I.

1. Use one brand of cement throughout Project.

B. Fly Ash: ASTM C 618, Type F, may be substituted for up to 20 percent of the portland cement in all concrete mixes unless noted otherwise.

1. Fly Ash shall not be permitted in concrete mixes designed for foundation use.

C. Normal-Weight Aggregates: ASTM C 33 and as specified. Provide aggregates from a single source for exposed concrete.

1. For exposed exterior surfaces, do not use fine or coarse aggregates that contain substances that cause spalling.
2. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to Architect.
3. Fine Aggregate: Clean, sharp, natural sand free from loam, clay lumps, or other deleterious substances.
4. Coarse Aggregate: Clean, un-coated, processed aggregate containing no clay, mud, loam, or foreign matter, as follows:

    a. Crushed stone, processed from natural rock or stone.
    b. Washed gravel, either natural or crushed. Use of pit or bankrun gravels not permitted.
    c. Maximum Aggregate Size: Not larger than one-fifth of narrowest dimension between sides of forms, one-third of depth of slabs, nor three-fourths of minimum clear spacing between individual reinforcing bars or bundles of bars.

5. Aggregate Supply: Provide aggregates from one source of supply to ensure uniformity in color, size, and shape.

D. Water: Potable.

2.2 CONCRETE ADMIXTURES

A. Provide admixtures produced by established reputable manufacturers and use in compliance with manufacturer's printed directions. Do not use admixtures which have not been incorporated and tested in accepted mixes, unless otherwise authorized specifically in writing by Architect.

1. Air-Entraining Admixture: ANSI/ASTM C260
2. Water-Reducing Admixture: ANSI/ASTM C494, Type A.

3. Set-Control Admixture: ANSI/ASTM C494
4. Super Plasticizer: ANSI/ASTM C494, Type F.

B. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.

1. Subject to compliance with requirements, provide one of the following:

a. “AEA-92 and Air Mix 200”, Euclid Chemical Co.
b. “MB-VR or MB-AE”, Master Builders, Inc.
c. “Sika AER”, Sika Corp.

2. Air-Entraining admixtures are not permitted in concrete mixes designated for use in any type of slab structure.

C. Water-Reducing Admixture: ASTM C494, Type A, and containing not more than 0.05 percent chloride ions.

1. Subject to compliance with requirements, provide one of the following:

a. “Eucon WR-75 or Eucon WR-91”, Euclid Chemical Co.
b. “Pozzolith Normal”, Master Builders, Inc.
c. “Plastocrete 160”, Sika Corp.

D. High-Range Water-Reducing Admixture (Superplasticizer): ASTM C494, Type F or Type G and containing not more than 0.05 percent chloride ions.

1. Subject to compliance with requirements, provide one of the following:

a. “Eucon 37”, Euclid Chemical Co.
b. “Rheobuild 1000”, Master Builders, Inc.
c. “Sikament 300”, Sika Corp.

E. Water-Reducing, Accelerating Admixture: Non-chloride, non-corrosive per ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water. The admixture manufacturer must have long-term non-corrosive test data from and independent testing laboratory (of at least a year’s duration) using an acceptable accelerated corrosion test method such as that using electrical potential measures.

1. Subject to compliance with requirements, provide one of the following:

a. “Accelguard 80”, Euclid Chemical Co.
b. “Pozzutec 20”, Master Builders, Inc.
c. Plastocrete 161 FL, Sika Corporation.

F. Water-Reducing, Retarding Admixture: ASTM C494, Type D and contain not more than 0.05 percent chloride ions.

1. Subject to compliance with requirements, provide one of the following:

a. “Eucon Retarder 75”, Euclid Chemical Co.
b. “Pozzolith Retarder”, Master Builders, Inc.
c. “Plastiment”, Sika Corporation.

G. Certification: Written conformance to the above-mentioned requirements and the chloride ion content of admixtures will be required from the admixture manufacturer prior to mix design review by the Architect.

H. Prohibited Admixtures: Calcium chloride or admixtures containing more than 0.05 percent chloride ions are not permitted.

2.3 PROPORTIONING AND DESIGN MIXES

A. Proportion mixes by either laboratory trial batch or field experience methods as specified in ACI 301, using materials to be employed on the project for each class of concrete required.

B. Submit written reports to Architect of each proposed mix for each type of concrete at least 15 days prior to start of Work. Indicate with each mix design the items or structures for which it is to be used. Do not begin concrete production until mixes have been reviewed by Architect. Submit the following information:

1. Complete identification of aggregate source of supply.
2. Tests of aggregate for compliance with specified requirements.
3. Scale weight of each aggregate.
4. Absorbed water in each aggregate.
5. Brand, type, and composition of cement.
6. Brand, type, and amount of each mixture.
7. Amounts of water used in trial mixes.
8. Proportions of each material per cu. yd. including fibrous secondary reinforcement.
9. Gross weight and yield per cu. yd. of trial mixtures.
10. Measured slump.
11. Measured air content.
12. Compressive strength developed at 7 days and 28 days, from not less than 3 test cylinders cast for each 7 and 28 day test, and for each design mix. These test reports may be from previous projects within the past 6 months.
13. Identification number or name of mix to verify agreement with compression test reports.

C. Water-Cement Ratio Methods: Concrete proportions may be established by use of Water-Cement Ratio Limits Table 5.4 and limiting restrictions in ACI 301.

D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix designs and strength results must be submitted to and accepted by Architect before using in work.

E. Maximum Water Cement Ratio: Concrete mixes shall be limited to those shown on the contract documents. Mixes shall comply with chapters 3, 4 and 5 of ACI 318 latest building code adopted edition.

Super plasticizers, flyash, and water reducers shall be used to obtain required slump while maintaining maximum water-cement ratio.

F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

1. Ramps, slabs, and sloping surfaces: Not more than 3 inches.
2. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
3. Concrete containing high-range water-reducing admixture (superplasticizer): Not more than 8 inches after adding admixture to site-verified 2-to-3-inch slump concrete.
4. Other concrete: Not more than 4 inches.

G. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work. Adjustments must be made in writing to the Architect. Only proceed when approval is granted.

H. Concrete mix for concrete used in metal pan stair treads and platforms shall be as follows:

1. Compressive Strength at 28 days: 4000 psi.
2. Minimum Cement Content: 517 pounds per cubic yard.
3. Maximum Water-Cement Ratio: 0.48.
4. Air Content: 0 to 3 percent.
5. High range water-reducing admixture is required (high-range not permitted.)
6. Fiber reinforcement required. Apply at rates as recommended by the fiber manufacturer.
7. 3/8” maximum aggregate size.
8. Surface hardener is required for all concrete filled metal pan stairs.

I. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to the Architect for preparing and reporting proposed mix designs. Trial batch and field experience tests shall have been performed within 12 months of submittal date.

2.4 RELATED MATERIALS

A. Rubber Waterstops: Corps of Engineers CRD-C 513.

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

a. Progress Unlimited.
b. Williams Products, Inc.
c. Synko-flex by Henry, Inc.

B. Sand Cushion: Clean, manufactured or natural sand.

C. Preformed Expansion Joint Fillers: Reflex by The JD Russell Company or other expansion joint filler made of Recycled rubber (tires).

2.5 CONCRETE CURING MATERIALS

A. Moisture-Retaining Cover: One of the following, complying with ANSI-ASTM C171 for concrete floors that are to be exposed or to receive floor sealer. Contractor’s option to obtain specified requirements for concrete slabs-on-grade. Coordinate uses with finish material manufacturer’s specifications.

1. Waterproof paper
2. Polyethylene film
3. Polyethylene-coated burlap

B. Water Based Acrylic Liquid Membrane-Forming Curing Compound: Liquid-type membrane-forming curing compound complying with ASTM C 309, Type I, Class B, with 18 to 20 percent minimum solids.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Safe Cure and Seal (J-18), Dayton Superior Corp.
b. Aqua-Cure VOX, Euclid Chemical Co.
c. Masterseal-W100, Master Builders, Inc.
d. Spartan Coate WBII, The Burke Group.

C. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Eucobar, Euclid Chemical Co.
b. E-Con, L&M Construction Chemicals, Inc.
c. Confilm, Master Builders, Inc.
d. Finishing Aid, The Burke Group.

D. Concrete curing materials shall be approved by the manufacturer of the product for the final finish on the concrete slabs. Submit written approval/certification.

2.6 SELF-LEVELING UNDERLAYMENT

A. Free-flowing, self-leveling, pumpable, cement-based compound for applications from 1 inch thick to feathered edges. (If required for patching and repairing).

B. Compressive strength: 4100 psi minimum at 28 days. Flexural strength: 1300 psi at 28 days. Tensile strength: 750 psi at 28 days. Shrinkage: .025 after 7 days.

C. Manufacturers:

1. "Thoro Underlayment": Thoro System Products, Centerville, Indiana.
2. "Ardex K-15": Ardex, Inc. Pittsburgh, Pennsylvania.
3. “300 Premium Underlayment”: The Burke Group, Converse, Texas.

2.7 CONCRETE UNDERLAYMENT

A. One-component, cement based trowel grade underlayment. (if required for patching and repairing).

B. Compressive strength: 4250 psi minimum at 28 days.
Flexural strength: 1000 psi minimum at 28 days.
Tensile strength: 650 psi minimum at 28 days.

C. Manufacturer:

1. "Thoro Underlayment Trowel Grade": Thoro System Products, Centerville, Indiana.
2. “Burke Feather Patch”: The Burke Group, Converse, Texas.
3. ARDEX TL 1000, Ardex America.

2.8 BONDING AGENT

A. Chemical Bonding Agent: Film-forming, freeze-thaw resistant compound suitable for brush or spray application complying with MIL-B-19235. Subject to compliance with requirements, provide one of the following:

1. Adbond (J40); Dayton Superior Corp.
2. Eucoweld; Euclid Chemical
3. Everbond; L & M Construction Chemicals
4. Sonocrete; Sonneborn Building Products
5. Intralok; W.R. Meadows, Inc.
6. Acrylic Bondcrete, The Burke Group

2.9 CONCRETE PATCHING COMPOUND

A. Single-component, cement based, polymer modified patching mortar with low slump properties.

1. "Thorite 100" by Thoro System Products, Centerville, Indiana
2. “V/O Patch” by The Burke Group, Converse, Texas.
3. “WunderFixx”, by CTS Cement Manufacturing Corp.

2.10 ADMIXTURES, GENERAL

A. Use air-entraining admixture in exterior concrete, unless otherwise indicated. Add air-entraining admixture at the manufacturer's prescribed rate to result in concrete at the point of placement having air content within the following limits:

1. Concrete structures and slabs exposed to freezing and thawing or subjected to hydraulic pressure:

a. 3 to 15 percent for maximum 2 inches aggregate.
b. 4-1/2 percent to 6-1/2 percent for maximum 1 inch aggregate.
c. 5 to 7 percent for maximum 3/4 inch aggregate.
d. 6 to 8 percent for maximum 1/2 inch aggregate.

2. Other Exterior Concrete: 2 to 4 percent

B. Use of admixtures for water-reducing and set-control shall be permitted only with prior approval of the Architect for each condition and shall be in strict compliance with the manufacturer's directions.

1. Design mix submittals shall include these admixtures and shall indicate for which types of concrete structures they are to be used.

C. Use amount of admixtures s recommended by manufacturer for climatic conditions prevailing at time of placing. Adjust quantities and types of admixtures as required to maintain quality control.

D. Use of calcium chloride will not be permitted.

2.11 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements of ASTM C 94, and as specified.

1. When air temperature is between 85 deg F and 95 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 95 deg F, reduce mixing and delivery time to 60 minutes.
2. Delete the references for allowing additional water to be added to the batch for material with sufficient slump. Addition of water to the batch will not be permitted.
3. During hot weather or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required.

PART 3 – EXECUTION

3.1 GENERAL

A. Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing steel.

3.2 PREPARATION

A. Pre-placement Inspection: Before placing concrete, inspect and complete the formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit the installation of their work; cooperate with other trades in setting such work, as required.

1. Inspect soil at bottom of foundation systems which will be subject to testing for soil bearing value by the testing laboratory, as directed by the Architect. Place concrete immediately after approval of foundation excavations.
2. Inspect underslab drainage course areas that were subject to testing for soil bearing value by the testing laboratory as required by Architect. Place concrete immediately after approval of underslab compaction tests.

B. Material placement for interior slabs on grade and exterior concrete stoops.

1. Under remaining building slabs, place vapor barrier, lapping joints and 6 inches minimum and seal with tape or mastic, lap and fold joints and turn membrane up on walls to top of floor on existing subgrade. Do not puncture membrane.
2. Install and properly anchor the slab reinforcing mesh.
3. Position waterstops and expansion joint fillers where indicated on the Drawings and as recommended by manufacturer. Special precautions shall be taken to avoid collapse during installation.

3.3 JOINTS

A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to Architect.

B. Provide keyways at least 1-1/2 inches deep in construction joints in walls and slabs and between walls and footings. Bulkheads designed and accepted for this purpose may be used for slabs.

C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.

D. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.

E. Waterstops: Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Support and protect exposed waterstops during progress of Work. Field-fabricate joints in waterstops according to manufacturer's printed instructions.

F. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Joint fillers and sealants are specified in Section 07 92 00.

G. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts 1/8 inch wide by one-fourth of slab depth or inserts 1/4 inch wide by one-fourth of slab depth, unless otherwise indicated.

1. Form contraction joints by inserting pre-molded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.
2. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.
3. If joint pattern is not shown, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
4. Joint fillers and self-leveling sealants are specified in Section 07 92 00.

H. Expansion Joints

1. Provide pre-molded joint filler for expansion joints abutting concrete curbs (except in integral walk and curb), catch basins, manholes, inlets, structures, masonry walls, and other fixed objects.
2. Set and secure continuous expansion joint strips where edge of slab abuts vertical surfaces.
3. Locate expansion joints at 30 feet o.c. for walks and curbs, unless otherwise shown.
4. Extend joint fillers full-width and depth of joint, flush with finished surface. Furnish joint fillers in one-piece lengths for the full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together. Form top edge of filler to conform to top profile of concrete.

3.4 INSTALLING EMBEDDED ITEMS

A. Set and build into formwork anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached.

B. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.

C. Install dovetail anchor slots in concrete structures as indicated on drawings.

D. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.5 PREPARING FORM SURFACES

A. Coat contact surfaces of forms with an approved, non-residual, low-VOC, form-coating compound before placing reinforcement.

B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply according to manufacturer's instructions.

1. Coat steel forms with a non-staining, rust-preventative material. Rust-stained steel formwork is not acceptable.

3.6 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete,"

and as specified.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.

1. Concreting shall be carried on at such a rate that at all times the concrete is at all times plastic and flows readily into spaces between reinforcement.

D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.
2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix to segregate.

E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.

1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
3. Maintain reinforcing in proper position on chairs during concrete placement.

F. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 95 deg F (32 deg C). Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Architect.

3.7 FINISHING FORMED SURFACES

A. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

B. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or another similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.

C. Smooth-Rubbed Finish: Provide smooth-rubbed finish on scheduled concrete surfaces that have received smooth-formed finish treatment not later than 1 day after form removal.

1. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. Grout-Cleaned Finish: Provide grout-cleaned finish on scheduled concrete surfaces that have received smooth-formed finish treatment.

1. Combine one part portland cement to one and one-half parts fine sand by volume, and a 50:50 mixture of acrylic or styrene butadiene-based bonding admixture and water to form the consistency of thick paint. Blend standard portland cement and white portland cement in amounts determined by trial patches so that final color of dry grout will match adjacent surfaces.
2. Thoroughly wet concrete surfaces, apply grout to coat surfaces, and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

E. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 MONOLITHIC SLAB FINISHES

A. General Information (Slabs on Grade): The requirements indicated are based upon the latest FF/FL method. Bids for this work shall reflect these requirements and enforcement thereof can be expected.

B. Typical Classroom, Corridors, Normal Sized Rooms:

1. Specified Overall Value: FF 30/FL 23
2. Minimum Local Value: FF 25/FL 20

3. Apply trowel finish to slab surfaces that are to be covered with resilient flooring, paint, or other thin film finish coating system.

C. Large Rooms and Public Areas:

1. Specified Overall Value: FF 36/FL 25
2. Minimum Local Value: FF 30/FL 22
3. Apply trowel finish to monolithic slab surfaces that are to receive resilient flooring, carpet, or other thin finish system.

D. Gym Floors and High Tolerance Floors where indicated:

1. Specified Overall Value: FF 50/FL 30
2. Minimum Local Value: FF 40/FL 25
3. Apply trowel finish to slab surfaces that are to be covered with wood flooring, paint, or other thin finish coating system.

E. Nonslip Broom Finish (NsBrm-Fn): Apply nonslip broom finish to exterior concrete with fiber bristle broom, perpendicular to main traffic route. Coordinate required final finish with the Architect before application.

F. Elevated slabs shall have a specified overall value of FF 22 to FF 27 and a minimum local of FF 20 with no FL number defined.

3.9 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.10 CONCRETE CURING AND PROTECTION

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before power floating and troweling.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 72 hours.

C. Curing Methods: Cure concrete by curing compound, by moist curing, by moisture-retaining cover curing, or by combining these methods, as specified. Curing methods are contractor’s option to obtain finishes as required. Coordinate curing method with floor finish manufacturer. Do not use certain methods as may be required by the floor finish manufacturer.

D. Provide moisture curing by the following methods:

1. Keep concrete surface continuously wet by covering with water.
2. Use continuous water-fog spray.
3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a 4-inch lap over adjacent absorptive covers.

E. Provide moisture-retaining cover curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

F. Apply curing compound on exposed interior slabs and on exterior slabs, walks, and curbs as follows:

1. Apply curing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

G. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

H. Curing Unformed Surfaces: Cure unformed surfaces, including slabs, floor topping, and other flat surfaces, by applying the appropriate curing method.

1. Final cure concrete surfaces to receive finish flooring with a moisture-retaining cover, unless otherwise directed.
2. Concrete floor surfaces scheduled to receive tile installations shall have been moist cured; curing of these surfaces by sprayed chemical curing compounds is not permitted.

3.11 SHORES AND SUPPORTS

A. Comply with ACI 347 for shoring and reshoring in multistory construction, and as specified.

B. Extend shoring from ground to roof for structures four stories or less, unless otherwise permitted.

C. Extend shoring at least three floors under floor or roof being placed for structures over four stories. Shore floor directly under floor or roof being placed, so that loads from construction above will transfer directly to these shores. Space shoring in stories below this level in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members where no reinforcing steel is provided. Extend shores beyond minimums to ensure proper distribution of loads throughout structure.

D. Remove shores and re-shore in a planned sequence to avoid damage to partially cured concrete. Locate and provide adequate re-shoring to support work without excessive stress or deflection.

E. Keep re-shores in place a minimum of 15 days after placing upper tier, or longer, if required, until concrete has attained its required 28-day strength and heavy loads due to construction operations have been removed.

3.12 REMOVING FORMS

A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days or until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

C. Form-facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form-facing material without loosening or disturbing shores and supports.

3.13 REUSING FORMS

A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use patched forms for exposed concrete surfaces except as acceptable to Architect.

3.14 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to Architect.

B. Mix dry-pack mortar, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.

1. Cut out honeycombs, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.
2. For surfaces exposed to view, blend white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

C. Repairing Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes and fill with dry-pack mortar or precast cement cone plugs secured in place with bonding agent.

1. Repair concealed formed surfaces, where possible, containing defects that affect the concrete's durability. If defects cannot be repaired, remove and replace the concrete.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.

1. Repair finished unformed surfaces containing defects that affect the concrete's durability. Surface defects include crazing and cracks in excess of 0.01 inch wide or that penetrate to the reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycombs, rock pockets, and other objectionable conditions.
2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
3. Correct low areas in unformed surfaces during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect.
4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same

manner as adjacent concrete.

E. Repair isolated random cracks and single holes 1 inch or less in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Place dry-pack before bonding agent has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

F. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

G. Repair methods not specified above may be used, subject to acceptance of Architect.

3.15 UNDERLAYMENTS

A. Install in strict accordance with manufacturer's written installation instructions and provide primers as recommended.

END OF SECTION 03 30 00

SECTION 03 47 14 - TILT-UP CONCRETE CONSTRUCTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Extent of tilt-up concrete construction is shown on drawings and as specified herein.

B. Tilt-up concrete construction, including complete engineering design required relative to erection stresses. In this connection:

1. Neither the Architect nor structural engineer have been retained to design the wall panels for stresses during erection, nor to determine the means and methods to be used for erection and bracing until permanent bracing is in place.
2. It shall be the contractor’s responsibility to erect the panels in a manner that will be both safe for personnel and property, and to brace and otherwise protect the panels until connections to the permanent structural system are completed.

1.3 SUBMITTALS

A. In addition to requirements of Section 03 30 00, Cast-In-Place Concrete, submit following:

1. Shop Drawings: Submit shop drawings and design calculations. Show panel dimensions, finish, location of openings, reinforcing steel, anchors, pickup devices, pickup reinforcement, connections, bracing system, details, and items furnished by others to be cast into panels.
2. Indicate on Shop Drawings dimensional tolerances and information required for coordination of other trades which interfere with job cast concrete tilt-up wall panels.
3. Pickup points and location of strong-backs shall be designed by a State of Florida registered structural engineer to withstand all loads to which they are subjected during handling, lifting, stripping and erection operations.

B. Casting and Erection Sequence: Submit proposed casting method and sequence of erection to Architect for review not less than 21 days prior to beginning work.

C. Contractor shall conduct a pre-installation meeting with all affected parties in attendance including the Architect, Structural Engineer and Owner.

D. Submit Coordination drawings indicating all inserts that go into each tilt-up concrete panel to include, but may not be limited to, the following:

1. The location of lifting and bracing points, and types.
2. The locations and sizes of the weld plates.

3. Window and door sizes and locations.
4. Thickened portions of the panels.
5. Reveals.
6. All other items in the panels and/or specific panel details and connections required.

E. All shop drawings shall indicate the outside view of the panels as well as the lifting side, or inside view as well. Indicate the location and size of all reveals and special items required on the outside face. Shop drawings and details shall also show the lifting view, to help reduce errors during the casting process.

F. Quality Control Submittals:

1. Test Reports: When, and as directed by the Architect, submit certified laboratory test reports confirming physical characteristics of materials used in the performance of the Work of this Section.
2. Manufacturer’s Instructions: Submit the manufacturer’s current recommended methods of installation, including relevant limitations and safety cautions.

1.4 QUALITY ASSURANCE

A. The following are in addition to Quality Assurance provisions of Section 03 30 00, Cast-In-Place Concrete.

1. Erector Qualifications: At least 5 years of successful experience in erection of tilt-up wall panels similar in size and amount as required for this Project.
2. Qualifications for Production: Contractor shall show evidence of at least 5 years experience in the production of job cast concrete tilt-up panels. Workmen shall be proficient in production operations and shall be under the direct supervision of a competent foreman at all times.
3. Construction Loads: Design and construct tilt-up wall panels to withstand construction loads that may occur during lifting, bracing, and impact by adjoining panels.
4. Qualifications for welders:

    a. Qualify welding processes and welding operators in accordance with AWS Standard Qualification Procedure.
    b. Provide certification that welders to be employed in the work have satisfactorily passed AWS qualification test within the previous 12 months.

B. Perform work in accordance with ACI C4, ACI 318, and ASTM C150.

C. Welding shall conform to AWS D1.1.

D. Design units under the direct supervision of a Structural Engineer experienced in the design of this work and licensed to practice in the State of Florida.

1.5 DESIGN REQUIREMENTS

A. Design units to withstand erection and design loads as calculated in accordance with State and local codes, and erection forces. Calculate structural properties of units in accordance with ACI 301 and ACI 318.

B. Design units to accommodate construction tolerances, deflection of building structural members and clearances of intended openings.

C. Design and size components to withstand erection loads and sway displacement as calculated in accordance with Florida Building Code 5th Edition (2014).

D. Design component connections to accommodate building movement and thermal movement. Provide adjustment to accommodate misalignment of structure without unit distortion or damage.

1.6 MOCK-UP

A. Construct a 6-foot by 6-foot mock-up with window opening (no window) at location as directed by the Architect.

B. Obtain Architect’s approval prior to proceeding with work.

C. Mock-up shall show typical panel joint, window head, jamb, and sill, ceiling typical reveal.

1.7 DELIVERY, STORAGE AND HANDLING

A. Handling Tilt-Up Units: Lift units to position, consistent with their shape and design. Lift and support only from support points.

B. Blocking and Lateral Support During Erection: Clean and non-staining, without causing harm to exposed surfaces. Provide temporary lateral support to prevent bowing, warping, or cracking.

C. Protect units from staining, chipping and spalling.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Tilt-up concrete construction materials are specified in Section 03 30 00, Cast-In-Place Concrete.

B. The following are in addition to requirements specified in Section 03 30 00, Cast-In-Place Concrete.

C. Bond Breaker: Polymerized solution containing no oils, waxes, paraffin’s, or other material that could affect bond of subsequent finishes or natural appearance of exposed concrete surfaces.

D. Anchors and Inserts: Provide inserts, dowels, bolts, nuts, washers, and other items shown to be cast in panels or required for connecting panels to adjacent work, including inserts required for pickup.

1. Structural Steel Shapes: ASTM A36.
2. Malleable Iron Castings: ASTM A47, grade 32510.

3. Carbon Steel Castings: ASTM A27, grade 60-30.
4. Stainless Steel Anchors: ASTM A240, type 301, mill finish.
5. Hot-Dip Galvanized iron and steel anchors, inserts, and connecting devices: ASTM A153.

2.2 PANEL MATERIALS

A. Forms: (See 2.7 herein for form liners)

1. Panel elements shall be cast on a level slab using rigidly constructed well braced steel or wood forms, with precise corners, reveals and arises. Design to withstand stresses resulting from the casting process. Where finish surface is exposed aggregate, do not miter corners.
2. Forms shall contain block-outs required to provide openings detailed on Drawings.
3. Panels may be stacked for ease of casting in forms as specified above.
4. Bond-Breaker:

    a. Burke Super Bond Breaker
    b. Thompson’s C & B
    c. Sure Lift, by Dayton Superior

B. Panel Materials:

1. Cement: Portland cement, conforming to ASTM C150.
2. Fine and coarse aggregates shall consist of clean, hard, strong, and durable inert material, free of injurious amounts of deleterious substances, conforming to ASTM C33.
3. Concrete shall be a laboratory design mix approved by Architect.
4. Mixing water shall be free of any acid, alkali, oil or organic material that may interfere with setting of the cement.
5. Admixtures shall be approved by Architect.
6. Miscellaneous metals shall conform to requirements of Section 05 50 00, Metal Fabrications. Provide all inserts, dowels, and other items to be cast in panels, including inserts required for pick-up. Steel which will be exposed in finished panels shall be hot dip galvanized after fabrication in accordance with ASTM A123.
7. Panel Inserts: Equal to Burke tapped inserts for casting in panels.

C. Quality of Concrete:

1. Transit mixed concrete shall conform to ASTM C94.
2. Water cement ratio shall be kept to a minimum, and concrete slump shall not exceed values as indicated on drawings when tested according to ASTM C143.
3. Water absorption shall be a maximum of 6-1/2 gallons per sack of cement.
4. Concrete shall have a compressive strength as indicated on Drawings at 28 days, when tested on 6-inch diameter by 12-inch high cylinders, according to ASTM C39.

D. Sacking Materials: Portland cement and water, mixed to a uniform creamy paste.

E. Dry-pack Materials: In accordance with requirements specified in Section 03 30 00 – Cast-In-Place Concrete.

1. Wire Mesh: 2 inches by 2 inches by 16 gage galvanized welded plain wire reinforcing meeting requirements of ASTM A1064.

F. Form Liners: Refer to Section 03 11 00, Concrete Formwork

2.3 CONCRETE CURING MATERIALS

A. Liquid Membrane-Forming Curing Compound:

1. Liquid type membrane forming curing compound complying with ASTM C309, Types I and ID, Class B, unless otherwise approved.
2. Materials selected shall be compatible with other applied finishes. Refer to manufacturer’s data for specific requirements.

2.4 TOLERANCES

A. Dimensions of the finished product shall be within the limits recommended by ACI 117, and the following, at the time of placement in the structure.

1. Overall Dimension: Plus or minus 1/8-inch per 10 feet, but not to exceed 3/8-inch within each panel and the finished wall.
2. Cross-Sectional Dimension:

   a. Section less than 3 inches: Plus or minus 1/8-inch.
   b. Section over 3 inches: Plus or minus 1/4-inch.

3. Deviations from Straight Line: Not more than 1/4-inch per 20 feet for vertical members; and 1/4-inch per 20 feet for horizontal members.
4. Warpage: Not to exceed 1/4-inch per 6 feet. Maximum differential between adjacent units in erected position shall be 3/8-inch.
5. Out-of-Square: Not to exceed 1/8-inch.
6. Location of Anchors and Inserts and Panel Pickup Devices: Not to be more than plus or minus 1/2-inch from centerline location.

2.5 CONCRETE MIX DESIGN

A. Comply with requirements of Section 03 30 00, Cast-In-Place Concrete.

2.6 CONCRETE PATCHING COMPOUND

A. Single-component, cement based, polymer modified patching mortar with low slump properties.

1. "Thorite 100" by Thoro System Products, Centerville, Indiana
2. “V/O Patch” by The Burke Group, Converse, Texas.
3. “WunderFix”, by CTS Cement Manufacturing Corp.

PART 3 - EXECUTION

3.1 GENERAL

A. Coordinate tilt-up operations with Work of other trades in order that work may be expedited and omissions and delays avoided.

B. Concrete shall also be so handled as to prevent segregation. Mixers, chutes, conveyers, and other handling equipment shall be kept clean and free of foreign matter.

3.2 CASTING OF PANELS

A. Casting Slab Preparation:

1. Casting slab shall be cured and sealed. Saw cuts, cracks, or joints in the casting bed shall be filled and leveled with a sealant so as to minimize transfer of the joint line to the panel face.
2. Waste slabs, if used, shall be of sufficient thickness and strength so as not to crack with the weight of the panels.
3. Contractor shall be responsible for compatibility of curing agents, sealants and releasing agents utilized in the Project. If panels are to be stacked, the troweled surface shall be considered the casting bed and shall be treated as the same.

B. Curing of Base Casting Slabs: Cure concrete surfaces upon which wall panels are to be cast in same manner specified for panels, except, do not use paper or other sheet materials. At completion of 48-hour fog spray curing, use liquid membrane-forming curing compound certified to have qualities as a bond breaker, applied in accordance with manufacturer’s instructions.

C. After placing reinforcing steel for panels, check casting slab surfaces for continuity of film. Touch up or recoat worn or damaged areas, taking care to prevent application of coating on reinforcing steel and inserts.

D. Coordinate installation of inserts and anchorages required to be set into concrete slabs prior to casting of panels.

1. Where grooves are required in panels, cast grooved side down. Ensure that forming strips are straight and securely fastened to prevent movement or floating during placing operations.

3.3 PLACING CONCRETE

A. Concrete shall be thoroughly compacted during placing and thoroughly worked around reinforcement, around the embedded items, and into corners of the form.

B. During placing vibrate concrete internally with mechanical vibrators in accordance with ACI requirements. Vibrators used shall be “stinger” type or a combination of “stingers” on a traveling screed. Provide one vibrator for each 100 cubic yards of concrete being placed, with one stand-by unit ready for use.

1. Cold joints are not permitted in an individual tilt-up panel.

3.4 CURING AND PROTECTION

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperature, and maintain without drying at a relatively constant temperature for the period of time necessary for hydration of the cement and proper hardening of the concrete.

B. Start initial curing as soon as free moisture has disappeared from the concrete surface after placing and finishing. Weather permitting; keep panels continuously moist for not less than 72 hours.

C. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days and in accordance with ACI 301 procedures. Avoid rapid drying at the end of the final curing period.

D. Provide liquid membrane curing as follows:

1. Apply membrane-forming curing compound to damp concrete surfaces as soon as the water film has disappeared. Apply uniformly in opposite directions in a two-coat continuous operation by power spray equipment in accordance with the manufacturer’s directions. Recoat areas that are subjected to heavy rainfall within three hours after initial application. Maintain the continuity of the coating and repair damage to the coat during the entire curing period.

3.5 HANDLING AND ERECTION

A. Minimum strength of panels at time of erection shall be as indicated on Structural Drawings. Panels shall not be lifted in less than 10 days after casting unless acceptable to Architect.

B. Prior to commencement of erection operations, Contractor shall check relevant job site conditions insofar as they are ready for the installation of panels. Each element shall be properly marked to correspond with designation on the approved Shop Drawings.

C. Support elements with strongbacks, or by other acceptable means, during storage, handling, hauling, or erection in such a manner as to prevent warpage or cracking.

D. Protect elements at all times to prevent staining.

E. Patch defects in panels, with patching materials matching panel concrete when deemed by the Architect as the appropriate method to correct such defects.

F. Use erection equipment to avoid damage to existing construction, permanent floor slabs, and panels.

G. Set elements in the position assigned on approved erection drawings. Place elements on metal shims, bring to proper level, properly anchor, and dry-pack for the full length of the bearing surface. Remove metal shims when dry-pack has developed sufficient strength to support elements, but not sooner than 7 days after placing dry-pack grout.

H. Panels not attached to the building frame at the time of erection shall be braced in position using a bracing system designed to resist anticipated wind loads with appropriate safety factor.

I. Dry-pack Grout Installation:

1. Preparation Work:

    a. Remove laitance down to sound concrete.
    b. Surface to receive grout shall be rough and reasonably level.
    c. Surface shall have been properly wet cured.
    d. Do not use curing compounds.
    e. Clean surface of oil, grease, dirt and loose particles.
    f. Saturate concrete including bolt holes for 24 hours prior to grouting.
    g. Remove free water from concrete and bolt holes immediately before grouting.

2. Formwork shall be compatible with proposed method of placing dry-pack grout. Design for rapid, continuous and complete filling of space to be dry-paced.

    a. Build strong, tight forms braced to avoid leakage or buckling under weight of dry-pack.

3. Do not overwork or retemper grout.

J. Panels shall be in final position at least 14 days before panel-to-panel connections are made. Perform welding required to attach panels to building frame and to each other. Comply with AWS code for procedures, appearances and quality of welds, and methods used in correcting weld work.

K. Protection of the erected elements shall be the responsibility of the Contractor.

L. Visible surfaces of the panels, when in place, shall be free from surface defects, including cracks.

M. Joint Width: 3/4” maximum, 1/2” minimum

N. After the panels are erected, dismantle panel pickup devices and patch panels as required for a uniform appearance.

3.6 SEALING OF PANEL JOINTS

A. Clean panel joints of contaminants, including form release agents and concrete laitance. Dust and loose particles shall be blown out with oil-free compressed air and vacuum cleaned.

B. Install fire-resistive blanket where indicated, back-up rod, primer, and sealant in accordance with Section 07 92 00, Joint Sealants.

3.7 PATCHING

A. Patch holes in panel surfaces created by lifting and bracing devices. Comply with Concrete Surface Repair requirements of Section 03 30 00, Cast-In-Place Concrete.

B. Repair of other defective or damaged surfaces will be permitted only upon acceptance by Architect. Remove and replace panels that are not acceptable for surface repairs.

3.8 FIELD QUALITY CONTROL

A. Comply with requirements of Section 03 30 00, Cast-In-Place Concrete.

3.9 ADJUSTING

A. Panels damaged during erection, including visible cracks, permanent bowing occurring from erection and spalls, shall be repaired or replaced to the satisfaction of the Architect and structural engineer.

3.10 CLEANING

A. When Work of this Section has been completed, and at other times as may be directed, remove trash, debris, surplus materials, tools, and equipment from site.

3.11 PROTECTION

A. During the curing period, protect tilt-up concrete from damaging mechanical disturbances, including load stress, heavy shock, excessive vibrations, and damage caused by rain or flowing water. Protect finished concrete surfaces from damage by subsequent construction operations.

END OF SECTION 03 45 13

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Division 04

Masonry

SECTION 04 20 00 – UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Provide labor, materials, and equipment necessary for complete installation of unit masonry, including the installation of rigid cavity insulation as shown on the Drawings and specified herein.

B. Work installed under this Section, but materials or products furnished under the following Divisions or Sections:

1. Anchor bolts, steel plates, and steel lintels; refer to Division 5

    a. Installation of lintels in masonry walls shall be included under the Work of this Section.

2. Wood bucks and nailing blocks in masonry construction; refer to Division 6.

C. Cooperate with other trades requiring items of equipment or services to be installed within or in conjunction with Unit Masonry Work.

D. Other Materials provided and installed by this Section:

1. Integral color
2. Integral water repellent additive
3. Masonry cleaners

1.2 SUBMITTALS

A. Test report from independent laboratory showing result of efflorescent test conducted per ASTM C67 for each provided face brick type.

B. Upon regular presentation within past 6 months of representative units by approved manufacturer, a test report from an independent laboratory showing resultant weight, compressive strength (based on net area), and water absorption properties, as well as adherances to standards where so specified, for:

Name of Manufacturer
Date of Manufacture of Test Specimen
Dimension Measurements (in.)
Calculated Gross Area (sq.in.)
Calculated Net Area (sq.in.)
Total Load (lbs.)
Net Unit Load (psi)

Sample Weight (lbs.)
Dry Weight (lbs.)
Wet Weight (lbs.)
Immersed Weight (lbs.)
Density (pcf)
Moisture Content (%)
Absorption (%)

C. Letter from approved manufacturer certifying that provided units will meet or exceed qualities of tested representative units for:

1. Each proposed type of concrete masonry unit.

D. Mock-up panels as erected on site grounds are only samples required.

E. Approved manufacturer's published complete product data, with particular items to be provided clearly marked thereon, for:

1. Proposed masonry cavity wall insulation.
Integral color.
Integral water repellant additive.
Preformed insulation inserts.

F. A test report from an independent testing laboratory showing compressive strength of concrete masonry prisms constructed from the concrete masonry units and mortar to be used in the masonry work for:

1. Each proposed type and size of concrete masonry unit as required on the Reinforced Masonry Plans in the Drawings.

G. Submit minutes from preinstallation conference.

H. Fire-rated CMU certification.

I. Installer’s examination report.

J. Submit written masonry inspection reports as specified in 1.3.C herein.

K. Certified Lumber (for wood used in formwork if any):

Submit chain-of-custody certificate from one of the certifying organizations listed in the Quality Assurance Article of Division 6, certifying that lumber is harvested from a well-managed forest.
Lumber shall be clearly marked by one of the certifying organizations listed in the Quality Assurance Article of Division 6.

1.3 QUALITY ASSURANCE

A. Standards: Comply with the provisions of the following in accordance with the Florida Building Code 5th Edition (2014), except as otherwise shown or specified.

1. ACI 530/ASCE 5/TMS 402-11 Building Code Requirements for Masonry Structures

2. ACI 530.1/ASCE 6/TMS 602-11 Specifications for Masonry Structures
3. NCMA-TEK 70A Concrete Masonry Prism Strength.
4. NCMA-TEK 132
5. NCMA-TEK 23A Grouting for Concrete Masonry Walls.
6. NCMA-TEK 65 Field Inspection of Engineered Concrete Masonry.
7. ASTM C140 Standard Methods of Sampling and Testing Concrete Masonry Units.
8. Comply with ALL NCMA-TEK Standards.

B. Changes in the source or brand of masonry materials during construction will require resubmission and re-testing at the Contractor's expense.

1.4 TESTS OF CONCRETE MASONRY PRISMS

A. For grout filled and reinforced or un-reinforced concrete masonry or brick masonry wall construction tests for the compressive strength of prisms as described in ASTM E 1388.

1. Provide a minimum of one set of 3 masonry prisms for testing per each 5000 square feet of masonry wall construction as required on the Structural Masonry Plan in the Drawings.

B. Submit written reports for each prism tested Provide the project identification name and number, date of report, name of Contractor, name of Testing service, name of material suppliers, specific location where masonry represented by the prism is used, test results, and values specified in the referenced specification. Indicate whether or not tested prism is acceptable for intended use.

C. If the compressive strength tests fail to meet he minimum requirements specified, the concrete masonry represented by such tests shall be considered deficient in strength.

D. Deficient masonry construction shall be removed and replaced by the Contractor without additional cost to the Owner. In lieu or removal and replacement, additional cores may be grouted as required and directed by the Architect without additional cost to the Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry materials to project in undamaged condition.

B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.

C. Store cementitious materials off the ground, under cover, and in dry location.

D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

A. Protect partially complete masonry against weather, when Work is not in progress, by covering top of walls with strong, waterproof, non-staining membrane. Extend membrane at least 2 foot down both sides of walls and anchor securely in place.

B. Protect partially complete masonry walls against wind damage by bracing as required until support of walls is integral with the building structure.

C. Protect masonry against freezing when the temperature of the surrounding air is 40 degrees F and falling. Heat materials and provide temporary protection of complete portions of masonry work. Comply with the requirements of the governing code and with the "Construction and Protection Recommendations for Cold Weather Masonry Construction" of the Technical Notes of Brick and Tile Construction by the Brick Institute of America (BIA).

D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.

E. Cold-Weather Construction: Comply with referenced unit masonry standard for cold-weather construction and the following:

1. Do not lay masonry units that are wet or frozen.
2. Remove masonry damaged by freezing conditions.

F. Hot-Weather Construction: Comply with referenced unit masonry standard.

G. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

PART 2 – PRODUCTS

2.1 MATERIALS, GENERAL

A. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated.

2.2 MASONRY UNITS

A. Obtain masonry units from one manufacturer for uniform texture and color for each kind required, for each continuous area and visually related areas.

B. Face Brick:

1. Quality Standard: ASTM C216, Grade SW for exterior exposure, Type FBS. Type FBX.
2. Sizes:
   a. Standard Modular 3-5/8 inch by 2-1/4 inch by 7-5/8 inch (Type A).

b. 8 inch by 8 inch by 4 inch (Type B).
c. Utility 3-5/8 inch by 3-5/8 inch by 11-5/8 inch (Type C).

3. Provide special molded shapes and solids as required. No brick holes shall be visible in the final product.
4. Compressive Strength: Shall exceed 3000 psi when tested with the loads applied normally to the bedding surface.
5. Water Absorption: Average maximum water absorption by submersion in boiling water for 5 hours shall be less than 17 percent. Average saturation coefficient shall be less than 0.78.
6. Manufacturer: Hanson, Charlotte, NC

7. Include in the Base Bid the cost for solid brick required, the cost for cutting of brick required, the cost for cutting of brick required to obtain special shapes, the cost of special size brick required, and the cost of special molded shapes required.

C. Concrete Masonry Units (CMU):

Manufacturer: Shall be member of the National Concrete Masonry Association.
(edit as required)
Size: Manufacturer's standard units with face dimensions of 15-5/8 by 7-5/8 inches (actual), 15-5/8 inches by 3-5/8 inches (actual), 7-5/8 inches by 7-5/8 inches.
Special Shapes: Provide, where shown and where required, lintels, inside and outside corners, jambs, sash, control joints, headers, bond beams, bullnoses, and other special conditions.

Provide bullnose corners at all exposed external corners (except at heads), and sills.
Not required at exterior columns, planters, and seat walls.

Hollow Load-Bearing (HL) CMU: Provide units complying with ASTM C90, 2N Class Designation for the aggregates, with a minimum compressive strength of (2420 psi) (1900 psi) on the net section.
Solid Loadbearing CMU (Solid CMU): Provide units complying with ASTM C90, 2N Class Designation for the aggregates, with a minimum compressive strength of (2420 psi) (1900 psi) on the gross section.
(The following two para’s are optional. We normally specify only normal weight units to be used at all locations)
Lightweight Units: ASTM C331 aggregate, except that aggregate material shall be limited to blast furnace slag, clay, shale, or slate. Dry net weight shall be not more than 105 lbs. per cu. ft. Strength shall be indicated above.
Medium Weight Units: ASTM C33 concrete aggregates for a net weight between 105 pounds and 125 pounds per cu. ft. Strength shall be as indicated above.
Normal Weight Units: ASTM C33 concrete aggregates for a dry net weight of not less than 125 pounds per cu. ft. Strength shall be as indicated above.
(The following is for Indiana and midwest projects only.)
Curing: Cure units in a moisture-controlled atmosphere or in an autoclave at normal pressure and temperature to comply with ASTM C90, Type I. (Linear drying shrinkage shall be 3 percent or less).
(The following is for all projects south of the Mason-Dixon line! Florida, Georgia, etc.)
Curing: Cure units in a non-moisture controlled atmosphere to comply with ASTM C90, Type II.
Exposed Face:

a. Manufacturer's standard color and texture. Smooth (Sand) face. No open textured block will be accepted.

Open textured face CMU made with gap-graded aggregates.

Smooth face scored CMU where indicated.

All exterior CMU, fluted and smooth, shall contain integral color from L.M. Scofield, as selected by Architect and integral water repellent additive, "Dry-Block" by W.R. Grace; or Architect approved equal. Integral water repellent additive shall be as specified herein.
Where CMU walls are indicated as fire-rated, provide materials and construction identical to those of assemblies whose fire resistance has been determined per ASTM E119 by a testing and inspection organization, by equivalent concrete masonry thickness, or by other means as acceptable to authorities having jurisdiction.
Fire Rated CMU shall meet requirements of the UL 618 and may be lightweight block manufactured with 100% rotary kiln produced expanded shale, clay, or slate. Blending of screenings or any other deleterious substance which impairs the fire rating is prohibited. The producer of the CMU shall furnish a one page certification showing conformance with all requirements of UL 618.
Provide masonry lintels at all openings greater than 1’-0” in width that occur in CMU walls.

2.3 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2-cup dry measure) and laundry detergent (1/2-cup dry measure) dissolved in one gallon of water.

B. Job-Mixed Muriatic Solution: Solution of 1 part muriatic acid and 10 parts clean water, mixed in a nonmetallic container with acid added to water.

C. Proprietary Acidic Cleaner: Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry units being cleaned:.

1. For masonry not subject to metallic oxidation stains, use formulation consisting of a concentrated blend of surface-acting acids, chelating, and wetting agents.
2. For dark colored masonry not subject to metallic oxidation stains, use formulation consisting of a liquid blend of surface-acting acids and special inhibitors.
3. For masonry subject to metallic oxidation stains, use formulation consisting of a liquid blend of organic and inorganic acids and special inhibitors.
4. Available Products: Subject to compliance with requirements, a product that may be used to clean unit masonry surfaces includes, but is not limited to, the following:
5. Products: Subject to compliance with requirements, provide the following:

   b. "Sure Klean No. 600 Detergent," ProSoCo, Inc.
   c. "Sure Klean No. 101 Lime Solvent," ProSoCo., Inc.
   d. "Sure Klean Vana Trol," ProSoCo, Inc.

2.4 SOURCE QUALITY CONTROL

A. Concrete Masonry Unit Tests: For each type, class, and grade of concrete masonry unit indicated, units will be tested by qualified independent testing laboratory for strength, absorption, and moisture content per ASTM C 140.

2.5 INTEGRAL WATER REPELLANT ADDITIVE

A. Acceptable Manufacturers: “Dry-Block” by W.R. Grace and Company; or Architect approved equal.

B. Install the integral waterproofing additive in all smooth face CMU, split-face CMU and ground face CMU installed in exterior walls.

C. Integral water repellent additive shall comply with ASTM E514, extended to 72 hours, ASTM C1357, ASTM C1314, and ASTM C1148.

D. Description: Integral liquid polymeric admixture for CMU added during block production.

E. Water Permeance of Masonry: Capable of achieving a Class E Rating when evaluated using ASTM E 514 with the test extended to 72 hours, using the rating criteria specified in ASTM E 514-74.

F. Flexural Bond Strength of Masonry: An increase of minimum 10% in masonry flexural bond strength shall occur as a result of adding integral water-repellent CMU and mortar admixtures when compared to a control (containing no admixtures) CMU and mortar when tested according to ASTM C 1357.

G. Compressive Strength of Masonry Prisms: Maximum 5% decrease in compressive strength of prisms shall occur as a result of adding integral water-repellent CMU and mortar admixtures when compared to a control (containing no admixtures) CMU and mortar when tested according to ASTM C 1314.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry.

B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.

B. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.

C. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of the Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.

D. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.

E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of new masonry with existing masonry.

G. Frozen Materials and Work: Do not use frozen materials mixed or coated with ice or frost. For masonry which is specified to be wetted, comply with the BIA recommendations. Do not build on frozen work. Remove and replace masonry work damaged by frost or freezing.

3.3 CONSTRUCTION TOLERANCES

A. Comply with construction tolerances of referenced unit masonry standard.

B. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10", or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story or 20' maximum, nor 1/2" in 40' or more. For vertical alignment of head joints do not exceed plus or minus 1/4" in 10', 1/2" maximum.

C. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.

D. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.

E. Variation in Cross-Sectional Dimensions: For columns and thicknesses of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".

F. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8"

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.

B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.

1. For the first and second block courses above and below apertures, run reinforcing continuous or extend two feet back from aperture edge. Refer to notes on Structural drawings.

C. Lay-up walls plumb and true and with courses level, accurately spaced and coordinated with other work. Do not wedge partitions tight against structural ceiling or beams, but provide a caulk or insulation filled joint between top of masonry and the structural roof deck, structural steel framing or structural floor deck. Stop masonry a minimum of 1/2 inch from vertical, horizontal and sloped steel surfaces.

D. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.

E. Built-In Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
2. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
3. Fill cores in hollow concrete masonry units with grout 3 courses (24 inches) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
4. Install adjustable hollow metal frame anchors, locating anchors on jambs in horizontal bed courses near the top and bottom of each frame and at intermediate points not over 24 inches apart.
5. Fill jambs and heads of all hollow metal door and window frames installed in CMU or concrete walls solid with grout.
6. Rake joints around exterior side of exterior hollow metal door frames for sealant under Division 7.
7. Where hollow metal frames do not wrap around masonry jambs and heads, rub exposed corners of block to remove sharp, irregular edges.

F. Intersecting Masonry Walls: Where interior nonload-bearing masonry partition or wall intersects an exterior or interior load-bearing masonry wall at 90 degrees, stop horizontal joint reinforcing

in interior partition 4 inches short of intersection. Horizontal joint reinforcing in exterior or interior load-bearing wall shall run continuous. In the same courses as horizontal reinforcing, install wire mesh extending 8 inches minimum into interior partition and projecting into the exterior wall to within 2 inches of exterior face of wall. Install wire mesh reinforcing in horizontal joints 16 inches o.c. vertically.

G. Intersecting Masonry Walls: Where interior CMU walls intersect other CMU walls located in all Cells and areas accessible to inmates, or jail population, all intersecting walls shall be of “toothed” construction. Interlock every other course by “toothing” every other course.

H. Grout masonry walls where indicated on drawings.

3.5 MORTAR BEDDING AND JOINTING

A. Mix mortar ingredients for a minimum of 5 minutes in a mechanical batch mixer. Use water clear and free of deleterious materials which would impair the work. Each mortar batch is allowed only one retempering. Do not use mortar which has begun to set after the first re-tempering or if more than 2-1/2 hours has elapsed since initial mixing.

B. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells; also bed webs in mortar in starting course on footings and foundation walls and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or to be filled with concrete or grout.

C. Joints: Maintain joint widths shown, except for minor variations required, to maintain joint alignment. Lay walls with 3/8 inch joints. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials. For exposed masonry, provide joints as follows:

1. All Exposed Joints: Concave tooled.
2. All Concealed Joints: Struck flush.

D. Remove masonry units disturbed after laying; clean and relay in fresh mortar. Do not pound corners at jams to fit stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar, and reset in fresh mortar.

3.6 HORIZONTAL JOINT REINFORCEMENT

A. Provide continuous horizontal joint reinforcing as shown and specified. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls and 1/2 inch at other locations. Lap reinforcement a minimum of 6 inches at ends of units. Do not bridge control and expansion joints with reinforcing.

B. Reinforce masonry openings greater than 1 foot wide, with horizontal joint reinforcing placed in 2 horizontal joints approximately 8 inches apart, both immediately above the lintel and immediately below the sill. Extend reinforcing a minimum of 2 foot beyond jambs of the opening except at control joints.

C. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

D. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.7 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.8 ANCHORING SINGLE-WYTHE MASONRY VENEER

A. Anchor single-wythe masonry veneer to metal studs with masonry veneer anchors to comply with the following requirements:

1. Fasten each anchor section through sheathing to metal studs with 2 metal fasteners of type indicated.
2. Embed tie section in masonry joints. Provide not less than 2-inch air space between back of masonry veneer wythe and face of sheathing.
3. Locate anchor section relative to course in which tie section is embedded to allow maximum vertical differential movement of tie up and down.
4. Space anchors as indicated but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally with not less than one anchor for each 2 sq. ft. of wall area. Install additional anchors within 1'-0" of openings and at intervals around perimeter not exceeding 8 inches.

B. Install vents at the top of each continuous air space in masonry veneer walls.

3.9 MOVEMENT (CONTROL AND EXPANSION) JOINTS

A. Install control and expansion joints in unit masonry where indicated, or if not indicated, space at a maximum of 2 times the wall height not to exceed 30’ o.c. Build in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Form control joints in concrete masonry as follows:

1. Fit bond breaker strips into hollow contour in ends of block units on one side of control joint. Fill the resultant core with grout and rake joints in exposed faces.
2. Install preformed control joint gaskets designed to fit standard sash block.
3. Install special shapes designed for control joints. Install bond breaker strips at joint. Keep head joints free and clear of mortar or rake joint.

C. Form expansion joints in brick made from clay or shale as follows:

1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints, if any.
2. Build flanges of factory-fabricated expansion joint units into masonry.
3. Build in joint fillers where indicated.
4. Form open joint of width indicated but not less than 3/8 inch for installation of sealant and backer rod specified in Division 7 Section. Maintain joint free and clear of mortar.

D. Build in horizontal pressure-relieving joints where indicated; construct joints by either leaving an air space or inserting nonmetallic 50 percent compressible joint filler of width required to permit installation of sealant and backer rod specified in Division 7 Section "Joint Sealers."

1. Locate horizontal pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

E. Control Joint Locations: If control joints are not shown on the Drawings, provide as follows:

1. Not to exceed 30 feet between joints in CMU walls, unless otherwise noted.
2. At change from wall setting on foundation to wall setting on floor slab.
3. At change from exterior wall to interior wall.
4. At walls setting on floors, that cross floor construction and control joints.
5. At columns within masonry walls.
6. At changes in wall thickness.

F. Column Isolation from Masonry: Continuously wrap steel columns or structural supports within masonry walls with 3/8 inch expansion joint filler sheets (column isolation). Secure with light gage wire.

3.10 LINTELS

A. Provide masonry lintels where shown and wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide formed-in-place masonry lintels. Temporarily support formed-in-place lintels.

1. For hollow concrete masonry unit walls, use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout.

B. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.11 INSTALLATION OF REINFORCED UNIT MASONRY

A. Install reinforced unit masonry to comply with requirements of referenced unit masonry standard.

B. Temporary Formwork: Construct formwork and shores to support reinforced masonry elements during construction.

1. Construct formwork to conform to shape, line, and dimensions shown. Make

sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

C. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

D. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

3.12 GROUTED FOUNDATION WALLS

A. Where concrete masonry foundations are required by the Drawings, reinforcing and grouting shall be completed within 72 hours after the completion of the wall and prior to backfilling on either side of the foundation wall.

3.13 VERTICAL REINFORCED CONCRETE MASONRY

A. Where grout filled or steel reinforced concrete block masonry foundations or masonry walls are called for on the Drawings, they shall be reinforced and grouted in accordance with the Drawings and details. All cells to be grouted shall be clean and free of mortar protrusions and droppings in the cells.

B. The low-lift grouting procedure shall be used as described in the Drawings and in NCMA-TEK 23A Grouting for Masonry Walls. Maximum height of grouting shall be 4 feet.

C. Grout to completely fill each cavity with homogenous grout, extending from the lowest course to the top of the reinforced portion of the foundation or wall. Concrete or mortar shall not be used as grout for CMU.

1. Aggregate used in the grout shall be small enough not to interfere with placement and plasticity.

D. After the grout is placed, it shall be consolidated with a small vibrator. The top of the grout filling shall be stopped 1-1/2 inches below the top of the concrete block, except for the top course in the wall where the grout shall be struck flush with the top. If highly absorptive masonry units are used, the grout shall be re-vibrated after it has begun to stiffen.

E. Caging devices and centering clips shall be spaced vertically such that every section of vertical reinforcing steel bar is restrained by 2 clips or devices, one near its top and one near its bottom.

3.14 ANCHORING MASONRY WORK

A. Provide anchoring devices of the type shown and as specified.

B. Anchor masonry to structural members where masonry abuts or faces such members to comply with the following:

1. Provide an open space not less than 1/2 inch width between masonry and structural member, unless other types of anchoring devices are shown. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with metal ties embedded in masonry joints and attached to structure. Provide anchors with flexible tie sections, unless other types of anchoring devices are shown.
3. Space anchors as shown, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally.
4. The ends of wall ties shall be embedded in mortar joints. Wall tie ends shall engage outer face shells of hollow units by at least 1/2 inch. Wire wall ties shall be embedded at least 1-1/2 inch into the mortar bed of solid masonry units or solid grouted hollow units.
5. Unless otherwise required, wythes not bonded by headers shall be bonded with wall ties as follows:

    a. Size - Minimum number of ties required
    b. #9 gage - One wall tie wire per 2.67 sq.ft.
    c. 3/16 inch diameter - One wall tie wire per 4.50 sq.ft.

6. Unless accepted by the Architect/Engineer, reinforcement shall not be bent after being embedded in grout or mortar.
7. Unless otherwise required adjustable ties shall meet the following requirements:

    a. Use one tie for each 1.77 sq.ft. of wall area.
    b. Neither horizontal nor vertical spacing shall exceed 16 inches.
    c. Maximum misalignment of bed joints from one wythe to the other shall be 1-1/4 inch.
    d. Maximum clearance between connecting parts of the ties shall be 1/16 inch.

3.15 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.

C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

5. Clean brick by means of bucket and brush hand-cleaning method described in BIA "Technical Note No. 20 Revised" using the following masonry cleaner:
   a. Job-mixed detergent solution.
   b. Job-mixed acidic solution.
   c. Proprietary acidic cleaner; apply in compliance with directions of acidic cleaner manufacturer.
   d. Cleaning shall be complete prior to the installation of the aluminum windows.

6. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 8-2A applicable to type of stain present on exposed surfaces.
7. Clean all exposed concrete masonry of efflorescence in strict accordance with NCMA TEK 8-3A.

D. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION 04 20 00

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Division 05

Metals

SECTION 05 12 00 STRUCTURAL STEEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. The Work required under this Section consists of structural steel, steel erection, shop painting, field touch-up painting, and related items necessary to complete the Work.

B. Miscellaneous angles, channels, anchor bolts, bent plates, sleeves, sag rods, leveling plates, bearing plates for structural steel and steel joists, and other incidental items of structural steel required to be built into concrete or masonry shall be provided as indicated or specified and be furnished to respective trades at proper time; including instructions and templates for their installation.

C. Provide, where specifically called for; steel shelf angles, perimeter angle closure, and accessories.

D. For openings in metal deck 12 by 12 inches and larger, provide steel reinforcing members. Reinforcing shall be not less than 3 by 3 inches by 3/8 inch angles, unless noted otherwise on Drawings. Openings in deck shall be cut under Section 05 31 00.

1.3 SUBMITTALS

A. Product data or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
2. High-strength bolts (each type), including nuts and washers.
3. Structural steel primer paint.
4. Shrinkage-resistant grout.

B. Shop drawings shall be prepared under supervision of a licensed Structural Engineer, in the State of Florida, including complete details and schedules for fabrication and assembly of structural steel members, procedures, and diagrams.

1. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols and show size, length, and type of each weld.
2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as work of other sections.
3. Complete shop drawings by approved fabricator including plan layouts of columns and anchor bolt locations, erection diagrams, and shop detail drawings. Symbols and indications used for structural components on design drawings must appear identically on

submitted shop drawings. Types of electrodes proposed for welding processes must also appear thereon.

a. The fabricator must review and check shop drawings prior to submission to the Architect.

C. Letter from a Professional Engineer registered in the State of Florida certifying that he has studied the design drawings, that shop drawings of fabricator designed elements have been prepared under his direct guidance and supervision, and that provided components and connections will meet or exceed loading requirements. Such letter of certification must be evidenced by Engineer's full signature and seal authenticity. Architect/Engineer's review of shop drawings will not begin until such certification has been received. This certification is to verify the adequacy of members and connections designed by the fabricator and is not intended to require verifications of the design of structural elements shown on the plans.

D. Test reports conducted on shop- and field-bolted and welded connections. Include data on type(s) of tests conducted and test results.

E. Shop drawing packages shall be by building submitted in sequence corresponding to Construction Manager’s building construction schedule.

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following:

1. AISC "Code of Standard Practice for Steel Buildings and Bridges."
2. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" and including the "Commentary of the AISC Specification," and the current supplements.
3. AISC "Specifications for Structural Joints using ASTM A325 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.
4. AWS "Structural Welding Code," AWS D1.1 and its latest revision.
5. ASTM A6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piping, and Bars for Structural Use."

B. Qualifications for Welding Work: Qualify welding procedures and welding operators in accordance with AWS "Qualification" requirements.

1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests. Documentation of current certification is required.
2. If re-certification of welders is required, retesting will be Contractor's responsibility.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site at such intervals to ensure uninterrupted progress of work.

B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not to delay work.

C. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. If bolts and nuts become dry or rusty, clean and re-lubricate before use.

1. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.6 INSPECTION

A. The materials and workmanship to be furnished under this Specification shall be subject to inspection in the mill, shop, and field by the Architect/Engineer. Inspection will be conducted without expense to the Contractor; however, inspection in the mill or shop shall not relieve the Contractor of his responsibility to furnish materials and workmanship in accordance with Contract Documents.

PART 2 - PRODUCTS

2.1 ACCEPTABLE FABRICATORS

A. Firms acceptable as fabricators for structural steel Work under this Section shall be members of The American Institute of Steel Construction **(or)** shall be certified by an approved independent professional testing agency as being qualified for Category I Conventional Steel Structures in conformance to the requirements of the AISC Quality Certification Program.

2.2 MATERIALS

A. Metal Surfaces, General: For fabrication of work that will be exposed to view, use only materials that are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names, and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and applying surface finishes.

B. Rolled Structural Steel Shapes, Plates, and Bars: ASTM A 36.

C. Structural Steel Tubular Products

1. Square, Rectangular, and Special Shapes: ASTM A500, Grade B.
2. Round, Structural Steel Pipe: ASTM A53, Type E or S, Grade B.

D. Steel Castings: ASTM A 27, Grade 65-35, medium-strength carbon steel.

E. Headed Stud-Type Shear Connectors: ASTM A 108, Grade 1015 or 1020, cold-finished carbon steel with dimensions complying with AISC Specifications.

F. Anchor Bolts: ASTM A 307, nonheaded type unless otherwise indicated.

G. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular low-carbon steel bolts and nuts.

1. Provide hexagonal heads and nuts for all connections.
2. Provide either hexagonal or square heads and nuts, except use only hexagonal units for exposed connections.

H. Bigh-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:

1. Quenched and tempered medium-carbon steel bolts, nuts, and washers, complying with ASTM A 325. Use 3/4-inch bolts, unless noted otherwise on Drawings. Use bearing type connections with threads included in the shear plane.

   a. Where indicated as galvanized, provide units that are zinc coated, either mechanically deposited complying with ASTM B 695, Class 50, or hot-dip galvanized complying with ASTM A 153.

2. Quenched and tempered alloy steel bolts, nuts, and washers, complying with ASTM A 490.
3. High-strength fasteners shall be domestically manufactured.

I. Electrodes and Flux for Submerged Arc Welding: AWS Code and ASTM A588, Series A233, Series E60 or E70 as required.

J. Electrodes and Flux for Submerged Arc Welding: AWS Code and ASTM A588, Series F60 and F70.

K. Structural Steel Primer Paint: Steel Structures Painting Council (SSPC) - Paint 15.

L. Nonmetallic Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with CE-CRD-C621-89A.

1. Products: Subject to compliance with requirements, provide one of the following:

   a. Sure-Grip High Performance Grout; Dayton Superior.
   b. Euco N.S.; Euclid Chemical Co.
   c. Masterflow 713; Master Builders.
   d. Sealtight 588 Grout; W. R. Meadows.
   e. Five Star Grout; U.S. Grout Corp.

M. Masonry Bearing Plates:

1. All joists shall bear on masonry bearing plates with anchor rods embedded in the masonry below. Weld joists to bearing plates in accordance with SJI Specifications. See Framing Details and Plans for bearing plate sizes.
2. All beams shall bear on masonry bearing plates with anchor rods embedded in the masonry below. Weld beams to bearing plates unless otherwise noted.
3. Bearing plates are to be set under Work of division 4 (if required).

N. Where trusses are indicated with continuous members, they shall be full length without splices or welded with full-penetration shop welds ground flush with grinding in the direction of applied stress and with weld soundness established by radiographic or ultrasonic inspection in accordance with the requirements of 9.2.5.2 or 9.2.5.3 of AWS D1.1 Splices will not be permitted at points of maximum stress. Field splices of tension members shall be designed to develop 110 percent of the spliced sections.

2.3 FABRICATION

A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members as shown.

1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.
2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

B. Connections: Weld or bolt shop connections, as shown.

1. Bolt field connections, except where welded connections or other connections are indicated.

a. Provide high-strength threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.
b. Provide unfinished threaded fasteners for only bolted connections of secondary framing members to primary members (including purlins, girts, and other framing members taking only nominal stresses) and for temporary bracing to facilitate erection.

C. High-Strength Bolted Construction: Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts."

D. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that will produce true alignment of axes without warp.

E. Built-up welded door frames attached to structural steel framing. Weld exposed joints continuously and grind smooth. Plug-weld steel bar stops to frames, except where shown removable. Secure removable stops to frames with countersunk, cross-recessed head machine screws, uniformly spaced not more than 10 inches o.c., unless otherwise indicated.

F. Holes for Other Work: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on final shop drawings.

G. Provide threaded nuts welded to framing and other specialty items as indicated to receive other work.

H. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame-cut holes or enlarge holes by burning. Drill holes in bearing plates.

I. Expansion Joints: Provide expansion joints in steel shelf angles when part of structural steel frame; locate at vertical brick expansion joints.

J. Provide 500 lineal feet of angle 3 X 3 X 1/4, including placement of same, to be used as directed by the Architect or Engineer.

2.4 SHOP PAINTING

A. Shop-paint all structural steel work, except those members or portions of members to be embedded in concrete or mortar. Paint embedded steel that is partially exposed; paint exposed portions and initial 2 inches of embedded areas only.

1. Do not paint surfaces to be welded or high-strength bolted with friction-type connections.
2. Do not paint surfaces scheduled to receive sprayed-on fireproofing.
3. Coat with tar all steel encased in concrete.

B. Surface Preparation for Exterior Exposed Steel (SSPC - SP 6): After inspection and before shipping, clean all steel work to be painted.

1. Clean all steel scheduled to be exposed and installed in the exterior walls and all steel scheduled to be exposed and installed on the exterior of the building in accordance with SSPC - SP 6, Commercial Blast Cleaning.
2. Prior to commercial blast cleaning, remove visible oil, grease, soluble welding residue and salts in accordance with SSPC - SP 1, Solvent Cleaning.
3. After commercial blast cleaning and prior to shop painting, remove dirt, dust, and all similar contaminants from the surface.
4. All steel lintels installed in exterior walls shall be hot-dipped galvanized, refer to requirements as specified herein.

C. Surface Preparation for Interior Steel (SSPC - SP 3): After inspection and before shipping, clean steel work to be painted.

1. Clean all steel installed in the interior of the building in accordance with SSPC - SP 3, Power Tool Cleaning.
2. Prior to power tool cleaning, remove visible oil, grease, soluble welding residue and salts in accordance with SSPC - SP 1, Solvent Cleaning.
3. After power tool cleaning and prior to shop painting, remove dirt, dust, and all similar contaminants from the surface.

D. Shop Prime Painting: Immediately after surface preparation, apply structural steel rust inhibited primer paint in accordance with manufacturer's instructions and at rates as specified. Use painting methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Exterior exposed steel receiving the SP 6, Commercial Blast Cleaning, shall be prime painted with primer as follows:

a. Tnemec “90-97 Tneme-Zinc” two-component aromatic urethane zinc-rich primer. Color 90G97 Green. Metallic zinc content shall be 83% by weight in dried film. Lead content shall be less than 0.06% by weight in the dried film as defined in Part 1303 of the Consumer Product Safety Act Regulations. Apply at a rate to achieve a dry film thickness of 2.5 to 3.5 mils. Or approved equal.

2. Interior steel receiving the SP 3, Power Tool Cleaning, shall be prime painted with primer as follows:

a. Tnemec “Series 10” primer. Chemically active, rust-inhibitive modified alkyd primer. Color 99G Green. Apply at a rate to achieve a dry film thickness of 2.0 to 3.5 mils. Or approved equal.

E. Galvanizing: All steel lintels exposed to the exterior and installed in exterior walls shall be hot-dipped galvanized with a G-90 coating.

2.5 SOURCE QUALITY CONTROL

A. Design of Members and Connections: Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delays in the work.

1. Promptly notify Architect/Engineer whenever design of members and connections for any portion of structure are not clearly indicated.

PART 3 - EXECUTION

3.1 INSPECTION

A. Erector must examine the areas and conditions under which structural steel work is to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Erector.

3.2 ERECTION

A. Comply with the AISC Specifications and Code of Standard Practice and with specified requirements.

B. Surveys: Employ a licensed land surveyor for accurate erection of structural steel. Check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Architect. Do not proceed with erection until corrections have been made or until compensating adjustments to structural steel work have been agreed upon with Architect.

C. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.

D. Temporary Planking: Provide temporary planking and working platforms as necessary to effectively complete work.

E. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and rough-in to improve bond to surfaces. Clean the bottom surface of base and bearing plates.

1. Setting Plate Procedure:

a. Set loose and attached base plates and bearing plates for structural members on wedges or other adjustable devices.
b. Tighten the anchor bolts after the supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the base or bearing plate prior to packing with grout.

c. Pack bedding grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure in strict compliance with the manufacturer's instructions, or as otherwise required.

2. Double Nut Procedure

a. Install lower nuts and washers to required elevation.
b. Erect column and install upper nuts and washers.
c. After structure has been erected and plumbed, adjust lower nuts to relieve racking, adjust elevation, and distribute load equally to all anchor bolts.
d. Tighten nuts.
e. Pack bedding grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure in strict compliance with the manufacturer's instructions, or as otherwise required.

F. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

G. Level and plumb individual members of structure within specified AISC tolerances.

H. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

I. Splice members only where indicated and accepted on shop drawings.

J. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.

1. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
2. Do not enlarge unfair holes in members by burning or by using drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.

K. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members that are not under stress, as acceptable to Architect. Finish gas-cut sections equal to a sheared appearance when permitted.

L. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.

1. Apply by brush or spray to provide minimum dry film thickness of 1.5 mils.

M. Touch-Up Painting: Cleaning and touch-up painting of field welds, bolted connections, and abraded areas of shop paint on structural steel is included in Division 9 under painting work.

N. Lintels and Shelf Angles: Weld, bolt, or rivet members together where so indicated.

1. Lintels shall have 8 inch bearing at each end, minimum, unless shown otherwise. Bearing pressures shall not exceed the allowable stress for masonry.
2. Where shelf angles are attached to concrete with bolts and adjustable inserts, provide slotted holes in proper size and spacing in the vertical leg of shelf angles.
3. Loose lintels are not acceptable.

3.3 HIGH STRENGTH STEEL BOLTS

A. Structural joints using high strength bolts, hardened washers, and nuts shall be tightened to a high tension; the materials, methods of installation and tension control, type of wrenches to be used, and inspection methods shall conform to specifications for "Structural Joints using ASTM A325 or A490 Bolts," as approved by the Research Council on Structural Connections of the Engineering Foundation, November 13, 1985.

B. The high strength bolts used shall have a suitable identifying mark placed on top of the head before leaving the factory.

C. Tightening of nuts shall be done by the turn-of-nut method, according to the specifications for "Structural Joints using ASTM A325 or A490 bolts," unless direct tension indicator washers are used, in which case tightening will terminate when proper gap is attained.

D. For turn of the nut method, bolts that have been "Snug-Tight" shall be marked with identifying symbol and then given an additional 1/2 turn. Marks shall be such that visual inspection can be made of finished connections. Snug tight is defined as the tightness developed by the full effort of a man using a spud wrench on all bolts in the connections.

E. High-strength fasteners shall be domestically manufactured.

3.4 ERECTION ALIGNMENT

A. Framing: The framing shall be carried up true, plumb, and level within a tolerance of 1:500; and temporary bracing shall be introduced, wherever necessary, to take care of loads to which the structure may be subjected, including erection equipment and its operation. Such bracing shall be left in place as long as may be required for safety. It shall finally be removed by the Contractor as part of his equipment. As erection progresses, the Work shall be securely connected to take care of dead load, wind, and erection stresses.

3.5 FIELD QUALITY CONTROL

A. Correct deficiencies in structural steel work that inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as necessary to reconfirm any noncompliance of original work and to show compliance of corrected work.

B. Shop-Bolted Connections: Inspect or test in accordance with AISC specifications.

1. Verify that gaps of installed Direct Tension Indicators are less than gaps specified in ASTM F 959, Table 2.

C. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
2. Perform visual inspection of all welds.
3. Perform tests of welds as follows. Inspection procedures listed are to be used at Contractor's option.

    a. Liquid Penetrant Inspection: ASTM E 165.
    b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.
    c. Radiographic Inspection: ASTM E 94 and ASTM E 94; minimum quality level "2-2T."
    d. Ultrasonic Inspection: ASTM E 164.

D. Field-Bolted Connections: Inspect in accordance with AISC specifications.

1. For Direct Tension Indicators, comply with requirements of ASTM F 959. Verify that gaps are less than gaps specified in Table 2.

E. Field Welding: Inspect and test during erection of structural steel as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
2. Perform visual inspection of all welds.
3. Perform tests of welds as follows: Inspection procedures listed are to be used at the Inspector's option.

    a. Liquid Penetrant Inspection: ASTM E 165.
    b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.
    c. Radiographic Inspection: ASTM E 94 and ASTM E 94; minimum quality level "2-2T."
    d. Ultrasonic Inspection: ASTM E 164.

END OF SECTION 05 12 00

SECTION 05 21 00 - STEEL JOISTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes steel joists and joist girders for floor and roof framing. Types of joists required include the following:

1. K-Series Open Web Steel Joists

B. When outriggers, angles, or other components are attached to the open web steel joists in the shop in such a way that they actually are a component part of the joists, they are to be provided under this Section.

C. The Work includes bridging anchors, sag rods, wall anchors, and beam anchors.

1.3 SUBMITTALS

A. Product data and installation instructions for each type of joist and accessories.

1. Include manufacturer's certification that joists comply with SJI "Specifications."
2. Certification from joist manufacturer that joists are properly designed and will be furnished to meet live loads, dead loads, and slope conditions indicated on the Drawings.

B. Complete shop drawings by approved fabricator including plan layouts of columns and anchor bolt locations, erection diagrams, and shop detail drawings. Symbols and indications used for structural components on design drawings must appear identically on submitted shop drawings. Types of electrodes proposed for welding processes must also appear thereon.

1. Provide templates or location drawings for installation of anchor bolts and metal bearing plates.
2. Shop drawing packages shall be by building submitted in sequence corresponding to Construction Manager’s building construction schedule.

C. Letter from a Professional Engineer licensed within the State of construction activities certifying that he has carefully studied the design drawings, that shop drawings have been prepared under his direct guidance and supervision, and that provided components and connections will meet or exceed loading requirements. Such letter of certification must be evidenced by Engineer's full signature and seal of authenticity. Architect/Engineer's review Fof shop drawings will not begin until such certification has been received.

1.4 QUALITY ASSURANCE

A. Provide joists fabricated in compliance with the following and as herein specified.

1. SJI "Standard Specifications and Load Tables" for K Series Open Web Steel Joists, latest edition, sizes as indicated on the Drawings.
2. Comply with Factory Mutual requirements.

B. Qualification of Field Welding Work

1. Qualify welding processes and welding operators in accordance with the AWS "Standard Qualification Procedure." Welders shall be certified to perform the type of work required.

C. Inspection: Inspect joists and girders in accordance with SJI "Specifications."

D. The deflection of floors and roofs with plaster ceiling or soffits suspended or attached, due to the design live load, shall not exceed 1/360 of the span; other roofs, not to exceed 1/240 of the span.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel joists as recommended in SJI and AISC "Standard Specifications," in a manner to avoid excessive stresses deforming members.

B. Bent joist members or broken welds shall be cause for joist rejection. Rejected joists shall be replaced without delay.

1.6 JOB CONDITIONS

A. During the construction period, Contractors shall provide means for the adequate distribution of concentrated loads so that the carrying capacity of any joist is not exceeded.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Member firms of the Steel Joist Institute will be acceptable manufacturers of steel joist specified herein.

2.2 MATERIALS

A. Steel: Comply with SJI and AISC "Standard Specifications."

1. Yield strength used as a basis for the design stresses shall be as follows:

a. Chords = 50,000 psi
b. Webs = 36,000 psi or 50,000 psi

2. Evidence that the steel furnished meets or exceeds the design yield strength shall be provided, on Architect's request, in the form of certified test reports.

3. Deduct the area of holes in chords from the area of the chord when calculating the strength of the member.

B. Steel Bearing Plates: ASTM A36.

C. Unfinished Threaded Fasteners: ASTM A307, Grade A, regular hexagon type, low carbon steel.

D. Nonmetallic Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining product containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with CE-CRD-C621-89A.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Sure-Grip High Performance Grout; Dayton Superior.
b. Euco N.S.; Euclid Chemical Co.
c. Crystex; L & M Construction Chemicals, Inc.
d. Set Grout; Master Builders.
e. Sealtight 588 Grout; W. R. Meadows.
f. Five Star Grout; U.S. Grout Corp.

E. Shop Prime Painting: Immediately after surface preparation, apply steel joist rust inhibiting primer paint in accordance with manufacturer’s instructions and at rates as specified. Use painting methods that result in full coverage of joints, corners, edges and exposed surfaces. Primer shall meet the standards listed in SSPC Paint 15, Type I, Red Oxide, or FS-TT-P-636 Red Oxide.

1. Do not apply primer to joists indicated to receive sprayed-on fireproofing

2.3 FABRICATION

A. General: Fabricate steel joists in accordance with SJI and AISC "Standard Specifications," and as follows:

1. Make shop connections and splices using either arc or resistance welding. Shop-bolted connections are not acceptable.
2. Do not splice web members; use only full length pieces.
3. Top and bottom chords shall be uniform size throughout their full length.
4. Do not splice bottom chord members in the middle third of the span.
5. Splices in bottom chord members shall be certified by the joist fabricator to provide 100 percent of the strength of the chord section used.

B. Holes in Chord Members: Provide holes in chord members where shown for securing other work to steel joists; however, deduct area of holes from the area of chord when calculating strength of member.

C. Extended End: Provide extended ends on joists where indicated, complying with SJI "Specifications" and load tables.

D. Ceiling Extension: Provide ceiling extensions in areas having ceilings attached directly to joist bottom chord. Provide either an extended bottom chord element or a separate unit, to suit manufacturer's standards, of sufficient strength to support ceiling construction. Extend ends to within 1/2 inch of finished wall surface, unless otherwise indicated.

E. Top Chord Extension: Provide top chord extensions on joists where indicated, complying with SJI "Specifications" and load tables.

F. Bridging: Provide horizontal or diagonal type bridging for joists and joist girders, complying with SJI "Specifications." Provide bridging anchors for ends of bridging lines terminating at walls or beams.

G. End Anchorage: Provide end anchorages, including steel bearing plates, to secure joists to adjacent construction, complying with SJI "Specifications."

H. Header Units: Provide header units to support tail joists at openings in floor or roof system not framed with steel shapes.

I. Top Chords: Shall be absolutely flat across its full width and length for application of metal decking.

J. Bottom Chords: Shall be extended and connected to columns or webs of girders at column lines and where shown on structural drawings.

K. Joist Ends: Shall be beveled when slope exceeds 1/4 inch in 12 inch or sloped shoes shall be provided.

L. Shop Painting:

1. Remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories before application of shop paint.
2. Apply one shop coat of steel primer paint to steel joists and accessories by spray, dipping, or other method to provide a continuous dry paint film thickness of not less than 1.0 mil.

PART 3 - EXECUTION

3.1 PREPARATION

A. Roof joist anchorage shall be designed to resist gross uplift force indicated on the Drawings.

B. Joist anchorage for un-enclosed areas and roof overhangs shall be designed to the upward pressure indicated on the Drawings.

3.2 ERECTION

A. Place and secure steel joists in accordance with SJI "Specifications," final shop drawings, and as herein specified.

B. Anchors: Furnish anchor bolts, steel bearing plates, and other devices to be built into concrete and masonry construction.

1. Provide unfinished threaded fasteners for anchor bolts, unless high strength bolts indicated.

C. Placing Joists: Do not start placement of steel joists until supporting work is in place and secured.

Place joists on supporting work, adjust and align in accurate locations and spacing before permanently fastening.

D. Provide temporary bridging, connections, and anchors to ensure lateral stability during construction.

E. Bridging: Install bridging simultaneously with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.

F. Fastening Joists: Comply with the following:

1. Field weld joists to supporting steel framework and steel bearing plates where indicated in accordance with SJI "Specifications" for type of joists used. Coordinate welding sequence and procedure with placing of joists.
2. Bolt joists to supporting steel framework in accordance with SJI "Specifications" for type of joists used.

    a. Use unfinished threaded fasteners for bolted connections, unless otherwise indicated.

G. End Anchorage

1. At steel supports the joist ends shall extend not less than 2-1/2 inches over beams.
2. At masonry the joist ends shall extend not less than 4 inches over walls. The center line of bearing the joist shall coincide with the center line of the masonry bearing plate and the masonry wythe on which it bears, except where 2 joists from opposite sides bear on the same wythe.
3. Ends shall be anchored with the equivalent of two 3/16 inch fillet welds 1-1/2 inches long or two 1/2 inch bolts.

H. Field Welding

1. The total length of weld at a cross-section shall not exceed 50 percent of the overall developed width of cold-formed members.
2. Extreme caution must be exercised during welding. Completely cover and protect masonry and concrete in place from damage during welding.

I. Touch-Up Painting: After joist installation, paint field bolt heads and nuts and abraded or rusty surfaces on joists and steel supporting members. Wire brush surfaces and clean with solvent before painting. Use the same type of paint as used for shop painting.

END OF SECTION 05 21 00

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SECTION 05 31 00 - STEEL DECK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes steel deck units for floor and roof applications.

1. Metal roof deck units – vented and non-vented
2. Corrugated steel forms
3. Metal cover plates and closure strips
4. Metal floor deck units

B. Related Work

1. The cutting, drilling, or punching of openings smaller than 10 by 10 inches for passage of pipes, ducts, and the attachment of other items shall be performed in the field by the respective trades requiring same.
2. For openings 10 by 10 inches and larger, each shall be predetermined and provided or cut under this Section. Steel framing members indicated or required around openings 12 by 12 inches and larger through decks shall be provided and erected under Section 05 12 00, Structural Steel.

1.3 SUBMITTALS

A. Product data including manufacturer's specifications and installation instructions for each type of decking and accessories. Provide test data for mechanical fasteners used in lieu of welding for fastening deck to supporting structures.

B. Shop drawings showing layout and types of deck units, anchorage details, and conditions requiring closure strips, supplementary framing, sump pans, cant strips, cut openings, special jointing, and other accessories. Shop drawings shall be submitted by building in sequence in accordance with the Construction Manager’s construction schedule.

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following codes and standards, except as otherwise indicated:

1. American Iron and Steel Institute (AISI), “North American Specification for the Design of Cold-Formed Steel Structural Members."
2. American Welding Society (AWS), D1.3 "Structural Welding Code - Sheet Steel."

3. Steel Deck Institute (SDI), "Design Manual for Composite Decks, Form Decks and Roof Decks."

B. Qualification of Field Welding: Use qualified welding processes and welding operators in accordance with "Welder Qualification" procedures of AWS. Welded decking in place is subject to inspection and testing. Owner will bear expense of removing and replacing portions of decking for testing purposes if welds are found to be satisfactory. Remove work found to be defective and replace with new acceptable work.

C. Design Criteria:

1. Compute the properties of metal roof deck sections on the basis of the effective design width as limited by the provisions of the SDI specifications. Provide the deck section properties, including section modulus and moment of inertia per foot of width.
2. Allowable Deflection: Design and fabricate deck for a maximum deflection of 1/240 of the clear span under the uniform live load.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel for Galvanized Metal Deck Units: ASTM A653, grade as required to comply with SDI specifications.

B. Miscellaneous Steel Shapes: ASTM A36.

C. Shear Connectors: Headed stud type, ASTM A108, Grade 1015 or 1020, cold-finished carbon steel, with dimensions complying with AISC specifications.

D. Shear Connectors: Strap type, ASTM A1011, Grade D, hot-rolled carbon steel.

E. Sheet Metal Accessories: ASTM A653, commercial quality, galvanized.

F. Galvanizing: ASTM A653, G60 (.60 oz. per sq.ft.).

G. Galvanizing Repair: Where galvanized surfaces are damaged, prepare surfaces and repair in accordance with procedures specified in ASTM A780.

H. Flexible Closure Strips: Manufacturer's standard vulcanized, closed-cell, synthetic rubber.

I. Acoustic Sound Barrier Closures: Manufacturer's standard mineral fiber closures.

J. Self-Drilling Screws: Hilti No. 10 self-drilling screws or approved equal.

K. Powder Actuated Fasteners: Hilti ENP$^{3/}$ENPH3/ENP2/ENKK pins or approved equal.

2.2 FABRICATION

A. General: Form deck units in lengths to span three or more supports, with flush, telescoped, or

nested 2-inch laps at ends and interlocking or nested side laps, of metal thickness, depth, and width as indicated.

B. Metal Roof Deck Units: Provide deck configurations that comply with SDI "Specifications and Commentary for Steel Roof Deck." Types, depths and gauges as indicated on the drawings.

C. Vented Roof Deck Units: Provide deck configurations complying with SDI "Roof Deck Specifications", of metal thickness, depth and width as shown. All deck receiving lightweight cellular concrete shall be vented a minimum of 0.5 percent open, unless a greater percentage is required by the lightweight concrete manufacturer or U.L. Design number.

D. Metal Cover Plates: Fabricate metal cover plates for end-abutting floor deck units of not less than same thickness as decking. Form to match contour of deck units and approximately 6 inches wide.

E. Metal Closure Strips: Fabricate metal closure strips, for cell raceways and openings between decking and other construction, of not less than 0.045-inch min. (18 gage) sheet steel. Form to provide tight-fitting closures at open ends of cells or flutes and sides of decking.

F. Metal Floor Deck Units: Provide deck configurations that comply with SDI requirements. Provide galvanized corrugated metal form deck as specified by SDI and gauge as indicated on drawings.

PART 3 - EXECUTION

3.1 INSPECTION

A. Install must examine the areas and conditions under which metal decking items are to be installed. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 INSTALLATION

A. General: Install deck units and accessories in accordance with manufacturer's recommendations, shop drawings, and as specified herein.

B. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.

1. Do not start placement of deck units before supporting members are installed. Place deck units on supporting metal steel framework and adjust to final position with ends bearing on supporting members and accurately aligned end to end before being permanently fastened.

    a. Lap ends 1-1/2 inch deck units not less than 2 inches.
    b. Butt ends of 3 inch deck units.
    c. Do not stretch or compress the side-lap interlocks.
    d. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.

C. Align deck units for entire length of run of cells and with close alignment between cells at ends of abutting units.

D. Place deck units flat and square, secured to adjacent framing without warp or deflection.

E. Do not place deck units on concrete supporting structure until concrete has cured and is dry.

F. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.

G. Attach deck to supports with 5/8" puddle welds as follows, unless otherwise noted on Drawings:

1. Corrugated Metal Roof Deck: Per Structural Drawings**.**
2. Corrugated Metal Floor Deck: Interior and end supports – Per Structural Drawings**.**
3. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work. Use welding washers where recommended by deck manufacturer.
4. Mechanical fasteners may be used in lieu of welding. Locate mechanical fasteners and install in accordance with deck manufacturer's instructions.
5. Uplift Loading: Install and anchor roof deck units to resist net uplift loading of as shown on plans. Keep the interiors of cells that will be used as raceways free of welds having sharp points or edges.

H. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking, as shown.

I. Reinforcement at Openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking, and support of other work shown.

J. Hanger Slots or Clips: Provide UL-approved hanger slots between cells or flutes of lower element where floor deck units are to receive hangers for support of ceiling construction, air ducts, diffusers, or lighting fixtures.

1. Hanger clips designed to clip over male side lap joints of floor deck units may be used instead of hanger slots.
2. Locate slots or clips at not more than 14 inches o.c. in both directions, not over 9 inches from walls at ends, and not more than 12 inches from walls at sides, unless otherwise indicated.
3. Provide manufacturer’s standard hanger attachment devices.

K. Joint Covers: Provide metal joint covers at abutting ends and changes in direction of floor deck units, except where taped joints are required.

L. Closure Strips: Provide metal closure strips at open uncovered ends and edges of roof decking and in voids between decking and other construction. Screw into position with #10 tek screws at 12” oc to provide a complete decking installation.

1. Provide flexible closure strips instead of metal closures, at Contractor's option, wherever their use will ensure complete closure. Install with adhesive in accordance with manufacturer's instructions.

M. Touch-Up Painting: After decking installation, wire brush, clean, and paint scarred areas, welds, and rust spots on top and bottom surfaces of decking units and supporting steel members.

1. Touch-up galvanized surfaces with galvanizing repair paint applied in accordance with manufacturer's instructions.

N. In areas where shop-painted surfaces are to be exposed, apply touch-up paint to blend into adjacent surfaces.

O. Placing and Fastening Corrugated Steel Forms: Place steel forms with ribs perpendicular to supports and secure with plug welds, No. 12 self-tapping screws, or powder actuated fasteners to each support. Space connectors at 12 inches on center. Provide at least 2 inches for end laps occurring over supports and laps sides at least one corrugation.

P. Ridge and Valley Plates: Weld ridge and valley plates to the top surface of the roof decking. Lap end joints not less than 3 inches, with laps made in the direction of water flow.

Q. Repair and Valley Plates:

1. Holes up to 1/2 inch in diameter fill with urethane or silicone sealant and cover with duct tape.
2. Holes above 1/2 inch diameter require sheet metal plate patches fastened to deck.

3.3 SUPPORT OF OTHER WORK

A. Suspension wires, straps, and chains such as those used to support acoustical ceilings, ductwork, and lights shall not be attached to or through steel roof decks.

B. Attachment of steel stud wall tracks may be braced to steel decks, but shall not support or suspend from the steel deck. Nothing shall be suspended from the steel deck.

END OF SECTION 05 31 00

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SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following metal fabrications:

1. Rough hardware
2. Ladders
3. Miscellaneous framing and supports.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design ladders, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Anchoring Criteria:

1. Steel Ladders:

a. Masonry wall: Ladder may be attached to the floor and wall.
b. Design and specify ladders to withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Paint products.
2. Grout.

B. Shop drawings detailing fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other Sections.

C. Samples representative of materials and finished products as may be requested by Architect.

D. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.

E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include a list of completed projects with project name, addresses, names of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Firm experienced in producing metal fabrications similar to those indicated for this Project with a record of successful in-service performance, and with sufficient production capacity to produce required units without delaying the Work.

B. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code--Steel," AWS D1.2 "Structural Welding Code--Aluminum," and AWS D1.3 "Structural Welding Code--Sheet Steel."

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

1.6 PROJECT CONDITIONS

A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

1.7 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Rolled Steel Floor Plates: ASTM A786.

C. Steel Tubing: Product type (manufacturing method) and as follows:

1. Cold-Formed Steel Tubing: ASTM A500, Grade B.
2. Hot-Formed Steel Tubing: ASTM A501.

a. For exterior installations and where indicated, provide tubing with hot-dip galvanized coating per ASTM A53.

D. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is required by structural loads.

1. Black finish, unless otherwise indicated.
2. Galvanized finish for exterior installations and where indicated.

E. Cast-in-Place Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials capable of sustaining, without failure, the load imposed within a safety factor of 4, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A47 malleable iron or ASTM A27 cast steel. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A153.

F. Welding Rods and Bare Electrodes: Select according to AWS specifications for the metal alloy to be welded.

G. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A47, or cast steel, ASTM A27. Provide bolts, washers, and shims as required, hot-dip galvanized, ASTM A153.

2.3 METAL LADDERS

A. General:

1. Comply with ANSI A14.3 unless otherwise indicated.

B. Steel Ladders:

1. Siderail Spacing: Space siderails as indicated.
2. Siderails: As indicated on the Drawings.
3. Rungs: As indicated on the Drawings.
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to rung.
6. Support each ladder at top and bottom and not more than 60 inches o.c. with welded steel brackets.
7. Prime interior ladders, including brackets and fasteners; refer to Section 09 91 00 Painting.
8. Galvanize ladders, including brackets and fasteners, in the following locations:

    a. Exterior locations.
    b. Interior locations, where indicated.

2.4 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports as necessary to complete the Work.

B. Fabrication: Fabricate units from structural-steel shapes, plates, and bars. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware.hangers, and similar items.

1. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.
2. Except as otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches wide by 1/4 inch thick by 8 inches long.

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

1. American Safety Tread Co., Inc.
2. Amstep Products.
3. Armstrong Products, Inc.
4. Balco/Metalines, Inc.
5. Safe-T-Metal Co.
6. Wooster Products Inc.

D. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with the manufacturer.

E. Drill for mechanical anchors with countersunk holes located not more than 4 inches (100 mm) from ends and not more than 12 inches o.c., evenly spaced between ends, unless otherwise indicated. Provide closer spacing if recommended by the manufacturer.

1. Provide 2 rows of holes for units over 5 inches wide, with 2 holes aligned at ends and staggered intermediate holes.

2.5 MISCELLANEOUS STEEL TRIM

1. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and bars of profiles shown with continuously welded joints, and smooth exposed edges. Miter corners and use concealed field splices wherever possible.
2. Provide cutouts, fittings, and anchorages as required to coordinate assembly and installation with other work. Provide anchors, welded to trim, for embedding in concrete or masonry construction, spaced not more than 6 inches from each end, 6 inches from corners, and 24 inches o.c., unless otherwise indicated.
3. Galvanize miscellaneous steel trim in the following locations:

    a. Exterior locations.

2.6 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

C. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designing finishes.

2.7 FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, or masonry, or unless otherwise indicated.

1. Shop prime with universal shop primer unless indicated.

D. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning." SSPC-SP 3, "Power Tool Cleaning." requirements indicated below:

1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Other Items: SSPC-SP 3, "Power Tool Cleaning."

E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

F. Galvanizing Repair Paint: High-zinc-dust-content paint for re-galvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.

G. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers.

H. Coordinate standard shop primers normally provided with the finish paint specifications for these items in Section 09 90 00, Painting. Metal fabricator will be required to provide the primers as specified in Section 09 90 00, no exceptions. All items scheduled to receive finish coats as specified in Section 09 90 00 shall be prepared for primer in accordance with SSPC - SP 6, Commercial Blast Cleaning, or SSPC - SP3, Power Tool Cleaning, as recommended by the manufacturer for the types of primers installed.

2.8 FASTENERS

A. Provide plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electro-deposited zinc coating, for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568, Property Class 4.6), with hex nuts, ASTM A 563 (ASTM A 563M), and, where indicated, flat washers.

C. Machine Screws: ANSI B18.6.3.

D. Lag Bolts: ANSI B18.2.1 (ANSI B18.2.3.8M).

E. Plain Washers: Round, carbon steel, ANSI B18.22.1 (ANSI B18.22M).

F. Lock Washers: Helical, spring type, carbon steel, ANSI B18.21.1.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

1. Material: Carbon steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Provide galvanized anchors at exterior locations.

2.9 GROUT

A. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, non-corrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

B. Products: Subject to compliance with requirements, provide one of the following:

1. B-6 Construction Grout; W. R. Bonsal Co.
2. Sure-grip High Performance Grout; Dayton Superior Corp.
3. Euco N-S Grout; Euclid Chemical Co.
4. Five Star Grout; Five Star Products.
5. Crystex; L & M Construction Chemicals, Inc.
6. Masterflow 928 and 713; Master Builders Technologies, Inc.
7. Sealtight 588 Grout; W. R. Meadows, Inc.

2.10 FABRICATION, GENERAL

A. Shear and punch metals cleanly and accurately. Remove burrs.

B. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

C. Remove sharp or rough areas on exposed traffic surfaces.

D. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.

E. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry for installation of miscellaneous metal work. Provide setting drawings, templates, instructions, and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

F. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.

G. Provide for anchorage; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

H. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

I. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

PART 3 - EXECUTION

3.1 INSPECTION

A. Installer must examine the areas and conditions under which miscellaneous and ornamental items are to be installed. Notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 PREPARATION

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installing anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

B. Set sleeves in concrete with tops flush with finish surface elevations. Protect sleeves from water and concrete entry.

3.3 INSTALLATION

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop-welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

E. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.4 STEEL LADDERS

A. Metal Stud Partitions: Ladder to be attached directly to floor and wall.

3.5 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a 2.0-mil minimum dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of the shop paint on miscellaneous metal is specified in Division 09 Section "Painting."

C. For galvanized surfaces, clean welds, bolted connections, and abraded areas, and apply galvanizing repair paint to comply with ASTM A780.

END OF SECTION 05 50 00

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Division 06

Wood, Plastics and Composites

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Wood sleepers, grounds, blocking and nailers.

1.3 DEFINITIONS

A. Rough carpentry includes carpentry work not specified as part of other Sections and generally not exposed, unless otherwise specified.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

C. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber.

1. Factory mark each piece of lumber with grade stamp of grading agency.

B. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

1. Provide dressed lumber, S4S, unless otherwise indicated.
2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.

C. Plywood Product Standards: Comply with PS 1 (ANSI A199.1) or, for products not manufactured under PS 1 provisions, with applicable APA Performance Standard PRP-108 for type of panel indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

2.3 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including but not limited to, the following:

1. Blocking.
2. Nailers.
3. Where necessary for installation of other work and not otherwise prohibited.

B. Moisture Content: 19 percent maximum for lumber items are not specified to receive wood preservative treatment.

C. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

D. Wood grounds, nailers, and sleepers shall be pressure treated as specified herein.

E. No wood grounds, nailers, blocking and sleepers shall be permitted inside the building. Refer to section 05 50 00, Metal Fabrications.

F. Non fire rated wood blocking is allowed at short throw wall projectors and restroom grab bars only.

2.4 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, C-C Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.5 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Treatment shall not promote corrosion of metal fasteners.
2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.

2.6 FASTENERS

A. Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

B. Nails, Wire, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 ICC-ES AC193 as appropriate for the substrate.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

E. Wood Screws: ASME B18.6.1.

F. Lag Bolts: ASME B18.2.1.

G. Bolts: Steel bolts complying with ASTM A307, Grade A; with ASTM A563 hex nuts and where indicated, flat washers.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

C. Fit carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

D. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated.

E. Use screws, unless otherwise indicated. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

3.2 WOOD SLEEPERS, GROUNDS, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

3.3 INSTALLATION OF CONSTRUCTION PANELS

A. Comply with applicable recommendations contained in Form No. E30, "APA Design/Construction Guide - Residential & Commercial," for types of construction panels and applications indicated.

END OF SECTION 06 10 00

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Division 07

Thermal and Moisture Protection

SECTION 07 21 00 - BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Sound attenuation blanket insulation.
2. Thermal insulation.

1.3 SUBMITTALS

A. Product Data: Each type of insulation product specified.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products complying with requirements indicated without delaying the Work.

B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated on Drawings or specified elsewhere in this Section as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Surface-Burning Characteristics: ASTM E 84.
2. Fire-Resistance Ratings: ASTM E 119.
3. Combustion Characteristics: ASTM E 136.

1.5 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 INSULATING MATERIALS

A. General: Provide insulating materials that comply with requirements and with referenced standards.

1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thickness, widths, and lengths.

B. Sound Attenuation Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool, with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

2.2 GLASS FIBER BOARD

A. Glass-Fiber Board, Unfaced: ASTM C 612, Type IA; unfaced, with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84, passing ASTM E 136 for combustion characteristics. Nominal density of 3 lb/cu. ft., thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F.

B. Basis-of-Design Product: Subject to compliance with requirements, provide Owens CorningJohns Manville; a Berkshire Hathaway company; Fiberglass 703 or Johns Manville, IS300, 1-1/2-inch thick or a comparable product by one of the following:

1. CertainTeed Corporation.
2. Knauf Insulation.
3. Owens Corning.

2.3 INSULATION FASTENERS

A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation, of thickness indicated, securely in position indicated with self-locking washer in place; and complying with the following requirements:

1. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
2. Spindle: Copper-coated low carbon steel, fully annealed, 0.105 inches in diameter, length to suit depth of insulation indicated.

B. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.

C. Insulation Standoff: Spacer fabricated from galvanized mild-steel sheet for fitting over spindle of insulation anchor to maintain air space of dimension indicated between face of insulation and substrate to which anchor is attached.

1. Where spindles will be exposed to human contact after installation, protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap.

D. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or that interfere with insulation attachment.

3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled

C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF MINERAL FIBER INSULATION

A. General: Apply insulation units to substrates, complying with manufacturer's written instructions.

B. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:

1. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically.

C. Stuff mineral-fiber insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

D. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

3.5 INSTALLATION OF BOARD INSULATION

A. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:

1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
2. Apply insulation standoffs to each spindle to create cavity width indicated between concrete substrate and insulation.
3. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
4. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

B. Install extruded-polystyrene board insulation between furring and other confining obstructions, with edges butted tightly both ways. Retain in place with small pads of adhesive or other means as recommended by manufacturer until gypsum board is placed.

END OF SECTION 07 21 00

SECTION 07 21 19 - FOAMED-IN-PLACE INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Masonry insulation; foamed-in-place insulation.

1.2 SUBMITTALS

A. Product Data: Submit product data for insulation specified.

B. Test Reports: Submit product test reports from and based on tests performed by a qualified independent testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test-response characteristics, and other properties, based on comprehensive testing of current products.

1.3 QUALITY ASSURANCE

A. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products complying with requirements indicated without delaying the Work.

B. Installers Qualifications: Installer shall be a firm having a minimum of five consecutive years of documented experience with the installation of foam plastic masonry wall insulation.

C. Fire Performance Characteristics: Insulation materials shall be identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated, by a testing agency acceptable to authorities having jurisdiction.

1. Surface Burning Characteristics: ASTM E-84
2. Combustion Characteristics: ASTM E-136

D. Preinstallation Conference: Conduct conference at Project site.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Comply with manufacturer's written instructions for handling and protecting during installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Injected Foam Insulation - Foamed-In-Place Insulation: Two-component, nitrogen-based, non-toxic amino-plast resin, utilizing a foaming catalyst, and air as a delivery method. Foam plastic insulation resin shall be pre-mixed, by the manufacture, to insure consistency.

1. Product and Manufacturer – Basis of Design: Core-Fill 500; Tailored Chemical Products of Florida, Inc.

a. Surface Burning Characteristics: Maximum flame spread, smoke developed and fuel contributed of 15, 75, and 0 respectively.
b. Combustion Characteristics: Non-combustible, Class A.
c. Thermal Values: Minimum R-Value of 4.91 per inch at 32 degrees F mean; ASTM C-177.

2. Other Acceptable Manufacturers: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

a. CFI Foam
b. Polymaster
c. Thermal Corp. of America

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with insulation manufacturer's written instructions applicable to products and application indicated.

1. Fill all open cells and voids in all exterior hollow concrete masonry walls.
2. Drill holes, only through grout joints, maximum 8-inches on center, where required, to verify complete insulation installation.

END OF SECTION 07 21 19

SECTION 07 22 00 - ROOF INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Provide labor, materials, and equipment necessary for complete installation of roof insulation for roofing as indicated on the Drawings and specified herein. Specification includes the following:

1. Roof insulation.

1.3 SUBMITTALS

A. Product Approval Certification: Submit current Product Approval certification indicating compliance with the Florida Building Code and FAC 9N-3.

B. Product data.

1. Roof insulation boards
2. Fasteners

C. Shop Drawings: Include plans, sections, details, and attachments to other Work.

1. Tapered insulation, including slopes.
2. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

1.4 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at the Project site.

B. Roof system shall be designed to meet wind-loading requirements for Building Code with the Supplement. Refer to Structural Drawings for wind velocity and “Importance Factor” requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original packaging, dry, undamaged, with seals and labels intact.

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

1.6 WARRANTY

A. Insulation shall be included as a covered component of the membrane roofing warranty. Refer to section 07 54 00 “Thermoplastic Membrane Roofing” for warranty requirements.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

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

B. Structural Performance: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to withstand the effects of the following:

1. Wind Loads: In accordance with Florida Building Code (current edition).

a. Basic Wind Speed: As indicated on the Structural Drawings.

2.2 MATERIALS

A. General: Preformed roof insulation boards manufactured or approved by membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Global-approved roof insulation.

B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Atlas EPS; a Division of Atlas Roofing Corporation.
2. Firestone Building Products.
3. GAF Materials Corporation.
4. Insulfoam LLC; a Carlisle company.
5. Johns Manville; a Berkshire Hathaway company.

C. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 3, felt or glass-fiber mat facer on both major surfaces.

1. Long Term Thermal Resistance (LTTR) minimum value of 5.6 per inch @ 75 degrees F.

D. Composite Polyisocyanurate Board Insulation: ASTM C 1289, with factory-applied facing board on one major surface, as indicated below by type, and felt or glass-fiber mat facer on the other.

1. Type IV, cellulosic-fiber-insulating-board facer, Grade 2, 1/2 inch thick.
2. Long Term Thermal Resistance (LTTR) minimum value of 5.6 per inch @ 75 degrees F.

2.3 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.

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

C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to another insulation layer.

PART 3 - EXECUTION

3.1 EXAMINATION

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

1. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

3.2 PREPARATION

A. Install insulation strips according to acoustical roof deck manufacturer's written instructions.

3.3 INSTALLATION

A. Comply with insulation manufacturer's instructions and recommendations for the handling, installation, and bonding or anchorage or insulation to substrate.

B. Roof Insulation: Install insulation per one of the following methods listed below:

1. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

3.4 INSULATION INSTALLATION

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

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

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

D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

1. Where installing composite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.

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

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

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

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

1. Fasten first layer of insulation according to requirements in FM Global's "RoofNav" for specified Windstorm Resistance Classification.
2. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
3. Set each subsequent layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.5 PROTECTING AND CLEANING

A. Protect insulation system from damage and wear unit; covered by roofing membrane.

B. Correct deficiencies in or remove insulation that does not comply with requirements, repair substrates, and repair or reinstall insulation to a condition free of damage and deterioration prior to installation of roofing membrane.

END OF SECTION 07 22 00

SECTION 07 26 10 - UNDERSLAB VAPOR BARRIER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide the Work required to provide and install the underslab vapor barrier and its accessories as indicated on the Drawings and as specified herein.

1.3 SUBMITTALS

A. Submit in accordance with Division 01 requirements.

B. Product data and general recommendations from materials manufacturer for types of underslab vapor barrier required.

C. Samples of underslab vapor barrier and auxiliary materials.

D. Submit pre-installation conference meeting minutes.

1.4 QUALITY ASSURANCE

A. Pre-installation Conference: Prior to installing vapor barrier and associated work, meet at Project site with the contractor. Review material selections and procedures to be followed in performing work. Notify Architect at least 48 hours before conducting meeting.

B. Definition: Vapor Barrier: A material or assembly of materials that resists water vapor transmission through it.

C. Vapor Barrier shall comply with:

1. ASTM E 1745, latest edition, “Water Vapor Barriers Used in Contact with Soil or Granular Fill under Concrete Slabs.”
2. ASTM E 1643, latest edition, “Installation of Water Vapor Barriers Used in Contact with Earth or Granular Fill Under Concrete Slabs.”
3. Federal Specification UU-B-790a Type 1, Grade A, Style 4.

1.5 PROJECT CONDITIONS

A. Substrate: Proceed with work after substrate construction, openings, and penetrating work have been completed and areas are free of standing or running water, ice, and frost.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Design: “Moistop Ultra 15 Underslab Vaper Barrier” as manufactured by Fortifiber Building Products Systems, Fernley, Nevada; www.fortifiber.com. Products of the following manufacturers are also acceptable provided compliance with requirements as specified herein:

1. Griffolyn Division of Reef Industries, Inc., Houston, Texas; www.reefindustries.com
2. Stego Industries, LLC, San Juan Capistrano, CA; www.stegoindustries.com

2.2 UNDERSLAB VAPOR BARRIER

A. Multi-layer composite polyethylene reinforced with fiberglass reinforcing.

B. Class A material in accordance with ASTM E 1745, latest edition.

C. Water Vapor Permeance: 0.02 perms (premium), ASTM F-1249/ASTM E-96.

D. Tensile Strength: 70 lbf/in.

E. Puncture Resistance: 3000 grams (premium) ASTM D-1709.

F. Thickness: 15 mil reinforced.

2.3 AUXILIARY MATERIALS

A. Joint Tape: Provide types of adhesive compound and tapes recommended by underslab vapor barrier manufacturer for seams in vapor barrier, and for projections through vapor barrier.

PART 3 - EXECUTION

3.1 PREPARATION

A. Ensure that all items that pass through the vapor barrier are properly and rigidly installed.

B. Substrate shall be free of projections and irregularities.

3.2 INSTALLATION

A. Comply with manufacturer's instructions for handling and installing underslab vapor barrier materials.

B. Seal projections through vapor barrier and seal seams. Bond to vertical surfaces and also, where shown or recommended by manufacturer, bond to horizontal surfaces.

C. Overlap and seal all seams in strict accordance with the manufacturers written installation instructions.

3.3 PROTECTION

A. Protect completed vapor barrier during installation of the concrete slab on grade.

B. Repair and seal all punctures that may occur prior or during installation.

C. Vapor barrier shall be continuously sealed at all joints and projections.

END OF SECTION 07 26 10

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SECTION 07 54 00 – THERMOPLASTIC MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Mechanically attached single-ply membrane roofing system.

1.3 CODE COMPLIANCE

A. General: Roofing membrane system shall meet the requirements of the Florida Building Code.

1. Provide Florida Product Approval information for thermoplastic membrane roofing system; include product evaluations and installation requirements indicating compliance.

1.4 PERFORMANCE REQUIREMENTS

A. Purpose: Provide installed roofing membrane and base flashings that remain watertight; do not allow water ponding 24 hours after a rain event; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Maintainability: Design roofing system and its related flashings so that removal of adjoining construction, or other types of adjacent roofing system(s), will not be necessary in order to replace membrane roofing or flashings during the life of the building.

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

D. Structural Performance: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to withstand the effects of the following:

1. Wind Loads: In accordance with Florida Building Code (current edition).

a. Basic Wind Speed: As indicated on the Structural Drawings.

1.5 SUBMITTALS

A. Product Approval Certification: Submit current Product Approval certification indicating compliance with the Florida Building Code and FAC 9N-3.

B. Product Data and Samples:

1. Product Data: For each type of product indicated.
2. Samples for Verification: For sheet roofing, membrane flashing, walkway products, roof cover fasteners, termination bars, and battens.

C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.

1. Membrane sheet layout.
2. Membrane flashings and terminations.
3. Roof plan showing orientation of steel roof deck and orientation of roofing, fastening spacings, and patterns for mechanically fastened roofing.
4. Walk pad layout.

D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system and is eligible to receive required manufacturer's warranty.

E. Manufacturer Certificates: Signed by roofing system manufacturer.

1. Certifying intent to warrant, and intent to comply with the Contract Documents.

2. Certifying that roofing system complies with requirements specified in "Performance Requirements" and "Quality Assurance" Articles.

a. Submit evidence of meeting performance requirements. Include Engineering Calculations signed and sealed by the qualified professional engineer who was responsible for their preparation.

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

1. Comply with requirements in Division 01 Section "Closeout Procedures".
2. Visual inspection checklist indicating specific flashings and details to be inspected. Include items such as base flashing, seams, reglets and counterflashings, roof edge flashings, roof penetration flashings, roof curb flashings, boot flashings, roof drain areas, parapet wall flashings, copings, roof membrane seams, etc. Applicable items shall be listed per project.

a. Include a set of instructions detailing preventative maintenance and noting a list of harmful substances which may damage the roofing membrane.
b. Include procedures for exercising warranty and guarantee provisions, leak calls, temporary repairs and future modifications to roof system.

3. Copies of as-built roofing details.
4. Roof plan indicating penetrations, detail locations, roof drains, and seams.
5. Copy of SPRI / NRCA "Manual of Roof Inspection, Maintenance and Emergency Repair for Existing Single-Ply Roofing Systems".

G. FBC Compliance: Contractor's final statement of compliance.

H. Inspection Reports: Copy of all roofing system manufacturer's inspection reports of roofing installation. Submit separate reports to Owner. Submit separate reports to Owner Designer for each building not to exceed 20,000 sq. ft. per report per inspection by the Manufacturer’s Representative.

a. Copy of BCCO inspection reports accepting the roofing system.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for membrane roofing system identical to that used for this Project.

1. Original Manufacture: Provide membrane roofing of original manufacture.
2. Track Record: Provide membrane roofing of same formulation, with not less than a ten year track record of successful performance under the proposed conditions of installation.

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

1. Provide documentation indicating that all personnel onsite that have been trained by the manufacturer and any authorized to operate the automatic and hand welders shall provide documentation from the manufacturer certifying training within the last year.

C. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.

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

D. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency. Identify materials with appropriate markings of applicable testing and inspecting agency.

E. Preinstallation Conference:

1. Review submittals, both completed and yet to be completed.
2. Review status of substrate work (not by the roofing installer), including drying, structural loading limitations, and similar considerations.
3. Review required inspection, testing, certifying, and accountability procedures.
4. Review regulations concerning code compliance, environmental protection, health, safety, and fire.
5. Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".
6. Meet with Owner, Architect, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
7. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

8. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
9. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
10. Bond-breaker and curing compounds for Concrete tilt-wall shall contain no diesel, kerosene, waxes or silicones that may inhibit the optimal adhesion of vertical flashing. The concrete shall be prepared for proper flashing adhesion, by the removal of oils, waxes, paraffins and all other incompatible materials that could affect the bond.
11. Review structural loading limitations of roof deck during and after roofing.
12. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
13. Review governing regulations and requirements for insurance and certificates.
14. Review temporary protection requirements for roofing system during and after installation.
15. Review roof observation and repair procedures after roofing installation.
16. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

1.7 DELIVERY, STORAGE, AND HANDLING

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

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

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

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

1.8 PROJECT CONDITIONS

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

1.9 EXTRA MATERIALS

A. Provide sufficient extra material to repair 100 square feet of the complete roof system to assure availability of compatible repair materials. Materials shall be turned over to Maintenance and Operations at Substantial Completion.

1.10 WARRANTY

A. Manufacturer's standard form, without monetary limitation (NDL type) non-prorated, non-penal sum warranty is required, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials, workmanship or items identified not in conformance with the project documents within specified warranty period. Failure includes roof leaks and delamination of membrane or flashing. A contractor’s final Statement of SREF compliance shall be issued by the Roofing contractor. If the manufacturer fails or refuses to issue the required warranty, the Contractor, with Surety, shall warrant the roof on the same terms as the manufacturer.

1. Warranty shall include roofing membrane, insulation, cover board, base flashings, roofing membrane accessories, walkway products and all other components of membrane roofing system.
2. Warranty Period: 20 years from date of Substantial Completion.
3. Special Warranty Rider: Coverage for winds up to and including 130 mph (3-second gust).
4. Provide a warranty for all buildings (or separate warranties for each individual building in phased construction projects) on the campus identified as to building and square footage, or separately and specifically identify each building on the campus included in and covered by the warranty with its respective square footage.
5. Changes in building use or transference through sale or lease shall not void this warranty. Where system failure is the result of building expansion, settling, shifting, distortion, structural cracking due to poor design, the Roof Contractor shall repair the roof, and all costs shall be presented to the Architect by the Owner for reimbursement. System failure due to moisture infiltration, condensation or insulation separation resulting from poor workmanship shall not void this warranty.

B. Installer Warranty: Including all components of membrane roofing system such as roofing membrane, base flashing, fasteners, and walkway products.

1. Warranty Period: Two years from date of Substantial Completion.
2. Provide separate warranties for each individual building on the campus identified as to building and square footage, or separately and specifically identify each building on the campus included in and covered by the warranty with its respective square footage.
3. During the warranty period, upon notification by the Owner, the Installer must be on site within 24 hours to make necessary permanent or temporary repairs. Should the Installer fail to make such repairs within the time period, the Owner may have the repairs made and charge the cost to the Installer; such repairs by the Owner shall not void the system warranty. Emergency repairs required reasonably and immediately to protect life or property shall not void this warranty. Installer roof access shall not be unreasonably denied. Delay of construction contract payment by Construction Manager/Contractor shall not be cause to withhold warranty performance. Patch work shall normally include a 3 year installer’s warranty.

PART 2 - PRODUCTS

2.1 ROOFING MEMBRANE

A. Manufacturers:

1. Where title below introduces lists, the following requirements apply for product selection:

a. Products: Subject to compliance with requirements, provide one of the products and respective methods of installation specified.

1) Product Certification: “Cool Roof Rating Council” (CRCC) Product Certification as recognized by EPA for the Energy Star Program; a third-party rating system for radiative properties of roof surfacing materials.

B. Roofing Membrane: Initial solar reflectance shall be greater than 0.70, which means the cool roof is reflecting greater than 70 percent of the solar radiation.

1. PVC Sheet: Type II or Type III, fiber reinforced.

a. Products:

1) Sika-Sarnafil Inc.; "Sarnafil G410 Feltback: Fully adhered to LWIC assemblies.

b. Thickness: 60 mils (1.5 mm), nominal, membrane.
c. Color: “Bright White”.

2. PVC Sheet: Type III, fabric reinforced.

a. Products:

1) Duro-Last Roofing, Inc.; "Duro-Last Fleeceback": Fully adhered to LWIC assemblies.

b. Thickness: 60 mils (1.5 mm), nominal, membrane.
c. Color: “Bright White”.

3. PVC Sheet: Type III, fabric reinforced.

a. Products:

1) Carlisle Corporation: “Sureflex Fleece Back”: Fully adhered to LWIC assemblies – Upon Owner Approval.

b. Thickness: 60 mils (1.5 mm), nominal, membrane.
c. Color: White.

4. PVC Sheet: Type III, fabric reinforced.

   a. Products:

      1) GAF Corporation: “EverGuard Fleece-back”: Fully adhered to LWIC assemblies - Upon Owner Approval

   b. Thickness : 60 mils (1.5 mm), nominal, membrane.
   c. Color : White.

5. PVC Sheet: Type III, fabric reinforced.

   a. Products:

      1) John Mansville Corporation: “JM PVC Fleece Backed”: Fully adhered to LWIC assemblies - Upon Owner Approval

   b. Thickness : 60 mils (1.5 mm), nominal, membrane.
   c. Color : White.

6. KEE Sheet: ASTM D 6754, fabric reinforced.

   a. Products:

      1) Seaman Corporation: “8552 FiberTite-SM Fleeceback”: Fully adhered to LWIC - Upon Owner Approval.

   b. Thickness: 60 mils (1.5 mm), nominal, membrane.
   c. Color: White.

7. PVC Sheet: Type III, fabric reinforced.

   a. Products:

      1) Johns Manville Corporation: “JM PVC Fleece Backed”: Fully adhered to LWIC assemblies – Upon Owner Approval.

   b. Thickness: 60 mils (1.5 mm), nominal, membrane.
   c. Color: White.

8. Membrane shall meet EPA Energy Star standards.

2.2 AUXILIARY MATERIALS

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

B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane.

C. Laminated Metal: Manufacturer's standard minimum 25 gauge galvanized steel laminated with a minimum 20 mil compatible polymeric coating, of same color as sheet membrane.

D. Pre-manufactured PVC boots, UV-resistant.

1. Color to match roofing membrane.

E. Bonding Adhesive:

1. Roofing Membrane: Manufacturer's standard solvent or water-based bonding adhesive for membrane.
2. Sheet Flashing: Manufacturer's standard solvent-based bonding adhesive for base flashings.

F. Metal Termination Bars: Manufacturer's standard predrilled aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

G. Metal Battens: Manufacturer's standard aluminum-zinc-alloy-coated or zinc-coated steel sheet, or aluminum alloy bar, approximately 1 inch wide, pre-punched.

H. Polymeric Battens: Manufacturer's standard high performance thermoplastic polymer strip, approximately 1 inch wide, pre-punched.

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

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

K. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16 inch thick, and acceptable to membrane roofing system manufacturer.

L. Sacrificial Pads: Provide sacrificial pads under all lightning protection cables, aerials and cable couplings.

M. Pitch Pans: Pitch pans are not acceptable.

2.3 WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16 inch thick and acceptable to roofing system manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

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

1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.

2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
5. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

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

3.3 ROOFING INSTALLATION, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions.

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

C. Secure membrane edges under battens or termination bars. Locate battens or termination bars continuously around the edge of the roof on the flat of the deck adjacent to the roof edge or parapet, around penetrations such as curbs in the field of the roof, and elsewhere as detailed.

D. Peel Stops: Install battens or termination bars continuously around the perimeter of the roof.

E. Field membrane sheets shall be installed so the water sheds and the laps do not create a dam.

F. Install crickets where slopes may be dammed by flat surfaces of curbs for roof hatches, vents, fans, etc.

G. Flash penetrations and inside and outside corners with sheet flashing. Prefabricated flashings as furnished by manufacturer are required and should be used wherever possible, field formed/fabricated are to be used only by acceptance of the Owner.

H. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

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

1. Install horizontal rows of intermediate fasteners vertically, up walls, area dividers, and parapets. Install at a maximum of 18” above the finish roof membrane and every 18” vertically.
2. Space fasteners at 6” in these horizontally running vertical rows.

J. Secure top edge of preformed boots and pipe flashings with stainless steel wormgear type drawbands

K. Apply a bead of sealant large enough to entirely fill the void at shaped term bars, reglets, and drawbands. Tool to shed water and insure full adherence to surfaces.

L. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

3.4 MECHANICALLY FASTENED ROOFING INSTALLATION

A. Mechanically fasten roofing over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing and allow to relax before retaining.

1. For in-splice attachment, install roofing with long dimension perpendicular to steel roof deck flutes.

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

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

D. Mechanically fasten or adhere roofing securely at terminations, penetrations, and perimeter of roofing.

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

F. In-Seam Attachment: Secure one edge of TPO sheet using fastening plates or metal battens centered within seam, and mechanically fasten TPO sheet to roof deck.

G. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.

1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.
2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.

H. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing in place with clamping ring.

3.5 PREFORMED FLASHING ACCESSORIES

A. Clean all vents, pipes, conduits, tubes and stacks to bare metal. All protrusions must be properly secured to the roof deck with approved fasteners. Remove and discard all lead, pipe and drain flashing. Flash all penetrations according to approved details.

B. Remove all loose and / or deteriorated cant strips and flashing.

C. Flash all curbs, parapets and interior walls in strict accordance with manufacturer’s recommendations.

D. Probe all seams with a dull pointed probe to insure the weld has created a homogeneous bond.

3.6 FLEXIBLE WALKWAYS

A. Install flexible walkways between and connecting the main roof access point and rooftop equipment requiring routine or seasonal maintenance or adjustment.

B. Heat weld to substrate and fully adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.7 FIELD QUALITY CONTROL

A. Manufacturer's Inspections: Manufacturer inspections shall be accomplished by technical representatives with technical department of roof membrane manufacturer.

1. In-progress inspections: Not less than three for each building but not to exceed 20,000 sq.ft. per inspection .

a. Make first in-progress inspection within 4 days of start of installation for each respective building.

2. Substantial Completion inspection, for each building.
3. Final Completion inspection, for each building.

B. Follow-up Roof Inspections: Arrange for roofing system manufacturer's technical personnel to provide follow-up inspections of roofing installation.

1. 11th month inspection, for each building.
2. 23rd month inspection, for each building.

C. Notify Owner not less than 48 hours in advance of dates and times of inspections. Manufacturer’s technical representative shall provide written report for every field inspection and forward copy to the Architect, Construction Manager/Contractor/Project Manager, Building Envelop Consultant and Roofing Contractor.

D. Written and signed documentation shall be provided by the Manufacturers Technical Inspection Representative indicating all deficiencies identified in their reports have been corrected and verified for each report where deficiencies have been indicated.

E. Upon completion of the Work and prior to final payment, the membrane manufacturer's representative, in the presence of the Owner, Architect, Building Envelope Consultant and Construction Manager shall inspect the Work. Discrepancies shall be recorded and

immediately rectified. Final payment will not be issued until the manufacturer's representative has given his approval for the Work.

3.8 PROTECTING AND CLEANING

A. Clean entire roof membrane surface area of stains, spills, including rust stains, dirt deposits, or other contaminates. Clean roof membrane surfaces where they form flashings and turn up inside faces of parapets.

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

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

END OF SECTION 07 54 00

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes sheet metal flashing and trim in the following categories:

1. Metal counter flashing and base flashing
2. Metal wall flashing and expansion joints
3. Miscellaneous sheet metal accessories
4. Coping caps
5. Concrete splash blocks
6. Scuppers
7. Roof curbs
8. Sealants and bonding agents between components of this Section and between the roof and other materials

1.3 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

C. Coping caps and edge metal shall be designed to meet wind-loading requirements for the 2007 Florida Building Code. Refer to Structural Drawings for pertinent wind design information.

D. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other by permanent separation.

1. Protect concealed side of uncoated aluminum or stainless-steel where in contact with wood, ferrous metal or cementitious construction by permanent separation using self-adhered membrane flashing material.

E. Anchoring Criteria: Except as otherwise shown on Drawings or specified, the workmanship of sheet metal work, methods for forming joints, anchoring, cleating and provisions for expansion shall conform to the standard details and recommendations of the Copper and Brass Research Association; and workmanship shall be of the best quality, in accordance with best trade practice and the recommendations and specifications of the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) and the Florida Building Code, whichever is more strict.

F. Roof coping and edge metal shall be CERTIFIED by the manufacturer to meet performance design criteria according to the following test standards:

1. ANSI/SPRI ES-1 Test Method RE-3 for Coping: Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems (current edition). The coping cap and edge metal system shall be tested simultaneously on horizontal and vertical surfaces and shall exceed horizontal and vertical design wind pressure as calculated in accord with the ANSI/SPRI ES-1 Test RE-3. Use the current edition of ANSI/SPRI ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

1.4 SUBMITTALS

A. Product Data: Include manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.

B. Shop Drawings: Show profiles, methods of joining, and anchorage details, including major counter flashings, trim/fascia units, scuppers, and expansion joint systems. Provide plan layouts at 1/4-inch scale and details at 3-inch scale, for all sheet metal pieces and accessories.

1. Signed and sealed Engineers drawings, certifying compliance with wind loads as required by FBC (current edition).
2. Reproductions of Architectural Details will not be permitted.

C. Shop Fabricated Coping and Metal Roof Edge Flashing or Pre-fabricated, In-Factory Components such as manufactured by:

1. W.P. Hickman Corporation,
2. Metal-Era, Inc.,
3. Architectural Products, Co.

a. Shall be accompanied by signed and sealed Engineers drawings, certifying compliance with wind loads as required by FBC (current edition) for code approval and approval of the Construction Manager/ Contractor, Project Manager, Architect and the Building Envelope Consultant.

D. Samples: Of sheet metal flashing in the specified finish.

1. 8-inch-square Samples of specified sheet materials to be exposed as finished surfaces.
2. 12-inch-long samples of factory-fabricated products exposed as finished work. Provide complete with specified factory finish.

E. Guarantee/warranty Compliance: Submit the following:

1. Submit equipment support curb guarantee as specified herein.
2. Submit coping cap and edge metal watertight guarantee as specified herein.

F. Product Approval: Submit Florida Product Approval certificates complying with Rule 9B-72.110, F.A.C.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Fabricator and installer shall be a company specializing in sheet metal work and installation with minimum five (5) years documented experience.

B. Quality Control Standard: Sheet Metal & Air Conditioning Contractor’s National Association (SMACNA), latest edition, and the Florida Building Code.

C. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to sheet metal flashing and trim.
2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
3. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

D. Where pre-engineered manufactured systems are specified, other field fabricated or shop fabricated substitutions will not be accepted.

1.6 PROJECT CONDITIONS

A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

1.7 GUARANTEE

A. Provide a “will not blow-off” wind warranty for copings and edge metals complying with roofing system wind coverage rider specified in respective roofing membrane sections.

B. The equipment support curbs shall be guaranteed to be free from defects in materials and workmanship for a period of fifteen (15) years from the Date of Substantial Completion.

C. Submit the weathertightness guarantee for the coping caps as specified herein.

PART 2 - PRODUCTS

2.1 METALS

A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:

1. Factory-Painted Aluminum Sheet: ASTM B 209, 3003-H14, minimum thickness as indicated or 0.032-inch thick (20 gage) minimum if not indicated.
2. Extruded Aluminum: ASTM B 221, alloy 6063-T52, with a minimum thickness of 0.080 inch for primary legs of extrusions unless otherwise indicated.

3. Stainless-Steel Sheet: AISI Type 302/304, complying with ASTM A 167, soft, except where harder temper required for forming or performance.

    a. Finish: 2D annealed finish.
    b. Surface: Smooth, flat.
    c. Thickness: Match existing.

2.2 MANUFACTURERS

A. Shop Fabricated Coping and Metal Roof Edge Flashing or Pre-fabricated, In-Factory Components such as manufactured by:

1. Architectural Products Company
2. Hickman Company, W.P.
3. Metal-Era, Inc.,

B. Prefabricated Reglets and Counterflashings: Shall be as manufactured by the Fry Reglet Corp., 625 S. Palm Avenue, Alhambra, CA.

C. 2-Piece Assembly Type: Provide standard Drive-Lock In-Wall Counter Flashing System as manufactured by W.P. Hickman Company, Asheville, NC. Shall be 0.050 prefinished aluminum cut-in type reglet with snap-in receiver flashing made of 0.032 prefinished aluminum. Provide factory fabricated mitered corners. Color selected by Architect.

D. 1-Piece Assembly Type: Provide Type “SR50 Reglet” surface mounted reglet as manufactured by W.P. Hickman Company, Asheville, NC. Shall be surface mounted receiver with snap-in flashing made of 0.050 prefinished aluminum with slots for expansion, punched approximately 16 inches o.c. for surface mounting. Provide factory fabricated mitered corners. Color selected by Architect.

1. Provide suitable screws or drive pins and washers for mounting to wall, similar to those indicated on the drawings.

E. Products of other manufacturers will be acceptable providing they meet or exceed the quality specified, and they can provide products of the type, size, and function required, including approval by the Architect.

1. Fry Reglet.
2. Or Equal.

F. Coping Caps:

1. 0.060 inch aluminum formed as indicated on the Drawings and as required for installation. Support shall be coping chairs with perforated cleats. Concealed splice plate shall match color and finish of coping caps. All flashings that will be secured under coping system will become part of coping system warranty and will be secured accordingly.
2. Finish: Clear anodized aluminum, 0.7 mil minimum thickness per AAMA.

    a. "Permasnap Coping" by W.P. Hickman Company, basis of design.
    b. Architectural Products Company
    c. Metal-Era, Inc.

3. Shop fabricated coping caps are not acceptable.
4. Provide manufacturers 20 year weathertightness guarantee with all coping caps.

5. All corners shall be pre-formed, mitered, and welded tight.
6. All cleats shall be continuous, no exceptions.

G. Edge Metal:

1. 0.060 inch aluminum formed as indicated on the Drawings and as required for the installation. Concealed splice plate shall match color and finish of edge metal.
2. Finish: Clear anodized aluminum, 0.7 mil minimum thickness per AAMA.
3. Manufacturers:

   a. W.P. Hickman Company
   b. Architectural Products Company
   c. Metal-Era, Inc.,

4. Shop fabricated edge metal systems are not acceptable.
5. Provide equivalent products complying with weathertightness, wind speeds and warranty lengths as specified for coping systems.
6. All corners shall be pre-formed.
7. All cleats shall be continuous, no exceptions.

H. Concrete Splash Blocks

1. Sizes as indicated on the Roof Plans.
2. Fix to roof with approved manufacturer’s roofing cement or adhesive.

I. Equipment Support Curbs:

1. Basis of Design: Provide roof curbs produced by Custom Curb, Inc., Chattanooga, TN. Products of other manufacturers are acceptable provided they comply with all technical requirements as specified herein.

   a. The Pate Company
   b. Portals Plus, Inc.
   c. RPS Accessories
   d. Thaler Metal Industries, Inc.

2. Curbs shall be constructed using minimum 14 gauge galvanized steel, with fully mitered and welded corners, integral base plates, internally reinforced with 1in. x 1 in. x 1/8 in. steel angle (curbs with any side longer than 3 ft. – 0 in.), and factory installed pressure treated wood nailers.
3. Units shall be factory insulated with 1-1/2 inch thick three pound density fiberglass insulation.
4. Minimum height of curb shall be 8 inches above finished roof. Curbs shall be constructed to match slope of roof and provide level top surface for mounting of mechanical equipment.
5. Coordinate sizes required with Drawings.

2.3 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Self-Adhered Membrane Flashing: Self-adhering membrane formed into uniform flexible sheets of not less than 40 mils thick.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

a. Perm-A-Barrier Wall Flashing; W.R. Grace & Co.
b. Or Equal.

B. Backer Rod and Sealants: Refer to Section 07 92 00 Joint Sealants.

C. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

D. Solder: Provide only 95% tin/5% antimony (95/5) or silver brazing. Solder containing lead shall not be used.

E. Bituminous Coating: SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

F. Mastic Sealant: Poly-isobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.

G. Epoxy Seam Sealer: 2-part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior nonmoving joints including riveted joints.

H. Paper Slip Sheet: 5-lb. rosin sided building paper.

2.4 FASTENERS

A. General: Same metal as flashing/sheet metal or other non- corrosive metal. Match finish of exposed heads with material being fastened. Fasteners shall not be used on inside and outside coping corners, they shall be welded or soldered.

2.5 FABRICATION, GENERAL

A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

B. Comply with details shown to fabricate sheet metal flashing that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Form exposed sheet metal Work that is without oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.

D. Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

E. Expansion Provisions: Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

F. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

G. Separate metal from noncompatible metal or corrosive substrates with self-adhering flashing material.

H. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

I. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.

1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

2.6 SHEET METAL FABRICATIONS

A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.

B. Metal Flashing: Fabricate from the following material:

1. Aluminum: 0.040 inch thick.

C. Flashing Extensions: Fabricate from the following material:

1. Aluminum: 0.040 inch thick.

2.7 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch-wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof. Fabricate from the following materials:

1. Stainless Steel: 0.019 inch thick.

2.8 ALUMINUM FINISHES

A. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.

1. Install exposed sheet metal Work that is without oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

3.3 ROOF-DRAINAGE SYSTEM INSTALLATION

A. Parapet Scuppers: Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

3.4 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Replace sheet metal flashing that has been damaged or that has deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

C. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION 07 62 00

SECTION 07 72 33 – ROOF HATCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Roof access hatches.

1.3 SUBMITTALS

A. Product Approval Certification: Submit current Product Approval certification indicating compliance with the Florida Building Code and FAC 9N-3.

B. Product Data: For products indicated. Include construction details, materials, dimensions of individual components and profiles, and finishes.

C. Sample of specified Product for installation.

D. Shop Drawings: Show fabrication and installation details. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other Work.

1. Anchoring methods for roof accessories shall comply with the requirements of the Florida Building Code.

E. Coordination Drawings: Roof plans drawn to scale and coordinating penetrations and roof-mounted items. Show the following:

1. Size and location of roof accessories specified in this Section.
2. Method of attaching roof accessories to roof or building structure.

1.4 WARRANTY

A. Warranty Requirements: Manufacturer's standard form in which manufacturer agrees that roof hatches will be free of defects in material and workmanship within specified warranty period. Should a part fail to function in normal use within the warranty period the manufacturer shall furnish a new part at no charge.

1. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ROOF ACCESS HATCH

A. General: Fabricate units to withstand 40-lbf/sq. ft. live load. Provide double-wall cover (lid) construction with 1-inch insulation core. Provide gasketing and equip corrosion-resistant hardware including pintle hinges, hold-open devices, interior padlock hasps, and both interior and exterior latch handles.

1. Model and Manufacturer – Basis of Design: Type S Roof Hatch; The Bilco Company or a comparable product by one of the following:

   a. JL Industries, Inc.; a division of the Activar Construction Products Group.
   b. Milcor; Commercial Products Group of Hart & Cooley, Inc.
   c. Pate Company (The).

2. Code Approval: Provide certification signed and sealed by a professional engineer registered in the state of Florida stating compliance with the Florida Building Code and with FAC 9N-3.
3. Size: As indicated on the Drawings.
4. Cover: High strength composite panels with 14 gauge zinc-coated, prime-painted steel exterior and 22 gauge zinc-coated, prime painted steel liner bonded to core of 2” rigid foam insulation.
5. Curbs: 12 inches high, 14 gauge zinc-coated steel, 14 gauge zinc-coated steel integral counter-flashing, and one inch (1”) factory installed fiberboard insulation on the exterior and metal encased.
6. Hatch: Assembled with heavy steel pintle hinges, automatic locking hold-open arms, snap latch, turn handles, padlock hasp inside, and closed-cell rubber weather seal.
7. Hardware: Steel; provide engineered composite compression spring tubes. Steel compression springs with electro-coated acrylic finish. All other hardware shall be zinc plated/chromate sealed.
8. Safety Post on Ladders to Roof Hatches: LadderUp Safety Post.

   a. Safety post shall be manufactured of high strength steel with telescoping tubular section that locks automatically when fully extended. Upward and downward movement shall be controlled by a stainless steel spring balancing mechanism.
   b. Provide manufacturer’s standard yellow powder coat finish.

9. Finish: Powder coated.

10. Color: White.

2.2 MATERIALS, GENERAL

A. Galvanized Steel Sheet: ASTM A 653/A 653M with G90 coating designation; commercial quality, unless otherwise indicated.

1. Structural Quality: Grade 40, where indicated or as required for strength.

B. Insulation: Manufacturer's standard rigid or semi-rigid glass-fiber board of thickness indicated.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where fasteners are used in or come in contact with pressure treated wood, fasteners shall be Type 304 stainless steel.

2.4 FABRICATION

A. Comply with SMACNA’s “Architectural Sheet Metal Manual” details for fabrications of units, including flanges, and cap flashing to coordinate with type of roofing indicated.

2.5 FINISHES

A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Comply with manufacturer's written instructions. Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction involving roof accessories to ensure that each element of the Work performs properly and that combined elements are waterproof and weather tight. Anchor roof accessories securely to supporting structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.

1. Install roof accessory items according to construction details of NRCA's "Roofing and Waterproofing Manual," and manufacturer’s instructions and recommendations.

B. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with permanent separation.

C. Operational Units: Test-operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

3.2 CLEANING AND PROTECTION

A. Clean exposed surfaces according to manufacturer's written instructions. Touch up damaged metal coatings.

END OF SECTION 07 72 33

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SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes sealants for the following applications, including those specified by reference to this Section:

1. Exterior joints in the following vertical surfaces and nontraffic horizontal surfaces:

    a. Control and expansion joints in cast-in-place concrete.
    b. Control and expansion joints in unit masonry.
    c. Joints between different materials listed above.
    d. Perimeter joints between materials listed above and frames of doors and windows.
    e. Other joints as indicated.

2. Exterior joints in the following horizontal traffic surfaces:

    a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
    b. Tile control and expansion joints.
    c. Joints between different materials listed above.
    d. Other joints as indicated.

3. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:

    a. Perimeter joints of exterior openings where indicated.
    b. Tile control and expansion joints.
    c. Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
    d. Perimeter joints between interior wall surfaces and frames of interior doors, and windows.
    e. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    f. Other joints as indicated.

4. Interior joints in the following horizontal traffic surfaces:

    a. Control and expansion joints in cast-in-place concrete slabs.
    b. Control and expansion joints in tile flooring.
    c. Other joints as indicated.

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Certifications, Testing, and Qualifications:

1. Certification by sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.
2. Certificates from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use indicated.
3. Compatibility and adhesion test reports from sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

C. Preconstruction Field Testing: Prior to installation of joint sealants, field-test their adhesion to joint substrates as follows:

1. Locate test joints where indicated or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:

    a. Each type of elastomeric sealant and joint substrate indicated.
    b. Each type of non-elastomeric sealant and joint substrate indicated.

3. Notify Architect one week in advance of the dates and times when mock-ups will be erected.
4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
5. Test Method: Test joint sealants by hand pull method described below:

    a. Install joint sealants in 5-feet joint lengths using same materials and methods for joint preparation and joint sealant installation required for completed Work. Allow sealants to cure fully before testing.
    b. Make knife cuts horizontally from one side of joint to the other followed by 2 vertical cuts approximately 2 inches long at side of joint and meeting horizontal cut at top of 2-inch cuts. Place a mark 1 inch from top of 2-inch piece.
    c. Use fingers to grasp 2-inch piece of sealant just above 1-inch mark; pull firmly down at a 90-degree angle or more while holding a ruler alongside of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.

6. Report whether or not sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
7. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 degrees F.
3. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 WARRANTY

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

B. Special Installer’s Warranty: Manufacturer’s standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within the specified warranty period.

1. Warranty Period: Two (2) years from date of Substantial Completion.

C. Special Manufacturer’s Warranty: Manufacturer’s standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Products: Provide the following products for each application listed. Substitutions for exterior building joint sealants shall be listed on the Validated Products list published by the Sealant, Waterproofing, and Restoration Institute (SWRI).

1. One-Part Silicone Sealant: For precast concrete, poured-in-place concrete, and concrete-to-concrete and concrete-to-masonry; one-part silicone sealant, having a joint movement capability of plus-or-minus 100% elongation, minus 50% compression, and Shore A durometer hardness of 15.

a. Product and Manufacturer: Provide one of the following.

1) Dow Corning 790 Silicone Building Sealant; Dow Corning Corp.
2) General Electric Co. Silpruf SCS-9000 NB
3) Pecora 890 FTS Silicone.

b. Warranty: Manufacturer's standard 20-year warranty.

2. One-Part Silicone Sealant: For masonry-to-aluminum, steel-to-aluminum, concrete-to-aluminum, steel-to-steel, and other metal-to-metal joints (including KYNAR coatings); one-part silicone sealant having a joint movement capability of plus-or-minus 50% elongation, and Shore A durometer hardness of 30.

    a. Products and Manufacturers: Provide one of the following.

        1) Dow Corning 795 Silicone Building Sealant; Dow Corning Corp.
        2) Silpruf SCS 2000; General Electric Co.

    b. Warranty: Manufacturer's extended 20-year warranty.

3. Two-Part, Pourable Urethane Sealant: For horizontal joints, exterior and interior; provide joint sealant with a joint movement capability of plus-or-minus 25%.

    a. Products and Manufacturers: Provide one of the following.

        1) Vulkem 245; Tremco, Inc.
        2) NR200 Urexpan; Pecora Corp.
        3) Sikaflex 2c SL; Sika Corp.
        4) THC-900; Tremco, Inc.

    b. Warranty: Manufacturer's extended 5-year warranty.

4. Two-Part Urethane Non-Sag Sealant: For general interior use; provide joint sealant with a joint movement capability of plus-or-minus 50%.

    a. Products and Manufacturers: Provide one of the following.

        1) Vulkem 922; Tremco, Inc.
        2) Dynatrol II; Pecora Corp.
        3) Sikaflex 2c NS; Sika Corp.
        4) NP II; Sonneborne Building Products Division, ChemRex, Inc.

    b. Warranty: Manufacturer's extended 5-year warranty.

5. One-Part Silicone - Sanitary Sealant: For Interior use at plumbing fixtures in toilets and janitor closets, and horizontal and vertical joints of dissimilar materials in toilets and other wet areas.

    a. Products and Manufacturers: Provide one of the following.

        1) Dow Corning 786 Silicone Mildew Resistant Sealant; Dow Corning Corp.
        2) SCS1700 Sanitary; General Electric Co.
        3) Pecora 898 Silicone Mildew Resistant Silicone Sealant; Pecora Corp.
        4) Tremsil 200; Tremco, Inc.

    b. Warranty: Manufacturer's extended 3-year warranty.

6. One-Part Latex Sealant: For interior use for horizontal and vertical joints around door frames, and joints between dissimilar materials.

    a. Products and Manufacturers: Provide one of the following.

        1) AC-2 + Silicone; Pecora Corp.
        2) Sonolac; Sonneborn Building Products Div., ChemRex, Inc.
        3) Tremflex 834; Tremco, Inc.

    b. Warranty: Manufacturer's standard warranty.

7. Joint Sealant - Acoustic Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

    a. Product and Manufacturer: Provide the following.

        1) Pecora Corporation; AC-20 FTR.
        2) USG Corporation; SHEETROCK Acoustical Sealant.
        3) Owens Corning, Quiet Zone Acoustical Selaant.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range for this characteristic.

2.3 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Backer Rod (Joint Fillers, Compressible Filler): Type B, ASTM C 1330, preformed, cylindrical, flexible, compressible, resilient, non-staining, bi-cellular material, with a density of 24-48 km/m3 per ASTM D1622, tensile strength greater than 200 kPa per ASTM D 1623, and water absorption less than 0.1 g/cc per ASTM C 1016.

    1. Product and Manufacturer - Basis of Design: Sof Rod; Nomaco, Inc., Zebulon, NC or equal.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

D. Premolded Joint Filler: Neoprene sponge rubber; ASTM D 1752 Type 1

1. Product and Manufacturer – Basis of Design: Sponge Rubber Expansion Joint Material; Masco Masons Supply.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates, unless otherwise recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience.

1. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

1. Install sealants by proven techniques and at the same time backings are installed.
2. Place sealants so they directly contact and fully wet joint substrates.
3. Completely fill recesses provided for each joint configuration.
4. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

B. Backing Materials: Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

C. Bond-Breaker Tape: Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.

D. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 07 92 00

Division 08
Openings

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Steel doors.
2. Steel door frames.

1.3 SUBMITTALS

A. Product Approval Certification: Submit current Product Approval certification indicating compliance with the Florida Building Code and FAC 9N-3 for all exterior steel doors and frames.

B. Product Data:

1. Include construction details, material descriptions, core descriptions, and finishes for each type of steel door and frame specified.

C. Structural Performance:

1. Provide schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
2. Shop drawings for exterior door assemblies shall be signed and sealed by a licensed engineer registered in the State of Florida.
3. Calculations for wind load design for exterior door assemblies shall be stamped, sealed and signed by a Professional Engineer in the State of Florida verifying compliance with ASCE/SEI 7-02.

D. Shop Drawings: SDI-106 Recommended Standard Door Type Nomenclature and SD-111 Recommended Standard Details for Steel Doors & Frames shall be used as a guide in the development of Schedules and Shop Drawings.

1. Show the following:

a. Elevations of each door design.
b. Indicate location, size, door and frame types, rating and hand of each door.
c. Indicate door construction, details and methods of assembling sections, hardware locations, anchorage & fastening methods and finish requirements.
d. Include anchoring details engineered to meet wind load requirements to comply with the Code.
e. Utilize same designation as Architect’s door mark.

E. Door Schedule: Use same reference designations indicated on Drawings in preparing schedule for doors and frames.

F. Samples:

1. Submit sample of typical mitered, welded door frame corner for quality verification.
2. Samples shall be specifically required for non-specified manufacturer’s products submitted as a Substitution.

G. Product Certificates: Product certificates shall be required by manufacturers of non-named products certifying that each product furnished meets the Specifications and with individual project requirements for the purpose intended. Certificates shall be submitted with Shop Drawings.

1.4 QUALITY ASSURANCE

A. Contractor Qualifications: Employ only experienced Contractors (Installers) skilled in the successful installation of the specified materials and assemblies on similar projects for a minimum of five years. Installers shall be state-certified or licensed Sub-Contractors, or locally registered Sub-Contractors in Orange County, Florida.

B. Source Limitations: Obtain steel doors and frames through one source from a single manufacturer.

C. Steel Door and Frame Standard: Comply with requirements contained in SDI 100 Recommended Specifications for Standard Steel Doors and Frames unless more stringent requirements are indicated.

D. Preparation/Field Verification

1. Verify doorframes are in proper location and have been properly anchored in accordance with Specifications and SDI 105 Recommended Erection Instruction for Steel Frames.
2. Verify that frames comply with indicated requirements for type, size, location and swing characteristics. Verify that frames have been installed with plumb jambs and level heads.
3. Verify that Shop Drawings have been successfully submitted, reviewed and returned.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage.

B. Doors shall be individually wrapped, protected and packaged as standard of manufacturer.

C. Each door shall be marked on top and bottom rail with same opening number used on Shop Drawings.

D. Inspect doors and frames on delivery for damage, and notify shipper and supplier if damage is found. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect. Remove and replace damaged items that cannot be repaired as directed.

E. Store doors and frames at building site under cover. Place units on minimum 4-inch- high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. If door packaging becomes wet, remove cartons immediately. Provide minimum 1/4-inch spaces between stacked doors to permit air circulation.

1.6 WARRANTY

A. Project Warranty shall be as stated in Division 1 of the Specifications.

B. Unless otherwise stated, duration of all warranties shall begin on the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Amweld Building Products, Inc.
2. Architectural Openings, Inc.
3. Ceco Door Products; an ASSA ABLOY Group Company.
4. CURRIES Company; an ASSA ABLOY Group Company.
5. Pioneer Industries, Inc.
6. Quality Engineered Products Co., Inc.
7. Republic Builders Products Company.
8. Steelcraft; an Ingersoll-Rand Company.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 (ZF180) zinc-iron-alloy (galvannealed) coating designation.

D. Supports and Anchors: After fabricating, galvanize units to be built into exterior walls according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Provide items to be built into exterior walls, hot-dip galvanized according to ASTM A 153/A 153M.

F. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 DOORS

A. General: Provide doors of sizes, thickness, and designs indicated.

B. Interior Doors: Face sheets fabricated from cold-rolled steel sheet. Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:

1. Minimum SDI Level and Physical Performance: Level 2 and Physical Performance Level B (Heavy Duty), Model 1 (Full Flush).
2. Minimum SDI Level and Physical Performance: Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 1 (Full Flush).

C. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:

1. SDI Level III, Physical Performance Level A (Extra Heavy-Duty), Model 1 (Full Flush).
2. Face sheets shall be not less than 16 gauge (0.053 in) hot-dipped galvannealed steel sheets conforming to ASTM A653/A653M, Commercial Steel (CS), Type B; with minimum A40 (ZF120) coating designation.
3. Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.

2.4 FRAMES

A. General: Provide steel frames for doors, transoms, sidelights, borrowed lights, and other openings that comply with ANSI A250.8 and with details indicated for type and profile. Conceal fastenings, unless otherwise indicated.

B. Exterior Frames: Fabricated from metallic-coated steel sheet.

1. Fabricate frames with mitered or coped and full back welded corners.
2. Frames for Level 3 Steel Doors: 14 ga., 0.067-inch-thick steel sheet, 14 ga., 0.067-inch for frames over 48 inches wide, unless otherwise indicated.

C. Interior Frames: Fabricated from cold-rolled steel sheet, unless otherwise indicated to comply with exterior frame requirements.

1. Fabricate frames with mitered or coped and full back welded corners.
2. Frames for Level 2 and Level 3 Steel Doors: 16 ga., 0.053-inch-thick steel sheet, 16 ga., 0.053 inch for frames over 48 inches wide, unless otherwise indicated.
3. Frames for Wood Doors: 16 ga., 0.053-inch-thick steel sheet, 16 ga., 0.053 inch for frames over 48 inches wide, unless otherwise indicated.
4. Frames for Borrowed Lights: 16 ga., 0.053-inch-thick steel sheet, 16 ga., 0.053 inch for frames over 40 inches wide, unless otherwise indicated.

D. Door Silencers: Except on weather-stripped frames, fabricate stops to receive three silencers on strike jambs of single-door frames and two silencers on heads of double-door frames.

E. Plaster Guards: Formed from same material as frames, not less than 0.016-inch (0.4-mm) thick.

F. Supports and Anchors: Fabricated from not less than 0.042-inch- thick, electrolytic zinc-coated or metallic-coated steel sheet.

1. Wall Anchors in Masonry Construction: 0.177-inch- diameter, steel wire complying with ASTM A 510 may be used in place of steel sheet.

G. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where zinc-coated items are to be built into exterior walls, comply with ASTM A 153/A 153M, Class C or D as applicable.

2.5 ACCESSORIES

A. Grilles: Provide sightproof grilles for interior doors, where indicated, which comply with SDI 111C, with blades or baffles formed of 0.020-inch- thick, cold-rolled steel sheet set into 0.032-inch- thick steel frame.

1. Performance:

a. Total core area greater than or equal to 1.5 square feet each
b. Negative static pressure not to exceed .039” for each grille.
c. Core Velocity not to exceed 200 FPM
d. NC rating not to exceed 16.

2.6 FABRICATION

A. General: Fabricate steel door and frame units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site.

B. Exterior Door Construction: For exterior locations and elsewhere as indicated, fabricate doors, panels, and frames from metallic-coated/galvanized steel sheet. Close top and bottom edges of doors flush as an integral part of door construction or by addition of 0.053-inch- thick, metallic-coated steel channels with channel webs placed even with top and bottom edges.

1. Face sheets shall be 16 gauge (0.053 in) hot-dipped galvanized steel sheets conforming to ASTM A591, Commercial Steel (CS) Class B coating, mill phosphatized.

C. Interior Door Faces: Fabricate exposed faces of doors, including stiles and rails of nonflush units, from the following material:

1. Face sheets shall be 18 gauge (0.042 in) cold-rolled steel sheets conforming to ASTM A366, Commercial Steel (CS) or ASTM A620, Drawing Steel (DS), Type B.

D. Construction: Steel stiffened, insulated.

1. Insulation: Manufacturer’s standard for applications indicated.

E. Clearances for Doors: Not more than 1/8 inch at jambs and heads, except not more than 1/4 inch between pairs of doors. Not more than 3/4 inch at bottom.

F. Single Acting, Door-Edge Profile: Beveled edge.

G. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."

H. Fabricate concealed stiffeners, reinforcement, edge channels, and moldings from either cold- or hot-rolled steel sheet.

I. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

J. Frame Construction: Fabricate frames to shape shown.

1. Frames shall be welded construction type and have mitered or butted corners with welded and finished frame faces (seamless). The remaining elements of the frame profile, i.e., rabbet, shall not be continuously welded.
2. Frames for exterior use shall have mitered or coped corners, and be full continuous back-welded with finished frame faces (seamless).
3. Weld joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
4. Headers and jambs shall be secured at corners either by external welding with seamless face joints.
5. Frames shall be provided with temporary spreader bars for shipping and handling purposes.
6. Frames for exterior use shall be hot-dipped galvanized steel after fabrication.
7. Frames for paired doors shall be furnished with a removable center mullion, where indicated.

8. Mullions and transom bars shall be joined to adjacent members by welding so as to maintain alignment of parts and assure performance of completed frames. Face joints shall be welded and ground smooth (seamless).
9. Provide closed tubular members with no visible face seams or joints; fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
10. Frames shall be provided with a minimum of three anchors per jamb suitable for the adjoining wall construction. Anchors shall be minimum 18-gauge steel or 7-gauge wire. Frames over 7’-6” shall be provided with additional wall anchors as required.
11. In addition, frames shall be provided with minimum 18-gauge base anchor. For existing masonry wall conditions that will not accept base anchor, an additional jamb anchor shall be provided.
12. Frames shall be furnished in manufacturer’s standard factory-applied coat of rust-inhibiting primer complying with ANSI A250.10 for acceptance criteria.
13. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners.
14. Weld plaster guards to frame at back of hardware mortises in frames installed in concrete or masonry.
15. Where installed in masonry, leave vertical mullions in frames open at top for grouting.
16. Weld jamb anchors to bottom of jambs and mullions with at least four spot welds per anchor.

K. Hardware Preparation: Factory prepare standard steel doors and frames to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping, according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Reinforce doors and frames to receive non-templated mortised and surface-mounted door hardware.

    a. Installation of surface mounted hardware with either through-bolts (TB) or sex-nuts and bolts (SNB) does not relieve the manufacturer of this requirement.

2. Comply with applicable requirements in ANSI A250.6 and ANSI/DHI A115 Series specifications for door and frame preparation for hardware. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.
3. Doors shall be reinforced for specified surface-mounted hardware. Drilling and tapping may be completed at the job site by the installers.

L. Supports and Anchors: Fabricated from electrolytic zinc-coated or metallic-coated steel sheet.

M. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
3. Post installed Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

N. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (50-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.7 FINISHES

A. Metallic-Coated Steel Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint to comply with ASTM A 780.

B. Steel Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning"; remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel; comply with SSPC-SP 3, "Power Tool Cleaning," or SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

C. Factory Priming for Field-Painted Finish: Apply shop primer specified below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mils.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.

PART 3 - EXECUTION

3.1 INSTALLATION ENVIRONMENTAL CONDITIONS:

A. Doors shall not be delivered or installed until building is enclosed, wet work completed and HVAC system is operating and maintaining temperature and humidity at occupancy level during remainder of construction period.

3.2 INSTALLATION

A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.

B. Placing Frames: Frames shall be installed plumb, level, rigid and in true alignment as recommended in SDI 105 and ANSI/DHI A115.IG.

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
2. Brace frames intended for construction in masonry walls that will prevent the pressure of the grout from deforming the frame members.
3. Grout shall be mixed to attain a 4-inch slump and hand-toweled into place. Grout mixed to a thinner, “pump-able” consistency shall not be used as the excess water causes premature rusting of frames.
4. Place frames before construction of enclosing walls and ceilings.
5. In masonry construction, provide at least three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
6. In metal-stud partitions, provide at least three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Attach wall anchors to studs with screws.
7. For openings 90 inches or more in height, install an additional anchor at hinge and strike jambs.

C. Door Installation: Comply with ANSI A250.8. Fit hollow-metal doors accurately in frames, within clearances specified in ANSI A250.8.

1. Doors shall be installed and fastened to maintain alignment with frames to achieve maximum operational effectiveness and appearance.
2. Doors shall be adjusted to maintain perimeter clearances specified.
3. Shimming shall be as indicated in ANSI/DHI A115.IG and SDI-122.

D. Door Grilles Installation: Install in accordance with door manufacturer’s instructions and recommendations.

3.3 PROTECTION DURING CONSTRUCTION

A. Steel doors shall be protected at all times during construction. After installation, take appropriate measures to protect doors from abuse.

B. Replace doors and frames that are damaged or do not comply with requirements. Doors and frames may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

3.4 ADJUSTING AND CLEANING

A. Prime-Coat Touchup: Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of compatible air-drying primer.

END OF SECTION 08 11 13

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SECTION 08 31 13 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following types of access doors:

1. Ceiling access doors.

1.3 SUBMITTALS

A. Product Data: For each type of access door assembly specified, including details of construction relative to materials, individual components, profiles, and finishes.

1. Include complete schedule, including types, general locations, sizes, wall and ceiling construction details, latching or locking provisions, and other data pertinent to installation.

B. Shop Drawings: Showing fabrication and installation of access doors and frames, including details of each frame type, elevations of door design types, anchorage, and accessory items.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain access doors for entire Project from one source and by a single manufacturer.

B. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.

1.5 COORDINATION

A. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed equipment, and indicate on schedule specified under "Submittals" Article.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Access Doors:

a. J.L. Industries.
b. Karp Associates, Inc.
c. Larsen's Manufacturing Co.
d. Milcor, Inc.
e. Nystrom, Inc.

2.2 MATERIALS

A. Steel Sheet: ASTM A 366 commercial-quality, cold-rolled steel sheet with baked-on, rust-inhibitive primer.

2.3 ACCESS DOORS

A. Flush Access Doors with Exposed Flanges:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Karp Associates, Inc.
b. Larsens Manufacturing Company.
c. MIFAB, Inc.
d. Milcor; Commercial Products Group of Hart & Cooley, Inc.
e. Nystrom, Inc.

2. Locations: Ceiling.
3. Door Size: As Indicated.
4. Uncoated Steel Sheet for Door: Nominal 0.060 inch, 16 gage, factory primed.
5. Frame Material: Same material, thickness, and finish as door.
6. Latches: Bolt type, operated by either a ring turn or flush key device (keyed alike).
7. Hinge: Continuous type.

2.4 FABRICATION

A. General: Manufacture each access door assembly as an integral unit ready for installation.

B. Steel Access Doors and Frames: Continuous welded construction. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.

1. Exposed Flange: Nominal 1 to 1-1/2 inches wide around perimeter of frame.
2. For gypsum board assemblies or gypsum veneer plaster, furnish frames with edge trim for gypsum board or gypsum base.

C. Locking Devices: Furnish number required to hold door in flush, smooth plane when closed.

1. For cylinder lock, furnish 2 keys per lock and key all locks alike.

PART 3 - EXECUTION

3.1 PREPARATION

A. Advise Installers of other work about specific requirements relating to access door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices. Furnish inserts and anchoring devices for access doors that must be built into other construction. Coordinate delivery with other work to avoid delay.

3.2 INSTALLATION

A. General: Comply with manufacturer's instructions for installing access doors.

1. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finished surfaces.
2. Install concealed-frame access doors flush with adjacent finish surfaces.
3. Paint exposed surface of access doors and frames to match adjacent surface finish.

3.3 ADJUST AND CLEAN

A. Adjust hardware and panels after installation for proper operation.

B. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.

END OF SECTION 08 31 13

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SECTION 08 33 13 - COILING COUNTER DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Counter doors.

1.3 SUBMITTALS

A. Product Data: For each type and size of coiling counter door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
2. Include description of automatic closing device and testing and resetting instructions.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. Show locations of, locking devices, and other accessories.
5. Provide schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings and Schedules.
6. Shop Drawings: Signed and sealed by a Professional Structural Engineer licensed in the State of Florida.

C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.

1. Include similar Samples of accessories involving color selection.

D. Samples for Verification: For each type of exposed finish on the following components, in manufacturer's standard sizes:

1. Curtain slats.
2. Bottom bar.
3. Guides.
4. Brackets.
5. Hood.
6. Locking device(s).
7. Include similar Samples of accessories involving color selection.

E. Qualification Data: For Installer.

F. Provide Florida Certificate of Product Approval pursuant to Rule 9B-72.090, F.A.C. for statewide product approval or product approval documentation from local authority or building official having jurisdiction pursuant to Rule 9B-72.050, F.A.C.

1. Provide letter verifying the products use is consistent with the approved evaluation and limitations of use established by the approved product evaluation as required by the design specifications.

G. Engineering Responsibility – Exterior Doors: Prepare engineering data for exterior coiling doors, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project as prepared by a professional engineer.

H. Warranty: Submit warranties as specified herein.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Capable of assuming engineering responsibility and performing Work of this Section and who is acceptable to manufacturer.

1.5 WARRANTY

A. Manufacturer’s Warranty: Provide manufacturer’s warranty for indicated warranty period against defects in workmanship and materials.

1. Warranty Period: Not less than one (1) year from the Date of Substantial Completion

PART 2 - PRODUCTS

2.1 COUNTER DOOR ASSEMBLY

A. Basis-of-Design Product: Subject to compliance with requirements, provide Cookson Company; ESC-10 or a comparable product by one of the following:

1. Clopay Building Products.
2. Cornell Iron Works, Inc.
3. Overhead Door Corporation.

B. Operation Cycles: Door components and operators capable of operating for not less than 50,000. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.

C. Curtain R-Value: 4.5 deg F x h x sq. ft./Btu.

D. Door Curtain Material: Steel.

E. Slats: No. 10, interlocked flat-faced slats, 1-1/4 inches high by 3/8 inch deep, 22 gauge ASTM A 653, Commercial Quality, galvanized steel with a bottom bar constructed of tubular extruded aluminum measuring 1-5/16” deep by 2-1/4” high.

F. Curtain Jamb Guides: Aluminum with exposed finish matching curtain slats. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.

G. Hood: Match curtain material and finish.

1. Shape: As Indicated.
2. Mounting: As shown on Drawings.

H. Sill Configuration: As Indicated.

I. Manual Door Operator: Manufacturer's standard crank operator

J. Coating System to include an ASTM A 653 galvanized base coating, bonderized coating for prime coat adhesion, and factory applied thermosetting powder coating applied with a minimum thickness of 2.5 mils. The color shall be selected by the architect and shall be chosen from standard color chart.

2.2 LOCKING

A. Locking: Equip doors for locking with slide bolts operable from coil side.

2.3 MANUAL DOOR OPERATORS

A. Crank Operator: Consisting of crank and crank gearbox, steel crank drive shaft, and gear-reduction unit, of type indicated. Size gears to require not more than 25-lbf force to turn crank. Fabricate gearbox to be oil tight and to completely enclose operating mechanism. Provide manufacturer's standard crank-locking device.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install coiling counter doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Install coiling counter doors, and hoods, at the mounting locations indicated for each door.

3.3 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Perform installation and startup checks according to manufacturer's written instructions.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

C. Adjust seals to provide tight fit around entire perimeter.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain coiling counter doors.

END OF SECTION 08 33 13

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Mechanical door hardware for the following:

    a. Swinging doors.
    b. Sliding doors.
    c. Folding doors.

2. Cylinders for door hardware specified in other Sections.
3. Electrified door hardware.

B. Related Requirements:

1. Section 081113 "Hollow Metal Doors and Frames" for astragals provided as part of labeled fire-rated assemblies and for door silencers provided as part of hollow-metal frames.
2. Section 081213 "Hollow Metal Frames" for door silencers provided as part of hollow-metal frames.
3. Section 081416 "Flush Wood Doors" for astragals and integral intumescent seals provided as part of labeled fire-rated assemblies.
4. Section 083323 "Overhead Coiling Doors" for door hardware provided as part of overhead coiling door assemblies.
5. Section 084113 "Aluminum-Framed Entrances and Storefronts" for entrance door hardware, **including** cylinders.
6. Section 084126 "All-Glass Entrances and Storefronts" for entrance door hardware, **including** cylinders.
7. Section 087113 "Automatic Door Operators" for low-energy power operators and low-energy power-assist operators.
8. Section 281300 "Access Control" for access control devices installed at door openings and provided as part of a security system.
9. Section 283112 "Zoned (DC Loop) Fire-Alarm System" for connections to building fire-alarm system.

1.3 COORDINATION

A. Floor-Recessed Door Hardware: Coordinate layout and installation with floor construction.

1. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at project site.

1. Conference participants shall include Installer's Architectural Hardware Consultant and Owner's security consultant.

B. Keying Conference: Conduct conference at project site.

1. Conference participants shall include Installer's Architectural Hardware Consultant.
2. Incorporate conference decisions into keying schedule after reviewing door hardware keying system including, but not limited to, the following:

a. Flow of traffic and degree of security required.
b. Preliminary key system schematic diagram.
c. Requirements for key control system.
d. Requirements for access control.
e. Address for delivery of keys.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For electrified door hardware.

1. Include diagrams for power, signal, and control wiring.
2. Include details of interface of electrified door hardware and building safety and security systems.

C. Samples: For each exposed product in each finish specified, in manufacturer's standard size.

1. Tag Samples with full product description to coordinate Samples with door hardware schedule.

D. Samples for Initial Selection: For each type of exposed finish.

E. Samples for Verification: For each type of exposed product, in each finish specified.

1. Sample Size: Full-size units or minimum 2-by-4-inch Samples for sheet and 4-inch long Samples for other products.

a. Full-size Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.

2. Tag Samples with full product description to coordinate Samples with door hardware schedule.

F. Door Hardware Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant. Coordinate door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
2. Format: Use same scheduling sequence and format and use same door numbers as in door hardware schedule in the Contract Documents.
3. Content: Include the following information:

a. Identification number, location, hand, fire rating, size, and material of each door and frame.
b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
d. Description of electrified door hardware sequences of operation and interfaces with other building control systems.
e. Fastenings and other installation information.
f. Explanation of abbreviations, symbols, and designations contained in door hardware schedule.
g. Mounting locations for door hardware.
h. List of related door devices specified in other Sections for each door and frame.

G. Keying Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Architectural Hardware Consultant.

B. Product Certificates: For each type of electrified door hardware.

1. Certify that door hardware for use on each type and size of labeled fire-rated doors complies with listed fire-rated door assemblies.

C. Product Test Reports: For compliance with accessibility requirements, for tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

D. Field quality-control reports.

E. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals.

B. Schedules: Final door hardware and keying schedule.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Door Hardware
2. Electrical Parts

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.
2. Scheduling Responsibility: Preparation of door hardware and keying schedule.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

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

1.10 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

D. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of doors and door hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three years from date of Substantial Completion unless otherwise indicated below:

a. Electromagnetic and Delayed-Egress Locks: Five years from date of Substantial Completion.
b. Exit Devices: Two years from date of Substantial Completion.
c. Manual Closers: 10 years from date of Substantial Completion.
d. Concealed Floor Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of door hardware from single manufacturer.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

B. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that complies with requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.

C. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the DOJ's "2010 ADA Standards for Accessible Design"

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:

a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
b. Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
4. Adjust door closer sweep periods so that, from an open position of 90 degrees, the door will take at least 5 seconds to move to a position of 12 degrees from the latch.
5. Adjust spring hinges so that, from an open position of 70 degrees, the door will take at least 1.5 seconds to move to the closed position.

2.3 SCHEDULED DOOR HARDWARE

A. Provide products for each door that comply with requirements indicated in Part 2 and door hardware schedule.

1. Door hardware is scheduled in Part 3.

B. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.

C. Standard Lock Cylinders: BHMA A156.5; Grade 1 permanent cores; face finished to match lockset.

1. Core Type: Interchangeable core.

D. High-Security Lock Cylinders: BHMA A156.30; Grade 1 permanent cores that are removable; face finished to match lockset.

E. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.

F. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.4 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock.

1. No Master Key System: Only change keys operate cylinders.

a. Provide three cylinder change keys.

2. Master Key System: Change keys and a master key operate cylinders.

   a. Provide three cylinder change keys and five master keys.

3. Grand Master Key System: Change keys, a master key, and a grand master key operate cylinders.

   a. Provide three cylinder change keys and five each of master and grand master keys.

4. Great-Grand Master Key System: Change keys, a master key, a grand master key, and a great-grand master key operate cylinders.

   a. Provide three cylinder change keys and five each of master, grand master, and great-grand master keys.

5. Existing System:

   a. Master key or grand master key locks to Owner's existing system.
   b. Re-key Owner's existing master key system into new keying system.

6. Keyed Alike: Key all cylinders to same change key.

B. Keys: Nickel silver.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

   a. Notation: "DO NOT DUPLICATE."

2.5 KEY CONTROL SYSTEM

A. Key Control Cabinet: BHMA A156.28; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, two sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of **150** percent of the number of locks.

B.

1. Wall-Mounted Cabinet: Grade 1 cabinet with hinged-panel door equipped with key-holding panels and pin-tumbler cylinder door lock.

C. Key Lock Boxes: Designed for storage of two keys.

D. Key Control System Software: Multiple-index system for recording and reporting key-holder listings, tracking keys and lock and key history, and printing receipts for transactions. Include instruction manual.

2.6 OPERATING TRIM

A. Operating Trim: BHMA A156.6; brass, bronze, or stainless steel unless otherwise indicated.

ACCESSORIES FOR PAIRS OF DOORS

B. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release.

C. Carry-Open Bars: BHMA A156.3; prevent the inactive leaf from opening before the active leaf; provide polished brass or bronze carry-open bars with strike plate for inactive leaves of pairs of doors unless automatic or self-latching bolts are used.

D. Astragals: BHMA A156.22.

2.7 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

2.8 CONCEALED CLOSERS

A. Concealed Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

2.9 CLOSER HOLDER RELEASE DEVICES

A. Closer Holder Release Devices: BHMA A156.15; Grade 1; closer connected with separate or integral releasing and fire- or smoke-detecting devices. Door shall become self-closing on interruption of signal to release device. Automatic release is activated by smoke detection system or loss of power.

2.10 MECHANICAL STOPS AND HOLDERS

A. Wall- and Floor-Mounted Stops: BHMA A156.16.

2.11 ELECTROMAGNETIC STOPS AND HOLDERS

A. Electromagnetic Door Holders: BHMA A156.15, Grade 1; wall-mounted electromagnetic single or floor-mounted electromagnet single unit with strike plate attached to swinging door; coordinated with fire detectors and interface with fire-alarm system for labeled fire-rated door assemblies.

2.12 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.

2.13 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

B. Maximum Air Leakage: When tested according to ASTM E 283 with tested pressure differential of 0.3-inch wg, as follows:

1. Smoke-Rated Gasketing: 0.3 cfm/sq. ft. of door opening.
2. Gasketing on Single Doors: 0.3 cfm/sq. ft. of door opening.
3. Gasketing on Double Doors: 0.50 cfm per foot of door opening.

2.14 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

2.15 SLIDING DOOR HARDWARE

A. Sliding Door Hardware: BHMA A156.14; consisting of complete sets including rails, hangers, supports, bumpers, floor guides, and accessories indicated.

2.16 FOLDING DOOR HARDWARE

A. General: BHMA A156.14; complete sets including overhead rails, hangers, supports, bumpers, floor guides, and accessories indicated.

2.17 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch-thick brass, bronze or stainless steel; with manufacturer's standard machine or self-tapping screw fasteners.

2.18 AUXILIARY DOOR HARDWARE

A. Auxiliary Hardware: BHMA A156.16.

2.19 AUXILIARY ELECTRIFIED DOOR HARDWARE

A. Auxiliary Electrified Door Hardware:

2.20 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rating labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Fire-Rated Applications:

    a. Wood or Machine Screws: For the following:

        1) Hinges mortised to doors or frames**; use threaded-to-the-head wood screws for wood doors and frames**.
        2) Strike plates to frames.
        3) Closers to doors and frames.

    b. Steel Through Bolts: For the following unless door blocking is provided:

        1) Surface hinges to doors.
        2) Closers to doors and frames.
        3) Surface-mounted exit devices.

3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
4. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.21 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance of the Work.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

B. Wood Doors: Comply with door and hardware manufacturers' written instructions.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights **to comply with the following** unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule, but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches.

E. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as directed by Owner.
2. Furnish permanent cores to Owner for installation.

F. Key Control System:

1. Key Control Cabinet: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
2. Key Lock Boxes: Install where indicated or approved by Architect to provide controlled access for fire and medical emergency personnel.
3. Key Control System Software: Set up multiple-index system based on final keying schedule.

G. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect.

1. Configuration: Provide one power supply for each door opening with electrified door hardware.

H. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

I. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

J. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

Do not notch perimeter gasketing to install other surface-applied hardware.

K. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

L. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

2. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 70 degrees and so that closing time complies with accessibility requirements of authorities having jurisdiction.
3. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.

B. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 MAINTENANCE SERVICE

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

B. Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

3.8 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain door hardware.

3.9 DOOR HARDWARE SCHEDULE

Hardware Group No. 01

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	98-L-06	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	GASKETING	188S-BK	S-Bk	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-MSLA-10	A	ZER
1	EA	RAIN DRIP	142A	A	ZER

Hardware Group No. 02

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5 NRP	630	IVE
1	EA	STOREROOM LOCK	LV9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	LOCK GUARD	LG12	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	GASKETING	188S-BK	S-Bk	ZER
1	EA	GASKETING	31AA	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-MSLA-10	A	ZER
1	EA	RAIN DRIP	142A	A	ZER

Hardware Group No. 03

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	LV9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	LOCK GUARD	LG12	630	IVE
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	GASKETING	31AA	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-MSLA-10	A	ZER
1	EA	RAIN DRIP	142A	A	ZER

Hardware Group No. 03A
Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	LV9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	LOCK GUARD	LG12	630	IVE
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	GASKETING	188S-BK	S-Bk	ZER

Hardware Group No. 04

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	LV9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	GASKETING	31AA	AA	ZER

Hardware Group No. 05

Provide each PR door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
6	EA	HINGE	3CB1 4.5 X 4.5 NRP	630	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	STOREROOM LOCK	LV9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	LOCK GUARD	LG12	630	IVE
1	EA	OH STOP	450S	630	GLY
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	GASKETING	31AA	AA	ZER
1	EA	ASTRAGAL	99A	A	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-MSLA-10	A	ZER
1	EA	RAIN DRIP	142A	A	ZER

Hardware Group No. 06

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	3CB1 4.5 X 4.5	630	IVE
1	EA	PRIVACY W/DB & IND	LV9496F 06A L583-363	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP CUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-MSLA-10	A	ZER
1	EA	RAIN DRIP	142A	A	ZER

Hardware Group No. 07

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	630	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 6" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	GASKETING	188S-BK	S-Bk	ZER

Hardware Group No. 08

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5	630	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 6" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP CUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	188S-BK	S-Bk	ZER

Hardware Group No. 09

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HW HINGE	3CB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	CLASSROOM DEAD LOCK	L463F	626	SCH
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 6" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP CUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	GASKETING	188S-BK	S-Bk	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-MSLA-10	A	ZER
1	EA	RAIN DRIP	142A	A	ZER

Hardware Group No. 10 – NOT USED

Hardware Group No. 11- NOT USED

Hardware Group No. 12

Provide each RU door(s) with the following:

HARDWARE BY DOOR MANUFACTURER

END OF SECTION 08 71 00

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SECTION 08 91 19 – FIXED LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Fixed, extruded-aluminum louvers.

1.2 PERFORMANCE REQUIREMENTS

A. General: Louvers shall meet the Florida Building Code requirements.

B. Structural Performance: Provide louvers capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act on vertical projection of louvers.

1. Wind Loads: Refer to the Structural Drawings.

C. Wind Zone: Louver systems shall be tested in accordance with the Code and meet all requirements for compliance.

D. Thermal Movements: Provide louvers that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 degrees F, ambient; 180 degrees F, material surfaces.

E. Air-Performance, Water-Penetration, Air-Leakage, and Wind-Driven Rain Ratings: Provide louvers complying with performance requirements indicated, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

1.3 SUBMITTALS

A. Notice of Acceptance: Submit current Notice of Acceptance indicating compliance with the Florida Building Code, issued by Miami-Dade County Product Control Division by for the following:

1. Louvers.

B. Product Data: For each type of product indicated. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

C. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other Work. Show blade profiles, angles, and spacing.

1. For installed louvers indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Samples for Initial Selection: For units with factory-applied color finishes.

E. Samples for Verification: For each type of metal finish required.

F. Qualification Data: For professional engineer.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain louvers through one source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.2, "Structural Welding Code--Aluminum."
2. AWS D1.3, "Structural Welding Code--Sheet Steel."

C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

D. UL and NEMA Compliance: Provide motors and related components for motor-operated adjustable louvers that are listed and labeled by UL and comply with applicable NEMA standards.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify louver openings by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 LOUVERS

A. Model and Manufacturer – Basis of Design: DC5304; Construction Specialties, Inc.

1. Profiles: As indicated.
2. Louver Depth: As indicated.
3. Finish: High performance organic coating.

B. Other Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Airolite Company (The).
2. Industrial Louvers, Inc.
3. Ruskin Company; Tomkins PLC.

2.2 MATERIALS

A. Aluminum Extrusions: ASTM B 221, alloy 6063-T5 or T-52.

B. Aluminum Sheet: ASTM B 209, alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Aluminum Castings: ASTM B 26/B 26M, alloy 319.

D. Fasteners: Of same basic metal and alloy as fastened metal or 300 Series stainless steel, unless otherwise indicated. Do not use metals that are incompatible with joined materials.

E. Postinstalled Fasteners for Concrete and Masonry: Epoxy.

2.3 FABRICATION, GENERAL

A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

C. Maintain equal louver blade spacing to produce uniform appearance.

D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

E. Include supports, anchorages, and accessories required for complete assembly.

F. Provide mullions fully recessed behind louver blades. Where length of louver exceeds fabrication and handling limitations, fabricate with close-fitting blade splices designed to permit expansion and contraction.

G. Join frame members to each other and to fixed louver blades with fillet welds concealed from view, unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

H. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer, concealed from view, unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

I. Bird Screen Frames: Fabricate with mitered corners to louver sizes indicated.

1. Metal: Same kind and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
2. Finish: Same finish as louver frames to which louver screens are attached.
3. Type: Rewirable frames with a driven spline or insert for securing screen mesh.
4. Fastening: Secure screens to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches on center.

5. Bird Screening:

a. Material: Stainless steel, 1/2-inch- square mesh, 0.047-inch wire.
b. Screen Location for Fixed Louvers: Interior face.
c. Finish: Mill.

J. Flashing: Provide flashing as indicated. Material and finish to match louvers.

2.4 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish louvers after assembly.

2.5 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.

B. High-Performance Organic-Coating Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Fluoropolymer Two-Coat Coating System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.

a. Color: To be selected by the Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Form closely fitted joints with exposed connections accurately located and secured.

D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.

F. Protect nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.

G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 7 Section "Joint Sealants" for sealants applied during louver installation.

H. Install blank-off panels and seal weathertight.

3.4 ADJUSTING AND CLEANING

A. Test operation of adjustable louvers and adjust as needed to produce fully functioning units that comply with requirements.

B. Clean exposed surfaces of louvers that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.

C. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

D. Restore louvers damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 08 91 19

Division 09
Finishes

SECTION 09 21 16 – GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Interior gypsum board.
2. Interior non-load-bearing steel framing systems

1.3 SUBMITTALS

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

1. Studs and Runners: Provide documentation that framing members' certification is according to SFIA's "Code Compliance Certification Program for Cold-Formed Steel Structural and Non-Structural Framing Members”. SFIA's program certifies that studs and runners comply with the IBC, ASTM C 645, AISI S100, and AISI S220. Mechanical properties, coatings, dimensions, and labeling are checked.
2. Manufacturers’ limiting tables indicating products provided.
3. Manufacturer's Certification: Submit manufacturer's certification of product compliance with codes and standards along with product literature and data sheets for specified products.
4. Evaluation Reports: For Metal Framing, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

B. Delegated-Design by Specialty Structural Engineer (SSE) Delegated-Design Submittal: For steel framing, fasteners, accessories and support. The design professional, individual or organization having responsibility for the design of the specialty items. This responsibility shall be in accordance with the state’s statues and regulations governing the professional registration and certification of architects or engineers.

C. Samples: For each type of product and texture indicated.

1.4 STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

PART 2 - PRODUCTS

2.1 INTERIOR GYPSUM BOARD

A. Gypsum Wallboard: ASTM C 1396/C 1396M.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. American Gypsum.
b. Georgia-Pacific Building Products.
c. National Gypsum Company.
d. United States Gypsum Company.

B. Interior Gypsum Board: ASTM C 36C, 5/8-inch thick for walls for system application.

1. Types: Regular and Type X; M&MR; flexible; long edges tapered.

C. Glass-Mat Water-Resistant Gypsum Board: ASTM C1177, of type and thickness indicated below:

1. Type and Thickness: Type “X,” 5/8 inch thick, unless otherwise indicated.
2. Acceptable Products:

a. Dens-Glass Gold manufactured by Georgia Pacific Corp.
b. American Gypsum; 5/8" M-Bloc IR Type X with Mold & Moisture Resistance.
c. Temple-Inland Building Products by Georgia-Pacific; Gypsum Board Water-Resistant Panels.

D. Tile Backer Panels: Glass-mat, water-resistant backing board; ASTM C 1178C 1177M, 1/2 inch minimum thickness.

2.2 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Paper-faced galvanized steel sheet.
2. Shapes: As indicated.

2.3 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475.

B. Joint Tape: ASTM C 475.

1. Interior Gypsum Wallboard: Paper.

C. Joint Compounds for Interior Gypsum Board: Types as recommended by panel manufacturer(s) for applications indicated.

D. Joint Compounds for Impact Resistant Gypsum Wallboard: Types as recommended by panel manufacturer(s) for applications indicated.

2.4 TEXTURE FINISHES:

A. Water-based, job-mixed, aggregated, drying-type texture finish for spray application.

1. Primer: As recommended by textured finish manufacturer.
2. Texture: Light Spatter, with semi-gloss paint finish.

2.5 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

C. Acoustical Sealant: ASTM C 834; ASTM E 90.

1. Exposed and Concealed Joints: ASTM C 834; non-sag, paintable, nonstaining, latex sealant.
2. Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant.

D. Auxiliary Materials: ASTM C 1002 for steel drill screws. Provide auxiliary materials that comply with referenced installation standards and manufacturer’s written recommendations.

2.6 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design steel framing systems.

1. Design framing systems in accordance with American Iron and Steel Institute Publication S220 “North American Specification for the Design of Cold-Formed Steel Framing – Non-Structural Members”, except as otherwise shown or specified.

2. Design loads: As indicated on the Architectural Drawings or 5 PSF minimum as required by the Building Code.
3. Design framing systems to accommodate deflection of primary building structure and construction tolerances and to withstand design loads with a maximum deflection of 1/240 inches and including finish material.

B. Metal Framing: Steel sheet components complying with ASTM C 645 requirements for metal and with ASTM A 653, G40, hot-dip galvanized zinc coating; and with ASTM C 754 for conditions indicated.

1. Deflection Limits: Design framing systems with maximum deflection limits of the wall height under a horizontal load of 5 lbf/sq. ft. and 15 lbf/sq. ft. (for walls supporting cabinets and countertops) as follows:

a. Gypsum Board Assemblies: l/240.
b. Tiled Assemblies: l/360

C. Steel Partitions and Soffit Framing.

1. Steel Studs and Runners: 0.0312 inch minimum base metal thickness; except 0.0538 inch for jamb studs for door and borrowed light framing, depth as indicated.
2. Flat Strap and Backing Plate: 0.0312 inch minimum base metal thickness.
3. Cold-Rolled Channel Bridging: 0.0538-inch minimum base metal thickness, minimum 1/2-inch- wide flange, minimum 1-1/2 inches depth.
4. Clip Angle: 0.068-inch-minimum base metal thickness, minimum 1-1/2 by 1-1/2 inch.
5. Hat-Shaped, Rigid Furring Channels: 0.0312 inch minimum base metal thickness, 1-1/2 inches depth.
6. Z-Shaped Furring: 0.0179 inch minimum base metal thickness, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, depth required to fit insulation thickness indicated, and with slotted or nonslotted web.

D. Steel Suspended Ceiling and Soffit Framing.

1. Carrying Channels: 0.0538 inch (1.37 mm) minimum base metal thickness, a minimum 1/2-inch- (12.7-mm-) wide flange.
2. Furring Members (Cold Rolled Channels): 0.0538-inch (1.37-mm) minimum base metal thickness, with minimum 1/2-inch- (12.7-mm-) wide flange, 3/4 inch (19.1 mm) deep.
3. Furring Members (Steel Studs): 0.0312 inch (0.79 mm) minimum base metal thickness.
4. Furring Members (Hat-Shaped, Rigid Furring Channels): 0.0312 inch (0.79 mm) minimum base metal thickness, 7/8 inch (22.2 mm) deep.
5. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.
6. Hangers, Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch (4.12-mm) diameter.
7. Hangers, Rod: ASTM A 510 (ASTM A 510M), mild carbon steel; ASTM A 153/A 153M, hot-dip galvanized.
8. Hangers, Flat: Commercial-steel sheet, ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized.
9. Hangers, Angle: ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized commercial steel sheet.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

A. General: Comply with ASTM C 840.

B. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

C. Form control joints with space between edges of adjoining gypsum panels.

1. Provide control joints in the following locations:

a. Partitions and Furring:

1) Install control joints in partitions and wall furring runs exceeding 30 feet.
2) Space control joints not more than 30 feet on center.

D. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints in non-rated assemblies between edges and abutting structural surfaces with acoustical sealant.

E. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

3.2 APPLYING INTERIOR GYPSUM BOARD

A. Single-Layer Application:

1. On partitions/walls, apply gypsum panels vertically (parallel to framing) or horizontally (perpendicular to framing), unless otherwise indicated.

a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

2. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.3 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners, unless otherwise indicated.
2. L-Bead: Use where indicated.
3. U-Bead: Use at exposed panel edges, unless otherwise indicated.

3.4 FINISHING INTERIOR GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

1. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

B. Gypsum Board Finish Levels: Finish panels to level 4 according to ASTM C 840.

3.5 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.6 NON-STRUCTURAL METAL FRAMING INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.

B. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.7 INSTALLING FRAMED ASSEMBLIES

A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

B. Install studs so flanges within framing system point in same direction.

1. Space studs 16 inches on center, unless otherwise indicated.

C. Install tracks (runners) at floors and overhead supports.

D. Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations. Install two studs at each jamb.

E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

END OF SECTION 09 21 16

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SECTION 09 26 13 - VENEER PLASTER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide labor, materials, services, and equipment necessary to complete veneer plastering work as shown on the Drawings or schedules and specified herein.

1.3 SUBMITTALS

A. Manufacturer's Data: Submit 2 copies of manufacturer's specifications and installation instructions for each material, and include other data as may be required to show compliance with these specifications. Indicate by transmittal form that a copy of each installation instruction has been distributed to the installer.

B. Manufacturer’s Certification: Submit certification that products meet or exceed specified requirements.

C. Submit two samples, 12 inch x 12 inch of veneer plaster on gypsum backing board indicating typical finish requirements.

D. Mock-up.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver manufactured materials in the original packages, containers, or bundles and bearing the name of the manufacturer and the brand. Except as otherwise specified herein, the mixing, installation, and application of manufactured material shall be in strict accordance with the printed directions of the manufacturer.

B. Protect plaster and associated materials against dampness until used. Store materials off the ground, under cover, and away from sweating walls and other damp surfaces. Protect metal accessories in a manner to prevent rusting. Do not install rusted metal accessories in the Work.

1.5 PROJECT CONDITIONS

A. Maintain a minimum temperature of 55 deg F in spaces to be plastered for at least 7 days before plastering, during plastering, and until plaster has cured. Protect plaster from freezing and from uneven or too rapid drying. Do not apply plaster to surfaces that contain frost. After plaster has set hard, provide and maintain free circulation of air to prevent sweatouts.

1.6 QUALITY ASSURANCE

A. Mockups: Build mockups for each substrate and finish texture indicated for cement plastering, including accessories.

1. Construct mockup, 4 feet long by 24 inches wide, illustrating surface finish and assembly.
2. Locate where directed.
3. Mockup may not remain as part of the work.
4. For interior plasterwork, simulate finished lighting conditions for review of mockups.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. American Gypsum.
2. Georgia-Pacific Building Products.
3. United States Gypsum Company.

B. Two Component Veneer Plaster: ASTM C587; manufacturer's standard products consisting of separate base coat and finish coat materials. Compressive strength, 2500 psi per ASTM C472.

1. Approved Manufacturers for veneer plaster base and finish coats: Basis of Design Kal-Cote: Gold Bond Bldg. Products Div., National Gypsum Co.

a. Thickness: 1/4 inch.
b. Two component system.

2.2 MATERIALS

A. Bond Coat: ASTM C631, vinyl polymer type.

2.3 MIX DESIGN

A. Mix plaster in accordance with ASTM C587 and the manufacturer's instructions.

2.4 ACCESSORIES

A. Reveal: Fry Reglet DRMV25. Painted finish with custom color as selected by the Architect.

PART 3 - EXECUTION

3.1 VENEER PLASTERING

A. Gypsum Veneer Plaster Application Standard: Comply with ASTM C843.

B. Mixing and Application: Machine mix plaster, except for small amounts of work requiring less than one bag of plaster; and apply to substrate either by machine or by hand as required to produce the required texture of finished plastering.

C. Install metal corner beads at external corners of veneer plaster work.

D. Corner Opening Reinforcing: Install glass fiber mesh at 45 degrees at openings in the plane of the plaster surface such as doors and windows. Mesh strips shall be 4 inches wide and a minimum of 9 inches long installed following manufacturer's recommendations.

E. Apply "base coat" and distribute as evenly as possible, smoothing out the variance in the surface of the substrate. The average thickness of the base coat is 1/8 inches thick from the high points of the substrate. Light scratch finish to provide key for finish coat. Allow to dry two hours before applying finish coat. Apply finish coat 1/8 inch average thickness. Trowel finish coat to a smooth, dense finish.

3.2 MOISTURE RETENTION, CURING

A. Dampen previous plaster coats which have dried out before time for applications of next coat. Dampen with water as required for uniform suction. The Contractor is responsible for determining the most effective procedure for cutting and time lapse between application of coats based on climatic and job conditions. Plaster which is cracked or crazed due to improper timing and curing will not be accepted. Remove and replace defective plaster, including plaster base materials, if damaged during removal of defective plaster.

3.3 CLEANING AND PATCHING

A. Provide temporary covering and whatever other provisions are needed to minimize spattering of plaster on other work. Promptly remove plaster from door frames, windows, and other surfaces that are not to be plastered. Repair surfaces which have been stained, marred, or otherwise damaged during the plastering work. When plastering work is completed, remove unused materials, containers, equipment, and plaster debris.

B. Upon completion point up plaster around trim and other work. Cut out and patch defective and damaged plaster, including damaged existing plaster. Patching of plaster shall match adjacent plaster in texture and finish.

END OF SECTION 09 26 13

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SECTION 09 30 00 - TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Tile.
2. Marble thresholds.

1.3 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

1. Level Surfaces: Minimum 0.6.
2. Step Treads: Minimum 0.6.
3. Ramp Surfaces: Minimum 0.8.

1.4 SUBMITTALS

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

B. Shop Drawings: Indicate plans, elevations, sections, details and attachments to other work.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.

a. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of 5 projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Manufacturer Qualifications:

1. A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Preinstallation Conference:

1. Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

D. Comply with: ANSI A108 Series; Tile Council of America Installation Guidelines.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement of ANSI A137.1 for labeling sealed tile packages.

B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

C. Handle tile with temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install specified items until building is enclosed, wet work completed and HVAC system is operating and maintaining temperature and humidity at occupancy level during remainder of construction period.

1.8 EXTRA MATERIALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 2 percent of amount installed for each type, composition, color, pattern, and size indicated.
2. Grout: Furnish quantity of grout equal to 2 percent of amount installed for each type, composition, and color indicated.

PART 2 - PRODUCTS

2.1 Product Performance:

A. Non-Slip Quarry Tile (NSQT): Unglazed, nominal 6” square vitreous clay tile units with water absorption no higher than 3.0 percent these types of floor tiles shall contain supplementary means to provide an extra level of non-slip surface performance. This may be in the form of surface textures or metallic abrasives added to the actual clay material.

B. Ceramic Mosaic Tile (CMT) and Porcelain Mosaic Tile (PMT): Unglazed impervious natural clay or porcelain units no larger than 3” x 3” with a moisture absorption less than 0.5%.

C. Glazed Ceramic Wall Tile (CWT): Nominal 4” x 4” units with a high-gloss or semi-gloss impervious glazed finish fused to a ceramic tile body that may be non-vitreous but with water absorption not exceeding 20%. Furnish Master Grade Certificate signed by both tile manufacturer and Tile Sub-Contractor stating that installed tile meets ANSI and provide manufacturer’s minimum ten-year glaze wear warranty.

D. Cove Base: Provide matching tile sanitary cove base in rest rooms and kitchens and serving areas. Base used in showers may match glazed wall tile.

E. Marble Thresholds: Use at doorways of dissimilar floor materials shall have beveled edges at 1:2 slope, aligning lower edge of bevel with adjacent floor finish. Height of bevel shall not exceed ½” with finish bevel to match face of threshold. Marble thresholds will be uniform, fine-to-medium-grained white stone with gray veining, minimum abrasion resistance of 10-12 per ASTM with honed bottom, ¼” radius on outstanding edges.

F. Marble Sills: Comply with recommendations and requirements of MIA, with a minimum abrasion-hardness value of 10 per ASTM. Provide matched marble from a single quarry for each type, variety, color and quantities required. Minimum thickness shall be ½-inch.

G. Waterproofing Membrane: Use at “thick-set” applications and where floor has minimum slope to drain(s); non-plasticized chlorinated-polyethylene sheet, 40-mil thickness.

2.2 MATERIALS

A. Tile:

1. Products and Manufacturers – Basis of Design: Refer to the Finish Material List on the Drawings.

B. Other Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. American Olean: www.aotile.com
2. Crossville Ceramics Company, LP: www.crossville-ceramics.com
3. Daltile: www.daltile.com
4. Florida Tile Industries, Inc.: www.fltile.com
5. Shaw Commercial Hard Surface: www.shawfloors.com
6. Trinity Tile Group: www.trinitytile.com

C. Accent Tile and Trim Units: Where accent tile or trim units are not indicated, provide tile trim units to match characteristics of adjoining flat tile and to comply with the following requirements:

1. Size: Coordinated with sizes and coursing of adjoining flat tile where applicable.
2. Shapes: As selected by the Architect from manufacturers standard shapes.

2.3 SETTING AND GROUTING MATERIALS

A. Manufacturer: Refer to the Finish Material List on the Drawings.

1. Grout Colors: Refer to the Finish Material List on the Drawings.

B. Other Acceptable Setting and Grout Manufacturers: (Must qualify as a “green” product)

1. Bostik (Hydroment)
2. Custom Building Products.
3. H.B. Fuller Co.
4. Mapei Corporation
5. Merkrete
6. StarQuartz.

C. Tile Systems Schedule:

1. “F” and “W” prefixed numbers refer to system designs designated by Handbook for Ceramic Tile Installation by the Tile Council of North America, Inc.

	Material	Setting Method	Grout
Concession	Non-Slip Quarry Tile (NSQT) Non-Slip Porcelain Tile (NSPT)	Mud Set (slope to drain) F132-02 ANSI A108.1	100% Solids Epoxy ANSI A108.6 ANSI A118.3
Group Toilet Floors (Slab on grade)	Ceramic Floor Tile (CMT) Porcelain Floor Tile (PFT)	Thin Set, ANSI A118.11 F115-02 ANSI A108.5 ANSI 118.11	100% Solids Epoxy ANSI A108.6 ANSI A118.3
Shower Floors (Slab on Grade)	Glazed & Unglazed Ceramic Mosaic Tile (CMT) Porcelain Mosaic Tile (PMT)	Mud Set (slope to drain) F112-02 ANSI A108.11	Latex-Modified Mortar 4000 psi
Shower Walls & Other Select Areas	Glazed Ceramic Wall Tile (CWT) Porcelain Mosaic Tile (PMT)	Thin Set W202, W244 or W245 ANSI A118.7	ANSI A 118.11 ANSI A 118.7

2.4 CRACK ISOLATION MEMBRANE - FLOORS

A. Products and Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1. 9235 Waterproofing Membrane; Laticrete International, Inc.
2. Mapelastic AquaDefense; MAPEI Corporation

2.5 WATERPROOFING MEMBRANE

A. Material: Non-plasticized chlorinated-polyethylene sheet, 40-mil thickness or a LEED 2.2 NC VOC EQ 4.1 <65 g/l VOC Exceeds ANSI 118.10 membrane.

2.6 THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.

1. Provide thresholds with beveled edges at 1:2 slope, aligning lower edge of bevel with adjacent floor finish. Height of bevel shall not exceed ½” with finish bevel to match face of threshold.

B. Marble Thresholds: Marble thresholds will be uniform, fine-to-medium-grained white stone with gray veining, conforming to ASTM C503, minimum abrasion resistance of 10-12 per ASTM C 1353 or ASTM C 241 with honed bottom, ¼” radius on outstanding edges.

2.7 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm; dry; clean; free from oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 series of tile installation standards for installations indicated.
2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust latter in consultation with Architect.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove coatings, including curing compounds, and other substances that contain soap, wax, oil, or silicone and are incompatible with tile-setting materials by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.

B. Provide concrete substrates for tile floors installed with dry-set or latex-portland cement mortars that comply with flatness tolerances specified in referenced ANSI A108 series of tile installation standards for installations indicated.

1. Use trowelable leveling and patching compounds per tile-setting material manufacturer's written instructions to fill cracks, holes, and depressions.
2. Remove protrusions, bumps, and ridges by sanding or grinding.

C. Blending: For tile exhibiting color variations within the ranges selected during Sample submittals, verify that tile has been blended in the factory and packaged so tile units taken from one package show the same range in colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

D. Field-Applied Temporary Protective Coating: Where needed to prevent adhesion or staining of exposed tile surfaces by grout, protect exposed surfaces of tile against adherence of mortar and grout.

E. Crack Isolation Membrane: Use at all tile floor areas where Waterproof Membrane is not installed.

F. Waterproof Membrane: Use at “thick-set” applications and where floor has minimum slope to drain(s).

3.3 FIELD QUALITY CONTROL

A. Installation Environmental Criteria:

1. Do not install specified items until building is enclosed, wet work completed and HVAC system is operating and maintaining temperature and humidity at occupancy level during remainder of construction period.
2. Remove grout residue from tile as soon as possible.
3. Clean haze from tile according to tile and grout manufacturer’s written instructions.
4. Prohibit foot traffic from tiled floors for at least seven days after grouting is completed.
5. Protect installed tile work with Kraft paper or other heavy covering during remaining construction period.

3.4 INSTALLATION, GENERAL

A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 series of tile installation standards in "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

B. NTCA Installation Guidelines: TCA Handbook for Ceramic Tile Installation. Comply with applicable NTCA installation methods for substrates indicated.

C. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are the same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

F. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.
2. Prepare joints and apply sealants to comply with requirements of Division 7 Section "Joint Sealants."

3.5 CRACK ISOLATION MEMBRANE INSTALLATION

A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.

B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

3.6 FLOOR TILE INSTALLATION

A. General: Install tile to comply with NTCA installation methods indicated.

B. Stone Thresholds: Install stone thresholds at locations indicated.

1. Set thresholds in latex-portland cement mortar.

3.7 WALL TILE INSTALLATION

A. General: Install tile to comply with NTCA installation methods indicated.

B. Joint Widths: As indicated or as directed by the Architect.

3.8 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove grout residue from tile as soon as possible.
2. Clean haze from tile according to tile and grout manufacturer’s written instructions.
3. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
4. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to brick and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.

C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure tile is without damage or deterioration at the time of Substantial Completion.

1. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.

2. Prohibit foot and wheel traffic from tiled floors for at least 7 days after grouting is completed.

a. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 09 30 00

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SECTION 09 65 13 -RESILIENT BASE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide labor, materials, and equipment necessary for complete resilient flooring work, including accessories as indicated and as specified herein; including but not limited to, the following:

1. Vinyl coved base

1.3 SUBMITTALS

A. Product Data: Submit technical data on each item specified including certification by tile manufacturer that products supplied for tile installation comply with local regulations controlling use of volatile organic compounds (VOC's).

B. Product Certificates: In lieu of laboratory test reports when permitted by Architect, signed by manufacturer certifying that each product complies with requirements.

C. Samples: Manufacturer's color charts consisting of actual tiles or sections of tiles showing full range of colors and patterns available for each type of resilient floor tile indicated.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility for Floor Tile: Obtain each type, color, and pattern of tile from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

B. Installer’s Qualifications: Employ only authorized representative of resilient flooring manufacturer for installation and maintenance of units required for this Project.

C. Manufacturer’s Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fire Performance Characteristics: Provide resilient floor tile with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Critical Radiant Flux: 0.45 watts per sq. cm or more per ASTM E648.
2. Smoke Density: Less than 450 per ASTM E662.
3. Flame Spread: Less than 75 per ASTM E84.

E. DELIVERY, STORAGE, AND HANDLING

F. Deliver materials to Project site in original manufacturer's unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.

G. Store materials in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F and 90 deg F.

H. Store base on flat surfaces. Move base into spaces where they will be installed at least 48 hours in advance of installation.

1.5 PROJECT CONDITIONS

A. Maintain a minimum temperature of 70 deg F in spaces to receive tiles for at least 48 hours before installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 deg F.

B. Do not install tiles until they are at the same temperature as the space where they are to be installed.

1.6 SEQUENCING AND SCHEDULING

A. Specified items shall not be delivered or installed until building is enclosed, wet work completed and HVAC system is operating and maintaining temperature and humidity at occupancy level during remainder of construction period.

1.7 WARRANTY

A. Manufacturer’s Warranty covering manufacturing defects and installation integrity shall be indicated warranty period. Installation integrity is defined as products installed in accordance with the manufacturer’s installation manual.

1. Warranty Period: Not less than 5 years from Date of Substantial Completion.

B. Installer’s Warranty: Fully guarantee installation of wall base against defects in installation, workmanship and loss of adhesion for indicated warranty period.

1. Warranty Period: Not less than 1 year from Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Vinyl Base - Refer to Finish Sheet.

1. Armstrong Commercial Floors
2. Johnsonite
3. Marley Flexco (USA), Inc.
4. Roppe Corporation
5. Mannington Commercial
6. Nora Rubber Flooring

2.2 RESILIENT BASE

A. Vinyl Cove Base:

1. Comply with ASTM F1861 Standard Specification for Resilient Wall Base.
2. 4 inch high roll stock, 1/8 inch thick, Type TV, vinyl; Group 1, solid (homogeneous); Style B, coved.
3. Provide molded corners 4 inches in height by 4 inches in length each way for external corners.
4. Coiled length straight sections.

B. Patterns and colors shall be as selected by Architect. Refer to the Color Schedule.

2.3 MISCELLANEOUS MATERIALS

A. Adhesive: Water-resistant type as recommended by product manufacturer. Water based adhesives are not allowed.

B. Trowelable Leveling and Patching Compounds. Latex-modified, Portland cement based or blended hydraulic-cement-based formulation or approved by manufacturer for applications indicated, as required to level uneven subfloor conditions

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas where installation of tiles will occur, with Installer present. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's installation specifications to prepare substrates to receive base.

B. Use trowelable leveling and patching compounds per tile manufacturer's directions to fill cracks, holes, and depressions in substrates.

3.3 INSTALLATION

A. Comply with tile manufacturer's installation directions and other requirements indicated that are applicable to each type of tile installation included in Project.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

1. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
2. Install preformed corners before installing straight pieces.

END OF SECTION 09 65 13

SECTION 09 90 00 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation and field painting of the following:

1. Exposed exterior items and surfaces.
2. Exposed interior items and surfaces.
3. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Environmental Standards: Approved products must meet VOC standards of Zero VOC coatings where specified, a maximum amount of VOC's of 150 g/L for all Interior coatings (except WB Epoxy at 245 g/L) and 200 g/L for all Exterior coatings. Exterior Texture Coating for concrete is excluded.

C. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.

1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment, including back flow assembly and valves.

D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Labels: Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.3 SUBMITTALS

A. Product Data: Furnish product data sheets for each item specified. Include block fillers and primers.

1. Material List: Provide an inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

2. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.

B. Samples: Of each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.

1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
2. Provide a list of materials and applications for each coat of each sample. Label each sample for location and application.

C. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

D. Warranties: Submit samples of warranties specified.

1.4 QUALITY ASSURANCE

A. Environmental Standards: Approved products must meet VOC standards of Zero VOC coatings where specified, a maximum amount of VOC's of 150 g/L for all Interior coatings (except WB Epoxy at 245 g/L) and 200 g/L for all Exterior coatings. Exterior Texture Coating for concrete is excluded.

B. Contractor Qualifications: Applicators shall be licensed Sub-Contractors, or locally registered Sub-Contractors in Orange County, Florida, skilled in successful applications of the specified products on comparable projects for a minimum of 5 years.

C. Manufacturer(s) Qualifications: Utilize only manufacturers making the specified products as a regular and current production item.

D. Pre-construction/Conferences:

1. Immediately prior to the start of Work for this Section, the Architect, in concert with the Owner, shall schedule a meeting with the General Contractor, Painting Sub-Contractor and Paint Manufacturer for the purpose of reviewing all elements necessary for the preparation, application and completion of Work. All deficiencies in substrates shall be noted and corrective action taken prior to commencement of Work.
2. Project scheduling, phasing, area access and procedures to be employed shall also be discussed.

E. Sample Finishes: The Architect, in concert with the Owner, will designate sample room(s)/space(s) to receive representative complete finishes of each finish required. When acceptable to the Architect and the Owner in all respects (substrate preparation, surface moisture content, primer/filler application, finish coat application, mil thicknesses, etc.), these spaces will be used as the basis for acceptability for all other similar finishes and spaces.

F. Contractor’s (Applicator) Acceptance:

1. It is assumed that the Painting Sub-Contractor (Applicator) is best qualified to recognize problems with substrates that could lead to coating failure.
2. The Applicator shall certify acceptance of all substrates prior to the application of any material. The certification shall state that the substrate is acceptable and ready for the finish coating application to begin and that the substrates do not exceed the allowable recommended moisture content.
3. Applicators shall not proceed with the Work until the Work is acceptable and certified as such by the Applicator.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 degrees F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 PROJECT CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 degrees F.

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 and 95 degrees F.

C. Do not apply paint in rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.7 COMMISSIONING

A. Closeout Submittals: Submit final copies of manufacturer’s warranties for each product specified.

B. Corrections: The Architect, in concert with the Owner, shall be the sole judge of defective work and the level of acceptability. Depending upon the gloss and texture of a particular surface, it may be necessary for the entire surface (wall exposure, ceiling, rail, trim board, etc.) to be recoated to meet acceptable standards.

C. Contractor’s Statement of Compliance: The Painting Sub-Contractor (Applicator) shall provide certification that the specified materials have been installed in the required number of coats, and that they were applied to the minimum coating thicknesses in accordance with the Contract Documents and the manufacturer’s instructions.

1.8 WARRANTIES

A. Warranty Requirements:

1. Project Warranty: General Project Warranty shall be as stated in Division 01 of the Specifications.
2. Paint Manufacturer’s Warranty: In addition to other warranties, the paint Manufacturer shall provide product warranties standard with the manufacturer of each product specified. Manufacturer shall warrant all exterior paint finishes for labor and materials against cracking and fading for a minimum of ten (10) years.
3. Texture Coating Manufacturer’s Warranty: In addition to other warranties, the texture coating Manufacturer shall warrant the texture coating against cracking and fading for a minimum of ten (10) years.
4. Unless otherwise stated, duration of all warranties shall begin on the date of Substantial Completion.

B. The Paint Manufacturer’s Representative shall inspect the job and provide an approval signature at each painting phase (substrate inspection, primer coat application, first finish coat application, final finish coat application, etc...). A signed document shall be provided at Project Closeout certifying that the Manufacturer accepts the work with assurance that the Contractor has taken all the necessary steps to provide a satisfactory finished product.

1.9 EXTRA MATERIALS

A. Immediately prior to Final Completion, provide the Owner with a voucher to purchase paint at later date instead of getting cans of attic stock that will expire.

B. This stock shall be designated for use by the Owner only, after completion of the Project and shall not be used for repair or touch-up during the warranty period.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Product and Manufacturer – Basis of Design: Refer to the Finish Material List.

B. Other Acceptable Manufacturers:

1. Duron
2. Glidden Professional
3. M. A. Bruder and Sons, Inc. (MAB Paints)
4. Porter Paint Company
5. PPG Industries, Inc. (Pittsburgh Paints)
6. Sherwin-Williams Company

C. Exterior Textured Coatings:

1. Glidden Professional
2. PPG Industries, Inc. (Pittsburgh Paints)
3. Sherwin-Williams Company
4. Textured Coatings of America, Inc. (Tex-Cote)

2.2 ALLOWABLE SUBSTITUTIONS

A. Products other than those named in Acceptable Manufacturers and Specific Products above may be substituted when in conformance with individual requirements stated in Component Characteristics, Division 01 substitution requirements and approved by the Owners Standards and Design.

2.3 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors: Refer to the Finish Materials List.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.

1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation:

1. Prior to starting Work, the Applicator shall certify acceptance of all substrates.
2. Carefully follow the paint manufacturer’s recommendations for minimum surface acceptability and the recommendations of recognized trade associations.
3. In general, substrates shall be dry, clean and slightly rough. Surfaces to be painted shall be free of dirt, oil, release agents, grease, rust, mill scale, efflorescence, laitance and other surface imperfections and contaminants or any substance which may adversely affect the performance of the coating before the application process begins.

4. The paint manufacturer shall assist the Paint Contractor with prearranged site visits during surface preparation or product application phases of the job to assure the quality of the work meets all plans, specifications, or applicable standards. Site Visit Reports are required for all visits to the job by Manufacturer’s representatives. Any deviations to the specifications must be included in the Site Visit Report and sent to the General Contractor and/or CM, Architect and the Owner. With the proper completion of the Site Visit Reports, the likelihood is increased that the manufacturers’ products will be applied in a proper manner, consistent with and in accordance with label and/or data sheet directions and the written specification which may have been established for the job by other than the paint manufacturer. These Site Visit Reports will be furnished free of charge as a courtesy of the paint manufacturer
5. Inspections for pH will be required by paint manufacturer on all masonry and concrete surfaces and will be documented on approved inspection forms on the behalf of the Owner. Acceptable range shall be 8.0 pH to 9.0 pH. Surfaces will be inspected for proper pH levels prior to the application of any primers, sealers or paint coatings. Inspections for DFT and wet film thickness will also be required by paint manufacturer and will be documented on approved inspections forms on the behalf of the Owner. Copies will be given to the Owner and/or Project Manager.
6. Exterior caulks and/or sealants shall not be applied until primers and/or sealers have been properly applied.
7. Painting Contractor shall be responsible to see that all surface rust and mill scale is removed in accordance with the Steel Structures Painting Council. This process should be performed to a minimum of SSPC-SP-2, Hand Tool Cleaning or SSPC-SP-3, Power Tool Cleaning.
8. Sand new wood and metal surfaces to roughen surfaces prior to the application of primer. Glossy and semi-glossy surfaces shall receive similar attention prior to application of finish coat when repainting.
9. Concrete, masonry, stucco, EIFS, plaster and similar surfaces shall be permitted to cure properly for 28 days, minimum, prior to application, unless specifically stated on the product data sheet, no exceptions allowed. Surfaces shall be checked with an electronic moisture meter for maximum allowable moisture content prior to application.
10. Concrete, masonry, stucco, EIFS, plaster and similar surfaces shall be pressure cleaned with minimum 2500 psi, 8”-wide pattern water stream prior to the application of elastomeric systems. Surface shall then be water-bead tested to assure that contaminants have been removed. Note: Surfaces should be allowed to dry a minimum of 48 hours prior to priming or painting.
11. Shellac-based knot sealers shall be used over knots and resinous areas in wood prior to the application of primer.
12. Apply elastomeric patching compound to cracked stucco and concrete surfaces prior to applying elastomeric coating. Application of sealants or exterior caulking to cracked stucco and concrete surfaces is unacceptable.
13. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
14. In general, substrates shall be dry, clean and slightly rough. Surfaces to be painted shall be free of dirt, oil, release agents, grease, rust, mill scale, efflorescence, laitance and other surface imperfections and contaminants or any substance which may adversely affect the performance of the coating before the application process begins.

D. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 COMPATIBILITY

A. Materials shall be applied as one unified system, i.e. surface preparation, primer, second coat and third coat, all compatible products, each dependent upon the other, and as recommended by the coating manufacturer for a particular finish on a particular surface. Likewise, coating materials and equipment shall be compatible in use; finish coats shall be compatible with prime coats; prime coats shall be compatible with the surface to be coated; tools and equipment and the method of application shall be compatible with the coating to be applied.

B. Thinners, if any, shall be only those recommended for that purpose by the manufacturer of the material to be thinned.

C. Coating materials selected for systems for each type of surface shall be the product of a single manufacturer.

3.4 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Environmental Conditions: Adhere to strict conformance of paint manufacturer’s written instructions with regard to temperature, humidity and moisture content requirements.
2. Do not apply finishes over UL door and frame labels.
3. Ensure that exterior caulks and/or sealants have not been applied until primers and/or sealers have been properly applied.
4. Do not apply finishes over UL door and frame labels.
5. Concrete, cement plaster (stucco), EIFS and CMU shall be allowed to cure for a minimum of 28 days prior to the application of any primers, finishes or coatings (including elastomerics). Concrete includes cast-in-place, pre-cast, tilt-wall, composite insulating panels and the like. Ensure that inspections for “Wet Film Thickness” (WFT) and “Dry Film Thickness” (DFT) are completed and approved as per Par. 3.2.E.
6. Topcoats shall not be applied over inadequately cured primers.
7. Apply each coat in the dry film thickness as recommended by the coating manufacturer. Coating thickness is based on the recommended WFT and DFT as listed on product data sheet. Ensure that inspections for pH are completed and approved on all masonry and concrete surfaces prior to application of any primers, sealers or painting coatings.

B. Proper Sequence and Scheduling:

1. Slightly vary the color of succeeding coats.
2. Allow sufficient time between successive coats for proper drying, in accordance to the manufacturer’s written instructions.
3. The number of coats and film thickness required are the same regardless of application method. Coatings shall be solid, continuous and producing pinhole-free surfaces.
4. If undercoats, stains or other conditions show through final coat of paint, at no additional cost to the Owner, apply additional coats until paint film is of uniform finish, color and appearance. Give special attention to ensure that edges, corners, crevices welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
5. Topcoats shall not be applied over inadequately cured primers.

3.5 Repainting Existing Construction

A. Surfaces previously painted with alkyd finish coats shall be primed with a tintable alkyd-based primer intended to bond latex or acrylic topcoats.

B. Surfaces previously painted with a latex or acrylic-based paint generally require no primer.

C. Typically, one finish coat is all that is required for coverage over correctly tinted primers.

D. CLEANING

E. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 INTERIOR PAINTING SYSTEMS

A. Products and Manufacturers:

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
CMU Dry Areas (Where scrub-bing is re-quired) (Epoxy S-G) [Min. Total 12.0 mils DFT] [System I-1]	1st	Concrete Coatings Block Filler 3010-1200 (apply to achieve min. 8.0 mils DFT)	PrepRite Block Filler B25W25 (apply to achieve min. 8.0 mils DFT)	SpeedHide6-15 Block Filler (apply to achieve min.10.0 mils DFT)
	2nd	TRU-GLAZE-WB 4426 Waterborne Epoxy Semi-Gloss (apply to achieve min. 2.0 mils DFT)	Pro Industrial Pre-Catalyzed Water-based Epoxy, Semi-Gloss K46-150 Series (apply to achieve min. 2.0 mils DFT)	PITT-GLAZE 16-510 WB1 Water-Borne Acrylic Epoxy (apply to achieve min. 1.5 mils DFT)
	3rd	TRU-GLAZE-WB 4426 Waterborne Epoxy Semi-Gloss (apply to achieve min. 2.0 mils DFT)	Pro Industrial Pre-Catalyzed Water-based Epoxy, Semi-Gloss K46-150 Series (apply to achieve min. 2.0 mils DFT)	PITT-GLAZE 16-510 WB1 Water-Borne Acrylic Epoxy (apply to achieve min. 1.5 mils DFT)

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
CMU Wet Areas (Toilets, Locker Rooms & Kitchens) (Epoxy Gloss) [Min. Total 12.0 mils DFT] [System I-2]	1st	TRU-GLAZE-WB 4015 Waterproofing Block Filler (apply to achieve min. 8.0 mils DFT)	Heavy Duty Block Filler B42W46 (apply to achieve min. 8.0 mils DFT)	SpeedHide6-15 Block Filler (apply to achieve min.10.0 mils DFT)
	2nd	TRU-GLAZE-WB 4428 Waterborne Epoxy Gloss (apply to achieve min. 2.0 mils DFT)	Water Based Catalyzed Epoxy Gloss B70/B60V15 (apply to achieve min. 2.5 mils DFT)	PITT-GLAZE 16-510 WB1 Water-Borne Acrylic Epoxy (apply to achieve min. 1.5 mils DFT)
	3rd	TRU-GLAZE-WB 4428 Waterborne Epoxy Gloss (apply to achieve min. 2.0 mils DFT)	Water Based Catalyzed Epoxy Gloss B70/B60V15 (apply to achieve min. 2.5 mils DFT)	PITT-GLAZE 16-510 WB1 Water-Borne Acrylic Epoxy (apply to achieve min. 1.5 mils DFT)

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
Concrete Dry Areas (Zero VOC Primer & Latex S-G) [Min. Total 4.8 mils DFT] [System I- 3]	1S	Concrete Coatings Block Filler 3010-1200 (apply to achieve min. 2.0 mils DFT)	Loxon Concrete & Masonry Primer, A24W300 (apply to achieve min. 3.6 mils DFT)	SpeedHide6-15 Block Filler (apply to achieve min.8.0 mils DFT)
	2nd	ULTRA-HIDE No VOC Semi-Gloss 1415 (apply to achieve min. 2.0 mils DFT)	ProMar 200 Zero VOC S/G B30-2600 Series (apply to achieve min. 2.0 mils DFT)	SpeedHide Zero VOC 6-4510XI Semi-Gloss (apply to achieve min. 1.5 mils DFT)
	3rd	ULTRA-HIDE No VOC Semi-Gloss 1415 (apply to achieve min. 2.0 mils DFT)	ProMar 200 Zero VOC S/G B30-2600 Series (apply to achieve min. 2.0 mils DFT)	SpeedHide Zero VOC 6-4510XI Semi-Gloss (apply to achieve min. 1.5 mils DFT)

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
GWB (Epoxy S-G) [Min Total 6.0 mils DFT] [System I-4]	1S	LIFEMASTER No VOC Interior Primer 9116-1200 (apply to achieve min. 2.0 mils DFT	ProMar 200 Zero VOC Interior Primer B28W02600 (apply to achieve min. 2.0 mils DFT)	SpeedHide Zero VOC 6-4900 XI Primer (apply to achieve min. 2.0 mils DFT)
	2nd	TRU-GLAZE-WB 4426 Waterborne Epoxy Semi-Gloss (apply to achieve min. 2.0 mils DFT)	Pro Industrial Pre-Catalyzed Water based Epoxy, Semi-Gloss K46-150 Series (apply to achieve min. 2.0 mils DFT)	PITT-GLAZE 16-510 WB1 Water-Borne Acrylic Epoxy (apply to achieve min. 2.0 mils DFT)
	3rd	TRU-GLAZE-WB 4426 Waterborne Epoxy Semi-Gloss (apply to achieve min. 2.0 mils DFT)	Pro Industrial Pre-Catalyzed Water-based Epoxy, Semi-Gloss K46-150 Series (apply to achieve min. 2.0 mils DFT)	PITT-GLAZE 16-510 WB1 Water-Borne Acrylic Epoxy (apply to achieve min. 2.0 mils DFT)

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
GWB (Latex S-G) [Min. Total 6.0 mils DFT] [System I – 5]	1S	LIFEMASTER No VOC Interior Primer 9116-1200 (apply to achieve min. 2.0 mils DFT)	ProMar 200 Zero VOC Interior Primer B28W02600 (apply to achieve min. 2.0 mils DFT)	SpeedHide Zero VOC 6-4900 XI Primer (apply to achieve min. 2.0 mils DFT)
	2nd	ULTRA-HIDE No VOC Semi-Gloss 1415 (apply to achieve min. 2.0 mils DFT)	ProMar 200 Zero VOC S/G B30-2600 Series (apply to achieve min. 2.0 mils DFT)	SpeedHide Zero VOC 6-4510XI Semi-Gloss (ap-ply to achieve min. 2.0 mils DFT)
	3rd	ULTRA-HIDE No VOC Semi-Gloss 1415 (apply to achieve min. 2.0 mils DFT)	ProMar 200 Zero VOC S/G B30 2600 Series (apply to achieve min. 2.0 mils DFT)	SpeedHide Zero VOC 6-4510XI Semi-Gloss (apply to achieve min. 2.0 mils DFT)

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
CMU (Latex S- G) [Min. Total 12.0 mils DFT] [System I- 6]	1st	Concrete Coatings Block Filler 3010-1200 (apply to achieve min. 8.0 mils DFT)	PrepRite Block Filler B25W25 (apply to achieve min. 8.0 mils DFT)	SpeedHide 6-15 Block Filler (apply to achieve min.10.0 mils DFT
	2nd	ULTRA-HIDE No VOC Semi-Gloss 1415 (apply to achieve min. 2.0 mils DFT)	ProMar 200 Zero VOC S/G B30-2600 Series (apply to achieve min. 2.0 mils DFT)	SpeedHide Zero VOC 6-4510XI Semi-Gloss (apply to achieve min. 1.5 mils DFT)
	3rd	ULTRA-HIDE No VOC Semi-Gloss 1415 (apply to achieve min. 2.0 mils DFT)	ProMar 200 Zero VOC S/G B30 2600 Series (apply to achieve min. 2.0 mils DFT)	SpeedHide Zero VOC 6-4510XI Semi-Gloss (apply to achieve min. 1.5 mils DFT)

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
Ferrous Metal & Galvanized Metal (WB Epoxy Gloss) [Min. Total 6.2 mils DFT] [System I- 7]	1S	Touch-up Shop-Coat Primer or DEVFLEX Acrylic Metal Primer 4020PF (apply to achieve min. 2.2 mils DFT)	Touch-up Shop-Coat Primer or Pro-Cryl Pro-Cry Universal Metal Primer B66-310 (apply to achieve min. 2.2 mils DFT)	Touch-up Shop-Coat Primer or Pitt-Tech Plus 90-712 DTM Primer (apply to achieve min. 2.2 mils DFT)
	2nd	TRU-GLAZE-WB 4428 Waterborne Epoxy Gloss (apply to achieve min. 2.0 mils DFT)	Water Based Catalyzed Epoxy Gloss B70/B60V15 (apply to achieve min. 2.5 mils DFT)	PITT-GLAZE 16-510 WB1 Water-Borne Acrylic Epoxy (apply to achieve min. 2.0 mils DFT)
	3rd	TRU-GLAZE-WB 4428 Waterborne Epoxy Gloss (apply to achieve min. 2.0 mils DFT)	Water Based Catalyzed Epoxy Gloss B70/B60V15 (apply to achieve min. 2.5 mils DFT)	PITT-GLAZE 16-510 WB1 Water-Borne Acrylic Epoxy (apply to achieve min. 2.0 mils DFT)

3.8 Exterior Painting Systems

A. Products and Manufacturers:

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
Aluminum (Industrial Grade S-G) [Min. Total 6.3 mils DFT] [System E-1]	1st	DEVFLEX Acrylic Metal Primer 4020PF (apply to achieve min. 2.2 mils DFT)	Pro Industrial Pro-Cryl Universal Primer, B66-310 Series (apply to achieve min. 2.2 mils DFT)	Pitt-Tech Plus 90-712 DTM Primer (apply to achieve min. 2.0 mils DFT)
	2nd	DEVFLEX High Performance Waterborne Acrylic Enamel, 4216L (apply to achieve min. 2.1 mils DFT)	Pro Industrial High Performance Acrylic, Semi-Gloss B66-650 Series (apply to achieve min. 2.5 mils DFT)	Pitt-Tech Plus 90-1210 Semi Gloss DTM. (apply to achieve min. 2.2 mils DFT)
	3rd	DEVFLEX High Performance Waterborne Acrylic Enamel, 4216L (apply to achieve min. 2.1 mils DFT	Pro Industrial High Performance Acrylic, Semi-Gloss B66-650 Series (apply to achieve min. 2.5 mils DFT)	Pitt-Tech Plus 90-1210 Semi Gloss DTM. (apply to achieve min. 2.2 mils DFT)

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
CMU (Acrylic Latex S-G) [Min. Total 12.0 mils DFT] [System E-2]	1st	BLOXFIL 4000 Interior/Exterior Heavy Duty Acrylic Block Filler (apply to achieve min. 10.0 mils DFT)	Heavy Duty Block Filler B42W46 (apply to achieve min. 8.0 mils DFT)	SpeedHide6-15 Block Filler (apply to achieve min.8.0 mils DFT)
	2nd	Professional 6403V Fortis 450 Premium Exterior 100% Acrylic Satin (apply to achieve min. 1.2 mils DFT)	Duration K33 Exterior Acrylic Latex Satin (apply to achieve min. 2.8 mils DFT)	Manor Hall 73-410 Acrylic Latex Satin (apply to achieve min. 2.2 mils DFT)
	3rd	Professional 6403V Fortis 450 Premium Exterior 100% Acrylic Satin (apply to achieve min. 1.2 mils DFT)	Duration K33 Exterior Acrylic Latex Satin (apply to achieve min. 2.8 mils DFT)	Manor Hall 73-410 Acrylic Latex Satin (apply to achieve min. 2.2 mils DFT)

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
Concrete (Acrylic Latex S-G) [Min. Total 5.0 mils DFT] [System E-3]	1st	Concrete Coatings Bond-Prep Pigmented Bonding Primer Conditioner 3030-1200 (apply a flood coat to achieve a min. 3.0 mils DFT, depending on porosity)	Loxon Conditioner A24W100 Conditioner (apply a flood coat to achieve a min. 1.0 mils DFT, depending on porosity)	Perma-Crete 4-808/809 Masonry Primer. (apply to achieve min. 3.6 mils DFT)
	2nd	Professional 6403V Fortis 450 Premium Exterior 100% Acrylic Satin (apply to achieve min. 1.2 mils DFT)	Duration K33 Exterior Acrylic Latex Satin (apply to achieve min. 2.8 mils DFT)	Manor Hall 73-410 Acrylic Latex Satin (apply to achieve min. 2.2 mils DFT)
	3rd	Professional 6403V Fortis 450 Premium Exterior 100% Acrylic Satin (apply to achieve min. 1.2 mils DFT)	Duration K33 Exterior Acrylic Latex Satin (apply to achieve min. 2.8 mils DFT)	Manor Hall 73-410 Acrylic Latex Satin (apply to achieve min. 2.2 mils DFT)

Substrate	Cts.	Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints PPG
Ferrous & Galva-nized Metal Industrial Grade Acrylic (S-G) [Min. To-tal 6.4 mils DFT] [System E-4]	1st	Touch-up Shop-Coat Primer or DEVFLEX Acrylic Metal Primer 4020PF (apply to achieve min. 2.2 mils DFT)	Touch-up Shop-Coat Primer w/Pro-Cryl Universal Metal Primer B66-310 (apply to achieve min. 2.2 mils DFT)	Touch-up Shop-Coat Primer or Pitt-Tech Plus 90-712 DTM Primer (apply to achieve min. 2.2 mils DFT)
	2nd	DEV FLEX High-Performance Waterborne Acrylic Semi-Gloss Enamel 4216L (apply to achieve min. 2.1 mils DFT)	Pro Industrial High Performance Acrylic, Semi-Gloss B66-650 Series (apply to achieve min. 2.1 mils DFT)	Pitt-Tech Plus 90-1210 Semi Gloss DTM. (apply to achieve min. 2.1 mils DFT)
	3rd	DEV FLEX High-Performance Waterborne Acrylic Semi-Gloss Enamel 4216L (apply to achieve min. 2.1 mils DFT)	Pro Industrial High Performance Acrylic, Semi-Gloss B66-650 Series (apply to achieve min. 2.1 mils DFT)	Pitt-Tech Plus 90-1210 Semi Gloss DTM. (apply to achieve min. 2.1 mils DFT)

3.9 EXTERIOR TEXTURED COATING SYSTEMS

A. Products and Manufacturers:

Substrate	Cts.	Glidden Professional	Sherwin-Williams	Textured Coatings/ America	Pittsburgh Paints PPG
Concrete (Tilt-Up), Acrylic [Min. To-tal 18.0 mils DFT, [System ETCS-1]	1st	HYDROSEALER 6001 Primer Sealer (apply to achieve min. 1.7 mils DFT)	Loxon Concrete Masonry Primer, B24 W8300 (apply to achieve min. 3.2 mils DFT)	Tex-Cote XL 70 “W” Water t Pri-mer (apply to achieve min. 1.5 mils DFT)	PPG PERMA-CRETE 4-809Acrylic Ma-sonry Sealer. (apply to achieve min. 1.5 mils DFT)
	2nd	Texture Coat-ings Exterior 3230-4340 Me-dium (apply to achieve min. 16.0 mils DFT)	UltraCrete Tex-tured Acrylic Masonry ‘Top-coat, A44 W800 Series (apply to achieve min. 13.0 mils DFT)	Tex-Cote XL 70 “W” Water based Tex-tured Coating (ap-ply to achieve min. 9.0 mils DFT)	PERMA-CRETE® 4-50 Texture Coat-ings (apply to achieve min. 15.2 mils DFT)
	3rd	Professional 6403V Fortis 450 Premium Exterior 100% Acrylic Satin (apply to achieve min. 1.2 mils DFT)	Duration K33 Exterior Acrylic Latex Satin (apply to achieve min. 2.6 mils DFT)	Tex-Cote COOLWALL SUPER-COTE Finish (apply to achieve min. 9.0 mils DFT)	410 Acrylic Latex Satin (apply to achieve min. 1.5 mils DFT)

3.10 Traffic Marking Paint on Asphalt

A. Products and Manufacturers:

Glidden Professional	Sherwin-Williams Co.	Pittsburgh Paints
Waterbased Acrylic TMP White 4800 Yellow 4800 Blue 4800	Setfast Acrylic Latex White TM2160 Yellow TM2159 Blue TM2133	Speedhide White 11-23 Yellow 11-34 Blue 11-25

3.11 Concrete Floors (Service Rooms - Mechanical Rooms, Electrical Rooms, Janitor’s Rooms, etc.)

A. Description: Water-based acrylic, solid/opaque color stain (gray), 2-coat application.

B. Products and Manufacturers: Provide one of the following:

1. Glidden Professional: “Concrete Coatings” Concrete Stain 3610.
2. Sherwin Williams: “H&C Shield Plus Ultra Concrete Stain”.
3. Color Wheel: “Ultracrete Hydrostain Concrete Stain”.

3.12 Exterior concrete deck paint

A. Products and Manufacturers: Subject to compliance with requirements, available products and manufacturers that may be incorporated into the Work include, but are not limited to, the following:

1. Concrete Coatings Concrete Stain 3610 Series; Glidden Professional
   a. Paint Type: Water-Based Acrylic Concrete Stain.
   b. Application: Two coats over prepared substrates.
   c. Color: Custom to match Architect’s samples.
   d. Coverage Rate: Comply with manufacturer’s requirements for substrates indicated.

3.13 Exterior ASPHALT COURT paint

A. Products and Manufacturers: Subject to compliance with requirements, available products and manufacturers that may be incorporated into the Work include, but are not limited to, the following:

1. ArmorSeal Tred-Plex Water Based Coating B90 Series; Sherwin-Williams

   a. Paint Type: Water-Based Acrylic Concrete Stain.
   b. Application: Two coats over prepared substrates.
   c. Color: Custom to match Architect’s samples.
   d. Coverage Rate: Comply with manufacturer’s requirements for substrates indicated.

END OF SECTION 09 90 00

Division 10

Specialties

SECTION 10 14 00 - SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Exterior signage.
2. Interior signage.

1.3 SUBMITTALS

A. Product Data and Samples: For each of product specified.

1. Manufacturer’s color charts consisting of actual units or sections of units showing full range of colors available each product.

B. Shop Drawings and installation templates.
1. Show sign mounting heights, locations of supplementary supports, and accessories.
2. Provide message list, typestyles, and graphic elements including tactile characters and Braille for each sign.

C. Warranty Requirements: One (1) year warranty

D. Samples for initial Selection: Submit 12” x 12” samples of wayfinding aluminum face sheets painted for Architects review of finish and color.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Only qualified installers shall be used

B. Manufacturer Qualifications: Minimum of 5 years experience in letter manufacture

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.5 PROJECT CONDITIONS

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay.

1.6 WARRANTY

A. General: Provide a written guarantee against defects in materials and workmanship for a period of one year from the date of Final Acceptance of the Project. Any defects occurring during this warranty period shall be repaired at no cost to the Owner.

1.7 COMMISSIONING

A. Cleanup: After installation and before dedication, signs shall be cleaned using products recommended by the manufacturers.

PART 2 - PRODUCTS

2.1 MATERIALS, PRODUCTS, EQUIPMENT, MANUFACTURED UNITS

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

1. APCO Graphics, Inc.
2. ASI Sign Systems
3. Bayuk Graphic Systems, Inc.
4. Best Sign Systems
5. Environmental Graphics, Inc.
6. Sign Design
7. Vital Signs of Orlando, Inc.
8. Multi-Graphics, Inc.

B. Materials and Finishes:

1. Exterior Signage (Dimensional Letters and Numbers): 3/4 inch thick cast aluminum, 1-inch deep, baked enamel finish, pin-mounted, 3/4-inch from wall. ASTM B 26/B.

a. Form individual letters/numbers from castings with smooth flat faces, sharp corners and precisely formed lines and profiles free from pits, scale, sand holes and other defects.
b. Color and Letter Style: Selected by Architect.
c. Size and Font: As Indicated.

2. Interior Signage: 7-1/2-inch by 7-1/2-inch by 1/8-inch, 3/8-inch radius corners, matt acrylic plastic panels with all edges eased. (Note: Other panel sizes may be specified by Architect.) ASTM D 4802, Category A-1.

   a. Graphic Process: Raised letters and Braille, formed as an integral part of the sign face.
   b. Characters: Upper case Sans Serif accompanied with Grade 2 Braille. Width-height ratio between 3:5 to 1:1, stroke-width ratio between 1:5 to 1:10. Raised characters shall be 5/8-inch minimum, 2-inches high maximum.
   c. Color of Characters and Panel Backgrounds: Selected by Architect.

2.2 ACCESSORIES

A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.3 FABRICATION

A. General: Provide manufacturer's standard signs of configurations indicated.

1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Verify that items, including anchor inserts are sized and located to accommodate signs.

C. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.

B. Exterior Signs: Mount characters using standard fastening methods recommended in writing by manufacturer for character form, type of mounting, wall construction, and condition of exposure indicated.

1. Install letters in locations indicated using mounting methods in template shop drawings.
2. Letters shall be free of distortion, warp or finish defect
3. Letters shall be installed plumb and level and at the height required by the drawings.
4. All scratches and damage occurring during installation shall be repaired; unsatisfactory repair shall require letter replacement
5. Any temporary letter protection shall be removed and adjacent mounting area cleaned.

C. Interior Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.

1. Attach signs to wall surfaces using both methods indicated below:

a. Vinyl-Tape Mounting: Use double-sided foam tape to mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
b. Mechanical Fasteners: Use nonremovable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

3.3 CLEANING AND PROTECTION

A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 10 14 00

SECTION 10 21 13 - TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes toilet partitions/compartments and screens as follows:

1. Type: Solid plastic (HDPE).
2. Compartment Style: Floor supported, overhead braced.
3. Screen Style: Wall hung.

1.3 SUBMITTALS

A. Product Data: For each type and style of toilet compartment and screen specified. Include details of construction relative to materials, fabrication, and installation. Include details of anchors, hardware, and fastenings.

B. Shop Drawings: Provide fabrication and installation drawings, including appurtenances, cutouts, all accessories, location of steel reinforcement or wood blocking in walls to be constructed by others for proper securing of finished Work. Provide color samples for all available color groups.

C. Samples for Initial Selection: Manufacturer's color charts consisting of sections of actual units showing the full range of colors, textures, and patterns available for each type of compartment or screen indicated.

D. Samples for Verification: Of each compartment or screen color and finish required, prepared on 6-inch- square Samples of same thickness and material indicated for Work.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Only authorized factory installers shall be used.

B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

C. Preparation/Field Verification:

1. Prior to installation of wall finishes, verify required blocking has been installed in proper locations.
2. Verify installation of finishes and required anchoring devices are complete.
3. Verify that Shop Drawings have been successfully submitted, reviewed and returned.
4. Take dimension with field measurements prior to component fabrication to ensure proper fitting of work
5. Proceed with installation of items only after unsatisfactory conditions have been corrected. Installation of items indicates all conditions are satisfactory.

D. Source Limitations: Provide products of the same manufacturer for each type of unit specified and for units exposed to view in the same areas.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.6 WARRANTY

A. Manufacturers Warranty: Manufacturer shall provide written warranty for minimum of 15 years against breakage, corrosion and delamination on all products furnished under this Guideline.

1. Warranty shall include full replacement of defective materials without charge.

B. Unless otherwise stated, duration of all warranties shall begin on the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TOILET COMPARTMENTS

A. Products and Manufacturers: Refer to the Finish Material List on the Drawings.

B. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:

1. Accurate Partitions Corp.
2. American Sanitary Partition Corp.
3. Ampco Products, Inc.
4. Columbia Partitions by Partition Systems, Inc. (PSI) of South Carolina
5. Scranton Products (Santana/Comtec/Capital)

2.2 MATERIALS

A. General: Provide materials that have been selected for surface flatness and smoothness. Exposed surfaces that exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are unacceptable.

1. Color and Pattern: As Selected by Architect from Manufacturers full range.

B. Door, Panel and Pilaster Construction: Solid, High Density polyethylene (HPDE) not less than 1-inch thickness, seamless, eased edges with homogenous color and pattern throughout thickness of material.

1. Dividing Panels: 55-inches high and mount at 14 inches above finished floor.
2. Doors: 55-inches high and mounted at 14 inches above finished floor. Handicapped doors shall have one door pull and one door stop.

C. Pilasters: 82-inches high, mounted in a one-piece plastic shoe with star-head security pins. Pilaster shall be machined to accept door and hinge mechanism.

1. Pilaster Shoes: Polymer color and pattern matching pilaster.

D. Brackets (Fittings):

1. Continuous Brackets: Full height extruded 6463-T5 brite-dip finished aluminum or full height extruded polymer. All holes pre-drilled, spaced at 12” o.c. for through-bolting with stainless steel theft-resistant type heads. Each bracket shall have a minimum wall thickness of 0.125”.
2. Heat-Sink Strip: Manufacturer’s standard continuous, extruded-aluminum strip fastened to exposed bottom edges of solid-polymer components to prevent burning.

E. Accessories:

1. Hardware and Accessories: All fasteners shall be stainless steel with theft proof heads, through-bolted unless noted otherwise. Chrome plated steel or brass are not acceptable.

2. Overhead Bracing: Continuous heavy duty extruded 6463-T5 brite-dip finish aluminum head rail with anti-grip profile. Provide headrail corner brackets, wall brackets and headrail end caps as required.

a. Provide floor to ceiling pilaster at accessible compartments at connection to other compartments for termination of overhead bracing.
b. No headrail at closed alcove accessible compartments.

F. Door Hardware:

1. Hinges: 11-gauge surface mounted stainless steel hinges. Hinge shall be cast of type 302/304 stainless steel and shall have a satin finish. Hinge shall be gravity type for self-closing action and shall be fully adjustable up to 360 degrees. Pivot pin shall be made of Type 302/304 stainless steel. Hinges shall provide emergency access by lifting the door. Hinges shall be pre-drilled for mounting to door and pilaster with stainless steel through-bolts.
2. Strike and Keeper: Heavy duty cast stainless steel, satin finish. Strike and keeper shall be: 2.50” high; mounting holes at 1.50” o.c.; wall thickness 0.125” inches minimum; have integral rubber bumper door stop.
3. Slide Latch: Heavy duty cast stainless steel, satin finish. Slide latch shall be: 0.150” thick; 1.020” wide; 3.720” long; have internal stainless steel buffering spring; latch knob riveted and welded to slide bar.
4. Coat Hook: Heavy duty cast stainless steel, satin finish. Coat hook and bumper shall be 2.340” high; 1.230” wide; protrude from door 3.05”. Furnish one (1) coat hook per door.
5. Door Bumper: Heavy duty cast stainless steel, satin finish. Door bumper shall have: 2.125” base diameter; protrude 1.80” from wall; 0.250” thick at end of door bumper; 0.6875” shaft diameter.
6. Door Pull: Heavy duty cast stainless steel, satin finish. Door pull handle shall be: 4.735” long; 0.655” wide; protrude 0.940” from face of door; mounted back-to-back with slide latch.

2.3 FABRICATION

A. General: Provide standard doors, panels, screens, and pilasters fabricated for compartment system. Provide units with cutouts and drilled holes to receive compartment-mounted hardware, accessories, and grab bars, as indicated.

1. Compartments shall be provided with emergency access.
2. All connections shall be thru-bolted; inserts shall not be allowed.
3. Panel units shall be provided with eased edges.
4. Attached toilet accessories shall be mounted at the heights indicated.

B. Solid-Plastic, Polymer-Resin Compartments and Screens: Provide aluminum heat-sink strips at exposed bottom edges of HDPE units to prevent burning.

C. Wall-Hung Screens: Provide units in sizes indicated of same construction and finish as compartment panels, unless otherwise indicated.

D. Doors: Unless otherwise indicated, provide 24-inch- wide in-swinging doors for standard toilet compartments and 36-inch- wide out-swinging doors with a minimum 32-inch- wide clear opening for compartments indicated to be handicapped accessible.

1. Hinges: Manufacturer's standard self-closing type that can be adjusted to hold door open at any angle up to 90 degrees.
2. Latch and Keeper: Manufacturer's standard surface-mounted latch unit with combination rubber-faced door strike and keeper designed for emergency access. Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be handicapped accessible.
3. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.

PART 3 - EXECUTION

3.1 INSTALLATION ENVIRONMENTAL CONDITIONS

A. Items specified shall not be delivered or installed until building is enclosed, wet work completed and HVAC system is operating and maintaining temperature and humidity at occupancy level during remainder of construction period.

3.2 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Secure units in position with manufacturer's recommended anchoring devices.

1. Provide all items and accessories as required for a total and complete installation in every respect.
2. Install units level, plumb and true, firmly anchored in locations and heights indicated.
3. Adjust and lubricate hardware according to manufacturer’s written instructions.

B. Urinal Screens: Full height bracket.

C. Pilasters: Arrange to prevent overhead cross brace traversing HC stall.

3.3 FIELD QUALITY CONTROL

A. All parts shall be erected straight, level and plumb.

B. No evidence of drilling, cutting or patching shall be visible in the finished work.

C. Vertical edge clearance shall be uniform top to bottom and shall not exceed ¼ inch.

D. Finished surfaces shall be cleaned after installation and left free of imperfections.

E. Adjust and clean hardware for proper operation. Set hinges on in-swing doors to hold open approximately 30 degrees from closed position when unlatched.

F. Provide final protection and maintain conditions that ensure toilet compartments and screens are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 10 21 13

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SECTION 10 28 13 - TOILET ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Toilet accessories.

1.3 SUBMITTALS

A. Product Data sheets shall be required for each toilet room accessory specified.

B. Samples shall be specifically required for non-specified manufacturer’s products submitted as a Substitution.

C. Product Certificates shall be required by manufacturers on non-named products certifying that each product furnished meets the Specifications and with individual project requirements for the purpose intended. Certificates shall be submitted with Shop Drawings.

D. Setting Drawings shall be required showing cutouts in other work; include templates, substrate preparation instructions and directions for preparing cutouts and installing anchoring devices.

E. Accessory Schedule shall be submitted for review by the Architect indicating types, quantities, sizes and installation locations by room of each accessory required.

1.4 QUALITY ASSURANCE

A. Contractor Qualifications: Employ only experienced Contractors (Installers) skilled in the successful installation of the specified materials and assemblies on similar projects for a minimum of five years. Installers shall be state-certified or licensed Sub-Contractors, or locally registered Sub-Contractors in Orange County, Florida.

B. Manufacturer(s) Qualifications: Employ only manufacturers making the specified materials as a regular production item.

C. Preparation/Field Verification

1. Prior to installation of wall finishes, verify required blocking has been installed in proper locations.
2. Verify installation of finishes and required anchoring devices are complete.
3. Verify that Shop Drawings have been successfully submitted, reviewed and returned.
4. Proceed with installation of toilet room accessories only after unsatis-factory conditions have been corrected. Installation of toilet room accessories indicates all conditions are satisfactory.

D. Source Limitations: Unless specifically noted otherwise, provide products of the same manufacturer for each type of accessory unit and for units exposed to view in the same areas.

1.5 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by disabled persons, proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.6 WARRANTY

A. Project Warranty shall be as stated in Division 01 of the Specifications.

B. Manufacturer’s Hand Dryer Warranty: Provide manufacturer’s standard 5-year full warranty or 10-year limited warranty on warm-air hand dryers.

C. Manufacturer's Mirror Warranty: Written warranty, executed by mirror manufacturer agreeing to replace mirrors that develop visible silver spoilage defects within minimum warranty period indicated.

1. Minimum Warranty Period: 15 years from date of Substantial Completion.

D. Unless otherwise stated, duration of all warranties shall begin on the date of Substantial Completion.

1.7 COMMISSIONING

A. Closeout Submittals: As part of Closeout Documents, submit maintenance data for accessories. Data shall include maintenance manuals, replacement parts lists and service recommendations, if any.

B. Keys: Provide six (6) universal keys for interior access to accessories for servicing and replenishment of supplies.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. A&J Washroom Accessories, Inc.

B. American Specialties, Inc. (ASI)

C. Bobrick Washroom Equipment, Inc.

D. Bradley Corporation

E. Columbia/Vortex, division of PCiSC

F. Excel Dryer Inc.

G. General Accessory Manufacturing Company (GAMCO)

H. Koala Corporation

I. Synergy Management

2.2 COMPONENTS

A. Products: Refer to Toilet Accessory Schedule.

2.3 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, with No. 4 finish (satin), in 0.0312-inch minimum nominal thickness, unless otherwise indicated.

B. Galvanized Steel Sheet: ASTM A 653/A 653M, G60.

C. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q2, nominal 6.0 mm thick, with silvering, electroplated copper coating, and protective organic coating complying with FS DD-M-411.

D. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.

2.4 FABRICATION

A. General: Names or labels are not permitted on exposed faces of accessories. On interior surface not exposed to view or on back surface of each accessory, provide printed, waterproof label or stamped nameplate indicating manufacturer's name and product model number.

B. Surface-Mounted Toilet Accessories: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with continuous stainless-steel hinge. Provide concealed anchorage where possible.

C. Recessed Toilet Accessories: Fabricate units of all-welded construction, without mitered corners. Hang doors and access panels with full-length, stainless steel hinge. Provide anchorage that is fully concealed when unit is closed.

D. Framed Glass-Mirror Units: Fabricate frames for glass-mirror units to accommodate glass edge protection material. Provide mirror backing and support system that permits rigid, tamper-resistant glass installation and prevents moisture accumulation.

1. Provide galvanized steel backing sheet, not less than 0.034 inch and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.

E. Mirror-Unit Hangers: Provide mirror-unit mounting system that permits rigid, tamper- and theft-resistant installation, as follows:

1. Heavy-duty wall brackets of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.

F. Keys: Provide six (6) universal keys for interior access to accessories for servicing and replenishment of supplies.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer.

B. Install units level, plumb, and firmly anchored in locations and at heights indicated.

C. Secure mirrors to walls in concealed, tamper-resistant manner with special hangers, toggle bolts, or screws. Set units level, plumb, and square at locations indicated, according to manufacturer's written instructions for substrate indicated.

D. Install grab bars each to withstand a separate bending stress, shear stress, shear force and tensile force of 250 lb-f.

E. Install changing stations to within static loads of 400 lb-f. and per manufacturer’s recommended instructions.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

3.3 PROTECTION DURING CONSTRUCTION

A. Provide proper protection of accessories after installation. Replace accessories that are damaged or do not comply with requirements.

END OF SECTION 10 28 13

SECTION 10 41 16 – EMERGENCY KEY CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Security lock box.

1.3 SUBMITTALS

A. Product Data and Samples: Provide as specified in Division 01 specifications.

B. Shop Drawings: Provide as specified in Division 01 specifications.

C. Warranty Requirements: One (1) year warranty, from date of Substantial Completion.

1.4 QUALITY ASSURANCE

A. Contractor Qualifications: Employ only experienced Contractors (Installers) skilled in the successful installation of the specified or similar products for a minimum of five years. Installers shall be state-certified or licensed Sub-Contractors, or locally registered Sub-Contractors in Orange County, Florida.

B. Manufacturer(s) Qualifications: Employ only manufacturers making the specified materials as a current catalog and regular production item.

C. Verify that product submittals have been successfully submitted, reviewed and returned.

1.5 WARRANTY

A. General: Provide manufacturer’s standard Warranty. Comply with requirements stated in Division 01.

1. Duration of all warranties shall start from date of installation.

1.6 COMMISSIONING

A. General: All corrections in emergency key cabinet installation shall be the responsibility of the emergency key cabinet installer.

B. Inspections: All installations shall be subject to the inspection and approval of the Owners Security Department.

C. Statement of Compliance: The installer shall provide certification that the specified products or assemblies have been installed in accordance with manufacturer’s instructions.

PART 2 - PRODUCT SYSTEM

2.1 MATERIALS, PRODUCTS, EQUIPMENT, MANUFACTURED UNITS

A. Manufacturers:

1. FAIL-SAFE, Rapid Access System, P.O. Box 940250, Maitland, Fl 32794-0250;

a. Phone: 407-628-1600/1-800-946-8832

2. KNOX RAPID ENTRY SYSTEM, 17672 Armstrong Avenue, Irvine, California 92614-5728

a. Phone: 949-252-8181/888-342-3530 Local Representative

3. SUPRA, 4001 Fairview Industrial Dr. SE; Salem, Oregon 97302

a. Phone: 800-547-0252, ext 8532

B. Component Performance Characteristics:

1. System Description:

a. Dimensions: Approximately 4” wide X 5” high X 4” deep; six sided.
b. Wall Thickness: ¼”.
c. Construction: Cold-Formed Hollow Structural Steel sections conforming to ASTM A 500 grade A.
d. Finish: Manufacturers standard powder coat finish for exterior applications.
e. Color: Gloss Black.
f. Rating: UL listed as a Fire Control Accessory.
g. Keying: The emergency key cabinet shall be equipped with a removable cover that has two (2) different cylinders (the Owners and the Fire Departments) to open the removable cover.

1) Fire Department Key: It shall be the responsibility of the Manufacturer to do the Master Keying for the Fire Department’s access key. This key will not be the same throughout Orange County, Florida. The Manufacturer will coordinate with each fire district within Orange County Florida and supply a cylinder that allows a Fire Department Master Key access for the Facility location within Orange County, Florida.

h. Facility Key: Opening the emergency key cabinet will allow access to a Facility Master Key or Keys. The Master Key shall be on a chain or a hook.
i. Hardware: Each emergency key cabinet shall be supplied with four (4) tamper proof (security) bolts, nuts and washers that allow installation of the cabinet into the wall. A bolt pattern template shall also be supplied with the cabinet.
j. System Identification:

1) Each emergency key cabinet shall be supplied to the Owner with the Facility name either painted on the side of the cabinet using a stencil and a contrasting color or an I.D. tag secured to the inside wall of the cabinet or a way of permanently identifying the cabinet to the Facility.

C. System Mounting:

1. Emergency key cabinet (lock box) shall be installed by the Contractor.
2. Cabinet shall be recessed, mounted 6’-8” above finish floor (AFF) to top of cabinet, mounted adjacent to the right of the main entrance door(s).

PART 3 - QUALITY ASSURANCE DURING EXECUTION

3.1 INSTALLATION:

A. Installation Requirements: Installation of the emergency key cabinet (lock box) shall include the recess mounting into the wall including escutcheon plate.

1. The contractor will be required to get a permit for the emergency key cabinet (lock box).
2. When the permit is picked up, contractor will be required to take the permit to the Orange County Fire Rescue (OCFR) Fire Marshall’s Office, 109 E. Church St., Lower Level, Orlando, FL and request a form to obtain an emergency key cabinet (lock box).
3. The OFCR will give the signed form to the contractor to order the emergency key cabinet (lock box).
4. Once the order form is completely filled out and signed by the responding fire department, the order form can be faxed to the Failsafe office for the emergency key cabinet (lock box) for release of the lock box to the contractor.
5. Installation involves drilling four (4) holes through the wall that allows four (4) security bolts to secure the emergency key cabinet (lock box) to the wall.

END OF SECTION 10 41 16

SECTION 10 44 00 - FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Fire extinguishers.
2. Mounting brackets for fire extinguishers.

1.3 PERFORMANCE REQUIREMENTS

A. Fire extinguishers shall by UL-rated, fully charged and ready for emergency use when applicable per the Florida Building Code, the Florida Fire Prevention Codes, NFPA 10 as adopted by the Florida State Fire Marshall Office and NFPA standards as adopted by the Florida State Fire Marshall Office.

1.4 SUBMITTALS

A. Manufacturer’s Product Data sheets shall be required for each item specified.

B. Sample Warranty.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Shall be State of Florida certified or locally registered Vendor/Contractors in Orange County. Minimum of five (5) years experience.

B. Manufacturer Qualifications: Minimum five (5) year.

C. Preparation/Field Verification

1. Verify that Shop Drawings have been successfully submitted, reviewed and returned.
2. Verify that all locations are completely finished and ready for final installation of bracket.

D. Fire extinguishers shall be UL certified with UL listing mark for type, rating and classification of extinguisher clearly indicated on extinguisher label.

E. Source Limitations: Unless specifically noted otherwise, provide products of the same manufacturer for each type of unit specified.

1.6 WARRANTY

A. Warranty Requirements: Provide a one (1) year warranty. The State required inspection/ certification tag shall be dated within 30 days from Substantial Completion of the Final Construction Phase.

PART 2 - PRODUCTS

2.1 MATERIALS, PRODUCTS, EQUIPMENT, MANUFACTURED UNITS.

A. Product Performance and Acceptable Manufacturers:

Type:	4-A:60-B:C	Class K
Amerex Corporation (205) 655-3271 www.amerex-fire.com	B456	B260
Ansul Incorporated (800) 862-6785 www.ansul.com	A10T	K01
J. L. Industries, Inc. (800) 554-6077 www.jlindustries.com	Cosmic 10E	Saturn 15

2.2 COMPONENT PERFORMANCE CHARACTERISTICS:

A. Standard fire extinguishers shall be multi-purpose dry chemical type, ammonium phosphate-based, UL-rated 4-A:60-B:C, nominal 10-lb capacity in manufacturer’s standard enameled steel container. Extinguisher shall meet or exceed requirements of ANSI/UL 299.

B. Wet-Chemical Type: UL-rated 2-A:1-B:C:K, 6-liter nominal capacity, with potassium acetate-based chemical in stainless-steel container; with pressure-indicating gage.

C. Brackets shall be designed to prevent accidentally dislodging extinguisher and shall be size required for type and capacity of extinguisher indicated.

2.3 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish. Brackets shall be designed to prevent accidentally dislodging extinguisher and shall be size required for type and capacity of extinguisher indicated.

1. Color: Match Architects sample.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged units.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SPECIAL INSTALLATION PROCEDURES

A. Provide all items and accessories as required for a total and complete installation in every respect.

B. Proceed with installation only after all finish work and unsatisfactory conditions have been corrected. Installation of any items indicates all conditions are satisfactory and acceptance of previous Work by other contractors.

3.3 INSTALLATION

A. Fire Extinguishers: Install bracket mounted fire extinguishers in accordance with manufacturer’s instructions and recommendations. Install fire extinguishers in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.

1. Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 10 44 00

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SECTION 10 51 13 - ATHLETIC LOCKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section Includes:

1. Lockers.
2. Locker Benches.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of locker.

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

1. Include type of material, gauges of metal, reinforcement, closures and fillers, finishing strips, sloping tops, end finish panels and other details of construction. Identify methods and details of attachment, layout of the lockers, and devices to be furnished by others.
2. Include locker-numbering sequence.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.

D. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals specified in Division 1.

E. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: When used with an entity, "experienced" means having successfully completed a minimum of 5 projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Pre-installation Conference:

1. Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".
2. Installer shall review sequences of locker type delivery and installation and be familiar with all locker features and accessories.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver lockers until spaces to receive them are clean, dry, and ready for locker installation.

B. Protect lockers from damage during delivery, handling, storage, and installation.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.
b. Faulty operation of latches and other door hardware.

2. Damage from deliberate destruction and vandalism is excluded.
3. Warranty Period for All-Welded Metal Lockers: Lifetime from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers: Provide lockers by one of the following:

1. Art Metal Products
2. ASI Storage Solutions, Inc.
3. DeBourgh All American Lockers
4. Hallowell
5. List Industries, Inc.
6. Lyon Metal Products
7. Penco Products, Inc.
8. Republic Storage Systems Company

2.2 LOCKERS

A. Athletic Lockers:

1. Material/Type/Size: Steel; all-welded construction/double tiered (12” x 15” x 40”).
2. Body: Assembly by use of fully framed all-welded components together.
3. Frames: Channel formed minimum 0.0528 in. thick galvanneal metal welded frames. Provide minimum 0.0528 in. thick galvanneal metal horizontal frame between doors of double and triple-tiered lockers.
4. Sides: Minimum 0.0528 in. thick galvanneal metal, diamond perforated.
5. Backs: Minimum 0.0428 in. thick galvanneal metal.
6. Solid Top, Bottom and Intermediates Shelves: Minimum 0.0428 in. thick galvanneal metal.
7. Doors: Minimum 0.0677 in. thick galvanneal metal, diamond perforated.
8. Door Stiffener: Minimum 0.0428 in. thick, full-height, 3” width, MIG welded top and bottom flange.
9. Door Handle: Deep-drain stainless steel recessed handle.
10. Latching System: Single-point non-moving latch hook.
11. Latch: Minimum 0.1116 in. thick MIG welded latch with pry resistant lug with a horizontal support channel.
12. Hooks: 2-single prong wall hooks and 1-double prong ceiling hook.
13. End and Top Finishing Panels: ½” thick High Density Polyethylene (HDPE), containing a minimum of 10% recycled material which is waterproof, impact resistant, containing a self-lubricating Poly-Glaze “280” surface that resists marking with pens, pencils, lipstick, and other writing or marking utensils.
14. Raised Base: Coordinate with architectural requirements for methods of locker base attachment to substrate.
15. Continuous Sloping Tops: Minimum 0.0528 in. thick galvanneal steel, manufacturer’s standard with splice covers and end closures.
16. Identification - Number Plates: Manufacturer’s standard aluminum numbering plates with 3/8-inch high embossed or etched numbers, attached near top of door, centered, with a least two aluminum rivets. Numbering selected by Architect.
17. Finish: Galvanneal sheet steel with baked enamel, interior and exterior. Colors – two-tone color combination at no additional cost, chosen from manufacturer’s standard selection.

B. Locker Benches

1. Bench Tops: Manufacturer’s standard 1-piece units of the following materials minimum 1-1/4” thick with rounded corners and edges.

    a. Laminated from all white clear northern hard maple with one (1) coat of deep penetrating hot sealer and two (2) coats of heavy body high impact hydraulically applied lacquer. Lengths shall be in 1’ increments from 3’ through 15’.
    b. Szies: As Indicated.

2. Fixed Pedestals: Manufacturer’s standard supports, with predrilled fastener holes for attaching bench top and anchoring to floor.

    a. Cast Iron Pedestal: 1-1/2” diameter with 6” top with cast aluminum base and concealed anchoring to floor, manufacturer’s standard color.
    b. Stainless Steel Pedestal: Fabricated from 0.0747 in. thick unfinished stainless steel, 2-piece design allowing concealment of fasteners, top and bottom.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install metal lockers and accessories level, plumb, rigid, and flush according to manufacturer's written instructions.

B. Knock down lockers shall be assembled off-site at locker manufacturer’s facility.

C. Anchor lockers to floors and walls at intervals recommended by manufacturer, but not more than 36 inches on center. Install anchors through backup reinforcing plates where necessary to avoid metal distortion, using concealed fasteners.

D. Attach sloping top units to lockers, with closures at exposed ends.

E. Attach finished end panels with fasteners only at perimeter to conceal exposed ends of nonrecessed lockers.

3.2 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust doors and latches to operate easily without binding. Check every locker and verify that integral locking devices operate properly and that all accessories have been installed.

B. Clean interior and exposed exterior surfaces and polish nonferrous-metal surfaces.

C. Protect lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit locker use during construction.

D. Touch up marred finishes, or replace locker units that cannot be restored to factory-finished appearance. Use only materials and procedures furnished by locker manufacturer.

E. Provide final protection and maintain conditions that ensure that metal lockers are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 10 51 13

SECTION 10 75 00 - FLAGPOLE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Aluminum flagpole.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide flagpole capable of withstanding the effects of wind loads as determined according to the building code in effect for this Project or NAAMM FP 1001, "Guide Specifications for Design Loads of Metal Flagpole," whichever is more stringent.

1. Base flagpole design on maximum standard-size flag suitable for use with pole.
2. Wind Speed: Refer to the Structural Drawings.

1.4 SUBMITTALS

A. Product Data: For each type of flagpole required. Include installation instructions.

B. Shop Drawings: Show general layout, jointing, grounding method, and anchoring and supporting systems.

1. Include details of foundation system for ground-set poles.

C. Structural Calculations: For flagpole indicated to comply with certain design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Finish Samples for Verification: For each finished metal used for flagpole and accessories.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each flagpole as a complete unit from a single manufacturer, including fittings, accessories, bases, and anchorage devices.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General: Spiral wrap flagpole with heavy kraft paper or other weather tight wrapping and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.1 PERFORMANCE

A. Design flagpole assemblies including anchorage and supports to withstand the project specific effects of gravity and wind loads and capable of flying (2) flags per pole.

1. Wind loading: As Indicated.

2.2 MANUFACTURERS

A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Baartol Co., Inc.
2. Eder Flag Manufacturing Co., Inc.
3. Concord Industries

2.3 FLAGPOLE

A. Aluminum Flagpole: Fabricate from seamless, extruded tubing complying with ASTM B 241, alloy 6063, with a minimum wall thickness of 3/16 inch. Heat treat after fabrication to comply with ASTM B 597, temper T6. Provide cone-tapered flagpole fabricated from seamless extruded tubing. Provide steel bottom and support plate, steel ground spike, steel centering wedges. Galvanize steel after assembly. Construct flagpole in one piece.

1. Flagpole Interior Finish: Treat the interior to prevent corrosion.
2. Exposed Height: 30 feet.

B. Foundation Tube: Galvanized corrugated-steel foundation tube, 0.0635-inch minimum wall thickness, sized to suit flagpole and installation. Provide with 3/16-inch steel bottom plate and support plate; 3/4-inch- diameter, steel ground spike; and steel centering wedges all welded together. Galvanize steel parts, including foundation tube, after assembly. Provide loose hardwood wedges at top of foundation tube for plumbing pole.

C. Flashing Collar: Spun aluminum, heavy gauge.

2.4 FITTINGS

A. Finial Ball: Manufacturer's standard flush-seam ball, sized to match pole-butt diameter.

1. 0.063-inch cast aluminum, finished to match flagpole. Manufacturer’s standard flush-seam ball, match flagpole butt diameter. Spun aluminum with gold anodic finish.
2. Exposed chrome plated Bronze Halyard swivel snap hooks, with braided polypropylene halyard, cleat with lockable cover box, external stationary truck assembly.

B. Halyard Flag Snaps: Provide 4 swivel snap hooks per halyard, as follows:

1. Stainless steel.
2. Provide with neoprene or vinyl covers.

2.5 MISCELLANEOUS MATERIALS

A. Concrete: Provide concrete composed of portland cement, coarse and fine aggregate, and water mixed in proportions to attain a 28-day compressive strength of not less than 3000 psi, complying with ASTM C 94.

B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

C. Sand: ASTM C 33, fine aggregate.

D. Flags: Owner furnished.

2.6 FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare in-ground flagpole by painting below-grade portions with a heavy coat of bituminous paint.

B. Excavation: For foundation, excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete.

C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure forms, foundation tube, fiberglass sleeve, or anchor bolts in position, braced to prevent displacement during concreting.

D. Place concrete immediately after mixing. Compact concrete in place by using vibrators. Moist-cure exposed concrete for not less than 7 days or use a nonstaining curing compound.

E. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to base perimeter.

3.2 FLAGPOLE INSTALLATION

A. General: Install flagpole where shown and according to Shop Drawings and manufacturer's written instructions.

B. Foundation-Tube Installation: Install flagpole in foundation tube, seated on bottom plate between steel centering wedges. Plumb flagpole and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch layer of elastomeric sealant and cover with flashing collar.

END OF SECTION 10 75 00

Division 11

Equipment

SECTION 11 30 00 –EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Appliances

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, dimensions, furnished accessories, and finishes for each appliance.

1. Catalog brochures of equipment specified
2. Model number and technical requirements of each unit
3. Manufacturers written installation instructions
4. Rough-in dimensions
5. Color selections

B. Product Certificates: For each type of appliance, from manufacturer.

C. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

D. Warranties: Sample of special warranties.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.

B. Regulatory Requirements: Comply with the following:

1. NFPA: Provide electrical appliances listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. ANSI: Provide gas-burning appliances that comply with ANSI Z21 Series standards.

1.5 WARRANTY

A. Special Warranties: Manufacturer's standard form in which manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Amana/Speed Queen, Benton Harbor.
2. Frigidaire.
3. General Electric Company (GE).
4. Whirlpool Corporation.
5. Hotpoint, Louisville.
6. Magic Chef, Benton Harbor.

B. Ice Machine Basis of Design: Product and manufacturer; Model ID 1106A with AR-Pre-filter and AR20,000 Filter as manufactured by Manitowoc Ice, Inc.

1. The following manufacturers are also acceptable for the ice machine provided compliance with technical Specifications of specified products:

a. Hoshizaki America, Inc.,

C. Refrigerator/ Cooler: As scheduled.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.

B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. General: Comply with manufacturer's written instructions.

B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.

C. Utilities: See Divisions 22 and 26 for plumbing and electrical requirements.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
2. Operational Test: After installation, start units to confirm proper operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.

C. An appliance will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain residential appliances.

END OF SECTION 11 30 00

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SECTION 11 66 00 - ATHLETIC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Outdoor Athletic equipment.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, features, and finishes. Include details of anchors, hardware, and fastenings. If applicable, include assembly, disassembly, and storage instructions.

B. Shop Drawings: Show location of equipment. Show method of field installation, operational clearances, and relationship to adjoining work.

1. Setting Drawings: For cast-in floor insert sleeves for post standards.

C. Pre-Installation Conference Minutes: Submit minutes in accordance with indicated requirements.

D. Warranty: Submit draft copies of warranties as herein indicated.

E. Submit signed and sealed shop drawings by a registered engineer in the State of Florida for all exterior concrete footings for basketball, volleyball and tennis posts.

1.4 REFERENCES

A. National Federation of State High School Associations, Court and Field Diagram Guide. Indianapolis, Indiana 46206, 2002.

B. Applicable Publications

1. Department of Community Affairs

a. Florida Americans with Disability Implementation Act.
b. Occupational Safety and Health Administration, U.S. Department of Labor, 29 CFR

1.5 QUALITY ASSURANCE

A. Contractor Qualifications: Employ only experienced Contractors (Installers) skilled in the successful installation of the specified materials and assemblies on similar projects for a minimum of five (5) years. Installers shall be state-certified or licensed Sub-Contractors, or locally licensed Sub-Contractors in Orange County, Florida.

B. Manufacturer Qualifications: Employ only manufacturers with not less than five (5) years’ experience making the specified materials as a current catalog and regular production item.

C. Source Limitations: Provide products of the same manufacturer for each type of unit specified, as much as possible, to have a one source warranty contact.

D. All exterior concrete footings for basketball, volleyball and tennis shall be designed by a registered structural engineer in the State of Florida and shop drawings shall include as such.

E. Installer Qualifications: A qualified installer employing workers trained and approved by manufacturer.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify position and elevation of floor inserts and layout for athletic equipment. Verify dimensions by field measurements.

1.7 COORDINATION

A. Coordinate with Divisions 23 and 26 contractors for installation of the physical education equipment. Also coordinate with the Architect for exact locations.

1.8 WARRANTY

A. Manufacturer’s Warranty

1. Provide a 25 year warranty on basketball structures.
2. Lifetime warranty on backboards
3. Three (3) year warranty on electric wenches.
4. Ten (10) year warranty on volleyball up-rights
5. Five (5) year warranty on indoor scoreboards

B. Installers Warranty

1. Installer shall warranty work for a period of one (1) year

C. Provide standard Manufacturer’s warranty for items not mentioned above for a period of one (1) year from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 OUTDOOR ATHLETIC EQUIPMENT

A. Football Goal Posts (permanent) 2 thus.

1. Draper 505122 or Equal.

a. Height of Cross bar: 10’-0” above grade (top edge)
b. Length of Crossbar: 23’-4”
c. Width of Uprights: 4” max
d. Length of Uprights: 10’-0” above crossbar
e. Padding: Goal Posts shall be padded with resilient shock absorbing material to a height of at least 6’-0” above the ground, vinyl covered, 3” thick and Velcro attached.

2. Model Porter 02960366 (same accessories as above)

B. Shot Put Toe Board (4’-0” in length on inside surface of arc x 4” high x 4-1/2” wide).

1. On Track Model T401
2. Everything Track & Field Model 4175.
3. Or Equal.

C. Discus and Shot Put Cage (portable 10’-4” high).

1. Everything Track & Field; SKU 2132
2. Or Equal.

D. Pole Vault Planting Box: Aluminum

1. OnTrack Model: T204.
2. Everything Track & Field Model 4192.
3. Or Equal.

E. Pole Vaulting Pit Pad.

1. On Track: Gill Scholastic 1 model 654. 19’-9” x 20’-0” x 28”, with weather cover model No. 6541102.
2. Everything Track and Field: Model 5794.
3. Or Equal.

F. High Jump Pit Pad.

1. OnTrack: Scholastic 1 model 641. 16’-6” x 8’-0” x 26”.With weather cover model 6421102.
2. Everything Track & Field Model 4789 w/ weather cover model No. 4834.
3. Or Equal.

G. Soccer Goals 24’ x 8’ x 3’-8” – Portable 2 thus.

1. Tomark Model 50314 w/ net
2. Draper Model 505006 w/ net
3. Porter Model 467100 w/ net.

H. Take-Off boards for long and Triple Jump.

1. Everything Track & Field / 2 outdoor “M” wide. Model 1177A.
2. On Track Model T444.
3. Or Equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, operational clearances, and other conditions affecting performance.

1. Verify critical dimensions.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. General: Comply with manufacturer's written installation instructions. Complete equipment field assembly, where required.

B. Permanently Placed Athletic Equipment and Components: Rigid, level, plumb, square, and true; position at locations and elevations indicated; in proper relation to adjacent construction; and aligned with court layout.

C. The athletic equipment installation shall only be done by the Manufacturers approved contractor. The contractor shall have received training from the Manufacturer on the installation of the equipment and on the maintenance of the equipment.

D. Floor Inserts shall be set in concrete slabs. Clean voids of debris. Fill void around sleeve with grout. Verify that sleeves are set plumb, aligned, and at correct height and spacing. Insert shall be set so the top cover surface is flush with the finished floor surface.

E. Mount wall panels with bottom edge 4” above finish floor.

3.3 SPECIAL INSTALLATION PROCEDURE / ADJUSTMENT PROCEDURES

A. Tolerances that are listed in the National Federation Of State High School Associations be complied with and certified by the installation contractor. Provide all items and accessories as required for a total and complete installation in every respect.

B. Operational Training

1. Engage a Manufacturer’s authorized service representative to train Maintenance personnel on the adjustment and correct operation and preventive maintenance of the Athletic Equipment.

C. Adjusting

1. Adjust movable components of equipment to operate safely, smoothly, easily and quietly, free from binding, warp, distortion or malfunction, throughout the entire operational range. Lubricate hardware and moving parts.

3.4 CLEANING AND PROTECTION

A. After completing equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.

B. Provide final protection and maintain conditions acceptable to manufacturer and Installer that ensure equipment is without damage or deterioration at time of Substantial Completion.

C. Replace equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 11 66 00

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SECTION 11 68 43 – EXTERIOR SCOREBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work of this Section includes outdoor athletic scoreboards.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer’s standard product data for each required type of scoreboard.

1. Include manufacturer’s operation and maintenance instructions for each type of scoreboards specified herein.

B. Shop drawings: Indicate the model number, type of material, gauges or thickness of metal, finishes and details of construction, and attachment.

C. Warranty: Submit warranties as specified herein.

1.4 PROJECT CONDITIONS

A. Loose items of equipment shall be turned over to the Owner after unpackaging or uncrating, and checking for proper type, material, size, and fit of each accessory. Obtain receipt from Owner for items turned over. No claim may be made for items turned over to the Owner without obtaining a receipt.

1.5 COORDINATION

A. Coordinate with Divisions 26 contractor for installation of Scoreboards. Also coordinate with the Architect for exact locations.

1.6 WARRANTY

A. Manufacturer’s Warranty: Provide manufacturer’s standard warranty on all scoreboards that units are and will remain free of defects in materials and/or workmanship for the indicated warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Product and Manufacturer; Daktronics, Inc., Model FB-2018, with optional electronic captions.

1. Overall Size: 8'-0" H x 18'-0" W x 8" D.
2. Optional Captions Height: 10.6-inches.

B. Other acceptable Manufacturers offering products which may be incorporated into the work but not limited to the following:

1. Eversan, Inc.
2. Scoretec

C. Control Console; One-pair shielded cable of 22 AWG minimum is required. A cover plate with mounted connector and standard 2" x 4" x 2" outlet box is provided. Connector mates with signal cable from control console.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

A. Inspect both the substrate and conditions under which Work is to be performed.

1. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again before installation.

D. Reject damaged and defective items.

E. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level.

1. Allow for expansion and building movement.

F. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect.

1. Refer questionable choices to the Architect for final decision.

G. Recheck measurements and dimensions, before starting each installation.

H. Install each component during weather conditions and Project status that will ensure the best possible results.

1. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

I. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

3.2 INSTALLATION

A. Install scoreboards in accordance with manufacturer’s written installation instructions.

B. Provide all items and accessories as required for a complete installation in every respect.

3.3 PROTECTION

A. Protect accessories against damage during remainder of construction period, complying with manufacturer’s directions.

END OF SECTION 11 68 43

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Division 12

Furnishings

SECTION 12 36 16 - METAL COUNTERTOPS, SHELVING AND TABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Stainless-steel service countertops and serving counter.
2. Stainless-steel Wall Shelving
3. Stainless-steel Tables

1.3 SUBMITTALS

A. Product Data: For products indicated. Include rated capacities, material descriptions, and finishes.

B. Shop Drawings: Include plans, sections, details, and attachments to other work.

1.4 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of construction to receive metal countertops by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.

B. Sealant for Countertops: Manufacturer's standard sealant of characteristics indicated below that complies with applicable requirements in Section 079200 "Joint Sealants."

1. Mildew-Resistant Joint Sealant: Mildew resistant, single component, nonsag, neutral curing, silicone.
2. Color: Clear.

2.2 STAINLESS-STEEL COUNTERTOPS

A. Countertops: Fabricate from 16-gauge-thick, stainless-steel sheet. Provide smooth, clean exposed tops and edges in uniform plane, free of defects.

1. Joints: Fabricate countertops without field-made joints.
2. Weld shop-made joints.
3. Sound deaden the undersurface with heavy-build mastic coating.
4. Extend the top down to provide a 1-inch-thick edge with a 1/2-inch return flange.
5. Where indicated, form the backsplash coved to and integral with top surface, with a 1/2-inch-thick top edge and 1/2-inch return flange, 4-inches tall.

2.3 METAL STORAGE SHELVES

A. Shelving: Fabricate from 14 gauge-thick, stainless-steel sheet. Provide smooth, clean exposed tops and edges in uniform plane, free of defects. 1-1/2-inch roll on front, with 1-1/2-inch upturn on rear and ends.

1. Stainless steel mounting brackets are stud welded to shelf.
2. Joints: Fabricate shelving without field-made joints.
3. Weld shop-made joints.

2.4 METAL TABLES

A. Top constructed of Fabricate from 14-gauge-thick, stainless-steel sheet. 1-1/2-inch roll on front and rear, and sides turned down 90°. Open front with 1-1/4-inch O.D. galvanized tubular crossbracing on sides and rear.

B. Top reinforced with welded hat channels and sound deadened. Constructed with gusset system with the gussets recessed into the hat channels to reduce lateral movement. Legs are 1-5/8-inch O.D. galvanized tubing, with galvanized gussets and 1-inch hi-impact plastic bullet feet.

2.5 STAINLESS-STEEL FINISH

A. Grind and polish surfaces to produce uniform, directional satin finish matching No. 4 finish, with no evidence of welds and free of cross scratches. Run grain with long dimension of each piece. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces clean.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of metal countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install metal countertops level, plumb, and true; shim as required, using concealed shims.

B. Field Jointing: Where possible, make field jointing in the same manner as shop jointing; use fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.

C. Secure tops to cabinets with Z- or L-type fasteners or equivalent; use two or more fasteners at each front, end, and back.

D. Abut top and edge surfaces in one true plane, with internal supports placed to prevent deflection.

E. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant.

3.3 SHELVING INSTALLATION

A. Install metal shelving level, plumb, and true; shim as required, using concealed shims.

B. Secure shelves to solid blocking fasteners or equivalent; in accordance with the manufactures requirements.

3.4 CLEANING AND PROTECTION

A. Repair or remove and replace defective work as directed on completion of installation.

B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

C. Protection: Provide 6-mil plastic or other suitable water-resistant covering over the countertop surfaces. Tape to underside of countertop at a minimum of 48 inches o.c.

END OF SECTION 12 36 16

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SECTION 12 93 13 – BICYCLE STORAGE RACKS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Bike racks.

1.3 SUBMITTALS

A. Product Data: For each product indicated.

B. Maintenance Data: For site furnishings to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of site furnishing(s) through one source from a single manufacturer.

1.5 WARRANTY

A. Manufacturer’s Warranty: Provide manufacturer’s standard 1-year warranty.

PART 2 - PRODUCTS

2.1 BIKE RACKS

A. Basis of Design Product and Manufacturer - As Indicated on the drawings.

B. Subject to compliance with requirements, other acceptable Manufacturers are but not limited to the following:

1. Belson
2. Dero Bike Rack Co.
3. Madrax.

2.2 FABRICATION

A. Metal Components: Form to required shapes and sizes with true, consistent curves and lines.

B. Pipes and Tubes: Form curves by bending members to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces.

C. Exposed Surfaces: All surfaces smooth, free of burrs, barbs, and sharpness; all edges and ends rolled, rounded, or capped.

2.3 FINISHES

A. Hot dipped galvanized heavy duty loop type 40 steel pipe conforming to the following specifications.

1. ASTM A312 standard specifications for zinc, hot dipped galvanized, coating on iron and steel pipe.
2. ASTM A53 standard specifications for pipe, steel, black, and hot-dipped, zinc coated, welded construction

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, and securely anchored and positioned at locations indicated on Drawings.

3.3 CLEANING

A. After completing site furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

END OF SECTION 12 93 13

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Division 13

Special Construction

SECTION 13 12 50 – BLEACHERS AND PRESSBOX

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 QUALITY ASSURANCE

A. Manufacturers Qualifications:

1. Manufacturers must have a minimum of ten years of experience in the manufacturing of grandstands and press boxes under current company name.
2. Manufacturer must provide five references (if requested) of similar projects within the State of Florida. References shall include scope of work, contract amount, owner's name and phone numbers, contract completion date and actual completion date.
3. Manufacturer shall have local representation/superintendent within a reasonable mile radius of the project. Representative is responsible to attend job site meetings, provide sequencing and scheduling information and make decisions on behalf of the manufacturer.

B. Welders must be AWS certified; manufacturing capabilities in accordance with the governmental agencies having jurisdiction.

C. Steel fabrication to be done in an AISC certified plant or in compliance with IBC Chapter 17. A third party AISC approved inspection agency must be hired to complete and properly document these inspections. The agency must disclose any possible conflicts of interest so that objectivity can be confirmed. Certified reports shall be submitted directly to the architect for confirmation. All associated costs shall be inclusive with the manufacturers bid.

D. Installers Qualifications:

1. Factory-trained and experienced in the installation of grandstands.
2. Source Quality Control: Mill Test Certification.
3. Single Source Responsibility: Obtain all of each distinct material required from a single manufacturer.

E. Code Compliance: Provide aluminum bleachers to meet or exceed all State and Local applicable codes and in compliance with the FBC, IBC/ICC National Code and CABO/ANSI A117.1 Barrier Free Sub code, Current Editions.

1.3 SUBMITTALS

A. Product Data: Submit technical data for each distinct type of material, component and accessory indicated.

1. Include information which specifically details physical properties and performance characteristics.

B. Shop Drawings: Manufacturer to submit shop drawings and structural design calculations signed and sealed by a Florida licensed Professional engineer, and schedules for type, location, quantity and details of all aluminum components required for this project.

1. Indicate on shop drawings that products are in compliance with FBC National IBC Building Code and all other State and Local Codes and Regulations.
2. Concrete designed per American Concrete Institute Guidelines
3. Samples: Submit manufacturer's samples upon request.

C. Certificate: Submit manufacturer's certification that materials furnished comply with requirements indicated and also in compliance with the FBC and IBC/ICC codes along with all other applicable Federal, State and local codes, and that materials meet or exceed test requirements indicated.

D. Maintenance manual submittals to include:

1. Manufacturer’s recommendations and criteria for annual visual inspection and required maintenance of grandstand and press box to assure safe conditions.
2. Manufacturer’s recommendations and criteria for biannual inspection for a professional engineer, registered architect or certified grandstand representative.

1.4 WARRANTY

A. Submit a written warranty signed by the manufacturer, installer, and the contractor, guaranteeing to correct failures for a period of two (2) years after substantial completion, without reducing or otherwise limiting any other rights to correction which owner may have under the contract documents. Failures are defined to include faulty workmanship or faulty materials. Correction may include repair or replacement.

1.5 BUILDING CODES

A. Comply with all applicable which includes but not limited to the following:

1. FBC – Florida Building Code
2. IBC/ICC Building Code- Current Edition
3. AISC Manual of Steel Construction, 9th Edition
4. Aluminum Association of America Guidelines
5. Florida Accessibility Current Edition
6. DBPR – for Manufactured Buildings (Press box)
7. American Concrete Institute

B. The bleacher shall be designed to support, in addition to its own weight, a uniformly distributed live load of not less than 100 pounds per square foot of gross horizontal projection of the bleacher. And 6 pounds per square foot of dead load on seats, footboards, risers and steel framing.

C. All seat and footboard members shall be designed to support not less than 120 pounds per linear foot. The bleacher shall be designed to resist, with or without live load, horizontal wind load appropriate for local conditions. It shall also be designed to resist, in addition to the live load, sway forces applied to the seats in a direction parallel to the length of the seat planks 24 pounds per liner foot; and, in a direction perpendicular, stresses in aluminum members and connections shall not exceed those specified for Building Type Structures by the Aluminum Association.

D. General: The structure shall be properly braced for wind and construction loads until all structural elements are secured. Lateral and longitudinal bays shall be cross-braced as required. Guardrails shall be of adequate size, location, and height to meet specified codes and designed to carry required loads. Exit stairs and intermediate aisle stairs shall be completely closed, in the direction of travel and shall have a maximum rise of 7” and a minimum tread of 11”.

E. Code Compliance: Submittals shall be based upon specifications and drawings contained in the bid documents. Architect will not review any design or product changes prior to the bid date. Design changes to reduce overall aisle egress calculations or number of stair and ramp exits will not be allowed. All bidders must bid in accordance with these specifications.

1. The Bleacher Contractor shall be responsible to meet the code interpretation provided in the bid documents and modify as required by state or local governmental review boards.
2. Calculations that demonstrate code compliance with egress and exit of aisles, stairs, and ramps are a required submission with approved drawings.

PART 2 - PRODUCTS

2.1 PRODUCT MANUFACTURERS

A. The Design intent is based on product provided by Southern Bleacher Company or approved equal.

B. Products specified herein have been selected because of their quality of construction, configuration, design, function, available finishes, components, accessories, dimensions, shape and style.

2.2 GALVANIZED STEEL ANGLE FRAME BLEACHERS

A. Product Description - Tongue and Groove Deck full plank – semi-closed decking configuration

1. The intent of the product design is to reduce and minimize the deflection of the aluminum deck and allow for future reconfiguration of seating as may be needed. All individual deck members shall be fitted together longitudinally at all tread, front walk and cross walk locations. This design, in ambient conditions, allows for expansion and contraction without damage or deformation of the aluminum deck. All deck members shall be secured with two hold down clips at each structural member.
2. Galvanized Steel Elevated Angle Frame Units.
3. Framing is placed with spacing as shown per plans.
4. Front Walkway:

a. Clear width 60 inches min. from the leading edge of row #1 seat to the railing system.
b. Grandstand: Elevated per plans.

5. Entry stairs to be firmly anchored to uniformly poured concrete bases.

a. Stair rise: 7 inches (max) per Building Code with vertical aluminum closure.
b. Stair tread depth: 11 inches (min) per Building Code with contrasting extruded aluminum aisle nosing at leading edge of each tread.
c. Guardrails on Stair to be 42 inches above leading edge of step with two- line anodized aluminum rail and filled with 6-gauge black vinyl coated chain link fence (2” mesh).
d. Stairs to have offset handrail extensions on each side of stair. The handgrip portion of handrails shall not be less than 1 1/2 inches or more than 2 inches in cross-sectional dimension or the shape shall provide an equivalent gripping surface. The handgrip portion of handrails shall have a smooth surface with no sharp corner. The top of handrails and handrail extensions shall be placed not less than 34 inches or more than 38 inches above the nosing of treads and landings. Handrails shall be continuous the full length of the stairs and shall extend in the direction of the stair run not less than 12 inches beyond the bottom riser. Ends shall be returned or shall terminate in newel posts or safety terminals. Handrails shall be extruded anodized aluminum.

6. Aisles:

a. Aisles with seating on both sides to have 34-inch high handrail with intermediate rail at approximately 22 inches above tread. Aisles with seating on one side shall have 34-inch high handrail attached to guardrail system. Handrail shall be mounted to provide clearance from guardrail system in accordance with building code.
b. Pre-fabricated anodized aluminum handrails with continuous rounded ends are discontinuous to allow access to seating through a space 22 inches (min.) to 36 inches (max.).
c. Handrails shall connect to decking / riser surface without penetration of the deck system. Any attachment which must have holes drilled through the decking or intermediate step members is not acceptable.
d. If half steps are required, these steps shall be constructed of the same materials as the treads and risers of the grandstands. Ends shall be completely closed and attached with same mechanical fasteners as used for seat brackets. Extruded aluminum contrasting aisle nosing shall be mechanically fastened to the leading edge of each step.

7. Aluminum Decking System:

a. Bleachers: rise per and tread depth per plans.
b. Each seat 17 inches above its respective tread.
c. Decking Arrangement Tongue and Groove Deck Construction- per section plans
d. The seats shall be 2 x 10 flat designed extruded aluminum alloy, 6063-T6 with clear anodized 204R1, AA-M10C22A31, Class II finish. Seats shall have serrations on top side to allow for safety of occupants.

e. The tread system shall be comprised of aluminum extrusions which fit together lengthwise in a male-female shape running the length of the planks. This tongue and groove mechanism will minimize deflection and not separate due to loads being applied to individual planks. The locking mechanism by design shall allow for expansion and contraction of individual planks without effecting performance of the system. Welded deck is not an acceptable product for this project. The rain water should be able to penetrate the deck and drip to stone base below.
f. The system shall cause the deck planks to react together at all treads and cross walks to live load and form the appearance of a single tread system. By design, this system forms a solid, overlapping tread and riser installation.
g. The nose extrusion at aisles shall allow for a 1” extruded aluminum contrasting nose piece to be flush mounted on the leading edge and shall capture the vertical riser plank in an extruded pocket. The heel extrusion shall have a.70” vertical lip at the rear of the plank to allow for placement of vertical riser plank.
h. These extrusions shall be such that the attachment of the seat brackets, step brackets, mid-aisle rails and all other components is accomplished without deck penetrations at aisle locations.
i. Entry stairs to be a minimum 2 x 11 mill finish aluminum with inset extrusion to accept contrasting nosing member.
j. Ramp planks to be interlocking to resist deflection of live loads.
k. Open ends of planks to be covered with anodized aluminum end caps, securely fastened to the plank.
l. Joint sleeves: Dual joint sleeves to be inserted at each butt joint of each load bearing aluminum plank, and to penetrate 6 inches into each plank at the joint.

8. Guard railing: To be at all sides of bleacher, entry stairs, ramps portals and landings.

a. Vertical rail risers to be galvanized steel angle 3” x 3” x ¼ (50 ksi) for steel to steel connection and fastened with 3/8” galvanized hardware
b. Horizontal railing to be anodized aluminum with aluminum cast end plugs at ends of straight runs and/or elbows at corners.
c. All guards shall be secured to vertical rail members with hot dipped galvanized fasteners and clamps
d. Railings shall be placed at a minimum of 42” above walkways, entrances and adjacent seat boards.
e. The barrier material shall include 6 - gauge black vinyl coated chain link fencing, fastened in place with hot dipped galvanized tension bars and aluminum ties.

9. Ramps:

a. Slope: 1 in 12.
b. Guardrails to be 42 inches above ramp with two-line anodized aluminum rail and in filled with 6- gauge black vinyl coated chain link fence (2” mesh) and 2 x 6 extruded aluminum toe board.
c. Handrail: Ramps to have handrail extensions. The handgrip portion of handrails shall not be less than 1 1/2 inches or more than 2 inches in cross-sectional dimension or the shape shall provide an equivalent gripping surface. The handgrip portion of handrails shall have a smooth surface with no sharp corners. The top of handrails and handrail extensions shall be placed not less than 34 inches or more than 38 inches above the ramp surface. Handrails shall be continuous the full length of the ramp and shall extend in the direction of the ramp not less than 12 inches beyond the end of the ramp. Ends shall be returned or shall terminate in newel posts or safety terminals. If returned, rail must be smooth with no external fittings.
d. Termination: Ramps shall end with smooth transition onto level concrete pad at benchmark elevation. Aluminum plate with end closures required.

10. Handicap provision:

    a. Quantity of wheelchair spaces: as shown on drawings and in full compliance with Florida ADA Standards set forth in State of Florida Accessibility Regulations
    b. Riser area adjacent to wheelchair spaces to have intermediate construction so 4-inch sphere cannot pass through opening.
    c. Guardrail: Area directly behind handicap areas shall have two-line anodized aluminum rail attached to the riser members. These rails shall be pre-fabricated to match the appearance of the mid-aisle handrails. A toe rail shall be attached to the base of the rail.

B. Substructures:

1. Structural shapes meet one of the following ASTM specifications: A36, A36/A572 grade 50, A572 grade 50, A529-50, or A500 grade B.
2. Shop connections are seal welds.
3. After fabrication, all steel is hot-dipped galvanized to ASTM-A-123 specifications. Painted and/or powder coated steel does not offer proper protection and is not an acceptable protective finish for this project
4. All hardware shall be hot-dipped galvanized to ASTM A-123, mechanically galvanized or aluminum (aluminum applies to pop rivets, drive rivets, wire ties).
5. A minimum of 3/8” galvanized connection hardware to be used on the substructure

C. Extruded Aluminum:

1. Seat Planks and Railing are extruded aluminum alloy, 6063-T6 with clear anodized 204R1, AA-M10C22A31, Class II finish.
2. Riser planks are extruded aluminum alloy, 6063-T6 with clear anodized finish
3. Tread, stair and ramp planks are extruded aluminum alloy 6063-T6 mill finish
4. Joint Sleeve Assembly to be inserted in flat plank to maintain true alignment in joining together two plank pieces. Extruded aluminum alloy, 6063-T, mill finish.

D. Accessories:

1. Channel End Caps: Aluminum alloy 6063-T6, clear anodized 204R1, AA-M10C22A31, Class II. Mechanically fastened.
2. Cast End Plugs: Aluminum 319 alloy, cast finish. (Required at termination ends of railing)
3. Hardware:

    a. Bolts, Nuts: Hot-dipped galvanized or mechanically galvanized.
    b. Hold-down Clip Assembly: Aluminum alloy 6005A-T6, mill finish.
    c. Structural Hardware: Equal to or greater than hot dipped galvanized ASTM-A307. No connections utilizing high strength bolts are classed as slip critical.
    d. Aisle Nose and Stair Nose: Aluminum alloy, 6063-T6, slip-resistant black painted finish. Mechanically fastened.

E. Signage

1. Properly label all handicap seating areas

a. Press Box – Type IIB, non-combustible steel Framed modular press box 8' deep x 18' wide with ship ladder stair access to filming platform. Interior finishes per plans. Support framing to be “Leg Truss” style heavy angle per plans.
b. An AISC certified steel fabricating plant is a requirement of this project for quality control and assurances. See Section Quality Assurance, C.
c. Stairs and ramps per plans and in accordance with State and Local codes and guidelines.

F. Design Load:

1. Live Load: 100 psf gross horizontal projection.
2. Lateral Sway Load: 24 plf seat plank.
3. Perpendicular Sway Load: 10 plf seat plank.
4. Live Load of Seat and Tread Planks: 120 plf.
5. Handrails and Guardrail: Designed to resist a single concentrated load of 200# applied in any direction at any point along the top. Per Florida Building Code.
6. Wind load: Per Florida Building Code.
7. Liveload deflection of structural members shall be limited to L/200 of the span.

G. All manufactured connections to be shop welded.

1. Manufactured by certified welders conforming to AWS Standards.

2.3 PRESS BOX WITH STEEL FRAME STRUCTURE

A. Product Description: Type IIB Construction.

B. Press box Dimensions: (8) feet wide x (18) feet long

C. Press box to be of open construction, allowing inspection of electrical wiring, switches and other components without destructive disassembly.

D. Press box to be constructed with roof hatch access to filming platform.

E. Special Inspections- Per the state of FL (DBPR) Manufactured Buildings

F. Press Box Support Structure:

1. Structural shapes meet one of the following ASTM specifications: A36, A36/A572 grade 50, A572 grade 50, A529-50, or A500 grade B.
2. Shop connections are seal welds.
3. After fabrication, all steel is hot-dipped galvanized to ASTM-A-123 specifications.

G. Press Box: All materials shall be new and shall comply with ASTM specifications.

1. Floor

a. Main support to be a galvanized steel floor frame sized to support structure and metal belly pan for support of insulation.

b. Floor to be INTERLOCK Aluminum Decking System, extruded aluminum alloy 6063-T6. Attach Decking System to steel floor frame with mechanical fasteners at end of plank and at intermediate supports. Wood/plywood base decking has proven to deteriorate over time and is not an acceptable alternative.

c. Insulation: Kraft faced fiberglass building insulation R-11, 3 1/2 inches thick. Batt or roll as manufactured by Owens-Corning Fiberglass Corp., or equal.

d. Wall Structure Steel Framing

1) 4 inch x 4 inch x 11 gauge square tubing with maximum span of 14 feet on front wall and maximum span of 6 feet on back wall and 4 inch x 2 1/2 inch x 14 gauge steel "cees" with maximum spacing of 5 feet for all walls with siding. Spans greater than these require engineered calculations for design.
2) Insulation: Kraft faced fiberglass building insulation R-11, 3 ½ inches thick. Batt or roll as manufactured by Owens-Corning Fiberglass Corp., or equal.

e. Interior Finish

1) 1/2 inch vinyl coated gypsum panels, Gold Bond vinyl-surfaced
2) Cove Base: Vinyl 4 inches x.080 color to be medium gray.

f. Exterior Finish

1) 26 - gauge prefinished R-Panel paneling as manufactured by MBCI, Signature 200 color series, color to be determined. Vinyl clad siding is not an acceptable product.
2) Wall panels are attached with #12 TEK screws - 6” O.C. at the top and bottom of the panels. Lap screws are placed at each end of the panels, at the intermediate supports, and at the mid-point between supports (TEK #14). All fasteners to be painted same color as exterior paneling.

g. Roof Structure

1) 4 inch x 4 inch x 11 gauge square tubing with maximum spacing of 6 feet on center and 4 inches x 2 1/2 inches x 14 gauge steel "cees" with maximum spacing of 2 feet on center.
2) Roof: 1/8 inch four way steel plate roof, continuous welded seams coated with acrylic metal primer as manufactured by Coronado and 36 mils of acrylink roof coating as manufactured by Isothermal Protective Coatings, or equal. Plate is welded on both sides of rafters with 1-1/2 inch long 1/8 inch fillet welds on 12 inch centers. Plywood sheathing will not be accepted.
3) Insulation: Kraft faced fiberglass building insulation, R-19 (minimum) 6 inches thick. Batt or roll as manufactured by Owens-Corning Fiberglas Corp., or equal.
4) Cornice: 26 gauge steel prefinished- color to be determined.
5) Ceiling: 24 inch x 24 inch x 5/8 inch acoustical ceiling tile architectural revealed edge style wind clips and other components as manufactured by USG, or equal.

h. Exterior Doors

1) Full flush steel construction with honeycomb core. 18 gauge skin sheets. Dimensions: 3 feet 0 inches x 6 feet 8 inches. Color: White.
2) Steel door frame (16 gauge) complete with 1/2 inch threshold and weather-stripping.
3) Exterior Hardware (Prior to completed fabrication check with the district to verify what core lock system they use): Yale 546F Exterior Trim, or equal. Handles shall be lever type that allows operation without tight grasping or twisting of the wrist. All exterior hardware must accommodate this.
4) Interior Hardware: Yale 2100 Exit Device, or equal. Handle shall be panic bar that allows for opening without any grasping, twisting or turning.
5) Interior Walls

a) Framing to be steel galvanized studs (25 gauge) 1 1/4 inch x 3 5/8 inch at maximum 2 feet on center.
b) Finishes to be consistent with all other interior finishes.
c) A 24” x 56” interior window in each wall.

i. Windows

1) Frame: Extruded aluminum single hung, horizontal sliding unit, thermal break.
2) Sash: Tilt toward inside for easy cleaning.
3) Glazing: Clear tempered panes.
4) Dimensions of each unit: Dependent on compartment size. At interior wall locations or structural support locations the dimension between windows shall be no greater than 6 inches.
5) Finish: Electrostatically applied acrylic enamel.

j. Work Bench

1) 18 inch deep clear anodized aluminum countertop with a radius front edge.
2) Support using 4” x 2” x 14 ga. Steel “cee” on 4” x 4” x 11 ga. Sq. tubing welded to steel.
3) Shelf brackets do not provide proper support and are not acceptable.

k. Painting: Materials equal to. Coronado or equal.

1) Surfaces: Exterior Door(s), Door Frame(s)

a) Primer: Applied by Door Manufacturer.
b) Finish: 2 coats acrylic latex semi-gloss enamel applied by press box manufacturer.

2) Surfaces, Exterior Siding

a) Primer: Applied by Siding Manufacturer.
b) Finish: Applied by Siding Manufacturer.
c) Touchup: If applicable

3) Surfaces: Wall and Roof Structure

a) Primer: Coronado DTM Industrial 180-11 acrylic metal primer applied after welding, or equal.

l. Caulking: Sonneborn NP1 - Polyurethane sealant, All temperature, UV resistant, or equal. Silicone products are not acceptable.

m. Electrical Work:

1) Submittal drawing shall indicate devices and circuitry.
2) Fixtures: Recessed 2'x4' static T8 Troffer fluorescent light fixture for use in grid ceiling systems.
3) Wiring to be in nonmetallic Panduit, or equal. N.E.C. breaker box to be 100 amp service mounted on wall with 2 inch rigid conduit to be stubbed out at back wall of press box ready for service line to be connected.
4) Service line to Press Box (By Electrical Contractor)
5) Electrical outlet(s) installed per NEC shall be standard duty.

a) All outlets shall be surface mounted on wall.

6) Sound, Telephone, Clock, Field Communication: Empty double outlet boxes per N.E.C. with 3/4 inch conduit stubbed out bottom of Press Box. Electrical contractor is responsible for re-connecting all electric, telecommunications and audio visual wiring, conduit and equipment to the press box.
7) Outlet boxes to be flush mounted into wall. Any wiring completed on-site will be responsibility of such contractor for inspections. Quantity per plans.
8) Filming Area/Observation Deck: Weathertight outlet box for cameras. Quantity: One. Owner shall indicate additional outlets needed.
9) Provide wall mounted Air Conditioning Unit.
10) Provide in each room an emergency combination exit/flood light with battery back-up. Also provide exterior emergency light with remote heads.
11) Provide (1) wall mount exterior lights with photocell

n. Provide fire extinguishers at each exit door (1) total.

2. Filming Area/Observation Deck

a. Access

1) Ships ladder and roof hatch to filming platform
2) Roof guard railing to be 48” above walking surface around perimeter of deck attached to 5/8 inch galvanized studs to be welded to roof support structure. The guard railing to be 6- gauge black vinyl fencing

PART 3 - EXECUTION

3.1 INSTALLATION

A. All work performed by technicians experienced in bleacher seating. Project references may be required to verify the quality of finished projects.

B. Installation with proven experience in the Florida region. Requirement for a minimum of (3) installer references in for this project of similar size and scope.

C. Project is only to be installed as per approved shop drawings.

3.2 EXAMINATION

A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position

3.3 ERECTION

A. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing. Locate braced bays as indicated.

B. Do not field cut or alter structural members without approval.

3.4 CLEAN-UP

A. Clean up all debris caused by work of this section removed from site.

B. Upon completion of the work and final inspections, bleacher manufacturer installer shall broom clean the stand removing all loose debris.

END OF SECTION 13 12 50

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