

SECTION 27 32 53 - EMERGENCY TELEPHONES

PART 1 - GENERAL

1.1 REFERENCES

- A. General provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections.
- B. Architectural, Electrical, and Technology Drawings. Other systems drawings may apply. Division 26 Basic Electrical Materials and Methods sections apply to work of this section.

1.2 SUMMARY

- A. Section 27 32 53 describes the codes, standards, specifications, recommendations, and practices required for emergency telephone placement and installation at the University of Colorado Denver | Anschutz Medical Campus (the university) including Free Standing Emergency Pole (FSEP) and Emergency Service Phones (ESP). Section 27 32 53 applies to all university campuses.
 - B. The project general contractor (GC) is responsible for installing emergency poles as per the requirements described in this document. The Office of Information Technology (OIT) is the approving authority at the downtown Auraria campus. University Police is the approving authority at Anschutz Medical Campus. Corrections, comments, questions, or omissions about this standard shall be submitted to OIT and the University Police via the university project manager.
 - C. Planning.
 - 1. To facilitate expansion of emergency communications services, the architect/engineer shall provide to OIT floor plan drawings for new building construction and major renovation projects during design and at construction for downtown Auraria campus projects or the University Police for AMC projects. CAD drawings of the Electrical/Communications plans shall be provided to OIT or the University Police upon release of construction document through the university project manager. These documents will serve as a baseline for emergency communications build out and expansion.
 - 2. The preliminary plans, indicating service locations and space requirements, will be returned to project managers for inclusion in the final plans.
 - D. Consult with OIT or the University Police for the following.
 - 1. Acceptability for specific substitutions of specified products.
 - 2. Guidance in the application of a standard or specification in a non-listed or design situation.
 - 3. Approval for deviation from standards and specifications or industry-standard methods and procedures if indicated by special circumstances.
 - E. Workmanship. All materials and equipment shall be installed in accordance with recommendations of the manufacturer as approved by the architect, to conform to initial design requirements or specification's and contract documents.
- #### 1.3 SUBMITTALS
- A. General Description and Requirements
 - 1. In addition to the requirements noted herein, refer to Division 1 Specification for additional requirements. As a minimum, Contractor shall ensure all requirements listed here are met.
 - 2. Within 45 days after award of contract or as dictated by the construction schedule (whichever period of time is shorter), the Contractor shall submit prefabrication submittals consisting of

- product data and shop drawings for approval. Partial submittals will not be accepted without prior written approval from the Architect.
3. Review of the Prefabrication Submittals by the Architect is for purposes of tracking the work and contract administration and does not relieve the Contractor of responsibility for any deviation from the Contract Documents, or from providing equipment and/or services required by the Contract Documents which were omitted from the prefabrication submittals.
 4. No portion of the project shall commence nor shall any equipment be procured until the prefabrication submittals have been approved in writing by the Architect. All installations shall be in accordance with the Contract Documents.
 5. A detailed completion schedule shall be submitted with the prefabrication submittals.
 6. Prefabrication submittals shall be accompanied by a letter of transmittal identifying the name of the project, Contractor's name, date submitted for review, and a list of items transmitted.
- B. Product Data:
1. Compliance Matrix: Provide full specification compliance matrix as described in the Specification Response section of this specification section.
 2. Warranty Information: Provide all warranty information as described in this specification section for review and approval.
 3. Component List: Provide complete submittal component list at the beginning of the submittal package. Component list shall identify each component name, manufacturer, and specific product/part number. All part numbers shall clearly indicate special options, color, accessories, etc. Component list and manufacturer cut-sheets shall be compiled to match the order of each Appendix.
 4. Cut-Sheets: Submit manufacturer's cut-sheets on all components listed within this specification and corresponding appendix. All components and parts being used shall be highlighted in color on cut-sheets to distinguish specific product/part numbers, options, colors, accessories, etc.
- C. Prefabrication Shop Drawings:
1. Symbol Legend, Abbreviations, and Description: Provide drawings including descriptions of all abbreviations, symbols, typical mounting heights, project information, etc.
 2. One-Line Wiring Diagrams: Include one-line wiring diagrams indicating all backbone and horizontal cabling, copper pair and fiber strand counts, cable quantities, splice enclosures, etc.
 3. Site Plan: Provide complete site and exterior plans indicating all site and building façade mounted communication device outlets, equipment, and components proposed to be installed. Additionally, manholes, pull-boxes, and all major raceway routing shall be indicated for conduits 2-inches and larger. Shop drawings shall represent final conduit routing and manhole and/or pull-box placement as coordinated and/or confirmed with Service Provider, Civil Engineer and other trades.
 4. Floor Plans: Indicating all communication device outlets, equipment, and components proposed to be installed. Floor plans shall indicate cable routing origin and labeling scheme for each cable and termination position. Additionally, major raceway routing shall be indicated for cable trays and conduits 2-inches and larger, based on final coordination with all other trades. Shop drawings shall clearly indicate areas with cable tray clearance limitations and/or other cable access limitations for review and approval by the university, Architect, and Engineer.
 5. Drawing Scale: Shop drawings shall be drawn to scale and completely dimensioned as to clearly show construction detail.
 6. Labeling: Provide documentation of all labeling schemes for conduit, back-boxes, cables, outlets, wiring blocks and/or patch panels, device faceplates, etc.
 7. Documentation: Provide a minimum of (1) hardcopy set of prints (in addition to electronic copies) for review or as indicated in Division-1 general conditions.

1.4 QUALITY ASSURANCE

- A. The following table of codes, standards, specifications, recommendations, and methods and procedures are applicable to the provisioning of emergency poles at The University. They are incorporated by reference. The most current version is referenced.

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|-----|-----------------|--|
| 1. | NFPA 70 | National Electric Code (NEC) (2005) |
| 2. | IEEE C2 | National Electric Safety Code (NESC) |
| 3. | ANSI/IEEE 802.3 | Information Technology–Local and Metropolitan Area Networks – Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications |
| 4. | TIA/EIA–568–B | Commercial Building Telecommunications Cabling Standard (Parts 1, 2, and 3) |
| 5. | TIA/EIA–569–B | Commercial Building Standard for Telecommunications Pathways and Spaces |
| 6. | TIA/EIA–606–B | Administration Standard for the Telecommunications Infrastructure of Commercial Buildings |
| 7. | J–STD–607–A | Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications |
| 8. | TIA/EIA–758 | Customer–Owned Outside Plant Telecommunications Cabling Standard |
| 9. | BICSI | Telecommunications Distribution Methods Manual (TDMM), 11th Ed.; Network Design Reference Manual, 5th Ed.; Customer-Owned Outside Plant Design Manual 3rd Ed.; Wireless Design Reference Manual, 2nd Ed.; Electronic Safety and Security Design Reference Manual, 1st Ed.; AV Design Reference Manual, 1st Ed. |
| 10. | ADA | Americans with Disabilities Act. |
| 11. | OSHA | Standard 29 CFR 1910.268 |
| 12. | Code Blue | Code Blue Install Guides |
| 13. | Talk-A-Phone | Installation and Operating Guide for Emergency Phones |

B. Requests for variations from code shall be submitted to the university code official via the university project manager and must have OIT or University Police approval, depending upon the campus. The university code official will either disapprove or approve the request. In general, requests for code variations shall not be looked upon favorably. Variations from standards may be authorized by OIT or the University Police on a case-by-case basis and must be requested in writing by the installer or designer through the university project manager.

C. OIT or the University Police will provide design parameters for all campus emergency communications systems, and OIT or the University Police shall be consulted during the project design through the assigned the university project manager.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Refer to Section 27 05 00 for requirements that shall be fulfilled as part of this specification section.

1.6 SEQUENCING AND SCHEDULING

A. Refer to Section 27 05 00 for requirements that shall be fulfilled as part of this specification section.

1.7 PROJECT SITE CONDITIONS

A. Refer to Section 27 05 00 for requirements that shall be fulfilled as part of this specification section.

1.8 WARRANTY

A. Refer to Section 27 05 00 for requirements that shall be fulfilled as part of this specification section.

1.9 SPECIFICATION RESPONSE

- A. Refer to Section 27 05 00 for requirements that shall be fulfilled as part of this specification section.

1.10 DEFINITIONS

- A. Refer to Section 27 05 00 for requirements that shall be fulfilled as part of this specification section.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufactures: subject to requirements, provide products by the following:
 - 1. Communications Poles
 - a. Code Blue – CB-1d at the Anschutz Medical Campus
 - b. Talk-A-Phone at the downtown Auraria campus
 - 2. Emergency Service Phones
 - a. Provided by the university

PART 3 - EXECUTION

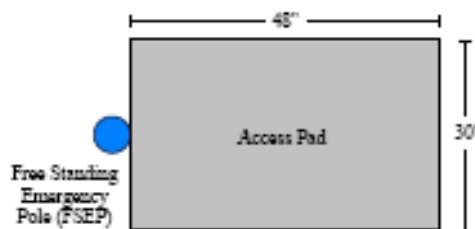
3.1 EMERGENCY POLE INSTALLATION REQUIREMENTS

- A. Free Standing Emergency Pole (FSEP) Placement.
 - 1. Free Standing Emergency Poles (FSEP) are placed to provide ready access to emergency services. OIT or the University Police shall be consulted with prior to the placement of any FSEP.
 - 2. No joint use. Joint use of FSEP infrastructure is prohibited. FSEP infrastructure is not shared with other utilities except those needed to directly support FSEP requirements including WIFI and video surveillance.
 - 3. FSEPs shall be thoughtfully placed so they do not impact sidewalk or parking lot snow removal or pedestrian traffic flow.
- B. Installation Practice.
 - 1. Safety. Follow all campus safety policies when installing FSEP. FSEP may be placed near high vehicular traffic areas. Care should be used when working in congested areas.
 - 2. FSEP designator. Campus emergency poles shall be assigned a designator by OIT or University Police to aid in maintenance and repair.
 - 3. Venting air gap. Installers shall provide a minimum ½-inch air gap between the concrete base and the FSEP pedestal. This gap facilitates moisture (dew) evaporation. A venting gap of no larger than 1 inch is desired. A gap larger than 1 inch would possibly allow snow, dust, and trash to blow into the FSEP. Larger gaps would also allow rodents to nest in the pole.
 - 4. Grounding rod. A grounding rod shall be placed in each concrete pad that supports a FSEP pedestal. The copper grounding rods shall be a minimum ½ inch in diameter by 8 feet in length. Bond and ground all metallic parts to the grounding rod with a minimum 6-AWG insulated, green conductor.
 - 5. IT conduits. OIT requires one Trade Size 2, 2-inch conduit to support voice and data connectivity to the FSEP. Conduit is to be sized to support wireless access point video surveillance cameras.
 - 6. Electrical conduits. One Trade Size 1, 1-inch conduit shall be placed to support the FSEP power requirements.
 - 7. Electrical service. Place a dual gang four-plex 120V, 20A electrical box in the lower portion of each FSEP. The receptacle shall be a minimum of 8 inches above the base.
 - 8. Conduit depth. The tops of underground conduits supporting FSEP installations shall be placed a minimum of 30 inches below grade.
 - 9. Direct buried cables. Direct buried cable shall be placed a minimum of 24 inches below grade, if used.

10. Water infiltration and seepage mitigation. FSEP conduits shall be sealed to preclude water infiltration and seepage. Conduit runs serving FSEPs shall be placed so that water infiltration and seepage flows away from buildings and towards maintenance holes or handholes. A minimum drain slope of 12.5 inches per 100 feet is required when extending conduits away from building structures.
11. Electrical underground clearances. The minimum clearance between electrical conduits and underground IT conduits is 12 inches of well-tamped earth or 3 inches of concrete. Joint trenches are permitted if these clearances can be maintained.
12. Foreign structure underground clearances. The minimum clearance for parallel underground foreign structures such as gas, oil, or water pipelines is 12 inches of well-tamped earth. The minimum clearance for crossing underground foreign structures is 6 inches of well-tamped earth.
13. Conduit bends. There shall be no more than the equivalent of two 90-degree bends, or 180-degrees total, between pulling points, including kicks (a pipe bend of less than 45-degrees made to change the pipe's direction) and offsets (two mirror-image bends made to avoid an obstruction). Manufactured bends shall be used where possible. Back-to-back 90-degree bends placed closer together than 10 feet shall be avoided.
14. Sweeps. Sweeps are preferred to 90-degree bends. Trade Size 2, 2-inch conduit sweeps should possess a minimum 24-inch bend radius.
15. Diverts. The maximum divert or change in direction in any plane between lengths of straight rigid conduit without the use of bends or sweeps shall be limited to 5 degrees.
16. Soil compaction. The trench shall be backfilled with native soil in lifts no greater than 12 inches. The replaced soil shall be mechanically compacted by tamping to maintain a minimum relative density of 90 percent.
17. Certification and commissioning. All underground conduits shall be tested prior to commissioning. Underground conduits shall be certified by pulling a mandrel through them. The mandrel shall be equivalent to the nominal inside conduit diameter. If the mandrel does not pass through the conduit, the conduit must be repaired or replaced at the failure point. University personnel shall witness the certification test and commission the underground conduits in writing.
18. Warning tape and markings. Orange detectable warning tape shall be placed within 12 inches to 18 inches of the surface for the length of the IT underground conduit run used to support FSEP. Red detectable warning tape shall be placed within 12 inches to 18 inches of the surface for the length of the electrical underground conduit run used to support FSEP. Use red detectable tape if a joint trench was used.
19. FSEP installation documentation. As-builts of the installed FSEPs shall be delivered to OIT or the University Police, in the prescribed format and media.

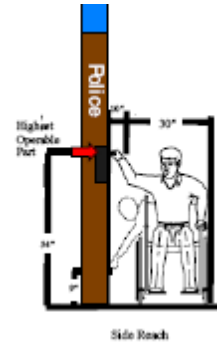
C. ADA Telephony Requirements.

1. Access pad. The FSEP shall have a minimum clear access pad of 30 inches by 48 inches in front of the operational part of the pole as shown in the sketch.

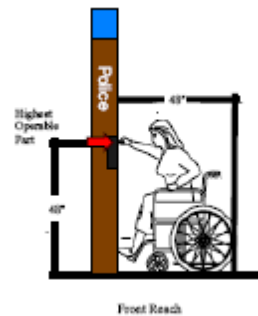


2. The highest operational part of the FSEP shall be no higher than 48 inches above the ground (access pad).
3. Barriers to FSEP access by wheelchairs, crutches, and walkers shall be eliminated. Curbs, rough terrain, unpaved access pads; etc. shall be avoided when placing a FSEP.
4. The FSEP installation shall comply with the following ADA side reach requirements.

- a. Maximum side reach height shall be 54 inches.
- b. Minimum side reach height shall be 9 inches.
- c. Maximum side reach height over an obstruction that is 24 inches wide and 34 inches high shall be 46 inches.



5. The FSEP installation shall comply with the following ADA front reach requirements.
 - a. Maximum forward reach height shall be 48 inches.
 - b. Minimum forward reach height shall be 15 inches.
 - c. Maximum front reach height over an obstruction shall be 44 inches.



D. Communications Media.

1. All FSEP communications media is provided by the OIT department and is managed under a separate contract.
2. Fiber optic media. OIT shall place 6 strands of single mode fiber (SMF) or 6 strands of 50-micron multimode fiber (MMF) to the FSEP, as required by distance and application.
3. Copper media. OIT shall place 6-pairs of copper wire to each FSEP. Depending upon distance, 22 (0.64 mm) or 24 (0.5 mm) AWG shall be used. The outside plant copper cable shall be shielded twisted pair (STP) or other copper media as selected by OIT. OIT will bond and ground all copper media entering campus buildings.
4. Phone line current. To reliably operate, the Code Blue phone requires a minimum of 20mA line current.

E. Installation Examples.

1. Picture 1, as shown below, shows a properly installed FSEP. It has an access pad exceeding 48 inches by 30 inches in front of the operating panel. The highest operable mechanism is below 48 inches. Finally, it has a ½-inch to 1-inch gap at its base to facilitate moisture evaporation.



2. Picture 2, below, illustrates an improperly installed FSEP. The FSEP does not have an ADA compliant access pad in front of the operating panel. The pad space is too small. Additionally, the highest operating mechanism exceeds 64 inches in height, well above the ADA required 48 inches. The FSEP does have a ½-inch air gap at its base to facilitate moisture evaporation.



3. Picture 3, on the next page, shows an improperly installed FSEP. The FSEP does not have an ADA compliant access pad in front of the operating panel. Additionally, the highest operating mechanism exceeds 48 inches in height. Finally, the FSEP does have a ½-inch air gap at its base to facilitate moisture evaporation.



4. Picture 4 is presented below. It portrays an improperly installed FSEP. The FSEP does not have ADA compliant access. That is, the 360-degree curb prevents access by wheelchairs. Additionally, the access pad in front of the operating panel is inadequate.



5. Picture 5, as shown below, is an improperly installed FSEP. The FSEP lacks a minimum ½-inch air gap to prevent moisture build up inside the pole. Note the apparent seepage.



3.2 EMERGENCY SERVICE PHONE (ESP) INSTALLATION (RED PHONES) REQUIREMENTS

- A. Emergency Services Phone (ESP) Placement.
1. Emergency Service Phones or red phones are to be placed to provide ready access to emergency services. They are to be placed 1 per floor near common areas including elevator lobbies and bathrooms. Larger floor plates may require 2 locations per floor. OIT will designate the placement of ESP red phone locales.
- B. Installation Practice.
1. IT conduits and back-boxes. OIT requires one Trade Size 1, 1-inch conduit to support voice connectivity to the ESP. Backbox shall be 2-gang deep with single gang mud ring.
- C. ADA Telephony Requirements.
1. The ESP installation shall comply with the following ADA side reach requirements.
 - a. Maximum side reach height shall be 54 inches.
 - b. Minimum side reach height shall be 9 inches.
 - c. Maximum side reach height over an obstruction that is 24 inches wide and 34 inches high shall be 46 inches.
 2. The ESP installation shall comply with the following ADA front reach requirements.
 - a. Maximum forward reach height shall be 48 inches.
 - b. Minimum forward reach height shall be 15 inches.
 - c. Maximum front reach height over an obstruction shall be 44 inches.
- D. Communications Media.
1. All ESP communications media is provided by the OIT department and is managed under a separate contract.

END OF SECTION 27 32 53