

SECTION 27 05 11
REQUIREMENTS FOR TELECOMMUNICATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section applies to all sections of Division 27.
- B. Furnish and install communication cabling, systems, equipment and accessories in accordance with the specifications and drawings. All necessary cabling for connection to active equipment shall be provided by this subcontractor to provide a complete and working system. Unless noted otherwise, junction boxes, back-boxes, and conduit rough-in for devices have been provided by the Division 26 subcontractor as defined in the specifications of Division 26. However, any special back-boxes required for Division 27 equipment shall be furnished by the Division 27 contractor. Refer to Division 26 documents for system rough-in coordination items.
- C. Section Includes:
 - 1. Communications equipment coordination and installation.
 - 2. Common communications installation requirements.
 - 3. Cutting and patching for communications and electronic safety and security construction.
 - 4. Touchup painting.

1.2 RELATED WORK

- A. Sealing around penetrations to maintain the integrity of time rated construction: Section 07 84 00, FIRESTOPPING.

1.3 MINIMUM REQUIREMENTS

- A. References to the International Building Code (IBC), National Electrical Code (NEC), Underwriters Laboratories, Inc. (UL) and National Fire Protection Association (NFPA) are minimum installation requirement standards.
- B. Drawings and other specification sections shall govern in those instances where requirements are greater than those specified in the above standards.

1.4 TEST STANDARDS

- A. All materials and equipment shall be listed, labeled or certified by a nationally recognized testing laboratory to meet Underwriters Laboratories, Inc., standards where test standards have been established. Equipment and materials which are not covered by UL Standards will be accepted provided equipment and material is listed, labeled, certified or otherwise determined to meet safety requirements

of a nationally recognized testing laboratory. Equipment of a class which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, will be considered if inspected or tested in accordance with national industrial standards, such as NEMA, or ANSI. Evidence of compliance shall include certified test reports and definitive shop drawings.

B. Definitions:

1. Listed; Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production or listed equipment or materials or periodic evaluation of services, and whose listing states that the equipment, material, or services either meets appropriate designated standards or has been tested and found suitable for a specified purpose.
2. Labeled; Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.
3. Certified; equipment or product which:
 - a. Has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner.
 - b. Production of equipment or product is periodically inspected by a nationally recognized testing laboratory.
 - c. Bears a label, tag, or other record of certification.
4. Nationally recognized testing laboratory; laboratory which is approved, in accordance with OSHA regulations, by the Secretary of Labor.
5. Provide: The term "provide" means "to furnish and install, ready for the intended use and in complete operating condition."
6. Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."
7. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Engineer," "requested by the Engineer," and similar phrases.
8. Approve: The term "approved," where used in conjunction with the Engineer's action on the Contractor's submittals, applications and requests, is limited to the Engineer's duties and responsibilities as stated in the Conditions of the Contracts.
9. Indicated: The term "indicated" refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled" and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.
10. Contractor: The term "Contractor" shall carry the same meaning as "Electrical Contractor"
11. Or Equal: The term "Or equal" shall carry the same meaning as "approved as equal by the Engineer"

12. Owner: All references here-in and on drawings to "Owner" shall be the same as "Veterans Administration - Minneapolis".

1.5 QUALIFICATIONS (PRODUCTS AND SERVICES)

- A. Manufacturers Qualifications: The manufacturer shall regularly and presently produce, as one of the manufacturer's principal products, the equipment and material specified for this project, and shall have manufactured the item for at least three years.
- B. Product Qualification:
 - 1. Manufacturer's product shall have been in satisfactory operation, on three installations of similar size and type as this project, for approximately three years.
 - 2. The Government reserves the right to require the Contractor to submit a list of installations where the products have been in operation before approval.
- C. Service Qualifications: There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation within four hours of receipt of notification that service is needed. Submit name and address of service organizations.

1.6 APPLICABLE PUBLICATIONS

- A. Applicable publications listed in all Sections of Division are the latest issue, unless otherwise noted.

1.7 MANUFACTURED PRODUCTS

- A. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, for which replacement parts shall be available.
- B. When more than one unit of the same class or type of equipment is required, such units shall be the product of a single manufacturer.
- C. Equipment Assemblies and Components:
 - 1. Components of an assembled unit need not be products of the same manufacturer.
 - 2. Manufacturers of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.
 - 3. Components shall be compatible with each other and with the total assembly for the intended service.
 - 4. Constituent parts which are similar shall be the product of a single manufacturer.
- D. Factory wiring shall be identified on the equipment being furnished and on all wiring diagrams.

E. When Factory Testing Is Specified:

1. The Government shall have the option of witnessing factory tests. The contractor shall notify the VA through the Resident Engineer a minimum of 15 working days prior to the manufacturers making the factory tests.
2. Four copies of certified test reports containing all test data shall be furnished to the Resident Engineer prior to final inspection and not more than 90 days after completion of the tests.
3. When equipment fails to meet factory test and re-inspection is required, the contractor shall be liable for all additional expenses, including expenses of the Government.

1.8 EQUIPMENT REQUIREMENTS

- A. Where variations from the contract requirements are requested in accordance with the GENERAL CONDITIONS and Section 01 33 23 "SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES," the connecting work and related components shall include, but not be limited to additions or changes to branch circuits, circuit protective devices, conduits, wire, feeders, controls, panels and installation methods.

1.9 PROJECT CONDITIONS

- A. Interior Environmental Conditions (fully conditioned spaces): Electrical systems shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
1. Ambient Temperature: 65 to 75 deg F
 2. Relative Humidity: 0 to 95 percent.
- B. Interior Environmental Conditions (heated only spaces): Electrical systems shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
1. Ambient Temperature: 55 to 95 deg F
 2. Relative Humidity: 0 to 95 percent. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 3. Notify Owner/Owner's Representative no fewer than 5 working days in advance of proposed interruption of electric service.
 4. Do not proceed with interruption of electric service without Owner/Owner's Representative's written permission.

1.10 EQUIPMENT PROTECTION

- A. Equipment and materials shall be protected during shipment and storage against physical damage, vermin, dirt, corrosive substances, fumes, moisture, cold and rain.
1. Store equipment indoors in clean dry space with uniform temperature to prevent condensation. Equipment shall include but

- not be limited to enclosures, controllers, circuit protective devices, cables, wire, electronic equipment, and accessories.
2. During installation, equipment shall be protected against entry of foreign matter; and be vacuum-cleaned both inside and outside before testing and operating. Compressed air shall not be used to clean equipment. Remove loose packing and flammable materials from inside equipment.
 3. Damaged equipment shall be, as determined by the COTR, placed in first class operating condition or be returned to the source of supply for repair or replacement.
 4. Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
 5. Damaged paint on equipment and materials shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are not obvious.

1.11 WORK PERFORMANCE

- A. All electrical work must comply with the requirements of NFPA 70 (NEC), NFPA 70B, NFPA 70E, OSHA Part 1910 subpart J, OSHA Part 1910 subpart S and OSHA Part 1910 subpart K in addition to other references required by contract.
- B. Job site safety and worker safety is the responsibility of the contractor.
- C. For work on existing stations, arrange, phase, and perform work to assure communication service for other buildings at all times. Refer to Article OPERATIONS AND STORAGE AREAS under Section 01 00 00 "GENERAL REQUIREMENTS."
- D. New work shall be installed and connected to existing work. Disturbed or damaged work shall be replaced or repaired to its prior conditions, as required by Section 01 00 00 "GENERAL REQUIREMENTS."
- E. Coordinate location of equipment and conduit with other trades to minimize interferences.
- F. All Telecommunication workmen on this project shall be thoroughly knowledgeable of all applicable codes related to all telecommunication systems for this project. All installations shall be performed by skilled tradesmen fully aware of the latest techniques, practices, and standards of the industry. Haphazard or poor installation practice will be cause for rejection of work.
- G. Good workmanship and appearance shall be considered important. Carefully lay out all work in advance to install in a neat and good workmanship-like manner all in accordance with recognized practices and standards of the industry.

1.12 COORDINATION

- A. EQUIPMENT INSTALLATION AND REQUIREMENTS
 1. Equipment location shall be as close as practical to locations shown on the drawings.

2. Inaccessible Equipment:
 - a. Where the Government determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the Government.
 - b. "Conveniently accessible" is defined as being capable of being reached quickly for operation, maintenance, or inspections without the use of ladders, or without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt guards, transformers, piping, ductwork, conduit and raceways.
- B. All drawings, specifications and documents for this project shall be taken as a whole. Before undertaking each part of the Work, the Contractor shall be familiar with this project by carefully reviewing and comparing all documents that pertain to this project.
- C. In preparation of the contract documents, a reasonable effort has been made to provide layouts and connections based on selected and specified manufacturer's equipment. Since physical space, electrical connections, equipment arrangements and other requirements may vary according to each manufacturer, the final responsibility for connections, initial access and proper fit rests with the Contractor.
- D. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.
 1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.
- E. Sequence, coordinate, and integrate installing telecommunication materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in the building.
- F. Provide access panels and doors for telecommunication items that are concealed by finished surfaces. Access doors and panels are specified in Division 8 Section "Access Doors." Locations shall be coordinated with the Architectural reflected ceiling plans, and shall be approved by the Architect before installation.
- G. Where identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.
- H. Where identification markings and devices will be concealed by acoustical ceilings and similar finishes, coordinate installation of these items before ceiling installation.
- I. The drawings indicate only the approximate locations of rough-ins and may not indicate complete connection requirements. Prior to progressing with any work or rough-ins the Contractor shall obtain all equipment rough-in requirements and information from the equipment supplier, manufacturer or from the respective trades furnishing the equipment or with Architect, to complete the installation in a neat and workmanship-like manner.

- J. Scaled and figured locations are approximate only. Before proceeding with work, carefully check and verify with building dimensions on architectural drawings, and be responsible for properly fitting equipment and materials together and to the structure in spaces provided.
- K. Drawings are essentially diagrammatic and indicate the general arrangement of equipment. Many offsets, bends, pull boxes, special fittings, etc. will be required which are not indicated. Carefully study drawings and premises in order to determine best methods, exact locations, conduit routes, building obstructions, etc., to install apparatus and equipment. Install apparatus and equipment in manner and locations to avoid obstructions, preserve headroom, and keep openings and passageways clear.
- L. Where located adjacent and opposite side of the same wall, outlet boxes shall not be placed back to back, nor shall extension rings be used in place of double boxes, all to limit sound transmission between rooms. Provide short horizontal nipple between adjacent outlet boxes, which shall have depth sufficient to maintain wall coverage in rear by masonry material.
- M. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
- N. Coordinate sleeve selection and application with selection and application of fire stopping specified in Division 07 Section "Penetration Fire stopping".

1.13 EQUIPMENT INSTALLATION AND REQUIREMENTS

- A. Equipment location shall be as close as practical to locations shown on the drawings.
- B. Inaccessible Equipment:
 - 1. Where the Government determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the Government.
 - 2. "Conveniently accessible" is defined as being capable of being reached quickly for operation, maintenance, or inspections without the use of ladders, or without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt guards, transformers, piping, ductwork, conduit and raceways.

1.14 SUBMITTALS

- A. Submit in accordance with Section 01 33 23 "SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES."
- B. The Government's approval shall be obtained for all equipment and material before delivery to the job site. Delivery, storage or installation of equipment or material which has not had prior approval will not be permitted at the job site.

- C. All submittals shall include adequate descriptive literature, catalog cuts, shop drawings and other data necessary for the Government to ascertain that the proposed equipment and materials comply with specification requirements. Catalog cuts submitted for approval shall be legible and clearly identify equipment being submitted.
- D. The review of shop drawings by the Architect/Engineer shall not constitute agreement of any deviations from the plans and specifications and shall not relieve the Contractor from responsibility for errors or omissions.
- E. Submittals for individual systems and equipment assemblies which consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be considered for approval.
 - 1. Mark the submittals, "SUBMITTED UNDER SECTION_____".
 - 2. Submittals shall be marked to show specification reference including the section and paragraph numbers.
 - 3. Submit each section separately.
- F. The submittals shall include the following:
 - 1. Information that confirms compliance with contract requirements. Include the manufacturer's name, model or catalog numbers, catalog information, technical data sheets, shop drawings, pictures, nameplate data and test reports as required.
 - 2. Elementary and interconnection wiring diagrams for communication and signal systems, control systems and equipment assemblies. All terminal points and wiring shall be identified on wiring diagrams.
 - 3. Parts list which shall include those replacement parts recommended by the equipment manufacturer.
 - 4. All shop drawings shall be bound neatly in four separate hard cover, 3-ring binders. Submit the following and refer to each Section for specific requirements. Tab and index each Section, sequenced in order of section. The four binders shall consist of the following:
 - a. Section 27 1200 Telecommunications Cabling Expansion
 - 5. Refer to drawings for the additional required equipment that is to be submitted as part of the shop drawing submittals.
- G. Maintenance and Operation Manuals: Submit in accordance with Section 01 00 00 "GENERAL REQUIREMENTS."
 - 1. Submit as required for systems and equipment specified in the technical sections. Furnish four copies, bound in hardback binders, (manufacturer's standard binders) or an approved equivalent. Furnish one complete manual as specified in the technical section but in no case later than prior to performance of systems or equipment test, and furnish the remaining manuals prior to contract completion.
 - 2. Inscribe the following identification on the cover: the words "MAINTENANCE AND OPERATION MANUAL," the name and location of the system, equipment, building, name of Contractor, and contract number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the system or equipment and the local representatives for the system or equipment.
 - 3. Provide a "Table of Contents" and assemble the manual to conform to the table of contents, with tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in.
 - 4. The manuals shall include:

- a. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the equipment.
 - b. A control sequence describing start-up, operation, and shutdown.
 - c. Description of the function of each principal item of equipment.
 - d. Installation instructions.
 - e. Safety precautions for operation and maintenance.
 - f. Diagrams and illustrations.
 - g. Periodic maintenance and testing procedures and frequencies, including replacement parts numbers and replacement frequencies.
 - h. Performance data.
 - i. Pictorial "exploded" parts list with part numbers. Emphasis shall be placed on the use of special tools and instruments. The list shall indicate sources of supply, recommended spare parts, and name of servicing organization.
 - j. List of factory approved or qualified permanent servicing organizations for equipment repair and periodic testing and maintenance, including addresses and factory certification qualifications.
- H. Record 'As-Built' Documents:
- 1. Prepare and record 'as-built' documents in accordance with the requirements in Division 1 Section "Project Closeout."
 - 2. Maintain a separate set of electrical drawings at the job site which is not used for construction purposes. This set shall be kept updated by neatly marking all changes and deviations made during construction. Use a color that contrasts with the drawings. This same set of drawings shall be made available at all times during construction for review at any time by the Architect/Engineer.
 - 3. In addition to the requirements specified in Division 1, indicate actual installed and 'as-built' conditions for:
 - a. Major raceway systems, size and location, for both exterior and interior.
 - b. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
 - c. Approved changes and actual equipment and materials installed.
 - d. Contract modifications, including deviation of branch circuit numbering where circuit breaker arrangements have been adjusted.
- I. Approvals will be based on complete submission of manuals together with shop drawings.
- J. After approval and prior to installation, furnish the Resident Engineer with one sample of each of the following:

1.15 SINGULAR NUMBER

- A. Where any device or part of equipment is referred to in these specifications in the singular number (e.g., "the switch"), this reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.

1.16 Acceptance Checks and Tests

- A. The contractor shall furnish the instruments, materials and labor for field tests.

1.17 TRAINING

- A. Training shall be provided in accordance with Article 1.25, INSTRUCTIONS, of Section 01 00 00 "GENERAL REQUIREMENTS."
- B. Training shall be provided for the particular equipment or system as required in each associated specification.
- C. A training schedule shall be developed and submitted by the contractor and approved by the Resident Engineer at least 30 days prior to the planned training.

1.18 PERMITS

- A. Obtain and pay for licenses and permits required, for fees and charges for use of outside services (i.e. inspecting agencies or delivery services) and use of property other than the site of the Work for storage of materials or other purposes.

1.19 INSPECTIONS

- A. Secure regular inspections as required by regulations. Pay charges by regulating agencies for the inspections of installations or Drawings and Specifications.

1.20 INSURANCE

- A. Procure and maintain such insurance required by law and/or specified in Division 0 or 1.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR TELECOMMUNICATION INSTALLATION

- A. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- B. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

- C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- D. Right of Way: Give to piping systems installed at a required slope.

3.2 FIRESTOPPING

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for telecommunications installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

3.3 FIELD QUALITY CONTROL

- A. Inspect installed components for damage and faulty work, including the following:
 - 1. Supporting devices for electrical components.
 - 2. Electrical identification.
 - 3. Concrete bases.
 - 4. Cutting and patching for electrical construction.
 - 5. Touchup painting.

3.4 REFINISHING AND TOUCHUP PAINTING

- A. Refinish and touch up paint. Paint materials and application requirements are specified in Division 9 Section "Painting."
 - 1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
 - 2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
 - 3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.5 CLEANING AND PROTECTION

- A. Thoroughly clean materials, equipment and apparatus to be free of dust, dirt, rust, and foreign materials before acceptance at Substantial Completion.
- B. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
- C. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

3.6 TELECOMMUNICATION CONTRACTOR DEMOLITION RESPONSIBILITIES

- A. Remove cabling to source for devices indicated to be removed. Existing conduit, boxes, cable, etc. indicated to remain which are presently being supported from existing ceiling or ceiling supports, which are to be removed, shall be re-supported to building structure.
- B. Demolition work shall be coordinated with the Owner. Should questions arise regarding the removal of a conduit and/or wiring, (i.e. Is it energized? Does it serve a load in an area not be remodeled?), confer with the Owner before such wiring or conduit is actually demolished.
- C. Reused and Reinstalled equipment and devices: Carefully disconnect and remove items to be reused or reinstalled. Any questions regarding the quality and reusability of an item shall be brought to the attention of the Engineer/Architect prior to removal. Items shall be properly stored in a manner causing no additional damage to the item. Prior to reinstalling, clean and test item. Upon completion, the item shall be in equivalent condition as prior to its removal. Items damaged due to improper handling and storage by the Contractor shall be replaced with new items of the same type and quality as the original items.
- D. Demolition equipment and devices: Existing equipment and devices not indicated for reuse shall become the property of this Contractor and disposed of properly.
- E. Disconnect and remove devices and replace with devices and cover plates as shown on the Drawings or as specified in other Division 27 sections.
- F. Refer to Division 1 for hazardous material removal requirements.

3.7 EXISTING CONDITIONS

- A. Conduits, cabling, devices, speakers, etc., shown on the Drawings as existing are based on existing plans and may not be installed as originally shown. A field survey was conducted to verify the general accuracy of the existing plans. However, no attempt has been made to find the changes which occur in concealed areas such as above inaccessible ceilings and in walls. Verify the accuracy of the "Existing Conditions" as shown on the Drawings as the demolition work progresses. Perform modifications and additions as necessary to correct for these hidden conditions and allow for the completion of the new Work.

3.8 CONTINUITY OF SERVICE

- A. Schedule and carry out the Work in such a manner as to cause the Owner a minimum of inconvenience due to service interruption. Temporary services (feeder, branch circuit and signal systems) shall be installed if one area or phase of construction disrupts service to another area of the building(s) or if equipment, conduits, or feeders have to be relocated to allow construction to progress. Service interruptions shall be confined to the smallest area possible at any one time and interruptions shall be scheduled in advance with the

Owner's site representative. All interruptions shall be conducted and shall be limited to after hours (9:00 pm - 6:00am) and weekends. After service has been restored following an interruption, inspect areas affected by the interruption and be responsible for returning automatically controlled equipment to the same operating condition which existed prior to the interruption.

3.9 BUILDING STRUCTURE PENETRATIONS

- A. Provide firestopping for all existing electrical penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."
- B. Where existing or temporary raceway systems are being demolished, which leave openings in the existing building structure, the building structure shall be patched to match the existing construction and maintain the existing building fire ratings.

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SPS Deficiencies, Phase 2
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