Section 01 33 00 Submittal Procedures

PART 1 - GENERAL

1.01 RELATED SECTIONS

A. Section 01 42 16 – Definitions

1.02 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review to ARC Architectural Group:
   1. Product data.
   2. Shop drawings.
      a. Submissions for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
   3. Samples for selection.
   4. Samples for verification.
   5. Samples will be reviewed for aesthetic, color, or finish selection.

B. CONTRACTOR - PROPOSED ALTERNATES:
   1. If alternate materials or equipment are proposed by the General Contractor for use in lieu of the specific materials and/or equipment specified or listed as acceptable within these Project Technical Specifications, the General Contractor shall provide full product manufacturer's technical documentation for review & evaluation by the Architect or Engineer prior to proceeding with use of the proposed alternate.
   2. Costs for Architect and or Engineer review, evaluation, and drawing revisions (if any) resulting from acceptance of GC-proposed alternates shall be invoiced at the Architect's and/or Engineer's standard billing rate to the General Contractor and paid by the contractor within 30 days of invoice date.
      a. General Contractor's failure to pay such invoiced costs shall result in a deduction from the next request for draw against the Contract Amount in the amount of the invoice(s) and payment to the Architect and/or Engineer.

1.03 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information to ARC Architectural Group. The information shall be kept securely for transfer to RUSD at the appropriate time, or at the completion of the Project.
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Ready mix concrete batch tickets
   5. Inspection reports.
   6. Manufacturer's instructions.
   7. Manufacturer's field reports.
   8. Other types included.

1.04 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:

1. Submit four (4) copies; two (2) will be processed & returned; two (2) which ARC Architectural Group will retain.

B. Documents for Information: Submit two (2) copies.

C. Samples: Submit four (4); two (2) will be processed & returned; two (2) which ARC Architectural Group will retain.

1. Retained samples will not be returned.

1.05 SUBMITTAL PROCEDURE

A. It is expected that the General Contractor shall thoroughly review each submittal from the Sub-Contractors and the Material Suppliers for compliance with the Specifications and format requirements prior to forwarding to the Architect for review.

B. Transmit each submittal with a transmittal letter.

C. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

D. Identify: Project, Subcontractor or supplier, pertinent drawing and detail number, and specification section number, as appropriate on each copy.

A. Apply stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

B. Electronic Submittals are acceptable. If the Architect deems additional information or representations are required, the General Contract shall comply and provide additional supplementary printed submittals.

G. NOTE: The above stated Submittal Procedures shall be the standard for the Project Architect's review of submittals by the contractors.

H. Schedule submittals to expedite the Project, and coordinate submission of related items. If an immediate review and response is needed to maintain project schedule, so state in the transmittal letter.

I. For each submittal for review, allow 10 days excluding delivery time to and from.

J. Identify variations from Contract Documents and Product or system limitations, which may be detrimental to successful performance of the completed Work.

K. Provide space for review stamp by the Project Architect or the Consulting Engineers.

L. If required, when revised for resubmission, identify all changes made since previous submission.

M. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

-- END OF SECTION -

Section 01 40 00 Quality Requirements

PART 1 - GENERAL

1.01 Quality Standard Requirements

A. Code Compliance: All work shall apply with all applicable local, state, and national codes, laws, and ordinances; including requirements for approval, inspection, permits, licenses, and standards.

B. The materials, fabrication and construction of all components of the work shall meet or exceed standards and references in the Construction Documents. If a conflict appears between referenced standards and or construction document details and/or specifications, the most stringent requirements shall be applied.

C. The Architect shall be the final authority regarding intent, interpretation, and implementation of the Construction Documents. Unless otherwise specifically stated:

1. Referenced design and construction standards shall be taken from the most current edition and/or revision.

2. The completed work shall comply with standards and practices for premium quality work commonly accepted by Architects, Engineers, and the Trade.

3. Installation of materials, fixtures, systems components, equipment, etc. shall comply with all printed instructions, specifications, and directions of the manufacturer.

E. Submittals:

1. If listed in the Contract Documents, or if requested by the Architect or Engineer, it shall be the contractor's responsibility to furnish proof that materials and workmanship meets or exceeds the requirements of the documents and standards. The General Contractor shall be responsible to obtain, maintain and furnish copies of original delivery tickets; furnish collies of mix and/or batch tickets; and testing agency reports; and provide same to the Architect upon request.

Section 01 77 00 Project Closeout Procedures

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.
B. Operations and Maintenance Data
C. Warranties and Bonds

1.02 RELATED SECTIONS

A. Section 01 33 00 - Submittals Procedures, shop drawings product data, and samples.
B. Individual Product Selections: Specific requirements for operation and maintenance data.
C. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to ARC Architectural Group with claim for final Application for Payment.

B. Operations and Maintenance Data:

1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work, to ARC Architectural Group. The Architect shall review draft and return one copy with comments.
2. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection with the Architect's comments.
3. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:

1. For equipment or component parts of equipment put into service during construction with the Owner's permission, submit documents within ten days after acceptance.
2. Make other submittals within ten days after Date of substantial Completion, prior to final Application for Payment.
3. Work items for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance listing the date of acceptance as the beginning of the warranty period.

PART 2 -- PRODUCTS Not Used

3.05 WARRANTIES AND BONDS

A. See RUSD requirements in the administrative section of this Project Manual.

B. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with RUSD's permission, leave date of beginning of time of warranty until the date of Substantial Completion is determined.

C. Verify that documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Retain warranties and bonds until time specified for submittal.

-- END OF SECTION --

Section 02 41 91 Selective Building Demolition

PART 1 - GENERAL

1.01 See Site Plan

1.02 Remove existing 1,300 sf wood frame Storage Garage, footings & foundation, and adjacent exterior concrete slabs.

1.03 Remove existing chain link fencing.

1.04 Remove portions of existing asphalt pathway.

1.05 Cut & remove portions of existing Curb & Gutter For installation of new Curb Cut on Yout Street.

1.06 Scope

A. Applicable requirements of Division 01 apply to all work specified in this Section.

B. The General, Mechanical, Plumbing, and Electrical Contractors must adhere to the requirements stated in this Section.

C. Work included but not limited to:
   1. Cutting, fitting, closing and patching, barricades, enclosures, and all work as required to provide openings through all existing floors, walls and roofs.
   2. Required by the work for all trades.
   3. Required to uncover, inspect, and correct non-conforming work.

D. Sealing of openings as required for work to provide finished openings.

E. Patching shall include painting or other finish as required to match existing exposed surfaces.

F. Related Items Specified Elsewhere:

G. Refer to trade Sections for additional requirements as per installation procedures.

1.07 APPROVALS AND SUBMITTALS

A. Obtain Architect's approval before cutting, drilling, sawing or coring through concrete, masonry or steel or otherwise disturbing any work affecting structural safety to new or existing construction.

B. Report any discrepancies to Architect in writing before proceeding with affected work.

C. Obtain all necessary permits and approvals before use of torches.

D. Obtain consent of other Contractors and Subcontractors before disturbing or interfering with their work.

DIVISION 07 - THERMAL & MOISTURE PROTECTION

Section 07 21 16 THERMAL BATT INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES: Blanket Insulation within steel stud wall cavities

A. RELATED SECTIONS
1. Section 05 12 00 Structural Steel Framing
2. Section 06 16 43 Gypsum Board Wall Construction

1.02 REFERENCES

A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
National Fire Protection Association (NFPA) Life Safety Code

B. SUBMITTALS Submit under provisions of Section 01 33 00:
1. Product Data: Manufacturer's data sheets on each product to be used, including:
a. Preparation instructions and recommendations.
b. Storage and handling requirements and recommendations.
c. Installation methods.
d. Manufacturer's Certificates: Certify products meet or exceed specified
c. requirements.

1.03. QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer with a minimum of ten years' experience manufacturing products in this section shall provide all products listed.

B. Installer Qualifications: Products listed in this section shall be installed by a single organization with at least five years' experience successfully installing insulation on projects of similar type and scope as specified in this section.

D. DELIVERY, STORAGE, AND HANDLING
1. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
2. Storage: Store materials in dry locations with adequate ventilation, free from water, and in such a manner to permit easy access for inspection and handling.
3. Handling: Handle materials to avoid damage.
4. SEQUENCING: Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
5. PROJECT CONDITIONS: Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

Section 08 36 16 VERHEAD SECTIONAL DOORS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Commercial sectional doors.

1.2 RELATED SECTIONS

A. Section 08710 - Door Hardware: Hardware, locks, access panels.

B. Section 09900 - Painting: Field painting.

C. Section 16050 - Basic Electrical Materials and Methods: Electrical connections and service for powered door operators.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM) A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

B. American Society for Testing and Materials (ASTM) C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

C. American Society for Testing and Materials (ASTM) E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings:
   1. Provide drawings indicating track details, head and jamb conditions, spring shafts, anchorage, accessories, finish colors, patterns and textures, operator mounts and other related information.
   2. Regulatory Requirements and Approvals: Provide shop drawings in compliance with local Authority having Jurisdiction (AHJ).

D. Certifications:
   1. Submit manufacturer's certificate that products meet or exceed specified requirements.
   2. Submit installer qualifications.

E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

F. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

Section 08 71 00 DOOR HARDWARE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Hardware for new steel flush doors.

1.02 REFERENCES

A. ANSI/CC Al 17.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 1998.

B. DHI (LOGS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; Door and Hardware Institute; 1990.

1.03 SUBMITTALS for review and approval by the Architect, prior to placing an order for the wood doors, submit:

A. Manufacturer's product data sheets and catalog cut sheets.

B. Shop Drawings, indicate hardware item, location, mounting height on the door, and written job-specific manufacturers' warranties.

C. See Section 01 33 00 - Submittal Procedures.

D. Warranty: Submit manufacturer's warranty and ensure that all necessary forms have been completed and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years of documented experience.

B. No substitutions for Schlage locksets.

1.06 COORDINATION

A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware.

B. Furnish templates for door and frame preparation.

Section 09 91 13 EXTERIOR PAINTING

PART 1 - GENERAL

1.01 Steel columns and guardrail shall be shop primed prior to delivery to the site

1.02 After installation apply finish paint coats.

1.03 The Painting/Finishing Contractor shall be responsible to comply with the specified system materials and apply in conformance with the paint manufacturer's printed instructions per applicable methods.

1.04 Provide pairs of finished painted material samples for review and approval by the Architect.

1.05 Submit product selection, color sample for approval, and manufacturer's technical information and application instructions for each product proposed for use.

1.06 Submit product safety outline describing how adequate ventilation will be provided for flammable or noxious products.

1.07 Deliver products to the job site in the original unopened containers bearing the manufacturer's name and label with trade name and instructions.

1.08 Store products and materials not in use in tightly covered containers in a well area ventilated at a minimum ambient temperature of 45 degrees.

1.09 Keep storage area clean and orderly. Remove used rags containing oils, solvents, or other flammable residues at the end of each day's work.

1.10 Upon completion of this work any paint purchased for the project and remaining unused may, at the Owner's option, be retained by the Owner. Seal as appropriate for storage, clearly mark contents on container, and store in room as directed by the Owner's Representative.

1.11 SECTION INCLUDES

A. Surface preparation.
   1. Field application of paints and other coatings.
   2. See Finish Schedule - Surfaces to be Finished, at end of Section.

1.12 SUBMITTALS

A. See Section 01 31 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on all finishing products.

C. Samples: Submit two paper chip samples, in size illustrating range of colors and textures available for each surface finishing product scheduled.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

1.04 SUBMITTALS

A. See Section 01 31 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on all finishing products.

C. Samples: Submit two paper chip samples, in size illustrating range of colors and textures available for each surface finishing product scheduled.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data: Submit data on cleaning, touch up, and repair of painted and coated surfaces.

1.05 DELIVERY, STORAGE, AND PROTECTION

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

D. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft. candles measured mid-height at substrate surface.

1.07 EXTRA MATERIALS

A. Supply 1 gallon of each color; store where directed.

B. Label each container with color in addition to the manufacturer's label.

5. Wind Load:
   a. Wind Speed: Gusts to 90 MPH
   b. Wind Exposure: 'C' Open Exposure 2 sides – East and South

6. Seismic Load:. Per SF
   a. Spectral response acceleration for short periods (Ss): 0.094 g
   b. Spectral response acceleration for 1-sec. period (S1): 0.054 g
   c. Site Class: C

7. Floor Load.
   a. Live Load: 100 lbs. per SF
   b. Collateral Loads:
      (2) Welding Stations; weight each allowance: 750 lbs.
      (1) Water Heater; weight allowance: 450 lbs.
      (1) Service Sink; weight allowance 150 lbs.
      (1) Air Compressor; weight allowance: 500 lbs.

D. General Serviceability Limits :
1. Deflection Limits shall be in accordance with the applicable provisions of the Metal Building Systems Manual (MBMA), latest edition.
2. Vertical Deflections:
   a. Roof Secondary (Purlins) – L/150.
   b. Main Frame roof beams – L/180.
3. Horizontal Deflections:
   a. Wall Secondary (Girts) – L/90.
   b. Main Frames – H/60.
4. Vertical deflection limits apply for snow load (50-year mean-recurrence interval) plus collateral load, or the code required live load. The horizontal drift and deflections limits apply for the loads induced by a basic wind speed corresponding to a 10 year mean-recurrence interval.

1.6 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Provide complete erection drawings for the proper identification and assembly of all building components. Drawings will show anchor bolt settings, transverse cross-sections, sidewall, end wall and roof framing, flashing and sheeting, and accessory installation details.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, representing actual product, color, and patterns.

DIVISION 22 - PLUMBING

SECTION 22 05 00 COMMON WORK RESULTS FOR PLUMBING

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes:
1. Piping materials and installation instructions common to most piping systems.
2. Transition fittings.
3. Dielectric fittings.
4. Mechanical sleeve seals.
5. Sleeves.
6. Escutcheons.
7. Grout.
8. Supports and anchorages.

1.02 DEFINITIONS

A. Abbreviations for materials
1. Plastic materials: PVC: Polyvinyl chloride plastic.
2. Rubber materials: EPDM: Ethylene-propylene-diene terpolymer rubber.
NBR: Acrylonitrile-butadiene rubber.

1.03 SUBMITTALS

A. Product Data: For the following:
1. Mechanical sleeve seals.
2. Welding certificates.

1.04 QUALITY ASSURANCE

A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."

B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

C. Electrical Characteristics for Plumbing Equipment: Equipment of higher electrical characteristics may be furnished provided if such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

SECTION 22 05 23 GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Bronze ball valves.
2. Bronze swing check valves.
3. Bronze gate valves.

1.02 DEFINITIONS

A. CWP: Cold working pressure.

B. EPDM: Ethylene propylene copolymer rubber.

C. RS: Rising stem.

1.03 ACTION SUBMITTALS

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

1.04 QUALITY ASSURANCE

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

B. ASME Compliance:
1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
2. ASME B31.9 for building services piping valves.

C. NSF Compliance: NSF 61 for valve materials for potable-water service.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:
1. Protect internal parts against rust and corrosion.
2. Protect threads, flange faces, grooves, and weld ends.
3. Set angle, gate, and globe valves closed to prevent rattling.
4. Set ball and plug valves open to minimize exposure of functional surfaces.
5. Block check valves in either closed or open position.

B. Use the following precautions during storage:
1. Maintain valve end protection.
2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

SECTION 22 11 10 FACILITY NATURAL GAS PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Pipes, tubes, and fittings.
2. Piping specialties.
3. Piping and tubing joining materials.
4. Valves.
5. Pressure regulators.

1.02 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

1.03 PERFORMANCE REQUIREMENTS

A. Minimum Operating-Pressure Ratings: Piping and Valves: 100 psig minimum unless otherwise indicated.

B. Natural-Gas System Pressures within Buildings: Two pressure ranges. Primary pressure is more than 0.5 psig but not more than 2 psig, and is reduced to secondary pressure of 0.5 psig or less.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of the following:
1. Valves. Include pressure rating, capacity, settings, and electrical connection data of selected models.
2. Pressure regulators. Indicate pressure ratings and capacities.

1.05 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans and details, drawn to scale, on which natural-gas piping is shown and coordinated with other installations, using input from installers of the items involved.

B. Welding certificates.

C. Field quality-control reports.

1.06 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For pressure regulators to include in emergency, operation, and maintenance manuals.

1.07 QUALITY ASSURANCE

A. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

SECTION 22 11 19 DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Vacuum breakers.
2. Backflow preventers.
3. Balancing valves.
4. Water mixing valves.
5. Strainers.
6. Drain valves.
7. Water-hammer arresters.
8. Air vents.
9. Flexible connectors.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For domestic water piping specialties; Include diagrams for power, signal, and control wiring.

1.03 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

A. Potable-water piping and components shall comply with NSF 61.

2.02 PERFORMANCE REQUIREMENTS

A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.03 VACUUM BREAKERS

A. Pipe-Applied, Atmospheric-Type Vacuum Breakers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Conbraco Industries, Inc.
b. Watts; a division of Watts Water Technologies, Inc.; Watts Regulator Company.
c. Zurn Industries, LLC; Plumbing Products Group; Wilkins Water Control Products.
2. Standard: ASSE 1001.
3. Size: NPS 1/4 to NPS 3, as required to match connected piping.
4. Body: Bronze.
5. Inlet and Outlet Connections: Threaded.
6. Finish: Chrome plated.

SECTION 22 13 19 SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
1. Cleanouts.
2. Floor drains.
3. Trench drains.
4. Roof flashing assemblies.
5. Through-penetration firestop assemblies.
6. Miscellaneous sanitary drainage piping specialties.
7. Flashing materials. 8. Grease interceptors.

1.02 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. FOG: Fats, oils, and greases.

C. HDPE: High-density polyethylene plastic.

D. PE: Polyethylene plastic.

E. PP: Polypropylene plastic.

F. PVC: Polyvinyl chloride plastic.

1.03 ACTION SUBMITTALS: Product Data for each type of product indicated.

1.04 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic sanitary piping specialty components.

1.05 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Coordinate size and location of roof penetrations.

PART 2 - PRODUCTS

2.01 CLEANOUTS

A. Metal Floor Cleanouts FCO:
1. Standard: ASME A112.36.2M for adjustable housing cleanout.
2. Size: Same as connected branch.
3. Type: Adjustable housing.
4. Body or Ferrule: Cast iron.
5. Clamping Device: Required.
6. Outlet Connection: Spigot.
7. Closure: Stainless steel plug with straight threads and gasket.
8. Adjustable Housing Material: Stainless steel with threads.
9. Frame and Cover Material and Finish: Stainless steel.
10. Frame and Cover Shape: Round.
11. Top Loading Classification: Heavy Duty.
12. Riser: ASTM A 74, Service class, cast-iron drainage pipe fitting and riser to clean-out.
13. Standard: ASME A112.3.1.

2.02 FLOOR DRAINS

A. Cast-Iron Floor Drains FD-1:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Josam Company; Josam Div.
b. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
c. Watts Drainage Products Inc. d. Zurn Plumbing Products Group
2. Standard: ASME A112.6.3.
3. Body Material: Cast Iron.
4. Clamping Device: Required.
5. Outlet: Bottom.
6. Top of Body and Strainer Finish: Adjustable, nickel bronze with vandal proof screws.
7. Top Shape: Round.

2.03 FLASHING ASSEMBLIES

A. Description: Manufactured assembly made of 4.0-lb/sq. ft., 0.0625-inch- thick, lead flashing collar and skirt extending at least 6 inches from pipe, with galvanized-steel boot reinforcement and counterflashing fitting; Open-Top Vent Cap: Without cap.

2.04 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Open Drains: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron, soil-pipe fittings. Include P-trap, hub-and-spigot riser section; and where required, increaser fitting joined with ASTM C 564, rubber gaskets. Size: Same as connected waste piping with increaser fitting of size indicated.

B. Deep-Seal Traps: Cast-iron or bronze casting, with inlet and outlet matching connected piping.
1. Size: Same as connected waste piping.
a. NPS 2: 4-inch- minimum water seal.
b. NPS 2-1/2 and Larger: 5-inch- minimum water seal.

C. Air-Gap Fittings:

1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
2. Body: Bronze or cast iron.
3. Inlet: Opening in top of body.
4. Outlet: Larger than inlet.
5. Same size as connected waste piping and with inlet large enough for associated indirect waste piping.

D. Stack Flashing Fittings: Counterflashing-type, cast-iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe. Size: Same as connected stack vent or vent stack.

E. Vent Caps: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and setscrews to secure to vent pipe. Size: Same as connected stack vent or vent stack.

F. Frost-Resistant Vent Terminals: Manufactured or shop-fabricated assembly constructed of copper, lead-coated copper, or galvanized steel.

1. Design: To provide 1-inch enclosed air space between outside of pipe and inside of flashing collar extension, with counterflashing.

2.07 FLASHING MATERIALS

A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:

1. General Use: 4.0-lb/sq. ft., 0.0625-inch thickness.
2. Vent Pipe Flashing: 3.0-lb/sq. ft., 0.0469-inch thickness.
3. Burning: 6-lb/sq. ft., 0.0938-inch thickness.

B. Copper Sheet: ASTM B 152/B 152M, of the following minimum weights and thicknesses, unless otherwise indicated. Applications: 12 oz./sq. ft.. 2. Vent Pipe Flashing: 8 oz./sq. ft..

C. Zinc-Coated Steel Sheet: ASTM A 653/A 653M, with 0.20 percent copper content and 0.04inch minimum thickness, unless otherwise indicated. Include G90 hot-dip galvanized, mill phosphatized finish for painting if indicated.

D. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil minimum thickness.

E. Fasteners: Metal compatible with material and substrate being fastened.

F. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

G. Solder: ASTM B 32, lead-free alloy.

H. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
   1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
   2. Locate at each change in direction of piping greater than 45 degrees.
   3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
   4. Locate at base of each vertical soil and waste stack.

B. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

C. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

D. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
   1. Position floor drains for easy access and maintenance.
   2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
      a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
      b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
      c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1inch total depression.
   3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
   4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

E. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.

F. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.

G. Install through-penetration firestop assemblies in stacks at floor penetrations.

H. Assemble open drain fittings and install with top of hub 1 inch above floor.

I. Install deep-seal traps on floor drains and other waste outlets, if indicated.

J. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

K. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.

L. Install frost-resistant vent terminals on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.

M. Install expansion joints on vertical stacks and conductors. Position expansion joints for easy access and maintenance.

N. Install wood-blocking reinforcement for wall-mounting-type specialties.

O. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.02 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

3.03 FLASHING INSTALLATION

A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
   1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft., 0.0938-inch thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft., 0.0625-inch thickness or thinner.
   2. Copper Sheets: Solder joints of copper sheets.

B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
   1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
   2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
   3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.

C. Set flashing on floors and roofs in solid coating of bituminous cement.

D. Secure flashing into sleeve and specialty clamping ring or device.

E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Division 07.

F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

G. Fabricate and install flashing and pans, sumps, and other drainage shapes.

3.04 LABELING AND IDENTIFYING

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each Solids Interceptor.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.05 FIELD QUALITY CONTROL

A. Tests and Inspections:
   1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
   2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.06 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION

SECTION 22 34 36 COMMERCIAL, HIGH-EFFIENCY, GAS DOMESTIC WATER HEATERS

PART 1 GENERAL

1.01 Provide one (1) gas-fired water heater in the general location shown on the Floor Plan.

1.02 Provide all required and incidental materials, components, piping, venting, and connections for a complete installation.

1.03 QUALITY ASSURANCE

A. Condensate piping specialties shall bear label, stamp, or other markings of specified testing agency.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic sanitary piping specialty components.

1.04 COORDINATION

A. Coordinate size and location of installation requirements with the General Contractor and the Electrical Contractor.

B. Coordinate size and location of roof / wall penetrations.

PART 2 - PRODUCTS

2.01 Rheem RTGH-90DVLN Prestige Condensing Tankless Direct Vent Indoor Water Heater. SKU: RTGH-90DVLN

PART 3 - EXECUTION

3.01 A. Install wood-blocking reinforcement for wall-mounting-type specialties.

B. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

3.02 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

3.03 FLASHING INSTALLATION

A. Install flashing on pipes, sleeves, and specialties passing through walls or roof with waterproof membrane.
   1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
   2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.

B. Set flashing on roofs in solid coating of bituminous cement.

C. Secure flashing into sleeve and specialty clamping ring or device.

D. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Division 07.

E. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

3.04 LABELING AND IDENTIFYING

A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each Solids Interceptor.

B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.05 FIELD QUALITY CONTROL

A. Tests and Inspections:
1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.06 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION

Section 22 42 16 Commercial Lavatories and Sinks

PART 1 - GENERAL

1.01 Provide and install (1) Service Sink. See Floor Plan for location

A. location may be adjusted in consultation with RUSD Representative and Architect per on-site discussion at time of Rough-In..

PART 2 - PRODUCTS

2.01 Service Sink: SWAN Model # MF-2F Laundry Tub; standard color.

2.02 Faucet: CHICAGO FAUCETS Model # 1895-L9ABCProvide all P

A. Provide ADA-Compliant Handles

PART 3 - EXECUTION

3.01 Install in compliance with all applicable product manufacturer's instructions, Code Requirements, industry standards, and best trade practices.

3.02 Provide all required and incidental components, fittings, piping, etc. for a complete installation.

END OF SECTION

Section 22 45 26 Eye / Face Wash Equipment

PART 1 - GENERAL

1.01 Provide and Install (1) Eyewash Station. See Floor Plan for location

A. location may be adjusted in consultation with RUSD Representative and Architect per on-site discussion at time of Rough-In.

PART 2 - PRODUCTS

2.01 Guardian Model # G1825 Pedestal-mounted Eyewash Station with Stainless Steel Bowl. (gesafety.com)

A. Include Optional additional components:
   1. BC Stainless steel bowl cover
   2. DC Stainless Steel dust cover for each spray head

PART 3 - EXECUTION

3.01 Install in compliance with all applicable product manufacturer's instructions, Code Requirements, industry standards, and best trade practices.

3.02 Provide all required and incidental components, fittings, piping, etc. for a complete installation.

END OF SECTION

DIVISION 23 – HEATING, VENTILATING, and AIR CONDITIONING (HVAC)

Section 23 81 00 DECENTRALIZED Unitary HVAC Equipment

PART 1 GENERAL

1.01 Provide & Install two (2) gas-fired Unit Heaters. See locations on Lighting & Electrical Plan.

PART 2 PRODUCTS

2.01 Units shall be Modine Effinity 93 Condensing Unit Heaters Model PTC

2.02

		Unit Tag
Model Number	PTC 85AS0111FBAN	
Quantity of Units	1	
Btu/Hr Input	85,000	
Btu/Hr Output	79,050	
CFM	1650	
Altitude	0-2000	
Temperature Rise (degrees F)	44	
External Static Pressure (E.S.P)	0.00	
Total Static Pressure (T.S.P.)	0.00	
Gas Type	Natural	
Gas Control Type	Single Stage, Direct Spark Ignition, 100% Shut-Off with Continuous Retry	
Supply Voltage	115/60/1	
Control Voltage	24V	
Motor HP	1/8	
Motor RPM	1625	
Blower RPM	N/A	
Heat Exchanger Type	Aluminized Steel Heat Exchanger/Burner	

Model	Description
PTC 85AS0111FBAN	Propeller Unit Heater
65795	PTC 85AS0111FBAN

2.03 Product Type; PTC - Separated Combustion, High Efficiency Condensing Propeller Unit

2.04 Furnace Input Rating 85 - 85,000 btu

2.05 Heat Exchanger Type: A - Aluminized Steel Heat Exchanger and Burner

2.06 Pilot Ignition; S – Direct Spark Ignition

2.07 Motor and Drive Code (Power Code); 01 - 115V motor

2.08 Gas and Valve/Ignition Control Type (Control Code)

2.09 Natural, Single Stage, Direct Spark Ignition, 100% Shut-Off with Continuous Retry

2.10 General Performance Data

Model	PTC 85
At 0' Elevation	
Btu/Hr. Input	85,000
Btu/Hr. Output	79,050
Entering Airflow (CFM)	1650
Outlet Velocity	619
Air Temp. Rise (°F)	44
Mounting Height (Max Ft.)[1]	13
Heat Throw (Max. Mtg. Ft.) [2]	48
Unit Total Power (Amps)	4.35
Condensate Produced (gal/hr)	0.5
As Configured at 0-2000 Ft. Elevation	
Btu/Hr. Input	85,000
Btu/Hr. Output	79,050
Configured Air Temp Rise (°F)	44
Motor Data	
Horse Power	1/8
RPM	1625
Type	P.S.C.
Motor Amps at 115V	2.20
Clearances to Combustibles	
Top and Bottom	6"
Vent/Combustion Air Connector	6"
Access Side	6"
Non-Access Side	6"
Rear	18"

[1] At 65°F ambient and unit fired at full-rated input. Mounting height as measured from bottom of unit.
[2] Heat Throws are calculated at 65°F ambient with a 44°F air temperature rise with the unit mounted at a maximum mounting height of 13 feet.

2.11 Shipping Weight: 125 lbs

2.12 Standards: ETL design certification for use in both the US and Canada to the ANSI Z83.8 - latest revision, standard for "Gas Unit Heater and Gas-Fired Duct Furnaces" for safe operation, construction, and performance

2.13 Mechanical Configuration: Condensing furnace section with 93% minimum efficiency provided by an indirect-fired tubular heat exchanger with individually fired tubes coupled to a secondary recuperative heat exchanger for maximum heat recovery.

2.14 Venting/Combustion Air Arrangement: The unit shall be separated combustion. The venting shall be a power exhausted arrangement with a separate combustion air intake pipe connection to allow for fresh combustion air from outside the conditioned space. The unit shall be tested to insure proper ignition when the unit is subjected to 40 mile per hour wind velocities. The unit shall also include a factory mounted differential pressure switch designed to prevent main burner ignition until positive venting has been proven.

2.15 Venting shall be Schedule 40 PVC. For Canadian installations, all vent pipe and components must be approved to ULC S636.

2.16 Unit Casing: The unit heater(s) casing shall be constructed of not less than 20 gauge aluminized steel with minimization of exposed fasteners. All exterior casing parts shall be cleaned of all oils and a phosphate coating applied prior to painting. The exterior casing parts shall then be painted with an electrostatically applied baked-on gray-green polyester powder paint (7-mil thickness) for corrosion resistance.

2.17 The unit shall be furnished with horizontal air deflectors. The deflectors are adjustable to provide for horizontal directional airflow control (up or down).

2.18 Furnace Section: The heat exchanger(s) shall be made of 18-gauge aluminized steel tubes and headers. Each heat exchanger tube shall be individually and directly flame-fired. The heat exchanger tube shall be crimped to allow for thermal expansion and contraction. The flue collector box shall be made of 20 gauge AL29-4C stainless steel.

2.19 Efficiency: The thermal efficiency of the unit(s) shall be a minimum of 93% efficient for all air flow ranges through the use of a secondary recuperative heat exchanger. The secondary heat exchanger shall be constructed of AL29-4C stainless steel to withstand the corrosive environment of condensing gas fired equipment.

2.20 The heat exchanger(s) seams and duct connections shall be certified to withstand 0.9" W.C. external static pressure without burner flame disturbance.

2.21 The burner(s) shall be in-shot type, directly firing each heat exchanger tube individually and is designed for good lighting characteristics without noise of extinction for both natural and propane gas.

2.22 The ignition controller(s) shall be 100% shut-off with continuous retry.

2.23 The gas pressure shall be between 6-7" W.C for natural gas.

2.24 The solid-state ignition system shall directly light the gas by means of a direct spark igniter each time the system is energized.

2.25 The unit gas controls shall be provided with the following:

A. Single-stage gas controls with a single-stage combination gas control, an ignition control. The unit fires at 100% full fire based on a call for heat from a room thermostat.

B. An automatic reset high limit switch mounted in the air stream to shut off the gas supply in the event of overheating.

C. An automatic reset high limit switch mounted on the power exhauster housing to shut off the gas supply in the event of overheating flue gas temperatures.

D. A condensate drain line overflow switch that senses if the condensate line is clogged and shuts the unit heater down. The switch is factory mounted inside the unit cabinet and wired to the unit controls.

E. An energy-saver control utilizes stratified ceiling air to heat the space at floor level before turning on the gas controls. Its operation is independent of the room thermostat and should have a higher set-point than the room thermostat. The Stat is factory mounted outside the unit and wired into the contractor convenience box.

F. A time delay relay that delays the start of the air mover to allow the heat exchanger a warm-up period after a call for heat. The time delay relay shall also continue the air mover operation after the thermostat has been satisfied to remove any residual heat in the heat exchanger.

G. The unit shall be ordered for 0-2000 feet elevation above sea level.

2.25 Electrical

A. All electrical components shall carry UL, ETL, or CSA listing.

B. A low voltage terminal board shall be provided for direct wiring connection to an external thermostat.

C. A Contractor Convenience Package that consists of an external junction box featuring simple connection of supply power wiring internally, thermostat wiring to terminals eternally, an On/Off switch, a single 115V outlet for connection of an external condensate pump, and status indicator lights to display the operational state of the unit shall be factory mounted on the rear panel of the casing.

D. A single 115V to 24V step down transformer shall be provided for all unit controls.

2.26 Air Mover

A. The motor horsepower shall be 1/8 H.P.

B. The motor wiring shall be in flexible metal BX conduit.

C. The motor shall be controlled by a time delay relay.

D. Propeller models shall meet the following requirements:

E. The motor type shall be Single-Speed, Totally Enclosed (TE).

F. The air mover motor shall be a 115V motor.

2.27 Mounting

A. The unit shall be equipped with tapped holes to accept 3/8”-16 threaded rod for suspension.

2.28 Accessories

A. The following field installed accessory control devices shall be provided with the unit:

B. A condensate drain kit consisting of one threaded PVC elbow and two specially designed condensate traps to allow the unit to operate and drain properly.

PART 3 -- EXECUTION

3.01 Install according to Modine printed instructions, and best trade practices.

END OF SECTION

DIVISION 26 – ELECTRICAL

Section 26 05 00 WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work included.

B. Temporary power and lighting.

1.02 RELATED SECTIONS

A. Applicable provisions of Division 0 and Division 1 shall govern work under this section.

B. All 26 00 00 electrical and 28 31 00 fire alarm sections.

C. All other sections requiring electrical work.

D. Coordinate work under provision of Division One - General Requirements.

E. Temporary light and power Section of Division 1.

F. Perform all trenching and backfilling required in connection with the work of this Section in strict accordance with the provisions of Division 2 of these Specifications.

1.03 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

B. NECA "Standard of Installation."

C. All state and local codes.

1.04 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc as suitable for purpose specified and shown.

C. Conform to all local codes.

1.05 WORK INCLUDED

A. The mention of any article, operation or method requires that the Contractor shall provide same and work in complete accordance with the conditions stated. The contractor shall provide all material, labor, equipment, tools and transportation as needed to complete the project according to construction documents. Work includes all items to complete the electrical installation of all items indicated on the drawings, specified herein, and needed for a complete and operable facility but not specifically described in any other sections of this document. Among the items required are:

1. Temporary power and lighting.
2. Branch circuit panels for power and lighting.

3. Complete branch circuit wiring system for lighting, motors, unit heaters, water heater, welding stations, air compressor, fans, overhead door operator, receptacles, junction boxes and similar uses, and equipment & appliances noted on the Drawings.
4. Wall switches, receptacles and similar items.
5. Complete feeder system, in conduit, to power panels, large individual loads and branch circuit panels.
6. Lighting fixtures.
7. Systems:
   a. Phone/Computer: Provide empty conduit and boxes at locations to be specified by RUSD. Provide and pull cable.
   b Fire alarm system as required.
8. Necessary equipment as shown on plans.
9. All items and appurtenances necessary, reasonably incidental or customarily included, even though each and every item is not specifically called out for or shown.

B. All work shall be installed in accordance with all state and local inspection authorities having jurisdiction together with the recommendations of the manufacturer whose equipment is to be supplied and installed under this contract.

C. Before submitting his bid, each bidder shall examine the drawings relating to his work and shall become fully informed as to the extent and character of the work required and its relation to other work in the building.

D. The contractor shall coordinate with the architect and establish exact locations of all materials and equipment to be installed. Consideration shall be given to construction features, equipment of other trades and requirements of the equipment.

E. Bids to include cost of all necessary permits and review fees.

1.06 QUALITY ASSURANCE AND WARRANTY

A. Qualifications of installers: For the actual fabrication, installation and testing of the work of this section, use only thoroughly trained and experienced personnel who are completely familiar with the requirements for this work and with the installation recommendations of the Manufacturers of the specified items.

B. Perform work to meet all codes.

C. Contractor shall warranty all parts and labor, except lamps, for one year. All lamps will be working at time of substantial completion. The contractor will replace any lamps not working at time of substantial completion.

1.07 SUBMITTALS

A. Within 14 days after award of contract, and before any of the materials of this section are delivered to the job site, submit eight complete sets to the Architect in accord with the provisions of Division One - General Requirements, the following:
   1. Shop Drawing Submittals.
   2. Show variations from contract documents.
   3. The contractor shall not be relieved of responsibility for executing work in accord with contract documents, even though such drawings have been approved.

B. Affidavits: The contractor shall execute the standard State Electrical Affidavit of Compliance with the Electrical Code and safe practices. Notarize and file two copies with the owner before final payment is made.

C. Record Drawings: Day by day, as installed, details shall be transferred to a set of scale tracings prepared by the electrical contractor. The completed tracings shall be turned over to the Owner upon completion.

D. Operation and Maintenance Data: The contractor shall provide two sets in loose leaf binders a compilation of catalog data of each manufactured item of equipment used in the electrical work and shall present this compilation to the Architect before final payment is made. Descriptive data and printed installation, operating and maintenance instructions and recommended spare parts list for each item of equipment shall be included.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle Products to site under provisions of Division One - General Requirements.

B. All materials shall be suitably stored and protected prior to installation and all work, including equipment of other trades, shall be protected after installation, during construction and prior to acceptance.

C. The contractor shall follow the manufacturer's directions completely in the delivery, storage and handling of equipment and materials. Equipment and materials shall be tightly covered and protected against dirt, water, chemical or mechanical injury and theft. At the completion of the work, fixtures, equipment and materials shall be cleaned and polished thoroughly and shall be in a condition satisfactory to the architect.

D. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

1.09 PROJECT CONDITIONS

A. The Electrical Contractor shall visit the site of construction to familiarize himself with the site and existing conditions so as to become fully informed as to extent and character of the work and its relationship to work of other trades and existing facilities.

B. Failure to provide for the cost of all contingencies in original bid will not be accepted as an excuse for extra payment.

1.10 ALTERNATIVES

A. The work of this section is affected by alternatives as described on the drawings and in Section 01 03 00 of these specifications. All alternates must be approved before bids are submitted.

B. The Electrical Contractor shall assume full responsibility for any alternate material or item proposed, regardless if it is approved or not. This responsibility will also include any and all costs of modifying feeders, branch circuits, ceilings, finishes, supports, structural, HVAC or any other incidental changes brought about by the alternate.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All equipment and materials shall be new, unless specifically noted otherwise and shall bear the Manufacturer's name, trademark and ASME, UL and/or other labels in every case where a standard has been established for the particular item. Equipment shall be the latest approved design of the standard product of a manufacturer regularly engaged in the production of the required type of equipment and shall be supported by a service organization that is, in the opinion of the architect reasonably convenient to the site.

B. It is the responsibility of the Contractor to insure that items furnished fit the space available. He shall make field measurements to ascertain space requirements, including those connections, and shall furnish and install such sizes and shapes of equipment that, in the final installation, will suit the true intent and meaning of the Drawings and Specifications.

C. The Contractor shall furnish and install all equipment accessories, connections and incidental items necessary to complete the work and operations.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection: Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Verify Conditions: Verify that all electrical installation may be made in complete accord with all pertinent codes, regulations, drawings and specifications.

C. Discrepancies: In the event of discrepancy, notify the Architect and/or Engineer immediately for clarification. Do not proceed until discrepancies have been fully resolved.

3.02 PREPARATION

A. Co-ordination of Work: The Contractor shall compare the electrical drawings and specifications with the drawings and specifications of other trades and report any discrepancies for changes necessary in the electrical work. The electrical work shall be installed in cooperation with other trades installing interrelated work. Before installation, the Contractor shall make proper provisions to avoid interferences. Changes required in the work of the Contractor caused by neglect to do so, shall be made at the Contractor's own expense.

B. Verification of Dimensions: The contractor shall visit the premises to verify all dimensions in the field; and shall advise the Architect and/or Engineer of any discrepancies before performing any work.

3.03 INSTALLATION

A. It is the intent of this Specification that the Owner is presented with a complete, operable facility and the Electrical Contractor shall include ALL costs in the original bid.

B. When the Architect has reviewed equipment submittals and given instructions to precede with the installation of items of equipment that require arrangements or connection different from those shown on the drawings, it shall be the responsibility of the contractor to install the equipment to operate properly and in accord with the intent of the drawings and specifications and shall provide any additional controllers, fittings or other equipment and materials that may be required. The contractor shall be responsible for the proper location of roughing in and connections by other trades. All changes shall be made at no increase in the contract amount or additional costs to other trades.

C. The contractor shall support work and equipment plumb, rigid and true to line. The contractor shall study the general, structural, mechanical and electrical drawings, shop drawings and catalog data to determine how equipment, fixtures, conduit, etc. are to be installed and shall provide foundations, bolts, inserts, stands, hangers, brackets and accessories for proper support whether or not shown on the drawings.

D. All materials and equipment shall be installed in accord with the approved recommendations of the manufacturer, the best practices of the trade, and in conformance with contract documents. Should the contractor perform any work that does not comply with the manufacturer's directions, the contractor shall bear all costs arising in correcting deficiencies.

E. Interferences:

1. Locations: Locations of conduit, equipment, fixtures, etc., shall be adjusted to accommodate the work to interferences anticipated or encountered. Devices specifically dimensioned on the drawings are critical dimensions and shall installed as shown. The contractor shall determine the exact route and locations of each conduit prior to installation.
2. Right-of-way: Lines which pitch shall have right-of-way over those which do not pitch. For example, plumbing drains shall normally have right-of-way over lines whose elevations can be changed.
3. Offsets: Offsets and changes in direction in conduit shall be made as required to maintain proper head room and not interfere with pitch of sloping lines whether or not indicated on the drawings.

F. Location of lighting switches, outlets and equipment as shown on drawings is approximate and exact locations will be verified.

G. Minor modifications in location of switches, outlets and equipment is considered incidental up to a distance of 10 feet with no additional compensation, provided necessary instructions are given prior to rough in.

H. Work involving shutdown of present service and equipment now functioning in present area shall be done at such time as to provide the least amount of inconvenience to the owner at times established by the owner.

I. The Contractor shall verify the location and elevation of utilities and their relation to the work before beginning work.

J. Temporary electric service and lighting during construction:

1. Electrical contractor shall provide temporary light and power from existing building distribution as required.
2. Use existing panels, new panel(s) and/or furnish temporary panels complete with ground fault protection as required.
3. Each contractor shall provide their own extension cord for portable lamps and tools.
4. Each contractor will make their own service arrangements for heavy duty equipment and tools or other voltages.
5. Owner to pay for temporary electrical energy used on the existing service until the project is complete and turned over to the owner.
6. Provide at least one temporary light per room, hallway or stair. Maintain all lamps.
7. Electrical contractor shall be responsible for all aspects of the temporary power and light unless noted otherwise.
8. Remove temporary panels, circuits, lighting, receptacles and all associated equipment when it is no longer required.

K. Unless otherwise specified, job finish painting will be done by the painting contractor. Electrical equipment shall have a baked enamel finish. The electrical contractor shall restore damaged painted surfaces of electrical equipment to its original condition.

3.04 FIELD QUALITY CONTROL

A. Control circuits, branch circuits, feeders, motor circuits and transformers:

1. Megger check of phase-to-phase and phase-to-ground insulation levels. Do not megger check solid state equipment.
2. Continuity.
3. Short circuit.
4. Operational check.

B. Wiring devices: Test receptacles with Hubbell 5200, Woodhead 1750 or equal tester for correct polarity, proper ground connection and wiring faults.

3.05 CLEANING

A. The electrical contractor shall daily remove crates, boxes, metal cuttings and debris from the building. At the end of the project, all electrically related debris shall be removed and the building shall be left in a clean condition.

B. The electrical contractor shall leave all electrical equipment (interior and exterior), in a clean condition.

3.06 EQUIPMENT START-UP AND TESTING

A. The contractor shall instruct the owner's operating personnel during start-up and separate operating test of each major item of equipment. During the operating test, the contractor shall prove the operation of each item of equipment to the satisfaction of the architect. At least two days' notice shall be given to the architect of equipment start-up and operating tests.

B. Should any item of the system fail to perform in an approved manner, this test shall be repeated until the operating test is approved by the architect.

C. Following the successful completion of operating tests by the Contractor, the owner shall have the privilege of making such tests as they may desire to ascertain in detail if any corrections are to be made to the system. At the end of the testing by the owner and architect, the architect shall direct the contractor in writing to make such corrections to the system as are within the scope of the contract.

END OF SECTION

Section 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Building wire and cable.

B. Underground feeder and branch circuit cable.

C. Wiring connectors and connections.

1.02 RELATED SECTIONS

A. Section 26 05 33.13 - Conduit.

B. Section 26 05 33.16 - Boxes.

C. Section 26 05 53 - Identification.

1.03 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.04 SUBMITTALS

A. Submit under provisions of Division One - General Requirements. Provide upon request.

B. Product Data: Provide for each cable assembly type.

C. Test Reports: Indicate procedures and values obtained.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

E. Contractor shall review and stamp all shop drawings prior to submitting them for review. Architect will not review any submittals that have not been stamped by the contractor.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70 - National Electrical Code.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

C. Conform to all local codes.

1.07 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet Project Conditions.

C. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

1.08 COORDINATION

A. Coordinate Work under provisions of Division One - General Requirements.

B. Determine required separation between cable and other work.

C. Determine cable routing to avoid interference with other work.

PART 2 - PRODUCTS

2.01 MANUFACTURERS - BUILDING WIRE

A. Carol.
B. Triangle.
C. Southwire.

2.02 BUILDING WIRE

A. Description: Single conductor insulated wire.
B. Conductor: Copper.
C. Insulation Voltage Rating: 600 volts.
D. Insulation: ANSI/NFPA 70, Type THW,RHW, TW, THHN/THWN, XHHW.
E. Insulation: Material rated 75 degrees C minimum for branch circuits or feeders in wet and damp locations. Material rated 90 degrees C for feeders in dry locations.

2.03 MANUFACTURERS – BUILDING MC CABLE

A. Anixter Brothers, Inc.
B. AFC Cable Systems, Inc.
C. General Cable Company.
D. Rome Cable Corp.
E. Substitutions: Under provisions of Division One - General Requirements.

2.04 BUILDING CABLE: MC

A. Description: Multi-conductor metal clad cable, polypropylene tape, galvanized steel armor. Lightweight steel metal-clad or steel metal clad cable on branch circuits. Steel metal clad fire alarm cable on fire alarm systems.

B. Conductor: Copper. Where type MC cable carries multiple phase conductors, the cable shall include an oversized neutral conductor (150 to 200%) or one neutral conductor per phase for multi-phase systems.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: ANSI/NFPA 70, Type THHN, material rated 90 degrees C minimum.

E. Grounding Conductors: An insulated grounding conductor, sized per code, shall be cabled with the circuit conductors and identified as a ground.

F. Type MC cable may only be used in concealed areas inside walls.

2.05 WIRING CONNECTORS

A. Split Bolt Connectors:
1. Burndy.
2. T&B.
3. Blackburn.
4. Panduit.

B. Solderless Pressure Connectors:
1. Burndy.
2. T&B.
3. Blackburn.
4. Panduit.

C. Spring Wire Connectors:
1. 3M.
2. Ideal.
3. T&B.
4. Blackburn.
5. Panduit.

D. Compression Connectors:
1. Burndy.
2. T&B.
3. Blackburn.
4. Blackburn.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that mechanical work likely to damage wire and cable has been completed.

3.02 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.03 WIRING METHODS

A. Concealed Dry Interior Locations: Use only building wire Type THHN/THWN or type MC cable. MC cable may only be used for branch circuits or fire alarm circuits in concealed locations.

B. Exposed Dry Interior Locations: Use only building wire Type THHN/THWN, XHHW insulation, in raceway.

C. Wet or Damp Interior Locations: Use only building wire Type THHN/THWN, XHHW insulation, in raceway.

E. Exterior Locations: Use only building wire Type THHN/THWN, XHHW insulation, in raceway.

F. Underground Installations: Use only building wire Type THW, THHN/THWN, XHHW insulation, in raceway.

G. Use wiring methods indicated on Drawings.

3.04 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Use solid or stranded conductors for feeders and branch circuits 10 AWG and smaller.

C. Use stranded conductors for control circuits.

D. Use conductor not smaller than 12 AWG for power and lighting circuits. Use oversized neutrals on electronic loads per code.

E. Use conductor not smaller than 14 AWG for control circuits.

F. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 50 feet. Size conductors for 3% voltage drop for circuits longer than 100 feet.

G. Use 10 AWG conductors for 20 amperes, 277-volt branch circuits longer than 100 feet. size conductors for 3% voltage drop for circuits longer than 200 feet.

H. Pull all conductors into raceway at same time.

I. Use suitable wire pulling lubricant for building wire 4 AWG and larger.

J. Protect exposed cable from damage.

K. Use suitable cable fittings and connectors.

L. Neatly train and lace wiring inside boxes, equipment, and panelboards.

M. Clean conductor surfaces before installing lugs and connectors.

N. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

P. Use suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.

Q. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.

R. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.

S. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

3.05 INTERFACE WITH OTHER PRODUCTS

A. Identify wire and cable under provisions of Section 26 05 53.

B. Identify each conductor with its circuit number or other designation indicated on Drawings.

3.06 FIELD QUALITY CONTROL

A. Perform field inspection and testing.

B. Inspect wire and cable for physical damage and proper connection.

C. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

D. Verify continuity of all conductors.

END OF SECTION

Section 26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Grounding electrodes and conductors.

B. Equipment grounding conductors.

C. Bonding.

1.02 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.03 GROUNDING ELECTRODE SYSTEM

A. Metal underground water pipe.

B. Metal frame of the building.

C. Concrete-encased electrode.

D. Rod electrode.

1.04 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 25 ohms.

1.05 PROJECT RECORD DOCUMENTS

A. Submit upon project completion.

B. Accurately record actual locations of grounding electrodes.

C. Record overall resistance to ground.

D. Contractor shall review and stamp all shop drawings prior to submitting them for review. The Architect will not review any submittals that have not been reviewed & stamped by the contractor.

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum 3 years' experience.

1.07 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70 - National Electrical Code.

B. Furnish products listed and classified by Underwriters Laboratories, Inc as suitable for purpose specified and shown.

C. Conform to all local codes.

PART 2 - PRODUCTS

2.01 ROD ELECTRODE

A. Manufacturers:
1. Appleton.
2. Crouse-Hinds.
3. Burndy.

B. Material: Copper-clad steel.

C. Diameter: 3/4 inch .

D. Length: 10 feet.

2.02 MECHANICAL CONNECTORS

A. Manufacturers:
1. Appleton.
2. Crouse-Hinds.
3. Burndy.

B. Material: Bronze.

2.03 EXOTHERMIC CONNECTIONS

A. Manufacturer: Cad-Weld.

2.04 WIRE

A. Material: Stranded copper.

B. Foundation Electrodes: per drawing.

C. Grounding Electrode Conductor: Size to meet NFPA 70 or local requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.02 INSTALLATION

A. Install Products in accordance with manufacturer's instructions.

B. Install rod electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.

C. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing where indicated. Bond steel together.

D. Provide bonding to meet Regulatory Requirements.

E. Provide isolated grounding conductor for circuits supplying electronic equipment.

F. Equipment Grounding Conductor: Provide separate, insulated conductor within each feeder circuit raceway. Terminate each end on suitable lug, bus, or bushing.

I. Ground each additional separate neutral to ground rods and water service.

J. Use 4 AWG minimum copper conductor to ground communications service.

K. Isolated ground: connect insulated ground conductor from service ground to device.

3.03 FIELD QUALITY CONTROL

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

B. Use suitable test instrument to measure resistance to ground of system. Perform testing in accordance with test instrument manufacturer's recommendations using the fall- of-potential method.

END OF SECTION

Section 26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Conduit and equipment supports.

B. Anchors and fasteners.

1.02 REFERENCES

A. NECA - National Electrical Contractors Association.

B. ANSI/NFPA 70 - National Electrical Code.

1.03 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70 - National Electrical Code.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

C. Conform to all local codes.

PART 2 - PRODUCTS

2.01 PRODUCT REQUIREMENTS

A. Materials and Finishes: Provide adequate corrosion resistance.

B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.

C. Anchors and Fasteners:

1. Concrete Structural Elements: Use precast insert system, expansion anchors and preset inserts.
2. Steel Structural Elements: Use beam clamps.
3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts and hollow wall fasteners.
5. Solid Masonry Walls: Use expansion anchors and preset inserts.
6. Sheet Metal: Use sheet metal screws.
7. Wood Elements: Use wood screws.

2.02 STEEL CHANNEL

A. Manufacturer:

1. UniStrut
2. B-Line.
3. Allied.
4. Kindorf.

B. Description: Galvanized (wet, damp locations) or painted steel (dry locations).

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".

C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.

D. Do not use spring steel clips and clamps.

E. Do not use powder-actuated anchors.

F. Obtain permission from Architect/Engineer before drilling or cutting structural members.

G. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

H. Install surface-mounted cabinets and panelboards with minimum of four anchors.

I. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch off wall.

J. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

END OF SECTION

Section 26 05 33.13 CONDUIT AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Metal conduit.
B. Flexible metal conduit.
C. Liquidtight flexible metal conduit.
D. Electrical metallic tubing.
E. Fittings and conduit bodies.

1.02 RELATED SECTIONS

A. General Requirements

B. Section 26 05 33.16 - Boxes.

C. Section 26 05 26 - Grounding and Bonding.

D. Section 26 05 29 - Supporting Devices.

E. Section 26 05 53 - Electrical Identification.

1.03 REFERENCES

A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.

B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.

C. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

D. ANSI/NFPA 70 - National Electrical Code.

E. NECA "Standard of Installation."

F. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).

G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.04 DESIGN REQUIREMENTS

A. Conduit Size: ANSI/NFPA 70.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of 26 05 00.

B. Accurately record actual routing of conduits larger than 1" inches.

1.06 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc as suitable for purpose specified and shown.

C. Conform to all local codes.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle Products to site under provisions of Division One -General Requirements.

B. Accept conduit on site. Inspect for damage.

C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

D. Protect PVC conduit from sunlight.

1.08 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Verify routing and termination locations of conduit prior to rough-in.

C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

PART 2 - PRODUCTS

2.01 CONDUIT REQUIREMENTS

A. Minimum Size: 1/2 inch in interior, 3/4 inch exterior.

B. Underground Installations:

1. Site: Use rigid steel conduit, intermediate metal conduit or nonmetallic PVC conduit. PVC conduit may only be used per local code.
2. In or Under Slab on Grade: Use rigid steel conduit, intermediate metal Conduit or thin-wall nonmetallic conduit.
3. Minimum Size: 3/4 inch.
4. PVC conduit may be used below grade per code, but not for elbows or stub ups. PVC conduit may be run up inside light pole or generator bases if allowed by local code.

C. Outdoor Locations, Above Grade: Use rigid steel conduit or intermediate metal conduit.

D. In Slab Above Grade:

1. Use rigid steel conduit, intermediate metal conduit, or electrical metallic tubing conduit.
2. Maximum Size Conduit in Slab: 1 inch. Maintain a minimum of 2" concrete covering. Run conduits within concrete parallel to each other and spaced on center at least three times the conduit trade size. Conduits over 1 inch may not be installed in slabs without approval of Architect.

E. Wet and Damp Locations: Use rigid steel, intermediate metal conduit or PVC (where not subject to damage) per code.

F. Dry Locations:

1. Concealed: Use electrical metallic tubing.
2. Exposed: Use electrical metallic tubing.

2.02 METAL CONDUIT

A. Manufacturers:
1. Republic Steel.
2. Allied.

B. Rigid Steel Conduit: ANSI C80.1.

C. Intermediate Metal Conduit (IMC): Rigid steel.

D. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match body.

2.03 FLEXIBLE METAL CONDUIT

A. Manufacturers:
1. Electri-Flex.
2. Alflex Corp.

B. Description: Interlocked steel construction.

C. Fittings: ANSI/NEMA FB 1.

2.04 LIQUID-TIGHT FLEXIBLE METAL CONDUIT

A. Manufacturers:
1. Electri-Flex.
2. Alflex Corp.

B. Description: Interlocked steel construction with PVC jacket.

C. Fittings: ANSI/NEMA FB 1.

2.05 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
1. Republic Steel.
2. Allied.

B. Description: ANSI C80.3; galvanized tubing.

C. Fittings and Conduit Bodies: ANSI/NEMA FB 1; set screw connectors and couplings may be used on interior EMT conduit.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install conduit in accordance with NECA "Standard of Installation."

B. Install nonmetallic conduit in accordance with manufacturer's instructions.

C. Arrange supports to prevent misalignment during wiring installation.

D. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

E. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.

F. Fasten conduit supports to building structure and surfaces under provisions of Section 26 05 29.

G. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports

H. Arrange conduit to maintain headroom and present neat appearance.

I. Route exposed conduit parallel and perpendicular to walls.

J. Route conduit in and under slab from point-to-point.

K. Do not cross conduits in slab.

L. Maintain adequate clearance between conduit and piping.

M. Maintain 12-inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F.

N. Cut conduit square using saw or pipe cutter; de-burr cut ends.

O. Bring conduit to shoulder of fittings; fasten securely.

P. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

Q. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.

R. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one-shot bender to fabricate factory elbows for bends in metal conduit larger than 2-inch size.

S. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

T. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints.

U. Provide suitable pull string in each empty conduit except sleeves and nipples.

V. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

W. Ground and bond conduit under provisions of Section 26 05 26.

X. Identify conduit under provisions of Section 26 05 53.

Y. All conduit to be concealed, except in mechanical rooms. If accessible walls and ceilings are present in mechanical rooms, conduits and devices will also be concealed. Surface wiring to be used only were absolutely necessary.

3.02 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods as recommended by manufacturer and under the general Provisions. All conduits penetrating non-rated walls shall be caulked.

B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installer.

END OF SECTION

Section 26 05 33.16 BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Wall and ceiling outlet boxes.

B. Pull and junction boxes.

1.02 RELATED SECTIONS

A. General Requirements - Division 7 - Roof Penetrations and Fire Stopping.

B. General Requirements - Division 8.

C. Section 26 27 26 - Wiring Devices: Wall plates.

D. Section 28 31 00 - Fire Alarm and Smoke Detection Systems.

1.03 REFERENCES

A. NECA - Standard of Installation.

B. NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.

C. NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

D. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

F. NFPA 70 - National Electrical Code.

1.04 SUBMITTALS

A. Submit under provisions of Division One - General Requirements if requested.

B. Contractor shall review and stamp all shop drawings prior to submitting them for review. Architect will not review any submittals that have not been reviewed & stamped by the contractor.

1.05 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70 - National Electrical Code.

B. Provide Products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

C. Conform to all local codes.

PART 2 - PRODUCTS

2.01 OUTLET BOXES

A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel,4" square minimum.
   1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch male fixture studs where required. 2. Concrete Ceiling Boxes: Concrete type.

B. Cast Boxes: NEMA FB 1, Type FD, aluminum . Provide gasketed cover by box manufacturer. Provide threaded hubs.

C. Wall Plates for Finished Areas: As specified in Section 26 27 26.

2.02 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Hinged Enclosures: As specified in Section 26 27 26.

C. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:
   1. Material: Galvanized cast iron, Cast aluminum.
   2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify locations of floor boxes and outlets in offices, and work areas prior to rough-in.

3.02 INSTALLATION

A. Install boxes in accordance with NECA "Standard of Installation."

B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

C. Set wall mounted boxes at elevations to accommodate mounting heights indicated and specified in section for outlet device.

D. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Adjust box location up to 5 feet if required to accommodate intended purpose.

E. Maintain headroom and present neat mechanical appearance.

F. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

G. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods as required.

H. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.

I. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.

J. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

L. Use flush mounting outlet box in finished areas.

M. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

N. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

Q. Use stamped steel bridges to fasten flush mounting outlet box between studs.

R. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

S. Use adjustable steel channel fasteners for hung ceiling outlet box.

T. Support boxes independently of conduit.

U. Use gang box where more than one device is mounted together. Do not use sectional box.

W. Use gang box with plaster ring for single device outlets.

X. Use cast outlet box in exterior locations exposed to the weather and wet locations.

Y. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.

Z. Set floor boxes level.

AA. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

3.03 INTERFACE WITH OTHER PRODUCTS

A. Coordinate installation of outlet box for equipment connected under Section 26 05 33.16.

3.04 ADJUSTING

A. Adjust floor box flush with finish flooring material.

B. Adjust flush-mounting outlets to make front flush with finished wall material.

C. Install knockout closures in unused box openings.

3.05 CLEANING

A. Clean interior of boxes to remove dust, debris, and other material.

B. Clean exposed surfaces and restore finish.

END OF SECTION

Section 26 05 33.23 SURFACE RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Surface metal raceways.

B. Multi-outlet assemblies.

C. Wireways.

D. Wall duct.

1.02 RELATED SECTIONS

A. Section 26 27 26 - Wiring Devices: Receptacles.

1.03 REFERENCES

A. NECA (National Electrical Contractors' Association) Standard of Installation.

B. NEMA WD 6 - Wiring Device Configurations.

1.04 SUBMITTALS

A. Submit under provisions of Division One - General Requirements.

B. Product Data: Provide dimensions, knockout sizes and locations, materials, fabrication details, finishes, and accessories.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

D. Contractor shall review and stamp all shop drawings prior to submitting them for review. Architect will not review any submittals that have not been reviewed & stamped by the contractor.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation.

B. Maintain one copy of document on site.

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum three years' experience.

.07 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc as suitable for purpose specified and shown.

C. Conform to all local codes.

PART 2 - PRODUCTS

2.01 SURFACE METAL RACEWAY

A. Manufacturers:
1. Wiremold V200, V500, V700, 4000 series as needed.
2. Hubbell.

B. Description: Sheet metal channel with fitted cover, suitable for use as surface metal raceway.

C. Size: As needed or shown on Drawings.

D. Finish: White or Ivory scuff coat.

E. Fittings, Boxes, and Extension Rings: Furnish manufacturer's standard accessories.

F. Run surface raceway in a neat and workman like manner. Surface raceway will only be allowed on existing walls where recessed devices cannot be cut in.

2.02 WIREWAY

A. Manufacturers:
1. Hoffmann.
2. Square D.
3. Wiegmann.

B. Description: General purpose type wireway.

C. Knockouts: Manufacturer's standard or none.

D. Size: As needed per NEC or as shown on Drawings.

E. Fittings: Lay-in type with removable top, bottom, and side; captive screws, drip shield for wet locations.

F. Finish: Rust inhibiting primer coating with gray enamel finish.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install Products in accordance with manufacturer's instructions.

B. Use flat-head screws, clips, and straps to fasten raceway channel to surfaces. Mount plumb and level.

C. Use suitable insulating bushings and inserts at connections to outlets and corner fittings.

D. Wireway Supports: Provide steel channel as specified in Section 26 05 29.

E. Close ends of wireway and unused conduit openings.

F. Ground and bond raceway and wireway under provisions of Section 26 05 26.

G. Verify surface raceway routing in field. All surface raceway routing shall be approved by the architect. Installation shall follow molding or floor wherever possible. Vertical runs to be located at corners of walls or sides of columns wherever possible. Coordinate location with other trades.

END OF SECTION

Section 26 05 53 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Nameplates and labels.

B. Wire and cable markers.

C. Conduit markers.

1.02 RELATED SECTIONS

A. Section 09900 - Painting.

1.03 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.04 SUBMITTALS

A. Submit under provisions of Division One - General Requirements.

B. Product Data: Provide catalog data for nameplates, labels, and markers.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under regulatory requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.05 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

C. Conform to all local codes.

PART 2 - PRODUCTS

2.01 NAMEPLATES AND LABELS

A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.

B. Labels: Embossed adhesive tape, with black letters on white background in shop/mechanical areas or black letters on clear background in office areas.

C. Locations:

1. Each electrical distribution and control equipment enclosure.
2. Communication cabinets.

D. Letter Size:

1. Use 1/8 or 1/4 inch letters for identifying individual equipment and loads.
2. Use 1/4 or 1/2 inch letters for identifying grouped equipment and loads.

2.02 WIRE MARKERS

A. Manufacturers:

1. Brady self-laminating type.

B. Description: self-laminating type wire markers.

C. Legend:

1. Control Circuits: Control wire number indicated on schematic and interconnection diagrams on drawings and/or shop drawings.

2.03 UNDERGROUND WARNING TAPE

A. Description: 4 inch wide (minimum) tape, colored yellow with suitable warning legend describing buried electrical lines; HTU6Y-E Model as manufactured by Panduit or equal.

PART 3 - EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.02 APPLICATION

A. Install nameplate and/or label parallel to equipment lines.

B. Secure nameplate to equipment front using adhesive.

C. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.

D. Identify underground conduits using underground warning tape. Install one tape per trench at 12 inches above conduit.

END OF SECTION

Section 26 05 83 WIRING CONNECTIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Electrical connections to equipment specified under other sections.

1.02 RELATED SECTIONS

A. Section 26 05 33.13 - Conduit.

B. Section 26 05 19 - Building Wire and Cable.

C. Section 26 05 33.16 - Boxes.

1.03 REFERENCES

A. NEMA WD 1 - General Purpose Wiring Devices.

B. NEMA WD 6 - Wiring Device Configurations.

C. ANSI/NFPA 70 - National Electrical Code.

1.04 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70 - National Electrical Code.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

C. Conform to all local codes.

1.05 COORDINATION

A. Coordinate work under all other sections.

B. Obtain and review shop drawings, product data, and manufacturer's instructions for equipment furnished under other sections.

C. Determine connection locations and requirements.

D. Sequence rough-in of electrical connections to coordinate with installation schedule for equipment.

E. Sequence electrical connections to coordinate with start-up schedule for equipment.

PART 2 - PRODUCTS

A. All motors provided under other sections.

B. (2) Ceiling Fans to be provided in future by RUSD and installed by others. Alternate Bid No. _____

1. Verify & provide electrical circuit, wiring, conduit, junction boxes, and switch boxes for future installation.
2. Fans shall be: Big Ass Ceiling Fans; Model: Essence;
   each: 110-125 VAC, 1 ohm, 50/60 Hz; 10 amps

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify conditions.

B. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.

B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.

C. Make wiring connections using wire and cable with insulation suitable for temperatures encountered in heat producing equipment.

D. Provide receptacle outlet where connection with attachment plug is indicated. Provide cord and cap where field-supplied attachment plug is indicated.

E. Provide suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

F. Install disconnect switches, controllers, control stations, and control devices as indicated.

G. Modify equipment control wiring with terminal block jumpers as indicated.

H. Provide interconnecting conduit and wiring between devices and equipment where indicated.

END OF SECTION

Section 26 24 16 PANELBOARDS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Distribution panelboards.

B. Branch circuit panelboards.

1.02 RELATED SECTIONS

A. Section 26 05 29 - Supporting Devices.

B. Section 26 05 53 - Electrical Identification: Engraved nameplates.

1.03 REFERENCES

A. NECA (National Electrical Contractors Association) "Standard of Installation."

B. NEMA AB 1 - Molded Case Circuit Breakers.

C. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.

D. NEMA KS 1 - Enclosed Switches.

E. NEMA PB 1 - Panelboards.

F. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.

G. NFPA 70 - National Electrical Code.

1.04 SUBMITTALS

A. Submit under provisions of Division One - General Requirements.

B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

C. Contractor shall review and stamp all shop drawings prior to submitting them for review. Architect will not review any submittals that have not been stamped by the contractor.

1.05 PROJECT RECORD DOCUMENTS

A. Record actual locations of Products; indicate actual branch circuit arrangement.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division One - General Requirements.

B. Maintenance Data: Include spare parts data listing; source of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.07 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation.

B. Maintain one copy of document on site.

1.08 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum ten years' experience.

1.09 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70 (National Electrical Code).

B. Furnish products listed and classified by UL as suitable for purpose specified and indicated.

1.10 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings and as instructed by manufacturer.

1.11 MAINTENANCE MATERIALS

A. Provide maintenance materials under provisions of Division One - General Requirements.

B. Provide two of each panelboard key.

1.12 EXTRA MATERIALS

A. Furnish under provisions of Division One - General Requirements.

B. Provide all accessories as needed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. General Electric.

B. Square D.

C. Cutler-Hammer.

D. Siemens/ITE.

E. Above manufacturers to provide equipment equal to that shown on drawings.

2.02 DISTRIBUTION PANELBOARDS

A. Panelboards: NEMA PB 1, circuit breaker type.

B. Panelboard Bus: Copper, ratings as indicated. Provide copper ground bus in each panelboard.

C. Molded Case Circuit Breakers: NEMA AB 1. Provide bolt-on circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.

E. Molded Case Circuit Breakers with Current Limiters: NEMA AB 1. Provide bolt-on circuit breakers with replaceable current limiting elements, in addition to integral thermal and instantaneous magnetic trip in each pole.

F. Current Limiting Molded Case Circuit Breakers: NEMA AB 1. Provide bolt on circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically re-setting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.

G. Provide circuit breaker accessory trip units and auxiliary switches as indicated.

H. Enclosure: NEMA PB 1, Type 1(indoor/dry) Type 3R (outdoor/wet/damp).

I. Cabinet Front: Recessed or surface type. Provide hinged door with flush lock. Finish in manufacturer's standard gray enamel.

2.03 BRANCH CIRCUIT PANELBOARDS

A. Lighting and Appliance Branch Circuit Panelboards: NEMA PB1, circuit breaker type.

B. Panelboard Bus: Copper, ratings as indicated. Provide copper ground bus in each panelboard.

C. Minimum integrated short circuit rating: 10,000 amperes rms symmetrical for 240 volt panelboards; 14,000 amperes rms symmetrical for 480 volt panelboards, or as indicated.

D. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles. Provide circuit breakers UL listed as Type SWD for lighting circuits. Provide UL Class A ground fault interrupter circuit breakers where scheduled. Do not use tandem circuit breakers.

E. Current Limiting Molded Case Circuit Breakers: NEMA AB 1. Provide bolt-on circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.

F. Enclosure: NEMA PB 1, Type 1 (indoor/dry), Type 3R (outdoor/wet/damp).

G. Cabinet box: 6 inches deep, 20 inches wide.

H. Cabinet Front: Flush or Surface cabinet front with concealed trim clamps, concealed hinge, and flush lock all keyed alike. Finish in manufacturer's standard gray.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install panelboards in accordance with NEMA PB 1.1.

B. Install panelboards plumb. Install recessed panelboards flush with wall finishes. Provide supports in accordance with Section 26 05 29.

C. Height: 6 ft to top of panelboard; install panelboards taller than 6 ft with bottom no more than 4 inches above floor.

D. Provide filler plates for unused spaces in panelboards.

E. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.

F. Provide engraved plastic nameplates under the provisions of Section 26 05 53.

G. Provide spare conduits out of each recessed panelboard to an accessible location above ceiling or below floor. Minimum spare conduits: 5 empty 1 inch . Identify each as SPARE.

3.02 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under Division One - General Requirements.

B. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

C. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses.

END OF SECTION

Section 26 27 16 ELECTRICAL CABINETS AND ENCLOSURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Hinged cover enclosures.

B. Terminal blocks.

C. Accessories.

1.02 RELATED SECTIONS

A. Section 26 05 29 - Supporting Devices.

1.03 REFERENCES

A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

B. NEMA ICS 4 - Terminal Blocks for Industrial Control Equipment and Systems.

C. ANSI/NFPA 70 - National Electrical Code.

1.04 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

C. Conform to all local codes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Hoffman.
B. Saginaw.

2.02 HINGED COVER ENCLOSURES

A. Construction: NEMA 250, Type 1, 3R, 4, 4x steel enclosure as required for application.

B. Covers: Continuous hinge, held closed by flush latch operable by screwdriver. Outdoor enclosures to have hasp and staple for padlock.

C. Provide interior metal panel for mounting terminal blocks and electrical components; finish with white enamel.

D. Enclosure Finish: Manufacturer's standard enamel.

2.03 TERMINAL BLOCKS

A. Manufacturers:
1. Allen-Bradley.
2. Cutler-Hammer.
3. General Electric.
4. Square D.

B. Terminal Blocks: ANSI/NEMA ICS 4.

C. Power Terminals: Unit construction type with closed back and tubular pressure screw connectors, rated 600 volts.

D. Signal and Control Terminals: Modular construction type, suitable for channel mounting, with tubular pressure screw connectors, rated 300 volts.

E. Provide ground bus terminal block, with each connector bonded to enclosure. Ground enclosure door.

2.04 ACCESSORIES

A. Plastic Raceway:
1. Hoffman.
2. Panduit.
3. Tyton.
4. Description: Slotted, light gray with cover.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Coordinate installation with other trades.

B. Verify that surfaces are ready to receive Work.

3.02 INSTALLATION

A. Install Products in accordance with manufacturer's instructions.

B. Install enclosures and boxes plumb. Anchor securely to wall and structural supports at each corner.

END OF SECTION

Section 26 27 26-1 WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall switches.

B. Wall dimmers.

C. Receptacles.

D. Device plates and decorative box covers.

1.02 RELATED SECTIONS

A. Section 26 05 33.16 - Boxes.

1.03 REFERENCES

A. NECA - Standard of Installation.

B. NEMA WD 1 - General Requirements for Wiring Devices.

C. NEMA WD 6 - Wiring Device -- Dimensional Requirements.

D. NFPA 70 - National Electrical Code.

1.04 SUBMITTALS FOR REVIEW

A. Submit under provisions of Division One - General Requirements.

B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

C. Contractor shall review and stamp all shop drawings prior to submitting them for review. Architect will not review any submittals that have not been stamped by the contractor.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum three years' experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Provide Products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

C. Conform to all local codes.

PART 2 - PRODUCTS

2.01 WALL SWITCHES

A. Single Pole Switch:
1. Leviton: CSB1-20 20 Amp commercial specification grade.
2. Hubbell: 20 Amp commercial specification grade equal to Leviton.
3. Cooper: 20 Amp commercial specification grade equal to Leviton.

B. Double Pole Switch:
1. Leviton: CSB2-20 20 Amp commercial specification grade.
2. Hubbell: 20 Amp commercial specification grade equal to Leviton.
3. Cooper: 20 Amp commercial specification grade equal to Leviton.

C. Three-way Switch:
1. Leviton: CSB3-20 20 Amp commercial specification grade.
2. Hubbell: 20 Amp commercial specification grade equal to Leviton.
3. Cooper: 20 Amp commercial specification grade equal to Leviton.

D. Four-way Switch:
1. Leviton: CSB4-20 20 Amp commercial specification grade.
2. Hubbell: 20 Amp commercial specification grade equal to Leviton.
3. Cooper: 20 Amp commercial specification grade equal to Leviton.

E. Indicator Switch:
1. Leviton: 1221PL, 1222PL, 1223PL 20 Amp industrial specification grade.
2. Hubbell: 20 Amp industrial specification grade equal to Leviton.
3. Cooper: 20 Amp industrial specification grade equal to Leviton.

F. Locator Switch:
1. Leviton: 1221LH, 1223LH 20 Amp industrial specification grade.
2. Hubbell: 20 Amp industrial specification grade equal to Leviton.
3. Cooper: 20 Amp industrial specification grade equal to Leviton.

G. Substitutions: under provisions of Division One - General Requirements.

H. Color: Per architect and owner.

2.02 RECEPTACLES

A. Duplex Convenience Receptacle:
1. Leviton: BR20 20 Amp commercial specification grade.
2. Hubbell: 20 Amp smooth face tamper resistant commercial specification grade equal to Leviton.
3. Cooper: 20 Amp smooth face tamper resistant commercial specification grade equal to Leviton.

B. GFCI Receptacle:
1. Leviton: 7899 series Smart lock pro 20 Amp GFCI.
2. Hubbell: Equal to Leviton.
3. Cooper: Equal to Leviton.
4. Weather resistant in damp or wet locations.

C. Isolated Ground Receptacle:
1. Hubbell: IG5362 20 Amp smooth face industrial specification grade.
2. Leviton: 5362IG 20 Amp smooth face industrial specification grade.
3. Cooper: IG5361 20 Amp smooth face industrial specification grade.

E. Color: Per Architect and owner. Receptacles on emergency power shall be red.

2.04 WALL PLATES

A. Decorative Cover Plate: Smooth nylon.
1. Leviton: 80700 series.
2. Hubbell: Equal to Leviton.
3. Cooper: Equal to Leviton.

B. Weatherproof Cover Plate: Gasketed aluminum with hinged gasketed in-use aluminum device cover.
1. Red Dot: CKMG series wet location in-use receptacle cover or equal.
2. Red Dot: CCT series raintight switch cover or equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Division 1 - Coordination and Meetings: Verification of existing conditions prior to beginning work.

B. Verify that outlet boxes are installed at proper height.

C. Verify that wall openings are neatly cut and will be completely covered by wall plates.

D. Verify that floor boxes are adjusted properly.

E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

F. Verify that openings in access floor are in proper locations.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean debris from outlet boxes.

3.03 INSTALLATION

A. Install in accordance with NECA "Standard of Installation."

B. Install devices plumb and level.

C. Install switches with OFF position down.

D. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

E. Do not share neutral conductor on load side of dimmers.

F. Install receptacles with grounding pole on bottom.

G. Connect wiring device grounding terminal to outlet box with bonding jumper or branch circuit equipment grounding conductor.

H. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

I. Connect wiring devices by wrapping conductor around screw terminal.

J. Use jumbo size plates for outlets installed in masonry walls.

K. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas and on surface mounted outlets.

L. Install protective rings on active flush cover service fittings.

3.04 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 26 05 33.16 to obtain mounting heights where specified / directed by Architect or/and indicated on drawings.

B. Install top of wall switch box 48 inches above finished floor.

C. Install bottom of convenience receptacle box 18 inches above finished floor.

D. Install bottom of convenience receptacle box 6 inches above counter or backsplash of counter.

E. Install top of box dimmer 48 inches above finished floor.

F. Install bottom of telephone jack box 18 inches above finished floor.

G. Install top of telephone jack box for side-reach wall telephone to position top of telephone at 54 inches above finished floor.

H. Install top of telephone jack box for forward-reach wall telephone to position top of telephone at 48 above finished floor.

3.05 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.

B. Operate each wall switch with circuit energized and verify proper operation.

C. Verify that each receptacle device is energized.

D. Test each receptacle device for proper polarity.

E. Test each GFCI receptacle device for proper operation.

F. Verify that each telephone jack is properly connected and circuit is operational.

3.06 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.07 CLEANING

A. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

Section 26 28 13-1 FUSES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fuses for switchboards, distribution equipment, motor control centers, combination starters, transformer protection and disconnect switches.

1.02 RELATED SECTIONS

A. Section 16 44 10.

1.03 REFERENCES

A. NFPA 70 - National Electric Code.

B. NEMA FU 1 - Low Voltage Cartridge Fuses.

1.04 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70 (National Electrical Code).

B. Furnish products listed and classified by UL as suitable for purpose specified and indicated.

C. Conform to all local codes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Bussmann.

B. Gould Shawmut.

C. Littelfuse.

2.02 FUSE REQUIREMENTS

A. Dimensions and Performance: NEMA FU 1, Class as specified or indicated.

B. Voltage: Provide fuses with voltage rating suitable for circuit phase-to-phase voltage.

C. Main Service Switches Larger than 600 amperes: Class L current limiting time delay.

D. Main Service Switches: Class RK1 time delay.

E. Motor Load Feeder Switches: Class RK1 time delay.

F. Lighting Load Feeder Switches: Class RK1 time delay.

G. Motor Branch Circuits: Class RK1 time delay.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install fuses in accordance with manufacturer's instructions.

B. Install fuse with label oriented such that manufacturer, type, and size are easily read.

END OF SECTION

Section 26 28 16.16 ENCLOSED SWITCHES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fusible switches.

B. Non-fusible switches.

C. Fuses.

1.02 REFERENCES

A. NEMA KS 1 - Enclosed Switches.

B. NFPA 70 - National Electrical Code.

C. UL 198C - High-Interrupting Capacity Fuses; Current Limiting Type.

D. UL 198E - Class R Fuses.

1.03 SUBMITTALS

A. Submit under provisions of Division One - General Requirements.

B. Product Data: Provide switch ratings and enclosure dimensions.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

D. Contractor shall review and stamp all shop drawings prior to submitting them for review. Architect will not review any submittals not stamped by the contractor.

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation.

B. Maintain one copy of each document on site.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum ten years' experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by UL as suitable for purpose specified and shown.

C. Conform to all local codes.

1.07 EXTRA MATERIALS

A. Furnish under provisions of Division One - General Requirements.

B. Provide three of each size and type fuse installed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. General Electric.

B. Square D.

C. Cutler-Hammer.

D. Siemens/ITE.

E. Above manufacturers to provide equipment equal to that shown on drawings.

2.02 ENCLOSED SWITCHES

A. Fusible Switch Assemblies: NEMA KS 1, Type HD load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips: Designed to accommodate Class R fuses.

B. Non-fusible Switch Assemblies: NEMA KS 1, Type HD load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.

C. Enclosures: NEMA KS 1.
1. Interior Dry Locations: Type 1.
2. Exterior Locations: Type 3R.
3. Wash down Locations: Type 4,4X.

2.03 FUSES

A. Manufacturers:
1. Bussmann
2. Gould Shawmut.
3. Littelfuse.

B. Description: Dual element, current limiting, time delay, one-time fuse, 250, 600 volt, UL 198E, Class RK 1.

C. Interrupting Rating: 200,000 rms amperes.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install disconnect switches where indicated.

B. Install fuses in fusible disconnect switches.

C. Provide adhesive label on inside door of each switch indicating UL fuse class and size for replacement.

END OF SECTION

Section 26 05 26 INTERIOR LIGHTING, FANS, & ACCESSORIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Interior luminaires and accessories.

B. Emergency lighting units.

C. Exit signs.

D. Luminaire accessories.

E. Retractable Cord Reels

1.02 RELATED SECTIONS

A. Section 26 05 33.16 - Boxes.

1.03 REFERENCES

A. ANSI C78.379 - Electric Lamps - Incandescent and High- Intensity Discharge Reflector Lamps - Classification of Beam Patterns.

B. ANSI C82.1 - Ballasts for Fluorescent Lamps - Specifications.

C. ANSI/NFPA 70 - National Electrical Code.

E. ANSI/NFPA 101 - Life Safety Code.

F. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.04 SUBMITTALS

A. Submit under provisions of Division One - General Requirements.

B. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.

C. Product Data: Provide dimensions, ratings, and performance data.

D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

E. Manufacturer's Instructions: Include instructions for storage, handling, protection, Examination, preparation, and installation of product.

F. Contractor shall review and stamp all shop drawings prior to submitting them for review. Architect will not review any submittals that have not been reviewed & stamped by the contractor.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division One - General Requirements.

B. Maintenance Data: Include replacement parts list.

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum ten years' experience.

1.07 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70 (National Electrical Code).

B. Conform to requirements of NFPA 101 .

C. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

D. Conform to all local codes.

PART 2 - PRODUCTS

2.01 LUMINAIRES

A. Furnish products as specified in schedule on Drawings.

1. Area Lighting Fixtures (12) Required
   Lithonia Lighting IBC LED High Bay fixtures
   IBH 2 ft 15,000 LM
   SEF WD AFL 4,000 k, 70 CRI, 14,686 LUMENS, 95.25 WATTS

2. Exterior Security Lighting Fixtures (3) Required
   E-Conolight E-WP10 Wall Pack

B. Install lamps and specified accessories at factory.

2.02 EXIT SIGNS & EMERGENCY LIGHTING UNITS

A. Furnish products as specified in schedule on Drawings.

1. Exit Signs / Egress Lighting fixtures (2) Required
   Lithonia Lighting LHQM LED Exit Unit Combo

2.03 LAMPS

A. Manufacturers:
   1. General Electric.
   2. Phillips.
   3. Sylvania.

2.04 LIGHTING CONTROL PANELS

A. Lighting control panel: Lighting control panel and override switches provided and programmed and installed by electrical contractor.

2.08 CORD REELS

A. Provide Drop-Down Cord Reels (7) Required

1. Model SL-8906 as manufactured by Bayco Products, Inc.
   www.baycoproducts.comLighting LHQM LED Exit Light
   50 ‘ 12/3 SJEOW cord with 4 outlet plug
   Each with 15 amp integral circuit breaker.

2. Verify locations with RUSD Representative on-site after new building is Enclosed.

2.09 FANS

A. Ceiling Fans – future, by RUSD: (2) Required

1. Provide wiring, but no installation, for (2) Big Ass Ceiling Fans
   Each: 110-125 VAC, 1 ohm, 50/60 Hz. 10 amps
2. Verify & provide electrical circuit, wiring, conduit, junction boxes, and switch boxes for future installation.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrate and supporting grids for luminaires.

B. Examine each luminaire to determine suitability for lamps specified.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install suspended luminaires and exit signs using pendants supported from swivel hangers or chain provided by fixture manufacturer. Provide pendant length required to suspend luminaire at height specified by Architect.

C. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prohibit movement.

F. Install wall mounted luminaires , emergency lighting units and exit signs at height specified by Architect.

G. Install accessories furnished with each luminaire.

H. Connect luminaires , emergency lighting units and exit signs to branch circuit outlets provided under Section 26 05 33.16 using flexible conduit as indicated.

I. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

J. Bond products and metal accessories to branch circuit equipment grounding conductor.

K. Install specified lamps in each luminaire , emergency lighting unit and exit sign.

3.03 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.04 ADJUSTING

A. Adjust Work under provisions of Division One -General Requirements.

B. Aim and adjust luminaires as required.

C. Adjust exit sign directional arrows as indicated.

D. Re-lamp luminaires that have failed lamps at Substantial Completion.

3.05 CLEANING

A. Clean Work under provisions of Division One - General Requirements.

B. Clean electrical parts to remove conductive and deleterious materials.

C. Remove dirt and debris from enclosure.

D. Clean photometric control surfaces as recommended by manufacturer.

E. Clean finishes and touch up damage.

END OF SECTION

DIVISION 27 - COMMUNICATIONS

SECTION 27 00 00 COMMUNICATIONS

Part I: General

1.01 A COPY OF THESE SPECIFICATIONS IS REQUIRED TO BE ON EVERY JOB SITE TABLE OF CONTENTS Section I General Standards (EIA/TIA 568B.2.1Standard for category 6) Specifications for Inside and Outside Plant Wiring Practices:

1.02 Included within Section

A. Contractor Requirements

B. Standards for Quality, Craftsmanship, and Completeness

C. Code Compliance

1.03 Included within Section II - Specifications

A. Information Outlets (Voice/Data Jacks)

B. Information Outlet for Wall Mounted Height

C. Labeling

1.04 Included within Section III - Testing

A. Information outlet Cabling

B. Levels of certification

1.05 Section IV - Certification/Acceptance

1.06 Section V - Warranty

1.07 All cabling, jacks, cover plates and termination according to TIA/EIA 568B.21 Standards and wiring to be terminated to 568B Standard. Cables provided and pulled by electrical contractor.

1.08 Data cables shall be terminated in panel to be directed by RUSD.

1.09 “AS BUILTS” are required. Provide to RUSD Representative at conclusion of construction.

1.10 The color scheme for all riser cable labeling designation strips is “BLUE”, and the color scheme for voice station cable labeling designation strips is “RED”.

1.11 Verify and match products and components of existing systems.

1.12 CONTRACTOR REQUIREMENTS and Qualifications

A. Final qualification to determine a successful contractor (Electrical Contractor or Communications Contractor subcontracted by Electrical Contractor) will be made by Racine Unified School District Representative.

B. There will be a prequalifying procedure. This procedure will involve checking and verifying references. Contractor shall submit for approval, before work begins, three (3) references of work of a similar type and scale. References must contain names and Telephone numbers of contact personnel. Contractor shall also submit names of technicians that will perform work specified herein, with documentation of schools and coursework (with Dates) indicating proficiency with the installation of data cable and fiber optic cable. The RUSD Representative; prior to the issuance of any purchase order or work authorization shall approve this submittal. The contractor installing the telecommunications facilities and equipment herein specified shall be an experienced TELECOMMUNICATIONS CONTRACTOR. Experienced "meaning that the contractor has been in this type of business for a minimum of three (3) years and have personnel that have been trained and certified in the installation of this type of telecommunications facilities products and systems. Additionally, the Contractor will have successfully completed installation of similar equipment and size to that specified herein within the last year of Project.

C. Contractors must have a BICSI Registered/Certified Communications Distribution Designer (RCDD) on staff. and furnish copy of current registration with submittal. Supervisor or Lead Tech on every project must have current Registered BICSI RCDD and/or Registered BICSI Technician Certification.

D. License and Codes: The successful Contractor must have applicable licenses (including but not necessarily limited to low voltage) and follow municipal codes for the areas in which projects are accomplished, to include NFPA, NEC, TIA/EIA/ANSI nd BICSI.

1.13 Safety Procedures: HARD HATS and all other appropriate safety equipment shall be worn during all construction procedures. The vendor shall furnish appropriate safety equipment for their employees and construction site, to include safety zoning and the securing of all equipment and tools at all times. Must have first aid and safety training certificate provided to the RUSD Representative prior to commencing work.

1.14 Damages: Any and all damages to property done by a Contractor will be the responsibility and liability of the Contractor. The RUSD Representative will designate all Telecommunications qualified contractors as "ONLY" are to be used.

1.15 Work Rules: Contractor's employees must keep in mind during all contacts with client personnel that client satisfaction is paramount. Contractor's employees' speech, actions, dress and attitude must not detract from client satisfaction at any time. Contractor employees must keep in mind, however, that they are representing the RUSD and in such contacts, avoid actions or speech that would reflect unfavorably on the District. Contactor must commit to maintaining high standards of professional conduct, neat and clean appearance of vehicles, equipment and personnel, and honest business practices are required. Parties agree that lackadaisical attitude of personnel, unwashed or battered vehicles, and misstatements on reports or invoices, and delayed payment of bills relating to such contracts are examples of unacceptable behavior. RUSD requires all contractor personnel to dress appropriately for the task at hand. RUSD requires all technicians who perform fieldwork to drive a contractor provided vehicle, which is clearly marked as belonging to the contractor. The vehicles can be any type preferred by the contractor as long as the vehicles are clearly marked, in good operating order, and have a good appearance. RUSD shall retain the right to request the removal of any of the contractor's personnel at any time.

1.16 QUALITY, CRAFTSMANSHIP, AND COMPLETENESS: It is expected that the work completed under these specifications will be on the highest professional quality and craftsmanship. All systems furnished herein shall be complete and in compliance with manufacturer's recommendations and designs. Contractor shall supply all components of the specified system as recommended by the manufacturer, whether specifically designated in these specifications or not.

1.17 CODE COMPLIANCE: The Contractor is responsible for compliance with all Federal State and Local codes that are applicable to electrical and telecommunications wiring and fire codes. If there is any conflict between these specifications and codes, the stringent requirement shall apply.

PART II - Specifications

2.01 INFORMATION OUTLETS (VOICE/DATA JACKS) For each information outlet location designated, owner to provide a Standard 2 port Category 6 data jack colored ORANGE mounted in an ivory triplex outlet cover. Terminations shall be in conformance with EIA/TIA 568B.2 by owner. Use Category 6A Systimax Jacks. Electrical outlets, jacks and receptacles, with (ivory color) faceplates matching the electrical outlet shall be and installed at the height to be designated by the Architect.

2.02 All information outlets shall be marked at the point of manufacture with engraved letters indicating that the top jack is voice and the bottom jacks are data. For horizontally mounted information outlets, the left jack shall be voice and the right jacks are data. Conduits provided for outlets must have protective caps on end of conduit. The minimum requirement for all information outlets is 3/4 inch EMT conduit unless noted otherwise. The minimum requirement for all media screen outlets is 1 inch EMT unless noted otherwise.

2.03 Each information outlet and its associated termination shall be labeled according to the following scheme:

A. FLOOR NUMBER THE JACK NUMBER. The information outlet shall be marked on the top right bevel of the faceplate. A black, letter Label is Mandatory for this purpose. Lettering shall be block letters and numerals

B. INFORMATION OUTLET FOR WALL MOUNTED HEIGHT All locations designated for hanging wall jacks shall be fitted with the information outlet as described in “INFORMATION OUTLET.” The outlet boxes shall be mounted 42 inches above the finished floor, unless otherwise directed by the Architect.

C. LABELING All twisted pair terminations shall be marked with the jack number.

PART III - Testing

3.01 INFORMATION OUTLET CABLING Owner shall certify all station wire as to fext (far end cross talk) and other appropriate Category 6A tests. Using a Results of said test will be submitted to RUSD MIS Department for building records,

3.02 Owner shall keep a record of all tests made indicating length, wire map, attenuation, NEXT, DC loop resistance, and return loss.

3.03 Levels of Cable Testing and Certification/Acceptance: Inspect and test company with RUSD MIS Department Representative.

PART IV - Warranty

4.01 All cable (not including terminations and components) of this cabling specification shall be warranted by the Installing Contractor to perform as new for a period of three (3) years from date of system acceptance.

END OF SECTION

DIVISION 28 – ELECTRONIC SAFETY & SECURITY

Section 28 31 00 FIRE DETECTION AND ALARM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fire alarm control panels.

B. Manual fire alarm stations.

C. Automatic smoke and heat detectors.

D. Fire alarm signaling appliances.

E. Auxiliary fire alarm equipment.

1.02 RELATED SECTIONS

A. Section 16 12 30 - Building Wire and Cable.

1.03 REFERENCES

A. NFPA 70 - National Electrical Code.

B. NFPA 72 - Installation, Maintenance, and Use of Protective Signaling Systems.

C. NFPA 72E - Automatic Fire Detectors.

D. NFPA 72G - Notification Appliances for Protective Signaling Systems.

E. NFPA 72H - Guide for Test Procedures for Protective Signaling Systems.

F. NFPA 101 - Life Safety Code.

G. International Fire Alarm Code.

H. International Building Code - IBC

1.04 REGULATORY REQUIREMENTS

A. UL and FM approved.

B. Conform to NFPA 72A, NFPA 72B, NFPA 72C, NFPA 72E, NFPA 72G, and NFPA72H, NFPA 101.

C. Conform to NFPA 70 - National Electrical Code.

D. Conform to ADA (Americans with Disabilities Act).

E. Conform to International Fire Alarm Code.

F. Conform to International Building Code.

G. Conform to all local codes. Include all permits and any review fees.

1.05 SYSTEM DESCRIPTION

A. Fire Alarm System: NFPA 72, verify, modify, and expand existing building system as needed and as required for Code compliance.

1.06 SUBMITTALS

A. Submit under provisions of Division One - General Requirements.

B. Shop Drawings: Provide riser drawing, battery calculations and equipment cut sheets.

C. Product Data: Provide electrical characteristics and connection requirements.

D. Test Reports: Indicate satisfactory completion of required tests and inspections.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of products.

1.07 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division One - General Requirements.

B. Record actual locations of all fire alarm devices.

1.08 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division One - General Requirements.

B. Operation Data: Operating instructions.

C. Maintenance Data: Maintenance and repair procedures.

1.09 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum ten years' experience.

B. Installer: Company specializing in installing the products specified in this section with minimum three years' experience.

1.10 MAINTENANCE SERVICE

A. Furnish service and maintenance of fire alarm system for one year from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Field Verify, match, and extend existing with products & components by same manufacturer.

2.02 FIRE ALARM AND SMOKE DETECTION CONTROL PANEL

A. Provide Control Sub-Panel within the new building; connect new system to existing building system. Include all devices, circuit boards, programming and all other equipment as required to expand existing system.

B. Power supply: Adequate to serve control panel modules, remote detectors, remote annunciators, door holders, smoke dampers, relays, and alarm signaling devices. Include battery-operated emergency power supply with capacity for operating system in standby mode for 24 hours followed by alarm mode for 10 minutes. Verify battery calculations. Increase power supply if required.

C. System Supervision: Component or power supply failure places system in trouble mode.

D. Initiating Device Circuits: Existing addressable initiation circuit with alarm and trouble indication; occurrence of single ground or open condition places circuit in trouble mode but does not disable that circuit from initiating an alarm. Connect new and reused devices to existing addressable circuit or provide a new addressable circuit if/as required.

E. Indicating Appliance Circuits: Add new audio/visual devices to existing third floor NAC panel. Audible and visible devices may be on the same circuit, but shall be controlled separately thru smart sync control modules or equal. Supervised signal module, sufficient for signal devices connected to system; occurrence of single ground or open condition places circuit in trouble mode but does not disable that circuit from signaling an alarm.

F. Match any existing digital communicators

G. Auxiliary Relays: Provide sufficient SPDT auxiliary relay contacts to provide accessory functions specified.

H. Provide TROUBLE ACKNOWLEDGE, DRILL, and ALARM SILENCE switch.

I. Trouble Sequence of Operation: System or circuit trouble places system in trouble mode, which causes the following system operations:
1. Visual and audible trouble alarm indicated by zone at fire alarm control panel.
2. Visual and audible trouble alarm indicated at remote annunciator panel.
3. Trouble signal transmitted to municipal or monitoring connection.
4. Manual acknowledge function at fire alarm control panel silences audible trouble alarm; visual alarm is displayed until initiating failure or circuit trouble is cleared.

J. Alarm Sequence of Operation: Actuation of initiating device places circuit in alarm mode, which causes the following system operations:
1. Sound horns with temporal signal. Strobes turn on (synchronized).
2. Transmit signal to municipal or monitoring connection.
3. Indicate location of alarm device on fire alarm control panel and on remote annunciator panel.
4. Transmit signals to building control panel.
5. Transmit signal to new building mechanical systems to initiate shutdown of fans and damper operation.

K. Alarm Reset: System remains in alarm mode until manually reset with key-accessible reset function; system resets only if initiating circuits are out of alarm mode.

L. Lamp Test: Manual lamp test function causes alarm indication at each zone at fire alarm control panel and at annunciator panel.

M. Drill Sequence of Operation: Manual drill function causes alarm mode operation as described above.

2.03 INITIATING DEVICES

A. Supervised individual addressable module: Module to match or be compatible with existing system to monitor tamper switches, flow switches and other dry contact devices as needed.

B. Ceiling Mounted Smoke Detector: Smoke detector to match or be compatible with existing system. NFPA 72E, photoelectric type with adjustable sensitivity, plug-in base, visual indication for power on and detector actuation, suitable for mounting on 4-inch outlet box.

2.04 SIGNALING APPLIANCES

A. Horn/Strobe: Horn/strobes and/or strobes to match or be compatible with existing system. NFPA 72G, surface or flush type, wall or ceiling mount, synchronized horn/strobe with red housing. Sound rating: 92dB at 10 feet (coded) minimum.

2.05 AUXILIARY DEVICES

A. Zone Adapter Module: Simplex module to match or be compatible with existing system. Provide interface relay if needed.

2.06 FIRE ALARM WIRE AND CABLE

A. Fire Alarm Power Branch Circuits: Building wire as specified in Section 16123 per local codes.

B. Initiating Device and Indicating Appliance Circuits: Building wire as specified in Section 16123 per local code.

C. Fire alarm wiring may be conductors or cable run inside conduit and/or steel Type MC cable used per code. Conduit will be used at all exposed locations.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install manual station with operating handle no more than 48 inches above finished floor.

C. Install strobes and horn/strobes 80 inches above finished floor.

D. Use cable as recommended by manufacturer for fire alarm detection and signal circuit conductors. Install wiring/cable in conduit.

E. Mount outlet box for electric door holder to withstand 80 pounds pulling force.

F. Make conduit and wiring connections to duct smoke detectors and hood suppression systems.

G. Automatic Detector Installation: Conform to NFPA 72E.

H. Paint 120V fire alarm circuit breakers fronts red.

3.02 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Division One - General Requirements.

B. Test in accordance with NFPA 72H and local fire department requirement.

3.03 MANUFACTURER'S FIELD SERVICES

A. Prepare and start systems under provisions of Division One - General Requirements.

B. Include services of certified technician to supervise installation, adjustments, final connections, programming and system testing.

3.04 FIRE ALARM WIRE AND CABLE COLOR CODE

A. Provide fire alarm circuit conductors with insulation color per code.

3.05 DEMONSTRATION

A. Provide systems demonstration under provisions of Division One – General Requirements.

B. Demonstrate normal and abnormal modes of operation, and required responses to each.

END OF SECTION

DIVISION 31 EARTHWORK

Section 31 20 00 Earth Moving

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Building excavation.

B. Shoring excavations.

C. Building perimeter backfilling to sub grade elevations.

D. Site backfilling.

E. Fill under slabs-on-grade.

F. Compaction requirements.

G. Excavate trenches for utilities to municipal utilities.

H. Compacted bed and compacted fill over utilities.

1.02 PROJECT

A. Submit documents in accordance with Section 01340 - SUBMITTALS.

B. Accurately record location of utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

1.03 PROTECTION

A. Protect trees, shrubs, lawns, rock outcroppings, and other features remaining as portion of final landscaping.

B. Protect benchmarks, existing structures, fences, roads, sidewalks, paving and curbs from equipment and vehicular traffic.

C. Protect above or below grade utilities which are to remain.

D. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer at no additional cost to the Owner.

E. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in shoring prior to backfilling.

F. Notify Architect of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

G. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.

I. Grade excavation top perimeter to prevent surface water run-off into excavation.

J. Maintain designated site access for vehicle and pedestrian traffic.

1.04 DUST CONTROL

A. Use all means necessary to control dust on near the work and on and near all off-site borrow areas if such dust is caused by the Contractor's operations during performance of the work or if resulting form the conditions in which the Contractor leaves the site.

B. Thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on-the site.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable codes for disposal of debris.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: Graded free of roots, rocks larger than one inch, subsoil, debris, and large weeds.

B. Use approved granular borrow soil materials from site.

C. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
Maximum passing 200 sieve content of 15%.

D. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

2.02 SELECT BED AND FILL MATERIALS

A. "General fill" for filling and backfilling all areas outside of the building lines (except under paved areas) may be broken stone, sand, bank run gravel, earth, or approved material from excavation. All such fill shall be free from peat, wood, large stones or boulders, roots, cinders, trash, or other similar objectionable material with maximum size of rocks or lumps not more than 6 inches.

B. "Structural fill" for fill under footings, structures, paved areas to below base course, and inside building up to 6" beneath the underside of floor slabs, shall be a coarse grained cohesionless soil with less than 8% passing the No. 200 sieve. The material shall be free of peat, loam, rocks or lumps not more than 1 - 1/2".

C. "Drainage fill" for use as a "base course" under interior floor slabs and exterior walks, steps, etc., shall be as shown or 6" minimum, thick bed of compacted granular free draining fill material consisting of clean bank run gravel, sand or crushed stone of full range of sizes. Maximum clay content not to exceed 5%. Maximum size of aggregate to be 3/4".

D. Trench backfill:
   1. On-site fill materials: All on-site fill material used for trench and structural backfill Shall- meet the requirements of Article B above.
   2. Imported cohesionless material: All imported cohesionless material used for trench and structural backfill shall be free from organic substance and other deleterious matter, shall be subject to the approval of the Architect, and shall meet the requirements of B above.

E. All other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by the Contractor subject to the approval of the Architect.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify stockpiled fill to be reused is approved.

B. Verify foundation perimeter drainage installation has been inspected.

C. Verify foundation walls are braced to support surcharge forces imposed by backfilling operation.

D. Verify areas to be backfilled are free of debris, snow, ice, or water, and ground surfaces are not frozen.

E. Backfilling prior to approvals:
   1. Do not allow or cause any work performed or installed to be covered up or enclosed by work of this Section prior to all required inspections, tests, and approvals.
   2. Should any of the work be so enclosed or covered up before it has been approved, uncover all such work at no additional cost to the Owner.
   3. After the work has been completely tested, inspected, and approved, make all repairs and replacements, necessary to restore the work to the condition in which it was found at the time of uncovering, all at no additional cost to the Owner.

3.02 CLEARING AND REMOVAL

A. Upon completion of the work of this Section, immediately remove all debris and excess earth-materials from the site.

3.03 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Identify known below grade utilities. Stake and flag locations.

C. Identify and flag above utilities.

D. Maintain and protect existing utilities remaining which pass through work area.

E. Notify utility company to remove and relocate utilities.

F. Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Architect.

G. When necessary, compact sub grade surfaces to density requirements for backfill material.

H. Cut out soft areas of sub-grade not readily capable of compaction. Backfill and compact to density equal to requirements for subsequent backfill material.

I. Provide berms to channels to prevent flooding of sub grade; promptly remove water collecting in depressions.

J. Sub grade preparation:
   1. Proof roll disturbed brown silty sandy gravel soil within the building and below paved areas with a minimum of 3 passes, using a heavy self-propelled vibratory type compactor with a minimum weight of ten tons. Proof roll prior to placing any fill.
   2. Leveling: Remove all ruts, hummocks, and other uneven surfaces by surface grading prior to placement of fill.

3.04 EXCAVATION

A. Excavate subsoil required for building foundations, construction operations, and other work.

B. Excavation shall not interfere with normal 45 degree bearing splay of any foundation.

C. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.

D. Hand trim excavation and leave free of loose matter. Hand trim for bell and spigot pipe joints.

E. Remove lumped subsoil, boulders, and rock.

F. Correct unauthorized excavation at no cost to Owner.

G. Stockpile excavated material in area designated on site and remove excess sub-soil not being reused, from site.

H. Depressions resulting from removal of obstructions: Where depressions result from, or have resulted from, the removal of surface or subsurface obstructions, open the depression to equipment working width and remove all debris and soft material as directed by the Architect.

I. Remove existing fill and topsoil within the building and below paved areas down to the silty sandy gravel soils. Deposit excavated material on site as directed.

J. Further excavate to elevations and dimensions shown on the drawings for Foundations.

K. Over-excavation: Backfill and compact all over-excavated areas as specified for fill below and at no additional cost to the Owner.

L. Frost Protection: Protect bottom of excavation from frost. Do not backfill or place foundations, footing, or slabs on frozen ground.

M. Excess excavation: Excavated material in excess of that required for backfill around the building shall be wasted off-site by the Contractor. Additional material required for grading and the Contractor as required will furnish backfilling.

3.05 BACKFILLING, FILLING AND COMPACTION

A. Backfill areas to contours and elevations. Use unfrozen materials.

B. Backfill trenches to contours and elevations. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy sub grade surfaces.

C. Employ a placement method so not to disturb or damage utilities in trenches.

D. Backfill against supported foundation walls. Backfill simultaneously on each side of unsupported foundation walls, until supports are in place.

E. Slope grade away from building minimum 2 inches in 10 feet unless noted otherwise.

F. Make changes in grade gradual. Blend slopes into level areas.

G. Remove surplus backfill materials from site.

H. Leave stockpile areas completely free of excess fill materials.

I. Filling: After sub grade compaction, has been approved by the Architect, spread the remaining fill material in layers not exceeding eight inches (8") around the building in un-compacted thickness.
   1. Fill all areas outside of building, protecting the underground utilities first, with amount of fill on site.
   2. Fill all areas under slabs and paving with "structural fill". Extend the "structural fill" outside of the paved areas a distance equal to the depth of excavation.
   3. Fill below concrete slabs: After the sub grade preparation work, and all required filling, compacting, and rough grading work to bring sub grade to proper alignment and cross section has been completed, provide a 6-inch layer of drainage fill under all interior slabs.
   4. Filling and backfilling shall be done carefully so as to avoid damage to foundation, walls, pipes, conduits, etc. Filling shall be done evenly on both sides of pipes and wall to avoid wedging or eccentric action.

J. Moisture-conditioning: Water or aerate the fill material as necessary and thoroughly mix to obtain a moisture content which will permit proper compaction in accordance with specified compaction procedures.

K. Compaction, general: Compact each soil layer to at least the specified compaction procedures.

L. Degree of compaction requirements, as follows:

M. Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose Depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

N. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

O. Compact soil to not less than the following percentages of maximum dry density according to ASTM D 1557: 95% of modified proctor.
   1. Under structures, building slabs, steps, and pavements, scarify and re-compact top 12 inches of existing sub grade and each layer of backfill or fill material at 95 percent.
   2. Under lawn or unpaved areas, scarify and re-compact top 6 inches below sub grade and compact each layer of backfill or fill material at 90 percent.

P. Filling against fresh concrete and masonry walls:
1. Special care is required when filling against walls.
2. Do not permit heavy trucks, excavators, or other heavy equipment to be driven in areas within 10"-0" of any such wall without written approval of the County. In the event the Contractor elects to brace a wall to accommodate trucks, compaction equipment, scaffolding, or other surface loads adjacent to walls, the design of bracing and the responsibility for its installation and performance and any damage to walls resulting from these operations are those of the contractor. Compaction of soils adjacent to walls shall be done using "manual" compaction equipment (jumping, plate vibrators, etc.).

Q. Jetting: Unless specifically approved in writing by the Architect, jetting will not be permitted.

3.06 TRENCHING

A. General:
1. Perform all trenching required for the installation of items where the trenching is not specifically described in other sections of theses Specifications. Trenching to be done before rough grading.
2. Make all trenches open vertical construction with sufficient width to provide free working space at both sides of the trench and around the installed item as required for caulking, joining, backfilling and compacting.

B. Depth:
1. Trench as required to provide the elevations shown on the Drawings.
2. Where elevations are not shown on the Drawings, trench to sufficient depth to give a minimum of 18 inches of fill above the top of the pipe measured from the adjacent finished grade.

C. Correction of faulty grades:
1. Where trench excavation is inadvertently carried below proper elevations, backfill with material approved by the Architect and then compact to provide a firm and unyielding sub grade and/or foundation to the approval of the Architect and at no additional cost to the Owner.

D. Trench bracing:
1. Properly support all trenches in strict accordance with all pertinent rules and regulations including OSHA requirements.
2. Brace, sheet, and support trench walls in such a manner that they will be safe and that a round alongside the excavation will not slide or settle, and that all existing improvements of every kind, whether on public or private property, will be fully protected from damage.
3. In the event of damage to such improvements, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.
4. Arrange all bracing, sheeting, and shoring so as to not place stress on any portion of the completed work until the general construction thereof has proceeded for enough to provide sufficient strength.

E. Removal of trench bracing: Exercise care in the drawing and removal of sheeting, shoring, bracing, and timbering to prevent collapse or caving of the excavation faces being supported."

F. Grading and stockpiling trenched material:
1. Control the stockpiling of trenched material in a manner to prevent water running into the excavations.
2. Do not obstruct surface drainage but provide means whereby storm and wastewaters are diverted into existing gutters, other surface drains, or temporary drains.

3.07 FIELD QUALITY CONTROL

A. Provide for visual inspection of bearing surfaces.

B. Treatment after completion of grading:
   1. After grading is completed and the County has finished his inspection, permit no further excavation, filling, or grading except with the approval of and inspection of the County.
   2. Use all means necessary to prevent the erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

3.08 PRODUCT APPROVAL

A. Additional fill material, if required, shall be provided under this Section as part of the Contract Price. All fill material shall be submitted to the Architect for review as to suitability. Acceptance by Architect in no way eliminates or reduces the Contractor's obligation to meet performance standards contained in these Specifications.

B. For approval of imported fill material, notify the Architect at least four working days in advance of intention to import material, designate the proposed borrow area, and permit the Architect to sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material.

C. All testing and review of fill materials will be done by the soil-testing laboratory selected by the Owner.

END OF SECTION

DIVISION 32 – EXTERIOR IMPROVEMENTS

Section 32 12 16 ASPHALT PAVING

PART 1 - GENERAL

1.01 Provide new asphalt pavement Service Path adjacent to the south and east building façade. See Site Plan.

1.02 Provide new asphalt pavement Driving Lane from the south overhead door to the sidewalk and new curb cut adjacent to Yout Street. See Site Plan.

PART 2 - PRODUCTS

2.01 Asphalt pavement Service Path

A. 9” Pavement, see Detail on Plan Sheet A1.6

B. Compacted appropriate Sub-Grade

C. 6” compacted dense aggregate Base Course
1. 1.25” Gradation (per Section 305.2.2.1 of the “State Specifications”
2. Base Course shall extend a minimum of 12 inches beyond the edge of pavement.

D. 3” HMA Pavement, WSDOT Type E-0.3
1. 1.50” thick Lower Course (19 mm gradation), PG 64-22 or 5B-28
2. 1.50” thick Upper Course (9.5 mm gradation), PG 64-22 or 5B-28

2.02 Asphalt pavement Driving Lane

A. 12” Pavement, see Detail on Plan Sheet A1.6

B. Compacted appropriate Sub-Grade

C. 8” compacted dense aggregate Base Course
1. 1.25” Gradation (per Section 305.2.2.1 of the “State Specifications”
2. Base Course shall extend a minimum of 12 inches beyond the edge of pavement.

D. 4” HMA Pavement, WSDOT Type E-0.3
1. 2.25” thick Lower Course (19 mm gradation), PG 64-22 or 5B-28
2. 1.75” thick Upper Course (9.5 mm gradation), PG 64-22 or 5B-28

PART 3 -- EXECUTION

3.01 ASPHALTIC CONCRETE PAVEMENT SHALL BE WISC DOT TYPE E-0.3 MEETING THE REQUIREMENTS OF SECTION 460 OF THE "STATE SPECIFICATIONS". PAVEMENT SHALL BE INSTALLED IN TWO (2) LIFTS IN ACCORDANCE WITH THE "TYPICAL SECTIONS & CONSTRUCTION DETAILS" SHEET(S) OF THE PLAN SET. A TACK COAT SHALL BE INSTALLED BETWEEN THE LOWER AND UPPER COURSES IN ACCORDANCE WITH SECTION 455.3.2 OF THE "STATE SPECIFICATIONS".

3.02 DENSE AGGREGATE BASE COURSE SHALL MEET THE REQUIREMENTS OF SECTION 305 OF THE "STATE SPECIFICATIONS". THE BASE SHALL BE EITHER EIGHT (8") OR SIX (6") INCHES TOTAL IN ACCORDANCE WITH THE "TYPICAL SECTIONS & CONSTRUCTION DETAILS" SHEET(S) OF THE PLAN SET AND SHALL BE CONSTRUCTED IN FOUR-INCH (4") LIFTS ACCORDING TO SUBSECTION 305.3.2.2 OF THE "STATE SPECIFICATIONS".

END OF SECTION

Section 32 13 13 CONCRETE PAVING

PART 1 - GENERAL

1.01 Provide new concrete curb & gutter, apron and sidewalk at new 16 ‘ wide curb cut at Yout Street. See Site Plan.

PART 2 - PRODUCTS

2.01 CONCRETE: CONCRETE FOR SIDEWALKS, CURB & GUTTER, APRONS, SHALL BE GRADE A-FA, AIR-ENTRAINED, AS IN SUBSECTION 501.3.1 OF THE "STATE SPECIFICATIONS". ALL EXTERIOR CONCRETE SHALL BE "READY-MIXED" AND RECEIVE A BROOM FINISH. ALL CONCRETE WORK SHALL BE CURED IN ACCORDANCE WITH THE REQUIREMENTS OF SUBSECTION 415.3.16 OF THE "STATE SPECIFICATIONS".

PART 3 -- EXECUTION

3.01 COORDINATE DEMOLITION AND CONSTRUCTION WITH APPROPRIATE CITY OF RACINE PUBLIC WORKS DEPARTMENT AUTHORITIES.

3.02 PROVIDE AND MAINTAIN APPROPRIATE GUARDS AND BARRICADES TO PROTECT THE PUBLIC USE OF SIDEWALKS AND ROADWAYS.

3.03 "PUBLIC" CONCRETE SIDEWALKS SHALL BE PLACED ACROSS A DRIVEWAY OPENING SHALL BE SIX INCHES (6") IN THICKNESS ON EIGHT INCHES (8") OF COMPACTED BASE COURSE. ALL PUBLIC SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD CITY OF RACINE TYPICAL CONSTRUCTION DETAILS AND REQUIREMENTS.

END OF SECTION