| Ģ | • | A. The use of manufacturer's names, models and numbers in this S |
|--|---|--|
| | | equal" do not require prior approval. Items noted "approved equ |
| ELECTRICAL SPECI | ICATIONS INDEX | B. Submit for the Architect's approval, manufacturer's detailed spec or sheets, if required, for each piece of equipment and shall give |
| DIVISION 26: | | and in Schedules shall be furnished, including all special feature |
| | Seneral Provisions | C. The Architect reserves the right to require the submission of an a 2.2 MATERIAL APPROVALS AND SHOP DRAWINGS |
| 26 05 00 | Basic Materials and Methods | A. Submit all electrical data in PDF format, indexed by section num |
| 26 05 19 | Conductors and Connectors | B. Review and recommendations by the Architect or Engineer are r |
| | | submitted and the Contract Documents are discovered either pri not occur without contract cost data as outlined below. |
| | Conduits, Raceways, Boxes and Fittings dentification | |
| | letwork Lighting Controls | |
| | Viring Devices and Plates | 3.1 CONTRACT COST DATA A. Furnish to the Architect a cost breakdown of the Electrical Contri |
| 26 28 00 | Circuit Protective Devices (Overcurrent Devices) | B. The cost breakdown shall include separate amounts for material |
| 26 28 16 | inclosed Switches and Circuit Breakers | shop drawings submittal. |
| 26 50 00 | ighting Fixtures and Lamps | Feeders. Disconnects, starters and equipment connections. |
| 28 31 00 | ire Alarm System | Branch circuit wiring and devices. |
| SECTION 26 00 00 G | NERAL PROVISIONS | 4. Telephone provisions. |
| PART 1 GENERAL | | Fire alarm system. Lighting control, luminaires, and drivers. |
| 1.1 DESCRIPTION | | 3.2 CHANGE ORDERS |
| | and Supplemental Conditions apply to this Division, including but not limited to: | A. All supplemental cost proposals by the Contractor shall be acco |
| 1. Drawing | and Specifications. | sheets for the supplemental cost proposals shall be included. L to be Contractor's actual "invoice" cost. All discounts shall be di |
| | dinances, permits. Including but not limited to electrical and fire alarm permits. | taxes and fees. The total estimated cost for any change will be |
| Paymen Change | s and fees required by governing authorities for work included in this Division. | but actual change order request for payment will be based on th breakdown of labor and materials cost with backup invoices, wit |
| , i i i i i i i i i i i i i i i i i i i | meral Requirements apply to this Division, including but not limited to: | 3.3 ELECTRONIC INFORMATION |
| 1. Summar | y of Work | A. Electronic record information in AutoCAD format will be provided |
| 2. Coordina | | upon its return a compact disk will be made available to be picke document files will be made available to the contractor at no cha |
| Cutting a Alternate | nd Patching. s. | B. All electrical subcontractors will make their request for the const |
| | s. Is, including Shop Drawings, Product Data and Samples. | 3.4 PROTECTION OF WORK |
| | tion facilities and Temporary Controls. | A. Protect all electrical work and equipment installed under this Div damaged or in other than new condition will be rejected as defe |
| | and Equipment: Substitution and Product Options. | B. Switchgear, transformers, panels, light fixtures and all electrical |
| Ψ | Closeout, Section: ect Record Documents. | paint and shall be free of all such contamination before accepta Properly refinish in a manner acceptable to the Architect, if dam |
| | rating and Maintenance Data. | 3.5 MAINTENANCE OF SERVICE |
| c. Sys | ems Demonstrations. | A. Electrical service shall be maintained to all functioning portions |
| 1.2 CONTRACT CO | | the building occupants. Outages to occupied areas shall be kep will be liable for any damages resulting from unscheduled outag |
| | Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings. | B. Signal and communication systems and equipment shall be kep |
| 1.3 ALTERNATE BI A. Refer to Sect | DS on 01 25 00 for possible effect upon Work of this Section. | these facilities shall be treated the same as electrical power out C. Telephone services where required during the construction worl |
| 1.4 PRODUCT SUB | | company in such a manner that service, as required by the build |
| | ements specified in Section 01 25 00. | D. Include all costs for temporary facilities, overtime labor and nece facilities, if used, shall be removed and the site left clean before |
| 1.5 RECORD DOCU | MENTS | |
| A. Prepare and | submit as specified in Section 01 78 00. | END OF SECTIONSECTION 26 05 00 - BASIC MATERIALS AND MET |
| | e of the contractor record drawings by the Project Manager, the contractor will transfer the record information in "AutoCAD" format to the electronic 13 (min)" drawing files. | PART 1 GENERAL |
| C. Deliver record | drawings files to the Project Manager promptly upon completion of the project. Record information added to the "AutoCAD" drawing files is to have | 1.1 DESCRIPTION |
| compatible fo | rmat, linework and lettering as the original files. All new work done by the contractor on the original drawing files is to be on a single layer noted in the ng file as "RECORD". | A. Conditions of the Contract and Section 26 00 00 apply to this Section 26 00 apply to this Section 26 00 apply to this Section 26 00 apply to this Sectio |
| 1.6 OPERATING & | - | 1.2 CONTRACT CONDITIONS |
| | submit as specified in Section 01 78 00. | A. Work of this Section is bound by the Contract Conditions and D |
| B The Contract | or shall provide operating instructions and maintenance data. Submit all electrical data in electronic PDF format; provide in individual sections, indexed | 1.3 PRODUCT SUBSTITUTIONS |
| | nbers, covering all items of equipment and systems, for all equipment and materials called for under this Division. | A. Follow requirements specified in Section 01 25 00. |
| 1.7 CONTRACT DO A. The Electrica | CUMENTS Drawings and Specifications are complementary and what is called for by one shall be as binding as if called for by both. Items shown on the | 1.4 COORDINATION OF WORK A. Conduct work in a manner to cooperate with all other trades for |
| Drawings are | not necessarily included in the Specifications. All directives and instructions to furnish, provide, install, complete, test and methods described in these | avoid conflicts with cabinets, counters, equipment, structural me |
| | and Drawings shall be interpreted as directives to the Electrical Contractor unless clearly specified otherwise. It is the intent of these specifications npanying drawings to describe complete and functional electrical systems. If errors or discrepancies are discovered, notify the Architect immediately. | Architect prior to rough-in. B. Verify the physical dimension of each item of electrical equipme |
| 1.8 SITE VISITATIO | N | access routes through the construction shall be the Contractor's |
| | r shall visit the site prior to bidding to familiarize himself with existing conditions and all other factors which may affect the execution of the work. All | C. Coordinate rough-in and wiring requirements for all mechanical rough-in and wiring diagrams provided by equipment supplier for |
| | erial shall be included in the bid. | actual equipment requirements. |
| , | ANCES AND REGULATIONS d installation shall conform to all applicable Federal, State and Local Codes, Ordinances and Regulations. | D. Coordinate all aspects of the electrical, telephone and other util Contractor for connection fees or additional work or equipment |
| ľ | essary permits and inspections required by the governing authorities having jurisdiction over this work. | E. Coordinate underground work with other contractors working or |
| | Architect a certificate of approval from the inspection authority at the completion of the work, prior to the application for final payment. | sewer, water and irrigation lines, to avoid conflicts. Common tr maintained. |
| 1.10 SCOPE OF WO | RK | maintained. 1.5 ELECTRICAL DRAWINGS |
| | ered by this Specification shall include: | A. The Electrical Drawings accompanying these Specifications are |
| , v | nd preparation of construction documents g all labor, materials, equipment, and services to construct and install the complete electrical system as shown on the Drawings and specified herein | wiring. They do not show every offset, bend, junction box, etc., circuiting and branch circuit distribution or arrangements to suit |
| a. Are | is where no scope of work is shown, those existing areas are to remain energized. Contractor shall provide labor and material to extend existing | B. The intent of the branch circuiting and control shown shall not b |
| brar | ch circuiting as required to existing panelboards in main electrical room. | combined or changed. |
| | Il include, but is not necessarily limited to, the following systems: and power systems as indicated herein and on the drawings. | C. Cross or hash marks on conduit runs indicate quantity of No. 12 Where such marks do not appear, provide minimum of two con |
| | e interior & exterior lighting, including: | Contractor is responsible to assure that the maximum volta schedule to verify wire/conduit size required. |
| a Lum | | D. Long runs: Contractor is responsible to size the conductors to a |
| Ŭ | ing control, including control devices, conductors, & LV dimming conductors. | E. Conduit sizes shown or listed on the drawings are for reference |
| | on of electrical equipment furnished under other Divisions of work. on of line voltage as required to flow/tamper and sprinkler alarm system including bells and all devices necessary. | requirements. |
| 5. Project v | ill comply with state energy code. Lighting controls which include daylight and/or occupant sensing automatic controls, automatic shut-off controls, | PART 2 PRODUCTS |
| occupar | cy sensors, or automatic time switches, the lighting controls shall be tested to ensure that control devices, components, equipment, and systems are d, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to ensure they | 2.1 MATERIALS |
| operate | n accordance with approved plans and specifications. A complete report of test procedures and results shall be prepared and filed with the owner. | A. Electrical products installed in this project shall be listed by a re |
| - | s shall be illuminated at all times and equipped with minimum 90-minute battery backup, IBC 1011.6.3. | governing codes and ordinances. B. Materials shall be new, of the best quality. The materials shall l |
| - | equipment and work will be furnished under other Divisions of Work: plug-in equipment. | - materiale endined from, or the best quality. The individus shall i |
| | ne and data wiring and equipment. (Note: coordinate w/above). | PART 3 EXECUTION |
| | cal equipment motor starters and heaters, unless otherwise noted on drawings. | 3.1 INSTALLATION |
| | nt control wiring beyond the provisions shown on the Electrical Drawings. | A. Provide a completely properly operating system for each item o manufacturer's instructions, the best industry practices, and the |
| 1.11 WARRANTY | ten one-year warranty covering the work done under this Division as required by the General Conditions. Incandescent lamps will be excluded from | provide proper clarification before work is roughed in and his de Contractor at no cost to the Owner. |
| A. Provide a wri this warranty | ton one year warranty covering the work cone tilluer this Division as required by the General Conditions. Incandescent lamps will be excluded from | Contractor at no cost to the Owner. B. Make installation in a neat, finished and safe manner, according |
| B. Systems and | | 3.2 MOUNTING HEIGHTS |
| | efects of material and workmanship and in accord with the Contract Documents. | A. Mount electrical devices per current ADA requirements. |
| | installed to deliver its full rated capacity at the efficiency for which it was designed. at full capacity without objectionable noise or vibration. | B. Unless otherwise specified on Architectural drawings, mounting |
| 1.12 SUBMITTALS | | 1. Lighting Switches 46" AFF (Center Line) 2. Recenterlage 17" AFF (Center Line) |
| | ion 1 requirements. | Receptacles Data/Telephone T7" AFF (Center Line) T7" AFF (Center Line) |
| B. Submit all ele | ctrical data in PDF format, indexed by section number, covering all items of equipment and systems. Mark items to be provided as SDC will not try to | 4. Wall Telephones 48" AFF (Center Line) |
| | actors' intent. Submit all electrical items by individual sections and at one time. SDC will take a minimum of seven (7) days to return to architect. In and Record Drawings called for under submittals shall show all outlets, devices, terminal cabinets, conduits, wiring and connections required for the | 5. FA Pull Stations48" AFF (To Top Of Unit) |
| complete sys | em described. Prints of these drawings shall be submitted prior to starting installation. The Contractor submitted drawings, when approved, will then | 6. FA Audible/Visual 84" AFF (To Top Of Unit) |
| | s for installation. | FA Visual Devices 84" AFF (To Top Of Unit) Clocks Per Architectural Elevation |
| D. Submittals w | I not be permitted by fax. I not be reviewed unless equipment is specifically indicated. | 8. Clocks Per Architectural Elevation 9. Speakers Per Architectural Elevation |
| F Submittele w | | C. "ACT" (above countertop) denotes 6" above highest countertop, |
| E. Submittals w | | |
| E. Submittals w | | 3.3 NOISE CONTROL |

cation is intended to establish style, quality, appearance and usefulness. Items noted "or

it" or "approved substitute" require prior approval. ions and data sheets for all proposed substitutions. Submittals shall consist of a single sheet, specific data needed for consideration of approval. All pertinent data listed in the Specifications e that all submittals are in proper order, and that all equipment will fit in the space provided. sample before the acceptance of any product as an equal to that specified.

covering all items of equipment and systems. Include wiring diagrams where called for. be construed as change authorizations. If discrepancies between the shop drawings or after the data is processed, the Contract Documents will govern. Shop drawing review will

labor for each category (as applicable to this project) listed below. Include costs data with the

nied with a complete itemized breakdown of labor and materials cost. Contractor's estimating nust be separated and allocated for each item of work. Material cost, as used in this section, d and shown on the invoice. Labor cost shall be the actual cost per manhour including all lered a not-to-exceed price. The supplemental cost approval will be based on this estimate ntractors actual cost to perform this work and shall be accompanied with a complete itemized xception.

e electrical contractor upon request. A drawing release form will be sent to the contractor and System Design Consultants, Inc office. One (1) copy of the base project construction each additional request will be provided at a cost of \$150 per request. n documents through the electrical contractor.

against damage by other trades, weather conditions or any other causes. Equipment found ment shall be kept covered or closed to exclude dust, dirt and splashes of plaster, cement or Enclosures and trims shall be in new condition, free of rust, scratches and other finish defects.

uilding throughout construction, except as noted below, during all normal working hours of minimum and be prearranged with the Architect or Owner's Representative. This Contractor for those not confined to the pre-arranged times. eration wherever these serve occupied or functional portions of the building. Outages of

e maintained by the telephone company. This work shall be coordinated with the telephone ccupants, can be readily installed and maintained.

provisions to maintain electrical services in the initial bid proposal. Temporary wiring and cceptance.

, bound herewith, in addition to this Specification and accompanying Drawings.

nstallation of all items of equipment. Consult the Drawings of all other trades or crafts to s, etc. In general, the architectural drawings govern but conflicts shall be resolved with the

fit the available space. Coordination of the equipment to fit into the available space and the nsibility.

ment with mechanical contractor and equipment supplier. Make installation in accordance with ntractor's use. Report immediately to architect any deviation between contract documents and

vices with the appropriate serving utility. No additional compensation will be allowed the vered in the Drawings or Specifications which are a result of policies of the serving utility. e. Particular coordination shall be performed with contractors installing storm sewer, sanitary s may be used with other trades, providing clearances required by codes and ordinances are

drawings and generally are diagrammatic indicating approximate locations of outlets and may be required for installation to complete the system. Minor deviations in methods, uction conditions are permissible.

nged nor homeruns combined without the approval of the Engineer. Feeder runs shall not be r branch circuit conductors, in addition to a grounding conductor, unless otherwise noted.

with ground, minimum No. 12, size as required for loads and/or equipment being served. op on any circuit does not exceed 3% at the load. The contractor shall review panel

that the maximum voltage drop on any circuit does not exceed 3% at the load. It is the responsibility of the contractor to provide and install conduit sized per current NEC

ted testing laboratory or approved in writing by the local inspection authority as required by

ufactured in accordance with NEMA, ANSI, UL or other applicable standards.

ment called for under this work. Installations shall be in accord with the equipment ct documents. Where a conflict in these guides appear, the Architect shall be requested to will be final. Work installed without such clarification shall be removed and corrected by the

latest published NECA Standard of Installation under competent supervision.

s are:

nt not to exceed 46" AFF to center line. Refer also to architectural elevations.

-back nor straight through boxes be employed, except where specifically permitted on the

Drawings by note, to minimize transmission of noise between occupied spaces. B. Contactors, transformers, starters and similar noise producing devices shall not be placed on walls which are common to occupied spaces unless specifically called for on the Drawings. Where such devices must be mounted on walls, common to occupied spaces, they shall be shock mounted or isolated in such a manner as to effectively prevent the transmission of their inherent noise to the occupied space.

3.4 EQUIPMENT CONNECTIONS

defective and shall be replaced.

A. Provide complete electrical connections for all items of equipment requiring such connections, including incidental wiring, materials, devices, and labor necessary for a finished working installation

C. Ballasts, contactors, starters, transformers and like equipment which are found to be noticeably noisier than other similar equipment on the project will be deemed

- B. Coordinate power requirements and final locations of all equipment with final equipment selection, i.e., actual equipment installed and install all necessary devices allowing for end terminations/connections.
- C. Verify the location and method for connecting to each item of equipment prior to roughing-in. Check the voltage and phase of each item of equipment before connecting.

- D. Make motor connections for the proper direction of rotation. Minimum size flex for mechanical equipment shall be 1/2-inch except at small control devices where 3/8-inch may be used. Exposed motor wiring shall be jacketed metallic flex with 6-inches minimum slack loop. Pump motors shall not be test run until liquid is in the system.
- E. Control devices and wiring relating to the HVAC systems will be furnished and installed under Division 23 except for provisions or items specifically shown on the Electrical Drawings or specified herein.
- F. Furnish all code required disconnects under this work, whether specifically shown or not.

3.5 EQUIPMENT SUPPORT

- A. Anchoring and bracing to the building structural elements in accord with all codes and regulations regarding seismic design conditions. The contractor is responsible to determine the means and methods of equipment installation and support. Seismic restraints for electrical and communication equipment shall bear the seal and signature of a structural engineer registered in the state of Oregon and shall be submitted to the Architect prior to fabrication. Calculations are to be included for all connections to the structure, considering localized effects.
- B. Each fastening device and support for electrical equipment, fixtures, panels, outlets, and cabinets shall be capable of supporting not less than four times the ultimate weight of the object or objects fastened or suspended from the building structure.
- C. Properly and adequately support fixtures installed under this work from the building structure. Supports shall provide proper alignment and leveling of fixtures. Flexible connections where permitted to exposed fixtures shall be neat and straight, without excess slack, attached to the support device. D. Support all junction boxes, pull boxes or other conduit terminating housings located above the suspended ceiling from the floor above, roof or penthouse floor
- structure to prevent sagging or swaying.
- E. Conduits: 1. Support suspended conduits 1-inch and larger from the overhead structural system with metal ring or trapeze hangers with threaded steel rod having a safety
- factor of 4.

2. Conduit installed in poured concrete shall be anchored to the reinforcing steel with No. 14 black iron wire.

3.6 ALIGNMENT

- A. Install panels, cabinets and equipment level and plumb, parallel with structural building lines. Switchgear panels and all electrical enclosures shall fit neatly without gaps, openings or distortion. Properly and neatly close all unused openings with approved devices.
- B. Fit surface panels, devices and outlets with neat, appropriate trims, plates or covers, without overhanging edges, protruding corners or raw edges, to leave a finished appearance.

3.7 CUTTING AND PATCHING

A. Include cutting, patching and restoration of finishes necessary for this work. Surfaces damaged by this work and spaces around conduits passing through floors and walls shall be neatly patched and finished to match the adjacent construction, including painting or other finishes. Clean up and remove all dirt and debris. This work shall all be performed to the satisfaction of the Architect. Refer to Section 01045.

- 3.8 FIRESTOPPING PENETRATIONS IN FIRE-RATED WALL/FLOOR ASSEMBLIES
- A. Contractors shall provide proper sizing when providing sleeves or core-drilled holes to accommodate their through penetrating items. All voids between sleeve or core-drilled hole and pipe passing through, shall be firestopped to meet the requirements of ASTM E-814, in accordance with Section 07270 - Firestopping.

END OF SECTION

3.9 BUILDING EXPANSION JOINTS

A. Provide properly sized expansion fittings for all conduits crossing over building expansion joints.

SECTION 26 05 19 - CONDUCTORS AND CONNECTORS

PART 1 GENERAL

- 1.1 DESCRIPTION
- A. Work Included:
- 1. Deliver conductors to the job site in cartons, protective covers or on reels.
- 2. Conductors for special systems shall be as recommended by the equipment manufacturer except as noted.
- 1.2 CONTRACT CONDITIONS
- A. Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings. 1.3 PRODUCT SUBSTITUTIONS
- A. Follow requirements specified in Section 01 25 00.

1.4 RELATED WORK

A. Section 26 00 00: General Provisions B. Section 26 05 00: Basic Materials and Methods.

1.5 SUBMITTALS

A. Shop Drawings.

B. Product Data.

PART 2 PRODUCTS

2.1 CONDUCTORS 600 V A. Type:

- 1. No. 12 AWG minimum size unless noted otherwise.
- 2. No. 8 and larger, stranded, Class B.
- B. Stranding: Copper, concentric or compressed
- C. Insulation: THHN, THWN, XHHW unless noted or specified otherwise.
- D. Through wiring in fluorescent fixtures shall be rated for 90-degree C.
- E. Manufacturers: G.E., Hatfield, Anaconda, Rome or equal.
- 2.2 CORD DROPS AND PORTABLE CORDS
- A. Copper type "S" or "SO" heavy duty, rubber insulated unless otherwise noted.

2.3 CONNECTORS

- A. Branch Circuit Conductor Splices: Live spring type, Scotch-Lok, Ideal Wing Nut or self-stripping type, 3M Series 560.
- B. Cable Splices: Compression tool applied sleeves, Kearney, Burndy or equal with 600V heat shrink insulation.
- C. Copper Conductor Lugs: Conductors no. 6 and larger, except on molded case circuit breakers, two-hole, long barrel pressure tool set Thomas & Betts No. 54,000 series, Burndy "Hydent", Anderson Electric VCEL, or approved. D. Aluminum Conductor Lugs: Conductors no. 6 and larger, except on molded case circuit breakers, one or two hole, long barrel pressure tool set. Molded case
- circuit breaker termination shall be via Terminal Plug pressure tool applied, Thomas & Betts No. 54,000 series, Burndy "Hydent", Anderson Electric VCEL, or approved.

PART 3 EXECUTION

3.1 CONDUCTORS

- A. Pulling compounds may be used with the residue cleaned from the conductors and raceway entrances after the pull is made. B. Pulleys or blocks shall be used for alignment of the conductors when pulling. Pulling shall be in accordance with manufacturer's specifications regarding pulling
- tensions, bending radii of the cable and compounds. C. Conductors entering terminal or junction boxes mounted on hermetically sealed refrigeration compressor motors shall be copper.
- D. Make up and insulate wiring promptly after installation of conductors. Wire shall not be pulled in until all bushings are installed and raceways terminations are
- completed. Wire shall not be pulled into conduit embedded in concrete until after the concrete is poured and forms are stripped.
- E. Conductor sizes shown on the Drawings are for copper only.
- 3.2 CONNECTORS
- A. Control and special systems wires shall be terminated with a tool applied spade flared lug when terminating at a screw connection.
- B. All screw and bolt type connectors shall be made up tight and retightened after an eight hour period. C. All tool-applied compression connectors shall be applied per manufacturer's recommendations and physically checked for tightness.
- 3.3 COLOR CODING
- A. Phase color code to be consistent at all feeder terminations, A-B-C left-to-right or A-B-C top-to-bottom.
- B. Switchlegs, travelers, etc. to be consistent with the phases to which connected or a color distinctive from that listed.
- C. Under 250 Volts Phase-to-Phase: Phase A - Black
- 2. Phase B Red (Wild leg in 240V Delta Orange)
- Phase C Blue
- Neutral White
- 5. Ground Green

| П | E | | | | |
|---|--------------------------------|-----------------------|--------------------------|-----------------|----------------------|
| D. Over 250 Volts Phase-to-Phase: | | | | | |
| 1. Phase A - Brown | REVISED | F | RAN | KR | |
| Phase B - Orange Phase C - Yellow | 4:14 pm, Oct 06, 2023 | $\hat{\Xi}$ | OF V | VASHINE | |
| 4. Neutral - Gray | | | | È. | ORS |
| 5. Ground - Green | | Joli | | | at - |
| END OF SECTION | | A PAR | EGIS | 94 TERED | |
| SECTION 26 05 26 - GROUNDING AND BONDING | ľ | | SION | IL ENG | |
| | | | | 10/ | /6/2023 |
| PART 1 GENERAL 1.1 DESCRIPTION | | b | , ut | tel | -mail web |
| A. Work Included: | | Planning | Environment | 222 | ъ |
| 1. Provide complete building grounding system. | | an | /iror | 503.644.4222 | c.com inc.co |
| 2. Provide ground bus bar at each telephone demarcation and data distribution location. | | ٩ | Бл С | 503.(| ekain leeka |
| 1.2 RELATED WORK A. Section 26 00 00: General Provisions, | | рq | Built | | <u> </u> |
| B. Section 26 05 00: Basic Materials and Methods, | | ש | | | succeed@ |
| C. Section 26 05 19: Conductors and Connectors | Ĭ | Architecture | in the | | ns |
| D. Section 26 27 26: Wiring Devices and Plates 1.3 CONTRACT CONDITIONS | | cti | | | |
| A. Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings. | | ite | Impressions | | |
| 1.4 PRODUCT SUBSTITUTIONS | | сh С | ores | | 175 |
| A. Follow requirements specified in Section 01 25 00. | | Ā | | | Suite 1 4 |
| PART 2 PRODUCTS | | | ive | | 'enue Si 97214 |
| 2.1 GROUND CONDUCTORS | | $\mathbf{\mathbf{Y}}$ | ositiv | | |
| A. Bare or green insulated copper. | | | <u> </u> | | Water Av Oregon |
| 2.2 GROUND ROD CONNECTORS | | | reating | | SE V Ind, C |
| A. Cast, set screw or bolted type. 2.3 ELECTRODES | | | Cre | | 1001 SE Portland, |
| A. Copper clad steel minimum 3/4-inch diameter by 8 feet long. | L | | | | . ــ |
| | ſ | | _ | _ | _ |
| PART 3 EXECUTION | | | | | |
| 3.1 INSTALLATION A. Grounding system will consist of the following: | φ | F | | сл П | |
| 1. Minimum of 20' bare no. 4 copper concrete-encase grounding conductor. | | | | Phase | I |
| Provide bond to building steel. provide bond to cold water piping within 5' of building entry. | | nt | | מר | WA. |
| provide bond to cold water piping within 5 of building entry. Provide bond to minimum of 2 ground rods. | | <u>e</u> | | ם | er < |
| B. Establish a ground for each separately derived system, e.g., transformers and generators, per NEC 250.30. | | Ъ | | \geq | |
| C. All grounding conductors shall be sized in accord with the National Electrical Code. | | rovement | N | cilit | Vancouver |
| D. Grounding conductor connectors shall be made up tight and located for future servicing and to ensure low impedance. E. Ground the electrical system, the cold water service, structural steel, and transformers to the building ground grid. | | 2 | 7 | ac | 29 |
| F. All feeder and service raceways shall be grounded. | | d | Ċ | Ш | |
| G. All plug-in receptacles shall be bonded to the boxes, raceways and grounding conductor. | | Е | $\overline{\mathcal{O}}$ | ţ | Ave |
| H. Provide equipment grounding conductor in all branch circuit, feeder and service raceways. I. Provide insulated grounding conductor in all branch circuit wiring serving Classrooms, Administration offices and all data locations. | | Jt | Ш | a <u>i</u> t | 65th |
| J. Provide bonding jumper between ground and neutral bus at main service. | | Tenant | | <u>þ</u> | NE 6 |
| 3.2 GROUND BUS BAR (TELEPHONE DEMARCATION AND DATA DISTRIBUTION) | | eD | | <u> </u> | 400 N |
| A. Provide & install copper ground bus bar on isolators, 6" x 2" minimum. Install 1 - #6 insulated conductor to the building grounding connection at the main distribution panel. | | F | | ta | 240 |
| END OF SECTION | | F | | Mental Health | |
| SECTION 26 05 33 - CONDUITS, RACEWAYS, BOXES AND FITTINGS | Ĩ | | | Σ | |
| PART 1 GENERAL | | | | | |
| 1.1 DESCRIPTION | | | | | |
| A. Work Included: 1. Provide raceways and conduits of specified types for all electrical systems wiring, except where clearly shown or specified otherwise. All fittings, boxes, | | | | | |
| hangers and appurtenances shall be included. | | | | | |
| Size raceways and conduits as indicated on the Drawings. Where no size is indicated, conduit may be the minimum code permitted size for the quantity of type THW conductors installed. Minimum size is 3/4". | | | | | |
| B. All wiring shall be installed in raceways where routed through plenum ceiling areas. | | | | | |
| 1.2 RELATED WORK | | | | | |
| A. Section 26 00 00: General Provisions B. Section 26 05 00: Basic Materials and Methods | | | | | |
| 1.3 CONTRACT CONDITIONS | | | | | |
| A. Work of this Section is bound by the Contract Conditions and Division 1, bound herewith, in addition to this Specification and accompanying Drawings. | | | | | |
| 1.4 PRODUCT SUBSTITUTIONS | | | | | |
| A. Follow requirements specified in Section 01 25 00. | l | | | | |
| 1.5 SUBMITTALS | Ϋ́ | r I | | | |
| A. Shop Drawings. B. Product Data. | ŀ | | | <u>.</u> | |
| C. Operational Instructions and Maintenance Data. | | 2023 | 2023 | 2023 | ZUZ |
| PART 2 PRODUCTS | | 10, | 17, | 3 5 | 03, |
| 2.1 METALLIC CONDUITS | | DATE: AUG. | AUG. | SEPT. | |
| A. GRC: Threaded rigid heavy wall galvanized steel. | | ATE: | DATE: | DATE | AIE |
| B. IMC: Threaded intermediate galvanized steel. | | ۵ | | | |
| C. EMT: Zinc coated steel electrical metallic tubing. D. ARC: Threaded rigid heavy wall aluminum. | | | | | |
| E. Flex: Flexible metal with and without polyvinyl chloride jacket. | | | EDITS | STIC | EDIIS |
| F. Liquidtight flexible conduit: Zinc steel core with smooth gray abrasion-resistant, liquid-tight PVC cover with integral ground wire wound in steel core. | | | I ED | APPLICANT EDITS | |
| G. MC (Metal Clad) cable. Note: Metal Clad cable may be used for branch circuit wiring as specified herein. Refer to Part 3 of this section for uses permitted. 1. MATERIALS | | 10 | APPLICANT | ICAN | APPLICAN |
| a. Cable shall be steel jacketed interlocking armor with internal fully insulated green grounding conductor. Cable shall contain multi-conductor thermoplastic | | Vised: | APPL | APPL | |
| insulated type THHN color coded solid or stranded copper conductors and shall be U.L. approved for the intended application. b. Connections, terminations and fasteners shall be U.L. approved for the application, and designed specifically for use with the cable used, and shall have | | × 1 | | | 4 |
| insulated throats to protect the wire. | | | | 7 | 1 |
| APPROVED MANUFACTURERS a. MC Cable: AFC/A Nortek Company, Type Mc-Lite, HC-90; Alflex, Armorlite. | Ĭ | Job No | D: | | 2246 |
| a. MC Cable: AFC/A Nortek Company, Type Mc-Lite, HC-90; Afflex, Armonite. b. Tools: Cable manufacturer approved type with controlled depth rotary cutter. | ſ | Date: | Febru | ary 18, | 2023 |
| 2.2 NON-METALLIC CONDUITS | ſ | File Si | ze: 2 | 4x36 | |
| A. Rigid non-metallic conduit: Type II PVC schedule 40, suitable for use with 90 degrees C rated wire. Conduit shall conform to UL Standard 651 and carry appropriate UL listing for above and below ground use. | ſ | Р | rogre | ss set | t |
| 2.3 SURFACE RACEWAYS | ſ | DRAW | /N: | | JJD |
| A. Acceptable manufacturer(s): Wiremold, Panduit or as noted on drawings. | ľ | CHEC | KED | | JFR |
| B. Type, size with quantity and spacing of outlets as shown on drawings. Provide with snap-on cover, connectors, fittings and incidental items required for a complete | ľ | ę | Sheet | t Title | |
| installation. Raceway shall be in continuous length as indicated on drawings. 2.4 WIREWAYS | | | Elec | | _ |
| | | Sp | pecifi | cation | IS |
| A Transfer Charl existed ensure in energy and in a standard back on standard ensure | | | | | |
| A. Troughs: Steel, painted, square in cross section, preformed knock-outs on standard spacing, hinged cover. B. Fittings: Tees, elbows, couplings as required for configuration shown on the Drawings. | STEM | - | | L | |
| A. Troughs: Steel, painted, square in cross section, preformed knock-outs on standard spacing, hinged cover. B. Fittings: Tees, elbows, couplings as required for configuration shown on the Drawings. C. Supports: U-shaped, 1/4-inch by 1-1/2-inch steel strap, bent and prime painted. | STEM SIGN NSULTANTS INC. | Sh | eet N | lumbe | er |

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