

CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

SPECIAL PROVISIONS
FOR THE
CONSTRUCTION
OF
DEPARTMENT OF VETERANS AFFAIRS
V.A. ROSEBURG HEALTHCARE SYSTEM
VA ACCESS IMPROVEMENT
PROJECT NO. 653-12-107
CONSTRUCT ACCESS IMPROVEMENTS 1A

MAY 2011

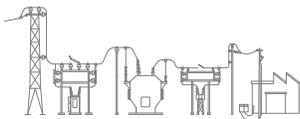
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1A, 100% Submittal Specification
Page 1 of 132

CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

CONSTRUCT ACCESS IMPROVEMENTS 1A

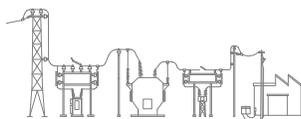
PROJECT NO. 653-12-107

PHASE 1A

TABLE OF CONTENTS

SECTION 01 00 00 GENERAL REQUIREMENTS

1.1 GENERAL INTENTION.....	13
1.2 STATEMENT OF BID ITEMS.....	14
1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR.....	15
1.4 CONSTRUCTION SECURITY REQUIREMENTS.....	16
1.5 FIRE SAFETY.....	18
1.6 OPERATIONS AND STORAGE AREAS.....	21
1.7 ALTERATIONS.....	24
1.8 NOT USED.....	25
1.9 DISPOSAL AND RETENTION.....	25
1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS.....	25
1.11 RESTORATION.....	26
1.12 PHYSICAL DATA.....	27
1.13 PROFESSIONAL SURVEYING SERVICES.....	27
1.14 LAYOUT OF WORK.....	28
1.15 AS-BUILT DRAWINGS.....	29
1.16 USE OF ROADWAYS.....	30
1.17 NOT USED.....	30

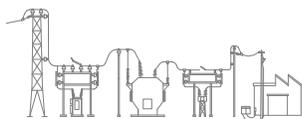


CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

1.18 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT	30
1.19 NOT USED	30
1.20 NOT USED	30
1.21 TEMPORARY TOILETS	30
1.22 AVAILABILITY AND USE OF UTILITY SERVICES	31
1.23 NOT USED	32
1.24 NOT USED	32
1.25 NOT USED	32
1.26 NOT USED	32
1.27 NOT USED	32
1.28 NOT USED	32
1.29 CONSTRUCTION SIGN	32
1.30 SAFETY SIGN	33
1.31 PHOTOGRAPHIC DOCUMENTATION	33
1.32 NOT USED	35
1.33 HISTORIC PRESERVATION	35

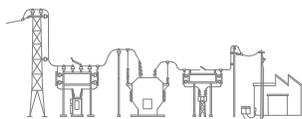
SPECIAL PROVISIONS FOR ADWA/ODOT

WORK TO BE DONE	36
APPLICABLE SPECIFICATIONS	36
SECTION 00110 – TERMS, ABBREVIATIONS, AND DEFINITIONS	37
SECTION 00120 – BIDDING REQUIREMENTS AND PROCEDURES	38
SECTION 00140 – SCOPE OF WORK.....	38
SECTION 00150 – CONTROL OF WORK	39
SECTION 00165 – QUALITY OF MATERIALS.....	40



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

SECTION 00170 – LEGAL RELATIONS AND RESPONSIBILITIES	41
SECTION 00180 – PROSECUTION AND PROGRESS	41
SECTION 00196 – PAYMENT FOR EXTRA WORK	42
SECTION 00197 – PAYMENT FOR EXTRA WORK DONE	
ON A FORCE ACCOUNT BASIS	42
SECTION 00199 – DISAGREEMENTS, PROTESTS, AND CLAIMS	43
SECTION 00210 - MOBILIZATION	43
SECTION 00220 - ACCOMMODATIONS FOR PUBLIC TRAFFIC	43
SECTION 00225 - WORK ZONE TRAFFIC CONTROL	44
SECTION 00280 - EROSION AND SEDIMENT CONTROL	44
SECTION 00305 - CONSTRUCTION SURVEY WORK	45
SECTION 00310 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS	48
SECTION 00320 - CLEARING AND GRUBBING	49
SECTION 00330 - EARTHWORK	50
SECTION 00340 - WATERING	50
SECTION 00370 - FINISHING ROADBEDS	51
SECTION 00405 - TRENCH EXCAVATION, BEDDING, AND BACKFILL	51
SECTION 00440 - COMMERCIAL GRADE CONCRETE	51
SECTION 00445 - SANITARY, STORM, CULVERT, SIPHON, AND IRRIGATION PIPE	51
SECTION 00470 - MANHOLES, CATCH BASINS, AND INLETS	51
SECTION 00490 - WORK ON EXISTING SEWERS AND STRUCTURES	52
SECTION 00640 - AGGREGATE BASE AND SHOULDERS	52
SECTION 00730 - EMULSIFIED ASPHALT TACK COAT	52
SECTION 00744 - MINOR HOT MIXED ASPHALT CONCRETE (MHMAC) PAVEMENT	52
SECTION 00759 - MISCELLANEOUS PORTLAND CEMENT CONCRETE STRUCTURES	57



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

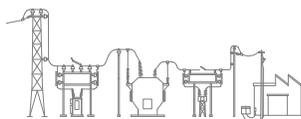
SECTION 00850 - COMMON PROVISIONS FOR PAVEMENT MARKINGS	57
SECTION 00860 - LONGITUDINAL PAVEMENT MARKINGS - PAINT	57
SECTION 00867 - TRANSVERSE PAVEMENT MARKINGS - LEGENDS AND BARS.....	58
SECTION 00932 – CUSTOM STOP SIGN	59
SECTION 00960 – COMMON PROVISIONS FOR ELECTRICAL SYSTEMS	61
SECTION 01120 – IRRIGATION SYSTEMS.....	62
SECTION 02920 – COMMON ELECTRICAL MATERIALS.....	62
SECTION 02926 – HIGHWAY ILLUMINATION MATERIALS.....	63

SECTION 01 01 00A OSHA REQUIREMENTS AND SAFETY AND HEALTH REGULATIONS

PART 1 - OSHA REQUIREMENTS.....	65
1.1 GENERAL.....	65

SECTION 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES	62
PART 1	62
1.1.....	62
1.2.....	62
1.3.....	62
1.4.....	62
1.5.....	63
1.6.....	63
1.7.....	63



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

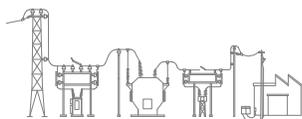
1.8..... 63
1.9..... 63
1.10..... 66
1.11..... 66

SECTION 01 45 29 TESTING LABORATORY SERVICES

PART 1 - GENERAL 72
1.1 DESCRIPTION: 72
1.2 APPLICABLE PUBLICATIONS:..... 72
1.3 REQUIREMENTS..... 73
PART 2 - PRODUCTS (NOT USED) 74
PART 3 - EXECUTION..... 74
3.1 EARTHWORK: 74
3.2 ASPHALT CONCRETE PAVING: 70
3.3 SITE WORK CONCRETE 76
3.4 CONCRETE: 76
3.5 TYPE OF TEST: 80

SECTION 01 74 19 CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL 83
1.1 DESCRIPTION 78
1.2 RELATED WORK 79
1.3 QUALITY ASSURANCE 79
1.4 TERMINOLOGY 81
1.5 SUBMITTALS 83

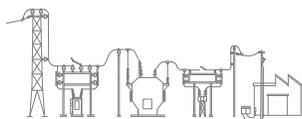


CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

1.6 APPLICABLE PUBLICATIONS.....	84
1.7 RECORDS.....	84
PART 2 - PRODUCTS.....	84
2.1 MATERIALS	84
PART 3 - EXECUTION.....	84
3.1 COLLECTION	84
3.2 DISPOSAL.....	85
3.3 REPORT	85

SECTION 26 05 11 REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

PART 1 - GENERAL	86
1.1 DESCRIPTION	86
1.2 MINIMUM REQUIREMENTS	86
1.3 TEST STANDARDS	86
1.4 QUALIFICATIONS (PRODUCTS AND SERVICES).....	88
1.5 APPLICABLE PUBLICATIONS.....	88
1.6 MANUFACTURED PRODUCTS.....	88
1.7 EQUIPMENT REQUIREMENTS.....	89
1.8 EQUIPMENT PROTECTION.....	89
1.9 WORK PERFORMANCE	90
1.10 EQUIPMENT INSTALLATION AND REQUIREMENTS.....	91
1.11 EQUIPMENT IDENTIFICATION	92
1.12 SUBMITTALS	92
1.13 SINGULAR NUMBER	95
1.14 ACCEPTANCE CHECKS AND TESTS	95



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

1.14 TRAINING..... 95

SECTION 26 05 21 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
(600 VOLTS AND BELOW)

PART 1 - GENERAL 96

1.1 DESCRIPTION 96

1.2 RELATED WORK 96

1.3 QUALITY ASSURANCE 96

1.4 FACTORY TESTS 96

1.5 SUBMITTALS 97

1.6 APPLICABLE PUBLICATIONS..... 97

PART 2 - PRODUCTS..... 98

2.1 CONDUCTORS AND CABLES 98

2.2 SPLICES AND JOINTS 99

2.3 CONTROL WIRING 100

2.4 WIRE LUBRICATING COMPOUND..... 100

PART 3 - EXECUTION..... 100

3.1 GENERAL..... 100

3.2 INSTALLATION IN MANHOLES 101

3.3 SPLICE INSTALLATION 101

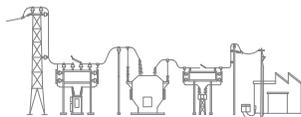
3.4 FEEDER IDENTIFICATION 102

3.5 EXISTING WIRING 102

3.6 CONTROL AND SIGNAL WIRING INSTALLATION..... 102

3.7 CONTROL AND SIGNAL SYSTEM WIRING IDENTIFICATION 102

3.8 NOT USED 102



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

3.9 ACCEPTANCE CHECKS AND TESTS 102

SECTION 26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL 103

1.1 DESCRIPTION 103

1.2 RELATED WORK 103

1.3 QUALITY ASSURANCE 103

1.4 SUBMITTALS 103

1.5 APPLICABLE PUBLICATIONS..... 104

PART 2 - PRODUCTS..... 105

2.1 GROUNDING AND BONDING CONDUCTORS..... 105

2.2 GROUND RODS 105

2.3 CONCRETE ENCASED ELECTRODE 105

2.4 MEDIUM VOLTAGE SPLICES AND TERMINATIONS 105

2.5 GROUND CONNECTIONS 105

2.6 EQUIPMENT RACK AND CABINET GROUND BARS..... 106

2.7 GROUND TERMINAL BLOCKS 106

2.8 GROUNDING BUS 106

PART 3 - EXECUTION..... 106

3.1 GENERAL..... 106

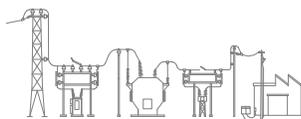
3.2 INACCESSIBLE GROUNDING CONNECTIONS 106

3.3 MEDIUM VOLTAGE EQUIPMENT AND CIRCUITS..... 106

3.4 SECONDARY VOLTAGE EQUIPMENT AND CIRCUITS..... 106

3.5 RACEWAY 106

3.6 OUTDOOR METALLIC FENCES AROUND ELECTRICAL EQUIPMENT 107



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

3.7 CORROSION INHIBITORS 107

3.8 CONDUCTIVE PIPING 107

3.9 LIGHTNING PROTECTION SYSTEM..... 107

3.10 ELECTRICAL ROOM GROUNDING 107

3.11 EXTERIOR LIGHT POLES 107

3.12 GROUND RESISTANCE 107

SECTION 26 05 33 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL 108

1.1 DESCRIPTION 108

1.2 RELATED WORK 108

1.3 QUALITY ASSURANCE 108

1.4 SUBMITTALS 108

1.5 APPLICABLE PUBLICATIONS..... 109

PART 2 - PRODUCTS..... 110

2.1 MATERIAL 110

PART 3 - EXECUTION..... 111

3.1 PENETRATIONS 111

3.2 INSTALLATION, GENERAL 111

3.3 CONCEALED WORK INSTALLATION 112

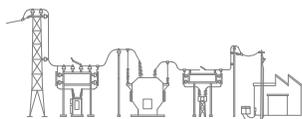
3.4 EXPOSED WORK INSTALLATION 112

3.5 DIRECT BURIAL INSTALLATION 112

3.6 HAZARDOUS LOCATIONS 112

3.7 WET OR DAMP LOCATIONS..... 112

3.8 MOTORS AND VIBRATING EQUIPMENT 112



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

3.9 EXPANSION JOINTS..... 112

3.10 CONDUIT SUPPORTS, INSTALLATION 112

3.11 BOX INSTALLATION..... 112

SECTION 26 05 41 UNDERGROUND ELECTRICAL CONSTRUCTION

PART 1 - GENERAL 113

1.1 DESCRIPTION 113

1.2 RELATED WORK 113

1.3 QUALITY ASSURANCE 113

1.4 SUBMITTALS 113

1.5 APPLICABLE PUBLICATIONS..... 114

1.6 STORAGE 116

PART 2 - PRODUCTS..... 116

2.1 PRE-CAST CONCRETE MANHOLES AND HARDWARE 116

2.2 PULLBOXES 116

2.3. DUCTS 116

2.4 GROUNDING 117

2.5 WARNING TAPE 117

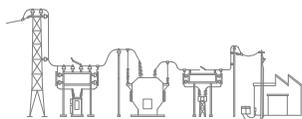
2.6 PULL ROPE FOR SPARE DUCTS 117

PART 3 - EXECUTION..... 117

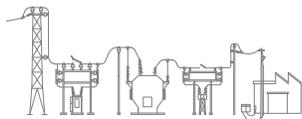
3.1 MANHOLE AND PULLBOX INSTALLATION 117

3.2 TRENCHING 117

3.3 DUCT INSTALLATION 118



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon



CONSTRUCT ACCESS IMPROVEMENTS 1A

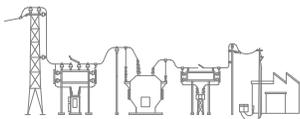
Roseburg VA Healthcare System – Roseburg, Oregon

SECTION 01 00 00

GENERAL REQUIREMENTS

1.1 GENERAL INTENTION

- A. **Project Summary**: This work will include building and constructing a new road. Work includes, but is no limited to the following:
1. Remove existing trees, shrubs, grass, curbing, and asphalt located inside the perimeter work area.
 2. Locate, protect, and maintain existing sanitary sewer, natural gas, storm water, electrical, and other utilities that are to remain in service and are located either adjacent to or inside the perimeter of work area.
 3. Locate existing utilities (i.e. Avista Utility) for location, and relocation of the existing utility in the work area.
 4. Furnish, place and maintain traffic control devices.
 5. Furnish, place and maintain erosion control measures.
 6. Construct general embankments and excavations.
 7. Furnish and install storm sewer pipe, inlets and catch basins.
 8. Construct concrete curb, gutter and sidewalks.
 9. Construct aggregate base and asphalt concrete pavement.
 10. Furnish and install electrical conduit, lighting pole bases, lighting poles, and luminaries.
 11. Furnish and install painted permanent pavement markings
 12. Furnish and install permanent signing.
 13. Perform additional and incidental work as called for by the specifications and plans.
 14. Contractor to apply for, at their cost, required storm water discharge permits from Oregon DEQ. (1200-c)



CONSTRUCT ACCESS IMPROVEMENTS 1A

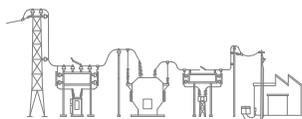
Roseburg VA Healthcare System – Roseburg, Oregon

- B. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.
- C. Prior to commencing work, general contractor shall provide proof that a OSHA certified “competent person” (CP) (29 CFR 1926.20(b)(2) will maintain a presence at the work site whenever the general or subcontractors are present.
- D. Training:
 - 1. All employees of general contractor or subcontractors shall have the 10-hour OSHA certified Construction Safety course and /or other relevant competency training, as determined by VA CP with input from the ICRA team.
 - 2. Submit training records of all such employees for approval before the start of work.

1.2 STATEMENT OF BID ITEMS

A. ROADWAY ITEMS

Item No.	Description	Unit of Measure	Estimated Quantity	Unit Price	Amount
1.	Mobilization	L.S.	1	_____	_____
2.	Temporary Work Zone (Traffic Control)	L.S.	1	_____	_____
3.	Erosion and Sediment Control	L.S.	1	_____	_____
4.	Construction Survey Work	L.S.	1	_____	_____
5.	Testing Laboratory Services	L.S.	1	_____	_____
6.	Removal of Pipes	L.F.	20	_____	_____
7.	Clearing and Grubbing	L.S.	1	_____	_____
8.	Earthwork	C.Y.	200	_____	_____



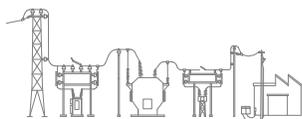
CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

9. 12" Culvert Pipe	L.F.	76	_____	_____
10. 18" Culvert Pipe	L.F.	301	_____	_____
11. 6" HDPE Pipe	L.F.	210	_____	_____
12. 12" HDPE Pipe	L.F.	60	_____	_____
13. 18" HDPE Pipe	L.F.	60	_____	_____
14. Concrete Inlets –Type Curb Inlet	EA.	3	_____	_____
15. Concrete Inlets – Area Drain	EA.	2	_____	_____
16. Aggregate Base	C.Y.	470	_____	_____
17. Level 1, ½ Inch Dense (MHMAC Mixture)	TON	390	_____	_____
18. Concrete Curb & Gutter	L.F.	840	_____	_____
19. Concrete Walks	S.F.	2580	_____	_____
20. Concrete Curb Ramps	S.F.	891	_____	_____
21. Longitudinal Pavement	L.F.	356	_____	_____
22. Pavement Bar, Type A	S.F.	170	_____	_____
23. Stop Sign	EA.	2	_____	_____
24. One – Post Road Sign	EA.	2	_____	_____
25. Timber Barricade	EA.	4	_____	_____
26. Irrigation Systems	L.S.	1	_____	_____
27. Electrical System	L.S.	1	_____	_____

(F) Indicates Final Pay Item

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

- A. AFTER AWARD OF CONTRACT, The VA will furnish the contractor with an electronic file of the specifications and drawings.



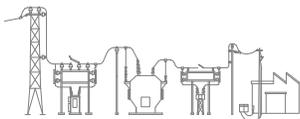
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- B. Sets of drawings may be made by the Contractor, at Contractor's expense, and distributed accordingly to the contractor's subcontractors as needed.
- C. The specifications, which are applicable are:
- APWA/DOT 2008 Edition of the "Oregon Standard Specification for Construction." Bound copies of the book are available for purchase at Contractor Plans (Phone 503-986-6936), or an order form can be downloaded for purchasing on the internet at: <http://oregon.gov/ODOT/HWY/SPECS/standardSpecifications.shtml>

1.4 CONSTRUCTION SECURITY REQUIREMENTS

- A. Security Plan:
1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.
 2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.
- B. Security Procedures:
1. General Contractor's employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.
 2. For working outside the "regular hours" as defined in the contract, The General Contractor shall give 3 days notice to the Contracting Officer so that security arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
 3. No photography of VA premises is allowed without written permission of the Contracting Officer.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

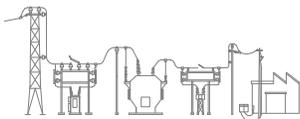
4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer.

C. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the COTR for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.

D. Document Control:

1. Before starting any work, the General Contractor/Sub Contractors shall submit an electronic security memorandum describing the approach to following goals and maintaining confidentiality of "sensitive information".
2. The General Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared only with those with a specific need to accomplish the project.
3. Certain documents, sketches, videos or photographs and drawings may be marked "Law Enforcement Sensitive" or "Sensitive Unclassified". Secure such information in separate containers and limit the access to only those who will need it for the project. Return the information to the Contracting Officer upon request.
4. These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.
5. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA.
6. Notify Contracting Officer and Site Security Officer immediately when there is a loss or compromise of "sensitive information".



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

7. All electronic information shall be stored in specified location following VA standards and procedures using an Engineering Document Management Software (EDMS).
 - a. Security, access and maintenance of all project drawings, both scanned and electronic shall be performed and tracked through the EDMS system.
 - b. “Sensitive information” including drawings and other documents may be attached to e-mail provided all VA encryption procedures are followed.

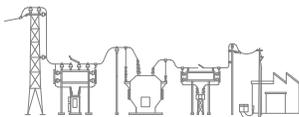
F. Motor Vehicle Restrictions

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours before the date and time of access. Access shall be restricted to picking up and dropping off materials and supplies. Contractor shall park in areas as designated by COTR.
2. Separate permits shall be issued for General Contractor and its employees for parking in designated areas only.

1.5 FIRE SAFETY

A. Applicable Publications: Publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

1. American Society for Testing and Materials (ASTM):
 - E84-2009 Surface Burning Characteristics of Building Materials
2. National Fire Protection Association (NFPA):
 - 10-2010 Standard for Portable Fire Extinguishers
 - 30-2008 Flammable and Combustible Liquids Code
 - 51B-2009 Standard for Fire Prevention During Welding, Cutting and Other Hot Work
 - 70-2011 National Electrical Code
 - 241-2009 Standard for Safeguarding Construction, Alteration, and Demolition Operations



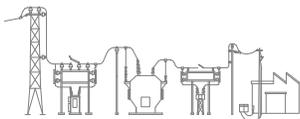
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

3. Occupational Safety and Health Administration (OSHA):

29 CFR 1926 Safety and Health Regulations for Construction

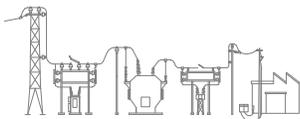
- B. Fire Safety Plan: Establish and maintain a fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to COTR for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the general contractor's competent person per OSHA requirements. This briefing shall include information on the construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, etc. Documentation shall be provided to the COTR that individuals have undergone contractor's safety briefing.
- C. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.
- D. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).
- E. Temporary Construction Partitions:
1. Install and maintain temporary construction partitions as needed or directed by COTR.
- F. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- G. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with COTR.
- H. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to the COTR and facility Safety Officer.
- I. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
- J. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.
- K. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with COTR and facility Safety Officer. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the COTR.
- L. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with COTR. Obtain permits from COTR at least 48 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.
- M. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to COTR and facility Safety Officer.



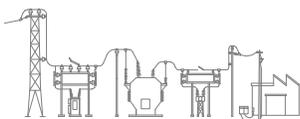
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- N. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- O. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.
- P. Perform other construction, alteration and demolition operations in accordance with 29 CFR 1926.
- Q. If required, submit documentation to the COTR that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

1.6 OPERATIONS AND STORAGE AREAS

- A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
- B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity

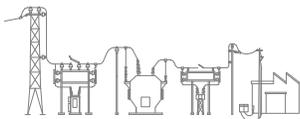


CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

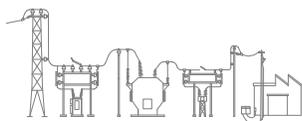
- D. Working space and space available for storing materials shall be as determined by the COTR.
- E. Workmen are subject to rules of Medical Center applicable to their conduct.
- F. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by COTR where required by limited working space.
 - 1. Do not store materials and equipment in other than assigned areas.
 - 2. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities sufficient for not more than two work days or as approved by the COTR. Provide unobstructed access to Medical Center areas required to remain in operation.
 - 3. Where access by Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.
- G. Phasing: To insure such executions, Contractor shall furnish the COTR with a schedule of approximate phasing dates on which the Contractor intends to accomplish work in each specific area of site, building or portion thereof.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- H. Owner occupation and use of space will require coordination and cooperation between the contractor and the VA staff at all times.
- I. Utilities Services: Take care to maintain existing utility services for Medical Center at all times.
 - 1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of COTR.
 - 2. Contractor shall submit a request to interrupt any such services to COTR, in writing, 48 hours in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
 - 3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center. Interruption time approved by Medical Center may occur at other than Contractor's normal working hours.
 - 4. In case of a contract construction emergency, service will be interrupted on approval of COTR. Such approval will be confirmed in writing as soon as practical.
- J. To minimize interference of construction activities with flow of Medical Center traffic, comply with the following:
 - 1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles.
 - 2. If the Contractor elects to modify or provide temporary road access to the project, method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the COTR.



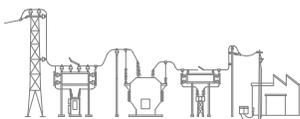
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- K. Coordinate the work for this contract with other construction operations as directed by COTR. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

1.7 ALTERATIONS

- A. Survey: Before any work is started, the Contractor shall make a thorough survey with the COTR and a representative of VA Supply Service, of access roads in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by all three, to the Contracting Officer. This report shall list:
 - 1. Any discrepancies between drawings and existing conditions at site.
 - 2. Designate areas for working space, materials storage and routes of access to areas within the VA grounds where alterations occur and which have been agreed upon by Contractor and COTR.
- B. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and COTR together shall make a thorough re-survey of the areas involved. They shall furnish a report on conditions then existing, and compare it with conditions of same as noted in first condition survey report:
 - 1. Re-survey report shall also list any damage caused by Contractor to such roadway, despite protection measures; and, will form basis for determining extent of repair work required of Contractor to restore damage caused by Contractor's workmen in executing work of this contract.
- C. Protection: Provide the following protective measures:
 - 1. Existing landscape areas, streets, and parking lot areas that are outside the working perimeter of the project are to be protected from damage caused by construction.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

2. Temporary protection against damage for portions of existing streets and parking lot areas where work is to be done, materials handled and equipment moved and/or relocated.

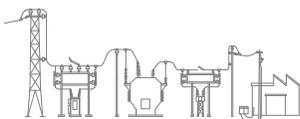
1.8 NOT USED

1.9 DISPOSAL AND RETENTION

- A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:
 1. Reserved items which are to remain property of the Government are noted on drawings or in specifications as items to be stored. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by Contracting Officer.
 2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center Cemetery.

1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS

- A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

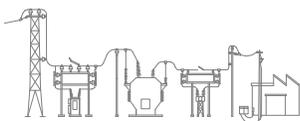
- B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

(FAR 52.236-9)

- C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

1.11 RESTORATION

- A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the COTR. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the COTR before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.
- B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.

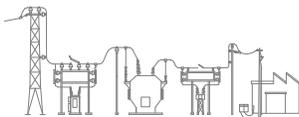
- C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are indicated on drawings and which are not scheduled for discontinuance or abandonment.

1.12 PHYSICAL DATA

- A. Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.
- B. A copy of the soil report will be made available for inspection by bidders upon request to the COTR at the VA Medical Center, and shall be considered part of the contract documents.
- C. Government does not guarantee that other materials will not be encountered nor that proportions, conditions or character of several materials will not vary from those indicated by explorations. Bidders are expected to examine site of work and logs of borings; and, after investigation, decide for themselves character of materials and make their bids accordingly. Upon proper application to Department of Veterans Affairs, bidders will be permitted to make subsurface explorations of their own at site.

1.13 PROFESSIONAL SURVEYING SERVICES

- A. A registered professional land surveyor or registered civil engineer whose services are retained and paid for by the Contractor shall perform services specified herein and in other specification sections. The Contractor shall certify that the land surveyor or civil



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

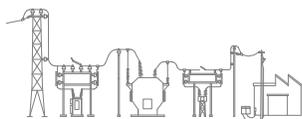
engineer is not one who is a regular employee of the Contractor, and that the land surveyor or civil engineer has no financial interest in this contract.

1.14 LAYOUT OF WORK

A. The Contractor shall lay out the work from Government established base lines and bench marks, indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at Contractor's own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through Contractor's negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

(FAR 52.236-17)

- B. Establish and plainly mark such other lines and grades that are reasonably necessary to properly assure that location, orientation, and elevations established for roads are in accordance with lines and elevations shown on contract drawings.
- C. Following completion of general mass excavation and before any other permanent work is performed, establish and plainly mark sufficient additional survey control points or system of points as may be necessary to assure proper alignment, orientation, and grade of all major features of work. Survey shall include, but not be limited to, location of finished grades and utilities.



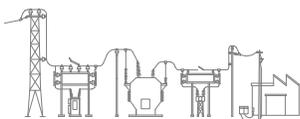
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

1. Such additional survey control points or system of points thus established shall be checked and certified by a registered land surveyor or registered civil engineer.
Furnish such certification to the COTR before any work is placed.
- D. During progress of work, Contractor shall have line grades of all major form work checked and certified by a registered land surveyor or registered civil engineer as meeting requirements of contract drawings. Furnish such certification to the COTR before any major items of concrete work are placed. In addition, Contractor shall furnish to the COTR certificates from a registered land surveyor or registered civil engineer that the following work is complete in every respect as required by contract drawings.
 1. Lines of elevations of all swales and interment areas.
 2. Lines and elevations of roads and streets.
- E. Whenever changes from contract drawings are made in line or grading requiring certificates, record such changes on a reproducible drawing bearing the registered land surveyor or registered civil engineer seal, and forward these drawings upon completion of work to COTR.
- F. The Contractor shall perform the surveying and layout work of this and other articles and specifications in accordance with the provisions of Article "Professional Surveying Services".

1.15 AS-BUILT DRAWINGS

- A. The contractor shall maintain two full size sets of as-built drawings which will be kept current during construction of the project, to include all contract changes, modifications and clarifications.
- B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, as-built drawings shall be made available for the Engineering Technician's (COTR) review, as often as requested.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- C. Contractor shall deliver two approved completed sets of as-built drawings to the COTR within 15 calendar days after each completed phase and after the acceptance of the project by the Government. Partial drawings sets will not be accepted.
- D. Paragraphs A, B, & C shall also apply to all shop drawings.

1.16 USE OF ROADWAYS

- A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the COTR, such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well-constructed bridges.
- B. When new permanent roads are to be a part of this contract, Contractor may construct them immediately for use to facilitate building operations. These roads may be used by all who have business thereon within zone of building operations.

1.17 NOT USED

1.18 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT

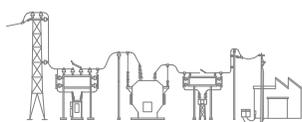
- A. Prior to final inspection, the equipment or parts used which show wear and tear beyond normal, shall be replaced with identical replacements, at no additional cost to the Government.

1.19 NOT USED

1.20 NOT USED

1.21 TEMPORARY TOILETS

- A. General contractor shall provide where directed, (for use of all Contractor's workmen) ample temporary sanitary toilet accommodations with suitable sewer and water



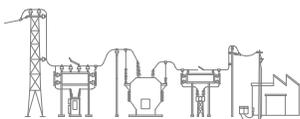
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

connections; or, when approved by COTR, provide suitable dry closets where directed. Keep such places clean and free from flies and all connections and appliances connected therewith are to be removed prior to completion of contract, and premises left perfectly clean and as found at the start of work.

1.22 AVAILABILITY AND USE OF UTILITY SERVICES

- A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The amount to be paid by the Contractor for chargeable electrical services shall be the prevailing rates charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge.
- B. The Contractor, at Contractor's expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of electricity used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.
- C. Contractor shall install meters at Contractor's expense and furnish the Medical Center a monthly record of the Contractor's usage of electricity as hereinafter specified.
- D. Electricity (for Construction and Testing): Furnish all temporary electric services.
 - 1. Obtain electricity by connecting to the Medical Center electrical distribution system. The Contractor shall meter and pay for electricity required for electric cranes and hoisting devices, electrical welding devices and any electrical heating devices providing temporary heat. Electricity for all other uses is available at no cost to the Contractor.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- F. Water (for Construction and Testing): General Contractor to coordinate for temporary water service.
1. Obtain water by connecting to the Medical Center water distribution system. Provide reduced pressure backflow preventer at each connection. Water is available at no cost to the Contractor.
 2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at COTR discretion) of use of water from Medical Center's system.

1.23 NOT USED

1.24 NOT USED

1.25 NOT USED

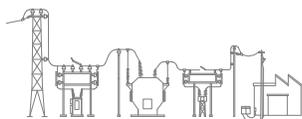
1.26 NOT USED

1.27 NOT USED

1.28 NOT USED

1.29 CONSTRUCTION SIGN

- A. Provide a Construction Sign where directed by the COTR. All wood members shall be of framing lumber. Cover sign frame with 0.7 mm (24 gage) galvanized sheet steel nailed securely around edges and on all bearings. Provide three 100 by 100 mm (4 inch by 4 inch) posts (or equivalent round posts) set 1200 mm (four feet) into ground. Set bottom of sign level at 900 mm (three feet) above ground and secure to posts with through bolts. Make posts full height of sign. Brace posts with 50 x 100 mm (two by four inch) material as directed.
- B. Paint all surfaces of sign and posts two coats of white gloss paint. Border and letters shall be of black gloss paint, except project title which shall be blue gloss paint.
- C. Maintain sign and remove it when directed by the COTR.



CONSTRUCT ACCESS IMPROVEMENTS 1A

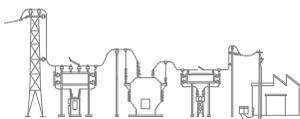
Roseburg VA Healthcare System – Roseburg, Oregon

1.30 SAFETY SIGN

- A. Provide a Safety Sign where directed by COTR. Face of sign shall be 19 mm (3/4 inch) thick exterior grade plywood. Provide two 100 mm by 100 mm (four by four inch) posts extending full height of sign and 900 mm (three feet) into ground. Set bottom of sign level at 1200 mm (four feet) above ground.
- B. Paint all surfaces of Safety Sign and posts with one prime coat and two coats of white gloss paint. Letters and design shall be painted with gloss paint of colors noted.
- C. Maintain sign and remove it when directed by COTR.

1.31 PHOTOGRAPHIC DOCUMENTATION

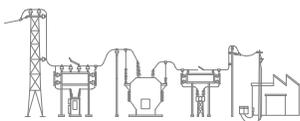
- A. During the construction period through completion, provide photographic documentation of construction progress and at selected milestones including electronic indexing, navigation, storage and remote access to the documentation, as per these specifications. The commercial photographer or the subcontractor used for this work shall meet the following qualifications:
 - 1. Demonstrable minimum experience of three (3) years in operation providing documentation and advanced indexing/navigation systems including a representative portfolio of construction projects of similar type, size, duration and complexity as the Project.
- B. Photographic documentation elements:
 - 1. Each digital image shall be taken with a professional grade camera with minimum size of 6 megapixels (MP) capable of producing 200x250mm (8 x 10 inch) prints with a minimum of 2272 x 1704 pixels and 400x500mm (16 x 20 inch) prints with a minimum 2592 x 1944 pixels.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

2. Documentation shall combine indexing and navigation system with inspection-grade digital photography designed to capture actual conditions throughout construction and at critical milestones. Documentation shall be accessible on-line through use of an internet connection. Documentation shall allow for secure multiple-user access, simultaneously, on-line.
 3. Before construction, adjacent streets, roadways, parkways, driveways, curbs, sidewalks, landscaping, adjacent utilities and adjacent structures surrounding and site shall be documented. Overlapping photographic techniques shall be used to insure maximum coverage.
 4. Construction progress for all trades shall be tracked at pre-determined intervals, but not less than once every thirty (30) calendar days (“Progressions”). Progressions shall track 360 degrees around the site.
 5. Miscellaneous events that occur during any Contractor site visit, or events captured by the Department of Veterans Affairs independently, shall be dated, labeled and inserted into a Section in the navigation structure entitled “Slideshows,” allowing this information to be stored in the same “place” as the formal scope.
 6. Weekly (21 Max) Site Progressions - Photographic documentation capturing the project at different stages of construction. These progressions shall capture underground utilities, excavation, grading, backfill, landscaping and road construction throughout the duration of the project.
 7. In event a greater or lesser number of images than specified above are required by the Resident Engineer, adjustment in contract price will be made in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).
- C. Images shall be taken by a commercial photographer and must show distinctly, at as large a scale as possible, all parts of work embraced in the picture.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

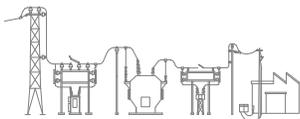
- D. Coordination of photo shoots is accomplished through COTR. Contractor shall also attend construction team meetings as necessary. Contractor's operations team shall provide regular updates regarding the status of the documentation, including photo shoots concluded, the availability of new Progressions or Exact-Builts viewable on-line and anticipated future shoot dates.
- E. Contractor shall provide all on-line domain/web hosting, security measures, and redundant server back-up of the documentation.
- F. Contractor shall provide technical support related to using the system or service.
- G. Upon completion of the project, final copies of the documentation (the "Permanent Record") with the indexing and navigation system embedded (and active) shall be provided in an electronic media format, typically a CD-ROM.

1.32 NOT USED

1.33 HISTORIC PRESERVATION

Where the Contractor or any of the Contractor's employees, prior to, or during the construction work, are advised of or discover any possible archeological, historical and/or cultural resources, the Contractor shall immediately notify the COTR verbally, and then with a written follow up.

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CONSTRUCT ACCESS IMPROVEMENTS 1A

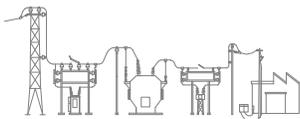
Roseburg VA Healthcare System – Roseburg, Oregon

SPECIAL PROVISIONS FOR ADWA/ODOT

WORK TO BE DONE

- A. The work to be done under this contract consists of the following for the department of Veteran Affairs, VA Access Improvement Phase 1A. Project No. 653-10-530
1. Remove existing trees, shrubs, grass, curbing, and asphalt located inside the perimeter work area.
 2. Locate, protect, and maintain existing sanitary sewer, natural gas, storm water, electrical, and other utilities that are to remain in service and are located either adjacent to or inside the perimeter of work area.
 3. Locate existing utilities (i.e. Avista Utility) for location, and relocation of the existing utility in the work area.
 4. Furnish, place and maintain traffic control devices.
 5. Furnish, place and maintain erosion control measures.
 6. Construct general embankments and excavations.
 7. Furnish and install storm sewer pipe, inlets and catch basins.
 8. Construct concrete Curb, gutter and sidewalks.
 9. Construct aggregate base and asphalt concrete pavement.
 10. Furnish and install electrical conduit, lighting pole bases, lighting poles, and luminaries.
 11. Furnish and install painted permanent pavement markings.
 12. Furnish and install permanent signing.
 13. Perform additional and incidental work as called for by the specifications and plans.
 14. Contractor to apply for, at their cost, required storm water discharge permits from Oregon DEQ. (1200-c)

APPLICABLE SPECIFICATIONS



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

The Specifications, which are applicable to the work on this project, are:

APWA/ODOT 2008 edition of the “Oregon Standard Specifications for Construction.”

Bound copies of the book are available for purchase at Contractor Plans (Phone 503-986-6936), or an order form can be downloaded for purchasing on the internet at:

http://www.oregon.gov/ODOT/HWY/SPECS/standard_Specifications.shtml

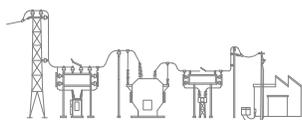
All number references in these special provisions shall be understood to refer to the Sections and subsections of the Standard Specifications and Supplemental Standard Specifications bearing like numbers and to Sections and subsections contained herein in their entirety.

SECTION 00110 – TERMS, ABBREVIATIONS, AND DEFINITIONS

Comply with Section 00110 of the Standard Specifications supplemented and/or modified as follows:

00110.00 Meaning of Terms – Add the following after the last bullet:

- This Department of Veteran Affairs project. Substitute terms pertaining to:
- Transportation Commission with VA
- Engineer with Public Works Director or his authorized representatives
- Department with VA
- Other like terms with VA substitutes



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

SECTION 00120 – BIDDING REQUIREMENTS AND PROCEDURES

Replace Section 00120 with the following:

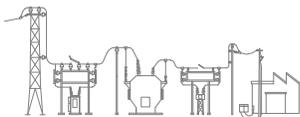
Comply with VA General Conditions located within this booklet and supplemented and/or modified as follows:

Roseburg Healthcare Systems
VA Access Improvements Phase 1A
Date, 2011
Project No. 653-10-530

Examination of Work Site and Bidding Documents – Before submitting a bid, bidders shall carefully examine the site of the proposed work, the bid booklet, plans, and specifications. Submission of a bid will be considered proof that the bidder had examined the site and bidding documents and understands the conditions to be encountered in performing the work and all requirements of the contract.

The VA or its employees or agents will not be responsible for loss or unanticipated costs suffered by the bidder because the bidder failed to become fully informed about all conditions of the work.

SECTION 00140 – SCOPE OF WORK



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

Comply with section 00140 of the Standard Specifications.

The scope of work shall also include General Requirements, Section 01 00 00

SECTION 00150 – CONTROL OF WORK

Comply with Section 00150 of the Standard Specifications supplemented and/or modified as follows:

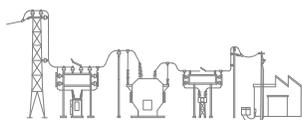
00150.10 Coordination of Specifications and Plans – Add the following before the first bullet:

- VA General Contract Conditions govern over Standard Specifications Sections 00120, 00130, 00170, 00180, and 00195.

0150.50 Cooperation with Utilities – Add the following:

The following organizations have utilities within or near the limits of this project:

<u>Utility</u>	<u>Conflict and Estimated Completion Date (Time)</u>
1. Avista C/O Luke Seals 480 NE Oakland Avenue Roseburg, OR 97470 Phone: (541) 580-2945	<u>Utility Work:</u> Utility to locate facilities <u>Conflict:</u> Potential Underground Conflict



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

This project is located within the area served by the Oregon Utility Notification Center. The Contractor shall notify owners of Utilities prior to the performance of the work in the vicinity of their facilities. The Utilities notification system telephone number is: 811 or 1-800-332-2344.

The Contractor shall comply with the rules of Oregon Utility Notification Center, OAR 952-001-0010 through OAR 952-001-0090, and ORS 757.993. The Contractor may contact the Oregon Utility Notification Center at 503-232-1987 about these rules.

The project area is served by existing, non-public utilities not served by the Oregon Utility Notification Center. The Contractor shall obtain the location of all existing utilities through the application of approximate surface geophysical methods to determine the existence and approximate horizontal and vertical position of subsurface utilities.

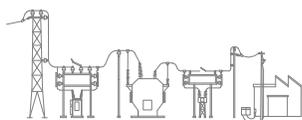
The contractor shall provide utility locates on VA owned utilities.

SECTION 00165 – QUALITY OF MATERIALS

Delete section 00165 of the Standard Specifications and substitute the following:

00165.03 Testing by Agency – No testing will be performed by the VA. All testing shall be the responsibility of the contractor.

00165.04 Cost of Testing – All testing required to be performed by the contractor will be held at the Contractor's expense.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

00165.10 Material Acceptance – Delete this subsection and substitute the following:

00165.10 Contractor Quality Control:

Responsibilities – Be responsible for:

Furnishing materials of the quality specified.

Performing testing as required by the Special Provisions or Supplemental Standard Specifications.

00165.50 (b-1) Specification Materials – delete 1.05 at the end and substitute 1.00 as there will be no PF greater than 1.00 on this project.

SECTION 00170 – LEGAL RELATIONS AND RESPONSIBILITIES

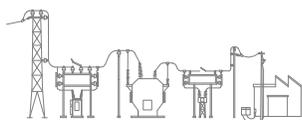
Comply with Section 00170 of the Standard Specifications.

SECTION 00180 – PROSECUTION AND PROGRESS

Comply with Section 00180 of the Standard Specifications supplemented and/or modified as follows:

00180.40 Limitation of Operations – Add the following at the end of this subsection:

Limitation of Operations – Limitation of operations specified in these special provisions include, but are not limited to the following:



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

Limitations

Subsection

Utilities Work00150.50

Final Completion Time00180.50

Traffic Restrictions00220.40

Be aware of the subject to schedule limitations in the Standard Specifications and supplemental Standard Specifications which are not listed in this subsection.

00180.41 Project Work Schedule – Add the following for work under this contract:

Type “A” schedule – Submit project schedules as outlined under this section.

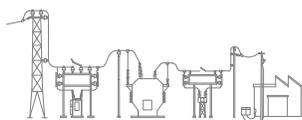
SECTION 00196 – PAYMENT FOR EXTRA WORK

Payment for extra work to be as specified in Section 00196 of the Standard Specifications.

Replace “Engineer” with “Contracting Officer.”

Delete Section 00196.10.

SECTION 00197 – PAYMENT FOR EXTRA WORK DONE ON A FORCE ACCOUNT BASIS



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

Delete Section 00197 of the Standard Specifications. Refer to the VA General Requirements.

SECTION 00199 – DISAGREEMENTS, PROTESTS, AND CLAIMS

Delete Section 00199 of the Standard Specifications. Refer to the VA General Requirements.

SECTION 00210 - MOBILIZATION

Comply with Section 00210 of the Standard Specifications.

SECTION 00220 - ACCOMMODATIONS FOR PUBLIC TRAFFIC

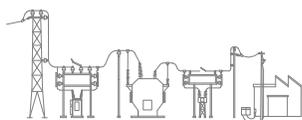
Comply with Section 00220 of the Standard Specifications modified as follows:

00220.02 Public Safety and Mobility - Add the following bullets to the end of the bullet list:

Do not place work zone signs or supports that will block existing walkways or existing bikeways.

00220.40(e) Lane Restrictions - Replace this subsection, except for the subsection number and title, with the following:

Do not close any traffic lanes unless work is being performed. Remove lane closures at the end of each work day.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

SECTION 00225 - WORK ZONE TRAFFIC CONTROL

Comply with Section 00225 of the Standard Specifications modified as follows:

00225.05 Contractor Traffic Control Plan - Replace this subsection, except for the subsection number and title, with the following:

Submit the following, for approval, five calendar days before performing work requiring traffic control:

Proposed TCP showing all TCM and quantities of all TCD.

Proposed order and duration of the TCM.

A detailed temporary striping plan.

00225.80 Measurement – Pedestrian fencing – no measurement of quantities will be made for this work.

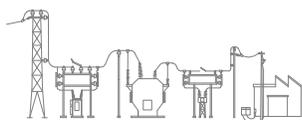
00225.90 Payment – Pedestrian fencing – no separate or additional payment will be made for pedestrian fencing work. Cost for Pedestrian fencing work will be included in the contract prices for the various items of work involved.

SECTION 00280 - EROSION AND SEDIMENT CONTROL

Comply with Section 00280 of the Standard Specifications modified as follows:

00280.48 Emergency Materials - The first paragraph is replaced with the following:

Provide, stockpile, and protect emergency materials on-site for unknown weather or erosion conditions. Contractor shall determine the types and amounts of emergency



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

materials to be stored based on site conditions. Replenish emergency materials as they are used.

SECTION 00305 - CONSTRUCTION SURVEY WORK

Section 00305, which is not a Standard Specification, is included for this Project by Special Provision.

Description

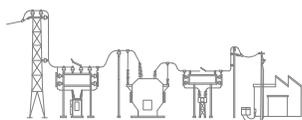
00305.00 Scope - Provide construction survey work (construction staking) according to the current edition on the date of Advertisement, of the ODOT "Construction Surveying Manual for Contractors". This manual is available on the web at:

<http://www.oregon.gov/ODOT/HWY/GEOMETRONICS/documents.shtml>

Construction

Staking shall be performed by a licensed surveyor or registered civil engineer with the authority to perform land surveying.

Electronic drawing files in AutoCAD format, containing 2-dimensional linework of vertical alignments, centerlines and layout lines will be furnished to the Contractor for his use in performing construction staking. A Digital Terrain Model (DTM) will not be provided.



CONSTRUCT ACCESS IMPROVEMENTS 1A

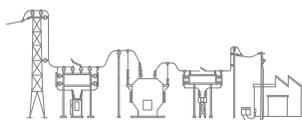
Roseburg VA Healthcare System – Roseburg, Oregon

In using, modifying, or accessing information from the electronic files, Contractor is responsible for confirmation, accuracy, and checking of the data from the electronic files against the data contained on the duplicate hard copy. The Agency and the Design Engineer hereby disclaim all responsibility from any results obtained in use of electronic files and does not guarantee any accuracy of the information. Contractor assumes full responsibility for comparing the electronic file information to the hard copy and immediately notifying the Engineer in writing of any observed discrepancies.

Contractor understands and agrees that the electronic files provided pursuant to this Contract, are instruments of professional services and shall remain the property of the Agency and will not be disseminated to others for purposes other than this project.

Because of the possibility that information and data delivered in AutoCAD format may be altered, whether inadvertently or otherwise, The Agency reserves the right to retain hard copy originals of all electronic files delivered to the Contractor, which originals shall be referred to and shall govern in the event of any inconsistency between the two.

In using the electronic information, Contractor understands that the automated conversion of information and data from the system and format used by the Design Engineer to an alternate system or format cannot be accomplished without the possibility of introduction of inexactitudes, anomalies, and errors. In the event the electronic files provided to the Contractor in AutoCAD format is so converted, Contractor agrees to assume all risks associated therewith, and to the fullest extent permitted by law, to hold harmless and indemnify the Agency and Omni-Means, Inc. from and against all claims, liabilities, losses,



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

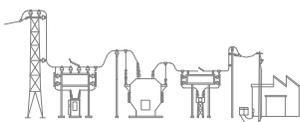
damages, and costs, including but not limited to attorney's fees, arising therefrom or in connection therewith.

In using the electronic information, Contractor recognizes that changes or modifications to electronic media introduced by anyone other than the Design Engineer may result in adverse consequences, which the Design Engineer can neither predict nor control. Therefore, and in consideration of the Design Engineer's agreement to deliver its instruments of professional service in AutoCAD format, Contractor agrees, to fullest extent permitted by laws, to hold harmless and indemnify the Agency and Omni-Means, Ltd. from and against all claims, liabilities, losses, damages, and costs, including but not limited to attorney's fees, arising out of or in any way connected with the modification, misrepresentation, misuse, or reuse by others of the electronic information provided by the Design Engineer. The foregoing indemnification applies, without limitation, to any use of the electronic files on other projects.

All computations necessary to establish the exact position of the work from control points shall be made by the Contractor. All computations, survey notes, cut sheets, and other records necessary to accomplish the work shall be neat, legible, and accurate. Copies of such computation, notes, cut sheets, and other records shall be furnished to the Engineer on the same day construction stakes are set.

Upon completion of construction staking and prior to acceptance of the contract, all computations, survey notes, cut sheets, and other data used to accomplish the work shall be furnished to the Engineer and shall become the property of the Agency.

Measurement



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

00305.80 Measurement - No measurement of quantities will be made for construction survey work.

Payment

00305.90 Payment - No separate or additional payment will be made for construction survey work. Costs for construction survey work including but not limited to office time, preparing and checking survey notes, and all other related preparation work will be included in the Contract prices for the various items of work involved.

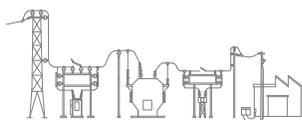
Costs incurred caused by survey errors will be at the Contractor's expense. These costs include price adjustments for failure to meet requirements of the "Construction Surveying Manual for Contractors", repair or removal and replacement of deficient product, and over-run of material.

SECTION 00310 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Comply with Section 00310 of the Standard Specifications modified as follows:

00310.41(a) General - Replace this subsection, except for the subsection number and title, with the following:

Where an abutting structure or part of a structure is to be left in place, make clean, smooth, vertical cuts with a saw or other approved cutting device. Avoid operations that may damage any portion of the remaining structure.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

SECTION 00320 - CLEARING AND GRUBBING

Comply with Section 00320 of the Standard Specifications modified as follows:

00320.40(a) Clearing Trees and Other Vegetation - Add the following paragraphs before the paragraph that begins "Cut trees and brush so they...":

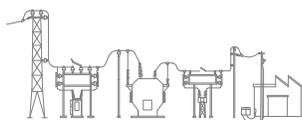
When clearing will be performed in one operation, provide the Engineer with 10 Calendar Day's notice before beginning clearing work. When clearing will be performed in stages, provide the Engineer with 10 Calendar Day's notice before beginning clearing work for each stage of operation.

00320.40(b) Preserving and Trimming Vegetation - Add the following to the end of this subsection:

(4) Trees To Be Saved - The Engineer will identify and mark trees to be saved. Provide and place orange plastic mesh fencing, from the QPL, around critical root zones of marked trees or tree groups as directed. Do not begin construction activity or move equipment into existing tree areas until the plastic mesh fencing is in place.

Do not work within the critical root zone of marked trees unless written approval is obtained from the Engineer. Be responsible for all damage to or for removal of marked trees. Tree damage will be determined by a certified arborist selected by the Engineer.

00320.90 Payment - Add the following after the first paragraph of this subsection:



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

No separate or additional payment will be made for plastic mesh fencing.

SECTION 00330 - EARTHWORK

Comply with Section 00330 of the Standard Specifications modified as follows:

00330.03 Basis of Performance - Add the following paragraph to the end of this subsection:

Perform all earthwork under this Section, except ditch excavation, on the excavation basis.

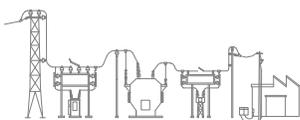
00330.20 Tamping Foot Rollers - In the paragraph, replace "115 tons" with "15 tons".

00330.80 Measurement - Replace the bullet that begins "Volume basis, computed by...", with the following bullet:

- Volume basis, based on the Agency's digital terrain model (DTM) calculated by Grid Volume, or by other methods of equivalent accuracy.

Earthwork shall conform to the provisions in Section 00330, "Earthwork" of this standard of specifications. A Materials Information handout prepared by CGI Technical Services Inc. – Geotechnical Report – Roseburg, VA Access Improvement Projects dated September 30, 2010 is available from the Contracting Officer.

SECTION 00340 - WATERING



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

Comply with Section 00340 of the Standard Specifications.

SECTION 00370 - FINISHING ROADBEDS

Comply with Section 00370 of the Standard Specifications.

SECTION 00405 - TRENCH EXCAVATION, BEDDING, AND BACKFILL

Comply with Section 00405 of the Standard Specifications.

SECTION 00440 - COMMERCIAL GRADE CONCRETE

Comply with Section 00440 of the Standard Specifications modified as follows:

SECTION 00445 - SANITARY, STORM, CULVERT, SIPHON, AND IRRIGATION PIPE

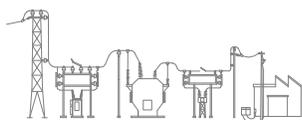
Comply with Section 00445 of the Standard Specifications modified as follows:

00445.11 Materials – Add the following sentence:

Corrugated Polyethylene Pipe shall be Type S.

00445.80(a) Pipes - In the length bullet, add ", to the nearest foot" after the word "applicable".

SECTION 00470 - MANHOLES, CATCH BASINS, AND INLETS



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

Comply with Section 00470 of the Standard Specifications.

SECTION 00490 - WORK ON EXISTING SEWERS AND STRUCTURES

Comply with Section 00490 of the Standard Specifications.

SECTION 00640 - AGGREGATE BASE AND SHOULDERS

Comply with Section 00640 of the Standard Specifications.

SECTION 00730 - EMULSIFIED ASPHALT TACK COAT

Comply with Section 00730 of the Standard Specifications modified as follows:

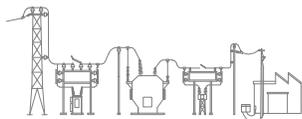
00730.90 Payment - Replace this subsection, except for the subsection number and title, with the following:

No separate or additional payment will be made for emulsified asphalt tack coat.

SECTION 00744 - MINOR HOT MIXED ASPHALT CONCRETE (MHMAC) PAVEMENT

Comply with Section 00744 of the Standard Specifications modified as follows:

00744.16 MHMAC Acceptance - Replace this subsection with the following subsection:



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

00744.16 MHMAC Acceptance - A CAT-1 shall perform a minimum of one asphalt content, gradation, mix moisture, and Maximum Specific Gravity (AASHTO T 209) test per day and provide results to the Engineer by the middle of the following work shift. The Contractor shall also provide split samples to the Engineer when requested. Testing may be waived upon written notice and accepted visually by the Engineer according to Section 4(B) of the MFTP.

When three or more tests are performed on a project, a price adjustment will be calculated according to 00744.95.

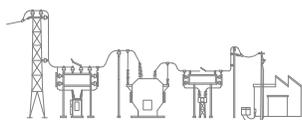
Add the following subsection:

00744.17 Small Quantity Acceptance - When less than three test results are obtained on a project and testing has not been waived by the Engineer, the MHMAC will be accepted according to the following:

(a) Within Specification Limits - If all subplot sample test results are within specification limits for all constituents (including compaction) the material will be accepted and the full bid price will be paid for the material represented by that test.

(b) Outside Specification Limits - If a subplot sample test result for any constituent is outside the specification limit the Engineer will have the backup sample tested.

(1) Backup Within Specifications - If the backup sample test results for all constituents are within specification, the material will be accepted and the full bid price will be paid for the material represented by that test.



CONSTRUCT ACCESS IMPROVEMENTS 1A

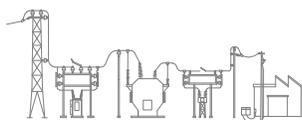
Roseburg VA Healthcare System – Roseburg, Oregon

(2) Backup Out of Specifications - If the backup sample test results are out of specification, the Contractor may choose to accept the price adjustment calculated according to 00744.95 or may choose to sample the in-place material for further testing. The price adjustments will be computed using all original test results as well as all backup test results. (If there are less than three tests, average the two tests you have and use the average as the third test result). In no case will the composite pay factor (CPF) be greater than 1.0.

(3) In-Place Samples - If the in-place material is sampled, the Engineer will select and sample from three random locations from the area represented by the lot in question. Those samples will be tested and if found to be within specification the material will be accepted and paid for at the full bid price. If the material proves to be outside of the specification limits, the material will be accepted and paid for at an adjusted price according to 00744.95. In no case will the CPF be above 1.0.

00744.49 Compaction - Replace this subsection with the following subsection:

00744.49 Compaction - Immediately after the MHMAC has been spread, struck off, and surface irregularities and other defects remedied, roll it uniformly with rollers meeting the requirements of 00744.24 until compacted to a minimum of 91% of MAMD. Perform finish rolling and continue until all roller marks are eliminated. Determine the density of each subplot by averaging five QC tests performed at random locations by a CDT with the nuclear gauge operated in the backscatter mode according to WAQTC TM 8. Calculate MAMD according to ODOT TM 305. When less than three subplot test results are obtained on a project, the MHMAC will be accepted according to 00744.17. Perform a minimum of one



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

sublot density test per day. The Engineer may waive compaction testing upon written notice.

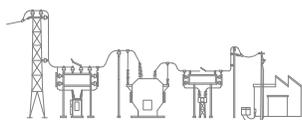
00744.80 Measurement - Delete the paragraph that begins "No separate measurement will be made...".

00744.90 Payment - Delete the paragraph that begins "No separate or additional payment will be made for the asphalt tack...".

Add the following subsection:

00744.95 MHMAC Price Adjustments -The Composite Pay Factor (CPF), calculated according to 00165.40 will be applied to the Contract unit price for the pay items of 00744.90 and to the applicable lot quantities. The CPF will be made available to the Contractor within 24 hours of receipt of the required quality control test results. If less than three samples are tested, the CPF will be computed as outlined in 00744.17. The maximum CPF for any case will be 1.0.

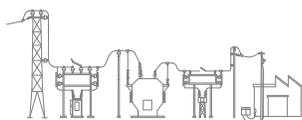
Use the following table to determine price adjustments in the CPF for constituents of MHMAC.



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

Gradation Constituents	Dense Graded MHMAC Type		
	Weighting Factor (f)		
All Aggregate Passing	3/4"	1/2"	3/8"
1"	1		
3/4"	1	1	
1/2"	1	1	1
3/8"	–	–	1
No. 4	5	5	5
No. 8	5	6	6
No. 30	3	3	3
No. 200	10	10	10
Other Constituents			
Asphalt Content	26	26	26
Moisture Content	8	8	8
Compaction	40	40	40

Those MHMAC constituents statistically evaluated will be eligible for a maximum PF of 1.00 (see 00165.50(b-1)), unless otherwise specified.



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

If these specifications do not require measurement of a constituent, its individual PF will be considered 1.00 in calculating the CPF according to 00165.40.

A price adjustment will be determined by the following formula:

$$(CPF - 1) \times \text{MHMAC Unit Price} \times (LQ) = \underline{\hspace{2cm}}$$

Where: LQ is the quantity of mixture in the lot

SECTION 00759 - MISCELLANEOUS PORTLAND CEMENT CONCRETE STRUCTURES

Comply with Section 00759 of the Standard Specifications modified as follows:

00759.90 Payment - Add the following pay items:

Pay Item	Unit of Measurement
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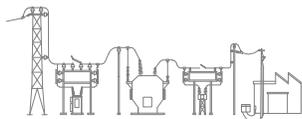
(k) Concrete Curb Ramps	Square Foot
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Delete the paragraph that reads "Items (e) and (f) include sidewalk ramps."

SECTION 00850 - COMMON PROVISIONS FOR PAVEMENT MARKINGS

Comply with Section 00850 of the Standard Specifications.

SECTION 00860 - LONGITUDINAL PAVEMENT MARKINGS - PAINT



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

Comply with Section 00860 of the Standard Specifications.

SECTION 00867 - TRANSVERSE PAVEMENT MARKINGS - LEGENDS AND BARS

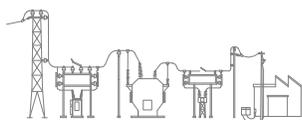
Comply with Section 00867 of the Standard Specifications modified as follows:

00867.40 General - Delete this subsection.

00867.45 Installation - Replace the bullet that begins "Type B: Preformed..." with the following three bullets:

- **Type B: Preformed, Fused Thermoplastic Film** - Install preformed, fused thermoplastic film as shown.
- **Type B-HS: Preformed, Fused Thermoplastic Film High Skid** - Install preformed, fused thermoplastic film high skid, that has intermixed reflective elements with factory installed crushed glass or aggregate on the surface for all staggered continental crosswalks, bike lane stencils, bike path railroad crossings, and other transverse pavement markings as shown.
- **Type AB:** Install Type A, Type B or Type B-HS as the Contractor elects.

00867.90 Payment - Replace this subsection, except for the subsection number and title, with the following:



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

The accepted quantities of work performed under this Section will be paid for at the Contract unit price, per unit of measurement, for the following items:

Pay Item	Unit of Measurement
(a) Pavement Bar, Type A	Square Foot

Item (r) includes all transverse pavement markings that are defined as a "BAR", including but not limited to, stop bars, crosswalk bars, chevron bars, transverse median bars, and transverse shoulder bars.

Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

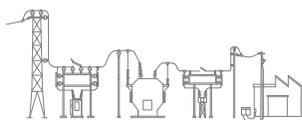
Payment for work under this Section will be limited to 75% of the amount due until the Agency has received the signed warranty.

SECTION 00932 – CUSTOM STOP SIGN

Section 00932, which is not a Standard Specification, is included for this Project by Special Provision.

Description

00932.00 Scope – Fabricate, paint, and install custom stop signs as shown on the plans and as directed.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

Materials

00932.10 Materials - Posts and panels for signs shall be fabricated using Aluminum. Sign panels shall be (.125" thick).

Concrete for sign post foundations shall be Commercial Grade Concrete.

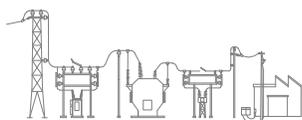
Construction

00932.20 Coating – Prior to delivery to the jobsite, prepare and powder coat exposed surfaces of aluminum sign supports and panels with 2 coats of color and 1 coat of clear gloss using the following system as manufactured by Mathews Paint Co. or equivalent:

- Bermuda Blue
- Bronze: Map SOA8522SP
- Map Converter: 74102SP
- Catalyst: 43 27OSP (universal)
- Reducer: 45 208SP
- Clear: 42 208SP

The Contractor must provide a product submittal and a substitution request to the Engineer for approval prior to using any other powder coat system.

Provide touch-up paint for field repair of damaged coatings, and re-coat hardware after installation.



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

Provide fine broom finish on exposed portions of concrete footings.

Measurement

00932.30 Measurement – The quantities of Custom Stop Signs will be measured on a unit basis.

Payment

00932.40 Payment – The accepted quantities of Custom Stop Signs will be paid for at the Contract unit price, per unit of measurement, for the following item:

Pay Item

Unit of Measurement

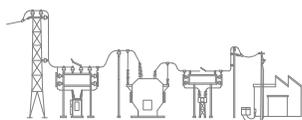
(a) Custom Stop Sign Each

No separate or additional payment will be made for powder coating, excavation, and concrete footings required for the custom stop signs.

SECTION 00960 – COMMON PROVISIONS FOR ELECTRICAL SYSTEMS

Delete Section 00960 of the Standard Specifications, except as follows. Refer to the following VA Specification Section:

26 05 11 Requirements for Electrical Installation



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

00960.41 (f) Disposition of Waste Materials – Replace this subsection with the following subsection:

00960.41 (f) Disposal of Materials – Dispose of all materials according to 00290.20.

Measurement

00960.80 Measurement – There will be no measurement for this item

Payment

00960.90 Payment – Payment for this item will be made on a “Lump Sum” basis for all work complete, as identified on the utility drawings for electrical work.

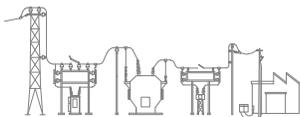
SECTION 01120 – IRRIGATION SYSTEMS

Comply with Section 01120 of the Standard Specifications modified as follows:

01120.11 Pipe, Tubing, and Fittings – In the paragraph delete “Class 200” for main and lateral lines.

SECTION 02920 – COMMON ELECTRICAL MATERIALS

Delete Section 02920 of the Standard Specifications, except as follows. Refer to the following VA Specification Section.



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

26 05 21 Low-Voltage Electrical Power Conductors and Cables

26 05 26 Grounding and Bounding for Electrical Systems

26 05 33 Raceway and Boxes for Electrical Systems

26 05 41 Underground Electrical Construction

Measurement

002920.80 Measurement – There will be no measurement for this item.

Payment

02920.90 Payment – Payment for this item will be made on a “Lump Sum” basis for all work complete, as identified on the electrical drawings.

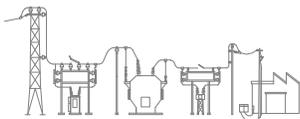
SECTION 02926 – HIGHWAY ILLUMINATION MATERIALS

Delete Section 02926 of the Standard Specifications, except as follows. Refer to the following VA Specification Section.

26 56 00 Exterior Lighting

Measurement

002926.80 Measurement – There will be no measurement for this item.



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

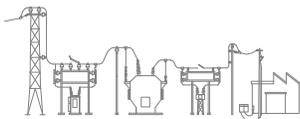
Payment

02926.90 Payment – Payment for this item will be made on a “Lump Sum” basis for all work complete, as identified on the utility drawings for electrical work.

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SECTION 01 01 00A

OSHA REQUIREMENTS AND SAFETY AND HEALTH REGULATIONS



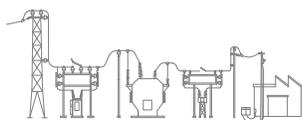
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

PART 1 - OSHA REQUIREMENTS

1.1 GENERAL

- A. This specification shall serve as a supplement to 01010 ‘General Requirements’.
- B. Contractors are required to comply with the Occupational Safety and Health Act of 1970. This will include the safety and health standard found in CFR 1910 and 1926. Copies of those standards can be acquired from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20420
- C. In addition, Contractor will be required to comply with other applicable Medical Center policies and safety regulations. These policies and regulations will be presented to the Contractor at the pre-construction meeting. Each of the Contractor’s employees will be required to read the statement of policies and regulations and sign an acknowledgment that such policies and regulations are understood. Signed acknowledgment will be returned to the COTR.
- D. Contractors involved with the removal, alteration, or disturbance of asbestos type insulation or materials will be required to comply strictly with the regulations found in CFR 1910.1001 and the appropriate EPA regulations regarding disposal of asbestos. Assistance in identifying asbestos can be requested from the Medical Center’s Industrial Hygienist and the COTR.
- E. Contractors entering locations of asbestos contamination (i.e. pipe basements) shall be responsible for providing respiratory protection to their employees and ensuring respirators are worn in accordance with OSHA (CFR 1910.1001 (g)). Asbestos contaminated areas may be defined on project drawings, although some unknown asbestos containing materials may exist. All contract workers on-site must be trained in asbestos building material recognition. The minimum equipment requirements will be a half-mask air-purifying respirator equipped with high efficiency filters and disposable coveralls.

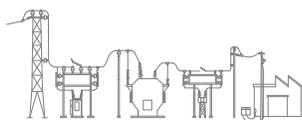


CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- F. Contractor, along with other submittals, and at least two weeks prior to bringing any materials on-site, must submit a complete list of chemicals the Contractor will use and MSDS for all hazardous materials as defined in OSHA 1910.1200 (d) Hazard Determination. Contracting Officer shall have final approval of all materials brought on site.
- G. The contractor will be held solely responsible for the safety and health of their employees. The contractor will also be held responsible to protect the health and safety of the VA Community (patients, staff, and visitors) from the unwanted effects of construction. VA staff will monitor the contractor's performance in complying with all safety and health aspects of the project. Additionally, sensitive computer and phone equipment, and other government property must be protected from dust and other construction hazards at all times. Severe or constant violations may result in an immediate work stoppage or request for a Compliance Officer from the Occupational Safety and Health Administration. {NOTE: Contractor is responsible for conducting daily site safety inspections and maintaining documentation of such inspections and actions taken to abate deficiencies and unsafe conditions as required by the contractor or at the request of the COTR. The Contractor shall be provided the appropriate inspection form by the COTR (See Attachment B “Daily Construction Area Safety Inspection”)}.}
- H. During all phases of demolition, construction and alterations, Contractors are required to understand and strictly follow NFPA 241 “Standard for Safeguarding Construction, Alteration and Demolition Operations”. The Medical Center’s Safety and Occupational Health Specialist, Industrial Hygienist and Fire Department will closely monitor the work area for compliance. Appropriate action will be taken for non-compliance

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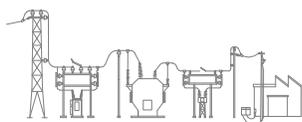
CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1

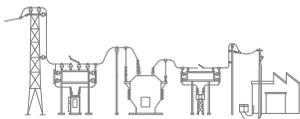
1.1 Refer to Articles titled SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in Section 00 72 00, GENERAL CONDITIONS.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- 1.2 For the purposes of this contract, samples, test reports, certificates, and manufacturers' literature and data shall also be subject to the previously referenced requirements. The following text refers to all items collectively as SUBMITTALS.
- 1.3 Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make will be permitted unless:
- A. Satisfactory written evidence is presented to, and approved by Contracting Officer, that manufacturer cannot make scheduled delivery of approved item or;
 - B. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
 - C. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.
- 1.4 Submittals shall be submitted ten (10) working days, excluding federal holidays, prior to proceeding with that portion of the contract work, which requires submittal approval. Schedule delivery of submissions to assure adequate lead-time for procurement of contract required items. Delays attributable to untimely and rejected submittals will not serve as a basis for extending contract time for completion. Partial submittals will not be accepted unless authorized by the Contracting Officer or COTR.
- 1.5 Architect-Engineer will review submittals for compliance with contract requirements, and action thereon will be taken by COTR on behalf of the Contracting Officer.
- 1.6 Upon receipt of submittals, Architect-Engineer will assign a file number thereto. Contractor, in any subsequent correspondence, shall refer to this file and identification number to expedite replies relative to previously approved or disapproved submittals.



CONSTRUCT ACCESS IMPROVEMENTS 1A

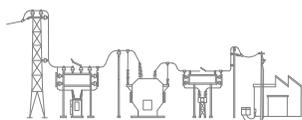
Roseburg VA Healthcare System – Roseburg, Oregon

1.7 The Government reserves the right to require additional submittals, whether or not particularly mentioned in this contract. If additional submittals beyond those required by the contract are furnished pursuant to request therefor by Contracting Officer, adjustment in contract price and time will be made in accordance with Articles titled CHANGES (FAR 52.243-4) and CHANGES - SUPPLEMENT (VAAR 852.236-88) of the GENERAL CONDITIONS.

1.8 Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs and Architect-Engineer. However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer and Architect-Engineer assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.

1.9 Submittals must be submitted by Contractor only and all items shall be delivered at the Contractor's expense. The Government and Architect assume no responsibility for checking quantities or exact numbers included in such submittals. All submittals shall be delivered in electronic format unless otherwise approved by the Contracting Officer.

- A. Submit samples required for finishes, in quadruplicate. Submit other samples in single units unless otherwise specified. Submit shop drawings, schedules, manufacturers' literature and data, and certificates in single units, except where a greater number is specified.
- B. Submittals will receive consideration only when covered by a transmittal letter signed by Contractor. Letter shall contain the list of items, name of Medical Center, name of Contractor, contract number, applicable specification paragraph numbers, applicable drawing numbers (and other information required for exact identification of location for each item), manufacturer and brand, ASTM or Federal Specification Number (if any) and such additional information as may be required by

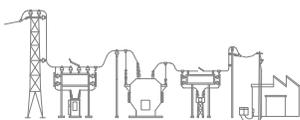


CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

specifications for particular item being furnished. In addition, catalogs shall be marked to indicate specific items submitted for approval.

1. A copy of letter must be enclosed with items, and any items received without identification letter will be considered "unclaimed goods" and held for a limited time only.
 2. Each sample, certificate, manufacturers' literature and data shall be labeled to indicate the name and location of the Medical Center , name of Contractor, manufacturer, brand, contract number and ASTM or Federal Specification Number as applicable and location(s) on project.
 3. Required certificates shall be signed by an authorized representative of manufacturer or supplier of material, and by Contractor.
- C. If submittal samples have been disapproved, resubmit new samples as soon as possible after notification of disapproval. Such new samples shall be marked "Resubmitted Sample" in addition to containing other previously specified information required on label and in transmittal letter.
- D. Approved samples will be kept on file by the COTR at the site until completion of contract, at which time such samples will be delivered to Contractor as Contractor's property. Where noted in technical sections of specifications, approved samples in good condition may be used in their proper locations in contract work. At completion of contract, samples that are not approved will be returned to Contractor only upon request and at Contractor's expense. Such request should be made prior to completion of the contract. Disapproved samples that are not requested for return by Contractor will be discarded after completion of contract.
- E. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

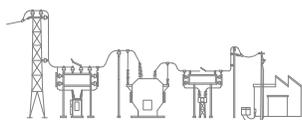
requirements. These drawings and schedules shall be stamped and signed by Contractor certifying to such check.

1. For each drawing required, submit one reproducible electronic copy.
2. All electronic documents shall be created at 1:1 scale to allow reproduction at full size.
3. Each drawing shall have marked thereon, proper descriptive title, including Medical Center location, project number, manufacturer's number, reference to contract drawing number, detail Section Number, and Specification Section Number.
4. A space 120 mm by 125 mm (4-3/4 by 5 inches) shall be reserved on each drawing to accommodate approval or disapproval stamp.
5. Submit hard copy drawings, rolled within a mailing tube or document envelope, fully protected and unfolded for shipment.
6. One electronic copy of approved or disapproved shop drawings will be forwarded to Contractor.
7. When work is directly related and involves more than one trade, shop drawings shall be submitted to Architect-Engineer under one cover.

1.10 Samples shop drawings, test reports, certificates and manufacturers' literature and data, shall be submitted for approval to

ADW Architects
1105 Siskiyou Blvd
P.O. Box 1348
Ashland, Oregon 97520

1.11 At the time of transmittal to the Architect-Engineer, the Contractor shall also send a copy of the complete submittal directly to the COTR.



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

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SECTION 01 45 29

TESTING LABORATORY SERVICES

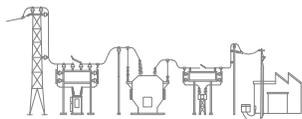
PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies materials testing activities and inspection services required during project construction to be provided by a Testing Laboratory retained and paid for by Contractor.

1.2 APPLICABLE PUBLICATIONS:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
- B. American Association of State Highway and Transportation Officials (AASHTO):
 - T27-06 Sieve Analysis of Fine and Coarse Aggregates
 - T96-02 (R2006) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine



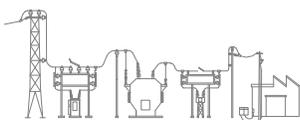
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- T99-01 (R2004) The Moisture-Density Relations of Soils Using a 2.5 Kg (5.5 lb.)
Rammer and a 305 mm (12 in.) Drop
- T104-99 (R2003) Soundness of Aggregate by Use of Sodium Sulfate or Magnesium
Sulfate
- T180-01 (R2004) Moisture-Density Relations of Soils using a 4.54 kg (10 lb.)
Rammer and a 457 mm (18 in.) Drop
- T191-02(R2006) Density of Soil In-Place by the Sand-Cone Method
- C. American Society for Testing and Materials (ASTM):
- C1077-06 Laboratories Testing Concrete and Concrete Aggregates for Use in
Construction and Criteria for Laboratory Evaluation
- D3666-(2002) Minimum Requirements for Agencies Testing and Inspection
Bituminous Paving Materials
- D3740-07 Minimum Requirements for Agencies Engaged in the Testing and
Inspecting Road and Paving Material
- E329-07 Agencies Engaged in Construction Inspection and/or Testing
- E543-06 Agencies Performing Non-Destructive Testing

1.3 REQUIREMENTS:

- A. Accreditation Requirements: Construction materials testing laboratories must be accredited by a laboratory accreditation authority and will be required to submit a copy of the Certificate of Accreditation and Scope of Accreditation. The laboratory's scope of accreditation must include the appropriate ASTM standards (i.e.; E 329, C 1077, D 3666, D3740, A 880, E 543) listed in the technical sections of the specifications. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA. The policy applies to the specific laboratory performing the actual testing, not just the "Corporate Office."



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

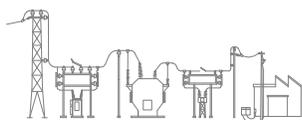
- B. Inspection and Testing: Testing laboratory shall inspect materials and workmanship and perform tests described herein and additional tests requested by COTR. When it appears materials furnished, or work performed by Contractor fails to meet construction contract requirements, Testing Laboratory shall direct attention of COTR to such failure.
- C. Written Reports: Testing laboratory shall submit test reports to COTR, Contractor, unless other arrangements are agreed to in writing by the COTR. Submit reports of tests that fail to meet construction contract requirements on colored paper.
- D. Verbal Reports: Give verbal notification to COTR immediately of any irregularity.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EARTHWORK:

- A. General: The Testing Laboratory shall provide qualified personnel, materials, equipment, and transportation as required to perform the services identified/required herein, within the agreed to schedule and/or time frame. The work to be performed shall be as identified herein and shall include but not be limited to the following:
 - 1. Observe fill and subgrades during proof-rolling to evaluate suitability of surface material to receive fill or base course. Provide recommendations to the COTR regarding suitability or unsuitability of areas where proof-rolling was observed. Where unsuitable results are observed, witness excavation of unsuitable material and recommend to COTR extent of removal and replacement of unsuitable materials and observe proof-rolling of replaced areas until satisfactory results are obtained.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

2. Provide full time observation of fill placement and compaction and field density testing in pavement areas to verify that earthwork compaction obtained is in accordance with contract documents.
3. Provide supervised geotechnical technician to inspect excavation, subsurface preparation, and backfill for structural fill.

B. Testing Compaction:

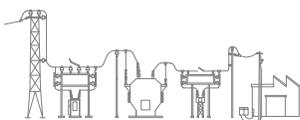
1. Determine maximum density and optimum moisture content for each type of fill, backfill and subgrade material used, in compliance with ASTM D1557.
2. Make field density tests in accordance with the primary testing method following ASTM D2922 wherever possible. Field density tests utilizing ASTM D1556 shall be utilized on a case by case basis only if there are problems with the validity of the results from the primary method due to specific site field conditions. Should the testing laboratory propose these alternative methods, they should provide satisfactory explanation to the COTR before the tests are conducted.
 - a. Pavement Subgrade: One test for each 335 m² (400 square yards), but in no case fewer than two tests.
 - b. Curb, Gutter, and Sidewalk: One test for each 90 m (300 feet), but in no case fewer than two tests.
 - c. Trenches: One test at maximum 30 m (100 foot) intervals per 1200 mm (4 foot) of vertical lift and at changes in required density, but in no case fewer than two tests.

C. Testing Materials: Test suitability of on-site and off-site borrow as directed by COTR.

3.2 ASPHALT CONCRETE PAVING:

A. Aggregate Base Course:

1. Determine maximum density and optimum moisture content for aggregate base material in accordance with ASTM D1557, Method D.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

2. Make a minimum of three field density tests on each day's final compaction on each aggregate course in accordance with ASTM D1556.
3. Sample and test aggregate as necessary to insure compliance with specification requirements for gradation, wear, and soundness as specified in the applicable state highway standards and specifications.

B. Asphalt Concrete:

1. Aggregate: Sample and test aggregates in stock pile and hot-bins as necessary to insure compliance with specification requirements for gradation (AASHTO T27), wear (AASHTO T96), and soundness (AASHTO T104).
2. Temperature: Check temperature of each load of asphalt concrete at mixing plant and at site of paving operation.
3. Density: Make a minimum of two field density tests in accordance with ASTM D1188 of asphalt base and surface course for each day's paving operation.

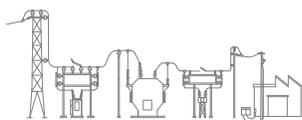
3.3 SITE WORK CONCRETE:

- A. Test site work concrete including materials for concrete as required in Article CONCRETE of this section.

3.4 CONCRETE:

A. Batch Plant Inspection and Materials Testing:

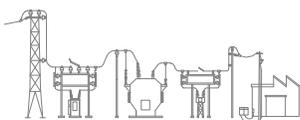
1. Perform continuous batch plant inspection until concrete quality is established to satisfaction of COTR with concurrence of Contracting Officer and perform periodic inspections thereafter as determined by COTR.
2. Periodically inspect and test batch proportioning equipment for accuracy and report deficiencies to COTR.
3. Sample and test mix ingredients as necessary to insure compliance with specifications.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

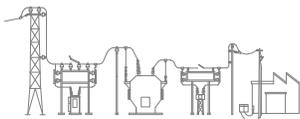
4. Sample and test aggregates daily and as necessary for moisture content. Test the dry rodded weight of the coarse aggregate whenever a sieve analysis is made, and when it appears there has been a change in the aggregate.
 5. Certify, in duplicate, ingredients and proportions and amounts of ingredients in concrete conform to approved trial mixes. When concrete is batched or mixed off immediate building site, certify (by signing, initialing or stamping thereon) on delivery slips (duplicate) that ingredients in truck-load mixes conform to proportions of aggregate weight, cement factor, and water-cement ratio of approved trial mixes.
- B. Field Inspection and Materials Testing:
1. Provide a technician at site of placement at all times to perform concrete sampling and testing.
 2. Review the delivery tickets of the ready-mix concrete trucks arriving on-site. Notify the Contractor if the concrete cannot be placed within the specified time limits or if the type of concrete delivered is incorrect. Reject any loads that do not comply with the Specification requirements. Rejected loads are to be removed from the site at the Contractor's expense. Any rejected concrete that is placed will be subject to removal.
 3. Take concrete samples at point of placement in accordance with ASTM C172. Mold and cure compression test cylinders in accordance with ASTM C31. Make at least three cylinders for each 40 m³ (50 cubic yards) or less of each concrete type, and at least three cylinders for any one day's pour for each concrete type. After good concrete quality control has been established and maintained as determined by COTR make three cylinders for each 80 m³ (100 cubic yards) or less of each concrete type, and at least three cylinders from any one day's pour for each concrete type. Label each cylinder with an identification number. COTR may require additional cylinders to be molded and cured under job conditions.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

4. Perform slump tests in accordance with ASTM C143. Test the first truck each day, and every time test cylinders are made. Test pumped concrete at the hopper and at the discharge end of the hose at the beginning of each day's pumping operations to determine change in slump.
5. Determine the air content of concrete per ASTM C173. For concrete required to be air-entrained, test the first truck and every 20 m³ (25 cubic yards) thereafter each day. For concrete not required to be air-entrained, test every 80 m³ (100 cubic yards) at random. For pumped concrete, initially test concrete at both the hopper and the discharge end of the hose to determine change in air content.
6. If slump or air content fall outside specified limits, make another test immediately from another portion of same batch.
7. Perform unit weight tests in compliance with ASTM C138 for normal weight concrete and ASTM C567 for lightweight concrete. Test the first truck and each time cylinders are made.
8. Notify laboratory technician at batch plant of mix irregularities and request materials and proportioning check.
9. Verify that specified mixing has been accomplished.
10. Environmental Conditions: Determine the temperature per ASTM C1064 for each truckload of concrete during hot weather and cold weather concreting operations:
 - a. When ambient air temperature falls below 4.4 degrees C (40 degrees F), record maximum and minimum air temperatures in each 24 hour period; record air temperature inside protective enclosure; record minimum temperature of surface of hardened concrete.
 - b. When ambient air temperature rises above 29.4 degrees C (85 degrees F), record maximum and minimum air temperature in each 24 hour period; record

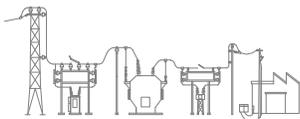


CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

minimum relative humidity; record maximum wind velocity; record maximum temperature of surface of hardened concrete.

11. Observe conveying, placement, and consolidation of concrete for conformance to specifications.
 12. Observe condition of formed surfaces upon removal of formwork prior to repair of surface defects and observe repair of surface defects.
 13. Observe curing procedures for conformance with specifications, record dates of concrete placement, start of preliminary curing, start of final curing, end of curing period.
 14. Observe preparations for placement of concrete:
 - a. Inspect handling, conveying, and placing equipment, inspect vibrating and compaction equipment.
 - b. Inspect preparation of construction, expansion, and isolation joints.
 15. Observe preparations for protection from hot weather, cold weather, sun, and rain, and preparations for curing.
 16. Observe concrete mixing:
 - a. Monitor and record amount of water added at project site.
 - b. Observe minimum and maximum mixing times.
 17. Other inspections:
 - a. Grouting under base plates.
 - b. Grouting anchor bolts and reinforcing steel in hardened concrete.
- C. Laboratory Tests of Field Samples:
1. Test compression test cylinders for strength in accordance with ASTM C39. For each test series, test one cylinder at 7 days and one cylinder at 28 days. Use remaining cylinder as a spare tested as directed by COTR. Compile laboratory test reports as follows: Compressive strength test shall be result of one cylinder, except when one



CONSTRUCT ACCESS IMPROVEMENTS 1A

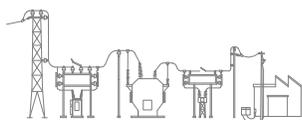
Roseburg VA Healthcare System – Roseburg, Oregon

cylinder shows evidence of improper sampling, molding or testing, in which case it shall be discarded and strength of spare cylinder shall be used.

2. Furnish certified compression test reports (duplicate) to COTR. In test report, indicate the following information:
 - a. Cylinder identification number and date cast.
 - b. Specific location at which test samples were taken.
 - c. Type of concrete, slump, and percent air.
 - d. Compressive strength of concrete in MPa (psi).
 - e. Weather conditions during placing.
 - f. Temperature of concrete in each test cylinder when test cylinder was molded.
 - g. Maximum and minimum ambient temperature during placing.
 - h. Ambient temperature when concrete sample in test cylinder was taken.
 - i. Date delivered to laboratory and date tested.

3.5 TYPE OF TEST:

	Approximate Number of Tests Required
A. Earthwork:	
Laboratory Compaction Test, Soils: (ASTM D1557)	1 per source
Field Density, Soils (AASHTO T191, T205, or T238)	Min 2 per lift and 1 per 500 C.Y.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

Penetration Test, Soils N/A

B. Aggregate Base:

Laboratory Compaction, (ASTM D1557) 1 per source

Field Density, (ASTM D1556) Min 2 per lift and 1 per 500 C.Y.

Aggregate, Base Course

Gradation (AASHTO T27) 1 per 1000 C.Y.

Wear (AASHTO T96) 1 per source

Soundness (AASHTO T104) 1 per source

C. Asphalt Concrete:

Field Density, (ASTM D1188) 1 per 700 tons

Aggregate, Asphalt Concrete

Gradation (AASHTO T27) 1 per 700 tons

Wear (AASHTO T96) 1 per design

Soundness (AASHTO T104) 1 per design

D. Concrete:

Making and Curing Concrete Test Cylinders (ASTM C31) 25 C.Y., min 1 per day

Compressive Strength, Test Cylinders (ASTM C39) 25 C.Y., min 1 per day

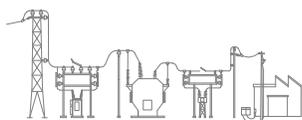
Concrete Slump Test (ASTM C143) 25 C.Y., min 1 per day

Gradation (ASTM C33) 1 per day

Deleterious Substances (ASTM C33) 1 per design

Soundness (ASTM C33) 1 per design

Abrasion (ASTM C33) 1 per design



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

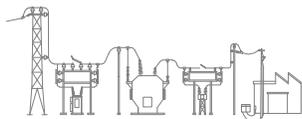
Aggregate, Lightweight

Gradation (ASTM C330)	1 per day
Deleterious Substances (ASTM C330)	1 per day
Unit Weight (ASTM C330)	1 per day
Flatness and Levelness Readings (ASTM E1155) (number of days)	1 per day

E. Technical Personnel: (Minimum 1 month)

1. Technicians to perform tests and inspection listed above. Laboratory will be equipped with concrete cylinder storage facilities, compression machine, cube molds, proctor molds, balances, scales, moisture ovens, slump cones, air meter, and all necessary equipment for compaction control.

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CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

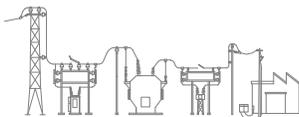
SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.
- B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.
- C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:
 - 1. Waste Management Plan development and implementation.
 - 2. Techniques to minimize waste generation.
 - 3. Sorting and separating of waste materials.
 - 4. Salvage of existing materials and items for reuse or resale.
 - 5. Recycling of materials that cannot be reused or sold.
- D. At a minimum the following waste categories shall be diverted from landfills:
 - 1. Soil.
 - 2. Inerts (eg, concrete, masonry and asphalt).
 - 3. Clean dimensional wood and palette wood.
 - 4. Green waste (biodegradable landscaping materials).
 - 5. Engineered wood products (plywood, particle board and I-joists, etc).
 - 6. Metal products (eg, copper, steel, wire, beverage containers, etc).
 - 7. Cardboard, paper and packaging.
 - 8. Bitumen roofing materials.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

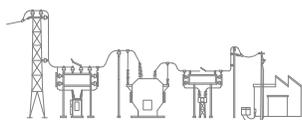
9. Plastics (eg, ABS, PVC).
 10. Gypsum board.
 11. Insulation.
 12. Paint.
 13. Clay roofing tiles. General Contractor is to salvage and set aside a minimum of 50 of the existing clay roofing tiles for possible use in patching existing roofs on campus. Stack on a suitable pallet, secure, provide protection, and deliver to storage on campus as directed by the COTR.
- E. Select tiles for appearance and absence of growth of molds and moss. Clean as necessary to remove molds and moss. Tiles shall be undamaged to the extent that they are easily reusable and suitable for patching existing roofs. All remaining tiles to be recycled or disposed of by the General Contractor.

1.2 RELATED WORK

- A. Section 01 00 00, GENERAL REQUIREMENTS.

1.3 QUALITY ASSURANCE

- A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed to ensure the generation of as little waste as possible. Construction /Demolition waste includes products of the following:
1. Excess or unusable construction materials.
 2. Packaging used for construction products.
 3. Poor planning and/or layout.
 4. Construction error.
 5. Over ordering.
 6. Weather damage.
 7. Contamination.
 8. Mishandling.

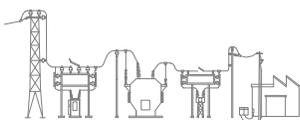


CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

9. Breakage.
- B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.
- C. Contractor shall develop and implement procedures to reuse and recycle new materials to a minimum of 50 percent.
- D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.
- E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website: <http://www.wbdg.org> provides a Construction Waste Management Database that contains information on companies that haul, collect, and process recyclable debris from construction projects.
- F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.
- G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.
- H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

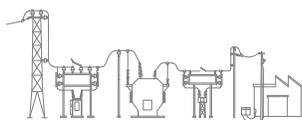
1.4 TERMINOLOGY



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.
- B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.
- C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.
- D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.
- E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).
- F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.
- G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.
- H. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.
- I. Mixed Debris: Loads that include co-mingled recyclable and non-recyclable materials generated at the construction site.
- J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.

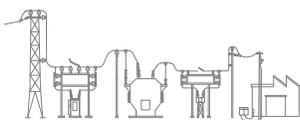


CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.
- L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
 - 1. On-site Recycling – Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.
 - 2. Off-site Recycling – Materials hauled to a location and used in an altered form in the manufacture of new products.
- M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials accepted and operating procedures, a recycling facility may or may not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.
- N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.
- O. Return: To give back reusable items or unused products to vendors for credit.
- P. Salvage: To remove waste materials from the site for resale or re-use by a third party.
- Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.
- R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.
- S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

1.5 SUBMITTALS

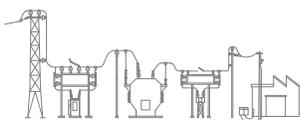


CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:
- B. Prepare and submit to the COTR a written Demolition Debris Management Plan. The plan shall include, but not be limited to, the following information:
 - 1. Procedures to be used for debris management.
 - 2. Techniques to be used to minimize waste generation.
 - 3. Analysis of the estimated job site waste to be generated:
 - a. List of each material and quantity to be salvaged, reused, or recycled.
 - b. List of each material and quantity proposed to be taken to a landfill.
 - 4. Detailed description of the Means/Methods to be used for material handling.
 - a. On site: Material separation, storage, protection where applicable.
 - b. Off site: Transportation means and destination. Include list of materials.
 - 1) Description of materials to be site-separated and self-hauled to designated facilities.
 - 2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
 - c. The names and locations of mixed debris reuse and recycling facilities or sites.
 - d. The names and locations of trash disposal landfill facilities or sites.
 - e. Documentation that the facilities or sites are approved to receive the materials.
- C. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.
- D. Monthly summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling.

1.6 APPLICABLE PUBLICATIONS



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. In the event that criteria requirements conflict, the most stringent requirements shall be met.
- B. U.S. Green Building Council (USGBC):
LEED Green Building Rating System for New Construction

1.7 RECORDS

- A. Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Records shall be kept in accordance with the LEED Reference Guide and LEED Template.

PART 2 - PRODUCTS

2.1 MATERIALS

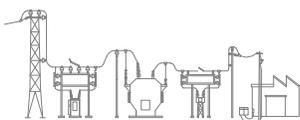
- A. List of each material and quantity to be salvaged, recycled, reused.
- B. List of each material and quantity proposed to be taken to a landfill.
- C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

PART 3 - EXECUTION

3.1 COLLECTION

- A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.
- B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.
- C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations, see Section 02 83 33.

3.2 DISPOSAL



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.
- B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

3.3 REPORT

- A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.
- B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.
- C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices. Include the net total costs for each disposal.

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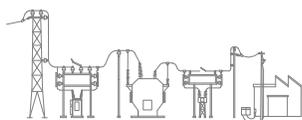
SECTION 26 05 11

REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section applies to all sections of Division 26.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

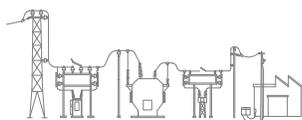
- B. Furnish and install electrical wiring, systems, equipment and accessories in accordance with the specifications and drawings. Capacities and ratings of cable, and other items and arrangements for the specified items are shown on drawings.
- C. Wiring ampacities specified or shown on the drawings are based on copper conductors, with the conduit and raceways accordingly sized. Aluminum conductors are prohibited.

1.2 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.

1.3 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



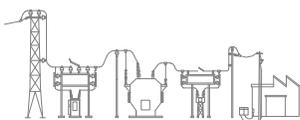
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- 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.

1.4 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.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

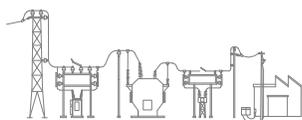
2. The Government reserves the right to require the Contractor to submit a list of installations where the products have been in operation before approval.
- C. Service Qualifications: There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation.

1.5 APPLICABLE PUBLICATIONS

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

1.6 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 COTR, a minimum of 15 working days prior to the manufacturers making the factory tests.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

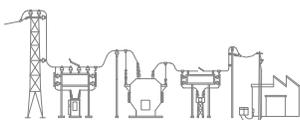
2. Four copies of certified test reports containing all test data shall be furnished to the Resident Engineer prior to final inspection and not more than 90 days after completion of the tests.
3. When equipment fails to meet factory test and re-inspection is required, the contractor shall be liable for all additional expenses, including expenses of the Government.

1.7 EQUIPMENT REQUIREMENTS

Where variations from the contract requirements are requested, 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.

1.8 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, cables, wire, light fixtures, 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.



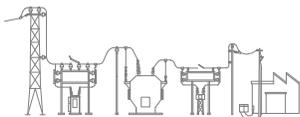
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

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.

1.9 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. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished in this manner for the required work, the following requirements are mandatory:
 1. Electricians must use full protective equipment (i.e., certified and tested insulating material to cover exposed energized electrical components, certified and tested insulated tools, etc.) while working on energized systems in accordance with NFPA 70E.
 2. Electricians must wear personal protective equipment while working on energized systems in accordance with NFPA 70E.
 3. Before initiating any work, a job specific work plan must be developed by the contractor with a peer review conducted and documented by the Engineering Technician (COTR) and Medical Center staff. The work plan must include procedures to be used on and near the live electrical equipment, barriers to be installed, safety equipment to be used and exit pathways.
 4. Work on energized circuits or equipment cannot begin until prior written approval is obtained from the Engineering Technician (COTR).



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

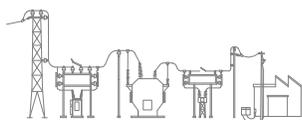
- D. For work on existing stations, arrange, phase and perform work to assure electrical service for other buildings at all times. Refer to Article OPERATIONS AND STORAGE AREAS under Section 01 00 00, GENERAL REQUIREMENTS.
- E. New work shall be installed and connected to existing work neatly, safely and professionally. Disturbed or damaged work shall be replaced or repaired to its prior conditions, as required by Section 01 00 00, GENERAL REQUIREMENTS.
- F. Coordinate location of equipment and conduit with other trades to minimize interferences.

1.10 EQUIPMENT INSTALLATION AND REQUIREMENTS

- A. Equipment location shall be as close as practical to locations shown on the drawings.
- B. Working spaces shall not be less than specified in the NEC for all voltages specified.
- C. 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.

1.11 EQUIPMENT IDENTIFICATION

- A. In addition to the requirements of the NEC, install an identification sign which clearly indicates information required for use and maintenance of items such as control devices and other significant equipment.
- B. Nameplates for Normal Power System equipment shall be laminated black phenolic resin with a white core with engraved lettering. Nameplates for Essential Electrical



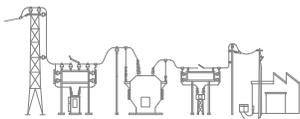
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

System (EES) equipment, as defined in the NEC, shall be laminated red phenolic resin with a white core with engraved lettering. Lettering shall be a minimum of 1/2 inch [12mm] high. Nameplates shall indicate equipment designation, rated bus amperage, voltage, number of phases, number of wires, and type of EES power branch as applicable. Secure nameplates with screws.

1.12 SUBMITTALS

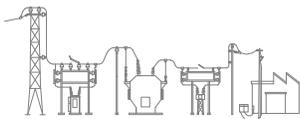
- A. The Government's approval shall be obtained for all equipment and material before delivery to the job site. Delivery, storage or installation of equipment or material which has not had prior approval will not be permitted at the job site.
- B. All submittals shall include adequate descriptive literature, 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.
- C. 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.
- D. 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 equipment assemblies. All terminal points and wiring shall be identified on wiring diagrams.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

3. Parts list which shall include those replacement parts recommended by the equipment manufacturer.
- E. Manuals: Submit in accordance with Section 01 00 00, GENERAL REQUIREMENTS.
1. Maintenance and Operation Manuals: Submit as required for 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 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 equipment, building, name of Contractor, and contract number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the equipment and the local representatives for the 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.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

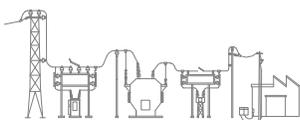
- g. Periodic maintenance and testing procedures and frequencies, including replacement parts numbers and replacement frequencies.
 - h. Performance data.
 - i. Pictorial "exploded" parts list with part numbers. Emphasis shall be placed on the use of special tools and instruments. The list shall indicate 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.
- G. Approvals will be based on complete submission of manuals together with shop drawings.
- H. After approval and prior to installation, furnish the Engineering Technician (COTR) with one sample of each of the following:
- 1. A 300 mm (12 inch) length of each type and size of wire and cable along with the tag from the coils of reels from which the samples were taken.
 - 2. Each type of conduit coupling, bushing and termination fitting.
 - 3. Conduit supports.
 - 4. Duct sealing compound.
 - 5. Each type of wire and cable splicing and terminating material.

1.13 SINGULAR NUMBER

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.

1.14 ACCEPTANCE CHECKS AND TESTS

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



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

1.15 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 COTR at least 30 days prior to the planned training.

--- E N D ---

SECTION 26 05 21

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW)

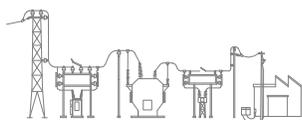
PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the furnishing, installation, and connection of the low voltage power and lighting wiring.

1.2 RELATED WORK

- A. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements that are common to more than one section.
- B. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.
- C. Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits for cables and wiring.
- D. Section 26 05 41, UNDERGROUND ELECTRICAL CONSTRUCTION: Installation of low-voltage conductors and cables in manholes and ducts.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

1.3 QUALITY ASSURANCE

- A. Refer to Paragraph, QUALIFICATIONS, in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

1.4 FACTORY TESTS

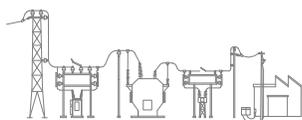
- A Low voltage cables shall be thoroughly tested at the factory per NEMA WC-70 to ensure that there are no electrical defects. Factory tests shall be certified.

1.5 SUBMITTALS

- A. In accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, submit the following:
 - 1. Manufacturer's Literature and Data: Showing each cable type and rating.
 - 2. Certifications: Two weeks prior to the final inspection, submit four copies of the following certifications to the Engineering Technician (COTR):
 - a. Certification by the manufacturer that the materials conform to the requirements of the drawings and specifications.
 - b. Certification by the contractor that the materials have been properly installed, connected, and tested.

1.6 APPLICABLE PUBLICATIONS

- A. Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. Publications are reference in the text by designation only.
- B. American Society of Testing Material (ASTM):
 - D2301-04 Standard Specification for Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape
- C. National Fire Protection Association (NFPA):
 - 70-Latest Edition National Electrical Code (NEC)



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

D. National Electrical Manufacturers Association (NEMA):

WC 70-09 Power Cables Rated 2000 Volts or Less for the Distribution of
Electrical Energy

E. Underwriters Laboratories, Inc. (UL):

44-05 Thermoset-Insulated Wires and Cables

83-08 Thermoplastic-Insulated Wires and Cables

467-071 Electrical Grounding and Bonding Equipment

486A-486B-03 Wire Connectors

486C-04 Splicing Wire Connectors

486D-05 Sealed Wire Connector Systems

486E-94 Equipment Wiring Terminals for Use with Aluminum and/or
Copper Conductors

493-07 Thermoplastic-Insulated Underground Feeder and Branch Circuit
Cable

514B-04 Conduit, Tubing, and Cable Fittings

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

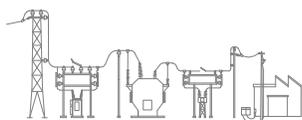
A. Conductors and cables shall be in accordance with NEMA WC-70 and as specified herein.

B. Single Conductor:

1. Shall be annealed copper.
2. Shall be stranded for sizes No. 8 AWG and larger, solid for sizes No. 10 AWG and smaller.
3. Shall be minimum size No. 12 AWG, except where smaller sizes are allowed herein.

C. Insulation:

1. Match existing lighting circuit.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

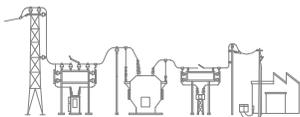
2. XHHW-2 or THHN-THWN shall be in accordance with NEMA WC-70, UL 44, and UL 83.

D. Color Code:

1. Feeder and branch circuit conductors shall be color-coded as follows:

208/120 volt	Phase	480/277 volt
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray *
* or white with colored (other than green) tracer.		

2. Use solid color insulation or solid color coating for No. 12 AWG and No. 10 AWG branch circuit phase, neutral, and ground conductors.
3. Conductors No. 8 AWG and larger shall be color-coded using one of the following methods:
 - a. Solid color insulation or solid color coating.
 - b. Stripes, bands, or hash marks of color specified above.
 - c. Color as specified using 0.75 in [19 mm] wide tape. Apply tape in half-overlapping turns for a minimum of 3 in [75 mm] for terminal points, and in junction boxes, pull-boxes, troughs, and manholes. Apply the last two laps of tape with no tension to prevent possible unwinding. Where cable markings are covered by tape, apply tags to cable, stating size and insulation type.



CONSTRUCT ACCESS IMPROVEMENTS 1A

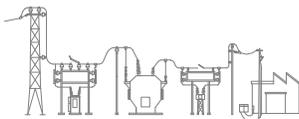
Roseburg VA Healthcare System – Roseburg, Oregon

4. For modifications and additions to existing wiring systems, color coding shall conform to the existing wiring system.

2.2 SPLICES AND JOINTS

- A. In accordance with UL 486A, C, D, E, and NEC.
- B. Aboveground Circuits (No. 10 AWG and smaller):
 1. Connectors: Solderless, screw-on, reusable pressure cable type, rated 600 V, 220° F [105° C], with integral insulation, approved for copper and aluminum conductors.
 2. The integral insulator shall have a skirt to completely cover the stripped wires.
 3. The number, size, and combination of conductors, as listed on the manufacturer's packaging, shall be strictly followed.
- C. Aboveground Circuits (No. 8 AWG and larger):
 1. Connectors shall be indent, hex screw, or bolt clamp-type of high conductivity and corrosion-resistant material, listed for use with copper and aluminum conductors.
 2. Field-installed compression connectors for cable sizes 250 kcmil and larger shall have not fewer than two clamping elements or compression indents per wire.
 3. Insulate splices and joints with materials approved for the particular use, location, voltage, and temperature. Splice and joint insulation level shall be not less than the insulation level of the conductors being joined.
 4. Plastic electrical insulating tape: Per ASTM D2304, flame-retardant, cold and weather resistant.
- D. Underground Branch Circuits and Feeders:
 1. Submersible connectors in accordance with UL 486D, rated 600 V, 190° F [90° C], with integral insulation.

2.3 (NOT USED)



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

2.4 WIRE LUBRICATING COMPOUND

- A. Lubricating compound shall be suitable for the wire insulation and conduit, and shall not harden or become adhesive.

PART 3 - EXECUTION

3.1 GENERAL

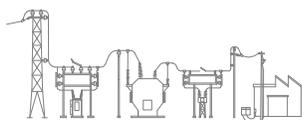
- A. Install in accordance with the NEC, and as specified.
- B. Install all wiring in raceway systems.
- C. Splice cables and wires only in outlet boxes, junction boxes, pull-boxes.
- D. Wires of different systems (e.g., 120 V, 277 V) shall not be installed in the same conduit or junction box system.
- E. Wire Pulling:
 - 1. Provide installation equipment that will prevent the cutting or abrasion of insulation during pulling of cables. Use lubricants approved for the cable.
 - 2. Use nonmetallic ropes for pulling feeders.
 - 3. Attach pulling lines for feeders by means of either woven basket grips or pulling eyes attached directly to the conductors, as approved by the Engineering Technician (COTR).
 - 4. All cables in a single conduit shall be pulled simultaneously.
 - 5. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- F. No more than three single-phase branch circuits shall be installed in any one conduit.

3.2 INSTALLATION IN PULL BOXES

- A. Install and support cables in pull boxes per the latest industrial standard practices. Do not bend to a radius less than six times the overall cable diameter.

3.3 SPLICE INSTALLATION

- A. Splices and terminations shall be mechanically and electrically secure.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- B. Tighten electrical connectors and terminals according to manufacturer's published torque values.
- C. Where the Government determines that unsatisfactory splices or terminations have been installed, remove the devices and install approved devices at no additional cost to the Government.

3.4 FEEDER IDENTIFICATION

- A. In each pull box, provide tags of the embossed brass type, showing the circuit identification and voltage. The tags shall be the embossed brass type, 1.5 in [40 mm] in diameter and 40 mils thick. Attach tags with plastic ties.

3.5 EXISTING WIRING

Unless specifically indicated on the plans, existing wiring shall not be reused for a new installation.

3.6 (NOT USED)

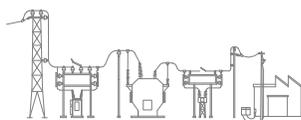
3.7 (NOT USED)

3.8 (NOT USED)

3.9 ACCEPTANCE CHECKS AND TESTS

- A. Feeders and branch circuits shall have their insulation tested after installation and before connection to utilization devices, such as fixtures, motors, or appliances. Test each conductor with respect to adjacent conductors and to ground. Existing conductors to be reused shall also be tested.
- B. Applied voltage shall be 500VDC for 300-volt rated cable, and 1000VDC for 600-volt rated cable. Apply test for one minute or until reading is constant for 15 seconds, whichever is longer. Minimum insulation resistance values shall not be less than 25 megohms for 300-volt rated cable and 100 megohms for 600-volt rated cable.
- C. The contractor shall furnish the instruments, materials, and labor for all tests.

--- E N D ---



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the general grounding and bonding requirements for electrical equipment and operations to provide a low impedance path for possible ground fault currents.
- B. “Grounding electrode system” refers to all electrodes required by NEC, as well as made, supplementary, and lightning protection system grounding electrodes.
- C. The terms “connect” and “bond” are used interchangeably in this specification and have the same meaning.

1.2 RELATED WORK

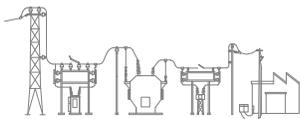
- A. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements and items that are common to more than one section of Division 26.
- B. Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Low Voltage power and lighting wiring.

1.3 QUALITY ASSURANCE

Refer to Paragraph, QUALIFICATIONS, in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

1.4 SUBMITTALS

- A. Submit in accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
- B. Shop Drawings:



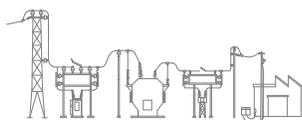
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

1. Clearly present enough information to determine compliance with drawings and specifications.
 2. Include the location of system grounding electrode connections and the routing of underground grounding electrode conductors.
- C. Certifications: Two weeks prior to final inspection, submit four copies of the following to the Engineering Technician (COTR):
1. Certification that the materials and installation are in accordance with the drawings and specifications.
 2. Certification by the contractor that the complete installation has been properly installed and tested.

1.5 APPLICABLE PUBLICATIONS

- A. Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by designation only.
- B. American Society for Testing and Materials (ASTM):
- B1-07 Standard Specification for Hard-Drawn Copper Wire
 - B3-07 Standard Specification for Soft or Annealed Copper Wire
 - B8-04 Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
- C. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
- 81-1983 IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System
 - C2-07 National Electrical Safety Code
- D. National Fire Protection Association (NFPA):
- 70-Latest Edition National Electrical Code (NEC)
 - 99-2005 Health Care Facilities



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- E. Underwriters Laboratories, Inc. (UL):
 - 44-05 Thermoset-Insulated Wires and Cables
 - 83-08 Thermoplastic-Insulated Wires and Cables
 - 467-07 Grounding and Bonding Equipment
 - 486A-486B-03 Wire Connectors

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING CONDUCTORS

- A. Equipment grounding conductors shall be UL 44 or UL 83 insulated stranded copper, except that sizes No. 10 AWG [6 mm²] and smaller shall be solid copper. Insulation color shall be continuous green for all equipment grounding conductors, except that wire sizes No. 4 AWG [25 mm²] and larger shall be identified per NEC.
- B. Bonding conductors shall be ASTM B8 bare stranded copper, except that sizes No. 10 AWG [6 mm²] and smaller shall be ASTM B1 solid bare copper wire.
- C. Conductor sizes shall match existing, or not less than required by the NEC, whichever is greater.

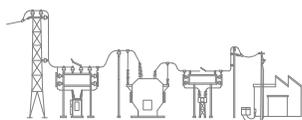
2.2 (NOT USED)

2.3 (NOT USED)

2.4 (NOT USED)

2.5 GROUND CONNECTIONS

- A. Above Grade:
 - 1. Bonding Jumpers: Compression-type connectors, using zinc-plated fasteners and external tooth lockwashers.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

2.6 (NOT USED)

2.7 (NOT USED)

2.8 (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL

- A. Ground in accordance with the NEC, as shown on drawings, and as specified herein.
- B. Equipment Grounding: Metallic structures, including enclosures, raceways, junction boxes, and other conductive items in close proximity with electrical circuits, shall be bonded and grounded.

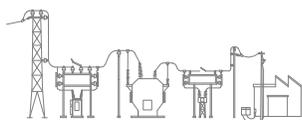
3.2 (NOT USED)

3.3 (NOT USED)

3.4 (NOT USED)

3.5 RACEWAY

- A. Conduit Systems:
 - 1. Ground all metallic conduit systems. All metallic conduit systems shall contain an equipment grounding conductor.
 - 2. Non-metallic conduit systems, shall contain an equipment grounding conductor.
 - 3. Conduit that only contains a grounding conductor, and is provided for its mechanical protection, shall be bonded to that conductor at the entrance and exit from the conduit.
- B. Feeders and Branch Circuits: Install equipment grounding conductors with all feeders and power and lighting branch circuits.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

3.6 (NOT USED)

3.7 CORROSION INHIBITORS

When making ground and ground bonding connections, apply a corrosion inhibitor to all contact surfaces. Use corrosion inhibitor appropriate for protecting a connection between the metals used.

3.8 CONDUCTIVE PIPING

- A. Bond all conductive piping systems, interior and exterior, to the grounding electrode system. Bonding connections shall be made as close as practical to the equipment ground bus.

3.9 (NOT USED)

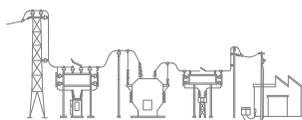
3.10 (NOT USED)

3.11 EXTERIOR LIGHT POLES

Provide 20 ft [6.1 M] of No. 4 bare copper coiled at bottom of pole base excavation prior to pour, plus additional unspliced length in and above foundation as required to reach pole ground stud.

3.12 (NOT USED)

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CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the furnishing, installation, and connection of conduit, fittings, and boxes, to form complete, coordinated, grounded raceway systems. Raceways are required for all wiring unless shown or specified otherwise.
- B. Definitions: The term conduit, as used in this specification, shall mean any or all of the raceway types specified.

1.2 RELATED WORK

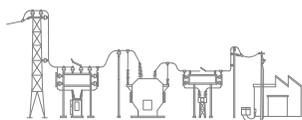
- A. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements and items that are common to more than one section of Division 26.
- B. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.
- C. Section 26 05 41, UNDERGROUND ELECTRICAL CONSTRUCTION: Underground conduits.

1.3 QUALITY ASSURANCE

Refer to Paragraph, QUALIFICATIONS, in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

1.4 SUBMITTALS

- A. In accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, submit the following:
 - 1. Manufacturer's Literature and Data: Showing each conduit type and rating. The specific item proposed and its area of application shall be identified on the catalog cuts.
 - 2. Shop Drawings:



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

- a. Size and location of main feeders.
- b. Size and location of pull-boxes.
3. Certifications:
 - a. Two weeks prior to the final inspection, submit four copies of the following certifications to the Engineering Technician (COTR):
 1. Certification by the manufacturer that the material conforms to the requirements of the drawings and specifications.
 2. Certification by the contractor that the material has been properly installed.

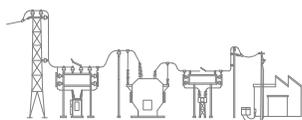
1.5 APPLICABLE PUBLICATIONS

- A. Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by designation only.
- B. American National Standards Institute (ANSI):

C80.1-05	Electrical Rigid Steel Conduit
C80.3-05	Steel Electrical Metal Tubing
- C. National Fire Protection Association (NFPA):

70-Latest Edition	National Electrical Code (NEC)
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- D. Underwriters Laboratories, Inc. (UL):

6-07	Electrical Rigid Metal Conduit - Steel
50-95	Enclosures for Electrical Equipment
467-07	Grounding and Bonding Equipment
514A-04	Metallic Outlet Boxes
514B-04	Conduit, Tubing, and Cable Fittings
514C-96	Nonmetallic Outlet Boxes, Flush-Device Boxes and Covers
651-05	Schedule 40 and 80 Rigid PVC Conduit and Fittings
797-07	Electrical Metallic Tubing



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

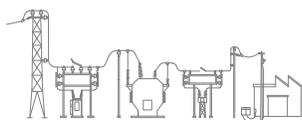
E. National Electrical Manufacturers Association (NEMA):

TC-2-03	Electrical Polyvinyl Chloride (PVC) Tubing and Conduit
TC-3-04	PVC Fittings for Use with Rigid PVC Conduit and Tubing
FB1-07	Fittings, Cast Metal Boxes and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable

PART 2 - PRODUCTS

2.1 MATERIAL

- A. Conduit Size: In accordance with the NEC, but not less than 0.5 in [13 mm] unless otherwise shown.
- B. Conduit:
1. Rigid steel: Shall conform to UL 6 and ANSI C80.1.
 2. Direct burial plastic conduit: Shall conform to UL 651 and UL 651A, heavy wall PVC.
- C. Conduit Fittings:
1. Rigid steel conduit fittings:
 - a. Fittings shall meet the requirements of UL 514B and NEMA FB1.
 - b. Standard threaded couplings, locknuts, bushings, conduit bodies, and elbows:
Only steel or malleable iron materials are acceptable. Integral retractable type IMC couplings are also acceptable.
 - c. Locknuts: Bonding type with sharp edges for digging into the metal wall of an enclosure.
 - d. Bushings: Metallic insulating type, consisting of an insulating insert, molded or locked into the metallic body of the fitting. Bushings made entirely of metal or nonmetallic material are not permitted.
 - e. Erickson (union-type) and set screw type couplings: Approved for use in concrete are permitted for use to complete a conduit run where conduit is installed in concrete. Use set screws of case-hardened steel with hex head and cup point to



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

firmly seat in conduit wall for positive ground. Tightening of set screws with pliers is prohibited.

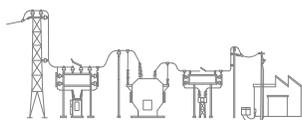
- f. Sealing fittings: Threaded cast iron type. Use continuous drain-type sealing fittings to prevent passage of water vapor. In concealed work, install fittings in flush steel boxes with blank cover plates having the same finishes as that of other electrical plates in the room.
2. Direct burial plastic conduit fittings:
Fittings shall meet the requirements of UL 514C and NEMA TC3.

PART 3 - EXECUTION

3.1 (NOT USED)

3.2 INSTALLATION, GENERAL

- A. In accordance with UL, NEC, as shown, and as specified herein.
- B. Essential (Emergency) raceway systems shall be entirely independent of other raceway systems, except where shown on drawings.
- C. Install conduit as follows:
 1. In complete mechanically and electrically continuous runs before pulling in cables or wires.
 2. Flattened, dented, or deformed conduit is not permitted. Remove and replace the damaged conduits with new undamaged material.
 3. Cut square, ream, remove burrs, and draw up tight.
 4. Conduit bodies shall only be used for changes in direction, and shall not contain splices.
 5. Do not use aluminum conduits in wet locations.
- D. Conduit Bends:
 1. Make bends with standard conduit bending machines.



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

2. Conduit hickey may be used for slight offsets and for straightening stubbed out conduits.

3. Bending of conduits with a pipe tee or vise is prohibited.

E. Layout and Homeruns:

1. Install conduit with wiring, including homeruns, as shown on drawings.

2. Deviations: Make where necessary to avoid interferences. Coordinate with Engineering Technician (COTR), on proposed deviations.

3.3 (NOT USED)

3.4 (NOT USED)

3.5 DIRECT BURIAL INSTALLATION

Refer to Section 26 05 41, UNDERGROUND ELECTRICAL CONSTRUCTION.

3.6 (NOT USED)

3.7 WET OR DAMP LOCATIONS

A. Unless otherwise shown, use conduits of rigid steel.

3.8 (NOT USED)

3.9 (NOT USED)

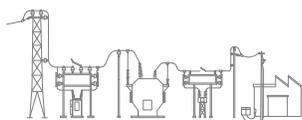
3.10 (NOT USED)

3.11 (NOT USED)

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SECTION 26 05 41

UNDERGROUND ELECTRICAL CONSTRUCTION



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Roseburg VA Healthcare System – Roseburg, Oregon

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the furnishing, installation, and connection of precast pull boxes with ducts to form a complete underground raceway system.
- B. “Duct” and “conduit,” “rigid non-metallic conduit” and “rigid metal conduit” and “rigid steel conduit” are used interchangeably in this specification.

1.2 RELATED WORK

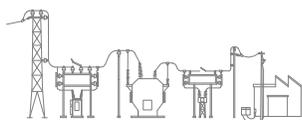
- A. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements and items that are common to more than one section of Division 26.
- B. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.
- C. Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits, fittings and boxes for raceway systems.

1.3 QUALITY ASSURANCE

- A. Refer to Paragraph, QUALIFICATIONS, in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
- B. Coordinate layout and installation of ducts, and pull boxes with final arrangement of other utilities, site grading, and surface features, as determined in the field.

1.4 SUBMITTALS

- A. Submit in accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.
- B. Shop Drawings:
 - 1. Clearly present sufficient information to determine compliance with drawings and specifications.



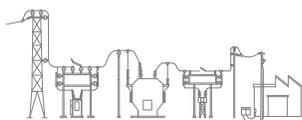
CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

2. Include pull boxes, duct materials, and hardware. Submit plan and elevation drawings, showing openings, cover, sump, and other accessories and details.
 3. Proposed deviations from details on the drawings shall be clearly marked on the submittals. If it is necessary to locate pull boxes at locations other than shown on the drawings, show the proposed locations accurately on scaled site drawings, and submit four copies to the Engineering Technician (COTR) for approval prior to construction.
- C. Certifications: Two weeks prior to the final inspection, submit four copies of the following certifications to the Engineering Technician (COTR):
1. Certification by the manufacturer that the materials conform to the requirements of the drawings and specifications.
 2. Certification by the contractor that the materials have been properly installed, connected, and tested.

1.5 APPLICABLE PUBLICATIONS

- A. Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by designation only.
- B. American Concrete Institute (ACI):
- | | |
|--|---|
| Building Code Requirements for Structural Concrete | |
| 318/318M-05 | Building Code Requirements for Structural Concrete & Commentary |
| SP-66-04 | ACI Detailing Manual |
- C. American National Standards Institute (ANSI):
- | | |
|-------|---------------------------------|
| 77-07 | Underground Enclosure Integrity |
|-------|---------------------------------|
- D. American Society for Testing and Materials (ASTM):



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

C478-09 Standard Specification for Precast Reinforced Concrete Manhole Sections

C990-09 Standard Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections Using Preformed Flexible Joint Sealants.

E. Institute of Electrical and Electronic Engineers (IEEE):

C2-07 National Electrical Safety Code

F. National Electrical Manufacturers Association (NEMA):

TC 2-03 Electrical Polyvinyl Chloride (PVC) Tubing And Conduit

TC 3-2004 PVC Fittings for Use With Rigid PVC Conduit And Tubing

TC 6 & 8 2003 PVC Plastic Utilities Duct For Underground Installations

TC 9-2004 Fittings For PVC Plastic Utilities Duct For Underground Installation

G. National Fire Protection Association (NFPA):

70-Latest Edition National Electrical Code (NEC)

H. Underwriters Laboratories, Inc. (UL):

6-07 Electrical Rigid Metal Conduit-Steel

467-07 Grounding and Bonding Equipment

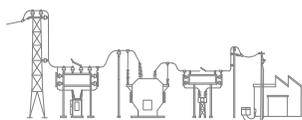
651-05 Schedule 40 and 80 Rigid PVC Conduit and Fittings

I. U.S. General Services Administration (GSA):

A-A-60005-1998 Frames, Covers, Gratings, Steps, Sump and Catch Basin, Manhole

1.6 STORAGE

Lift and support pre-cast concrete structures only at designated lifting or supporting points.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

PART 2 - PRODUCTS

2.1 (NOT USED)

2.2 PULL BOXES

- A. General: Size as required to meet NEC. Provide pull boxes with weatherproof, non-skid covers with recessed hook eyes, secured with corrosion- and tamper-resistant hardware, as applicable. Cover material shall be identical to pull box material. Covers shall have molded lettering, street lighting as applicable. Pull boxes shall comply with the requirements of ANSI/SCTE 77, Tier 5, Tier 8, Tier 15, and Tier 22 loading.
- B. Polymer Concrete Pull boxes: Shall be molded of sand, aggregate, and polymer resin, and reinforced with steel, fiberglass, or both. Pull box shall have open bottom.
- C. Concrete Pull boxes: Shall be monolithically-poured reinforced concrete.

2.3. DUCTS

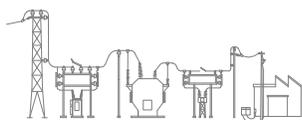
- A. Number shall be as shown on drawings and sized to match existing.
- B. Ducts (direct-burial):
 - 1. Plastic duct:
 - a. NEMA TC2 and TC3
 - b. UL 651, 651A, and 651B, Schedule 40, Schedule 80 PVC.
 - c. Duct shall be suitable for use with 167° F [75° C] or 194° F [90° C] rated conductors, as applicable.
 - 2. Rigid metal conduit: UL6 and NEMA RN1 galvanized rigid steel, threaded type, half-lapped with 10 mil PVC tape.

2.4 GROUNDING

- A. Per Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

2.5 WARNING TAPE

Standard 4-mil polyethylene 3 in [76 mm] wide detectable tape, red with black letters, imprinted with “CAUTION - BURIED ELECTRIC CABLE BELOW” or similar.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

2.6 (NOT USED)

PART 3 - EXECUTION

3.1 PULL BOX INSTALLATION

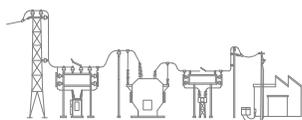
- A. Assembly and installation shall follow the printed instructions and recommendations of the manufacturer. Install pull boxes level and plumb.
 - 1. Units shall be installed on a 12 in [300 mm] level bed of 90% compacted granular fill, well-graded from the 1 in [25 mm] sieve to the No. 4 sieve. Granular fill shall be compacted with a plate compactor.
 - 2. Seal duct terminations so they are watertight.
- B. Access: Ensure the top of frames and covers are flush with finished grade.

3.2 TRENCHING

- A. Before performing trenching work at existing facilities, the Ground Penetrating Radar Survey shall be carefully performed by certified technician to reveal all existing underground ducts, conduits, cables, and other utility systems.
- B. Work with extreme care near existing ducts, conduits, cables, and other utilities to avoid damaging them.
- C. Cut the trenches neatly and uniformly.
- D. Conduits to be installed under existing paved areas and roads that cannot be disturbed shall be jacked into place. Conduits shall be heavy wall rigid steel.

3.3 DUCT INSTALLATION

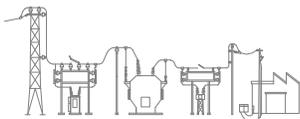
- A. General Requirements:
 - 1. Ducts shall be in accordance with the NEC and IEEE C2, as shown on the drawings, and as specified.
 - 2. Slope ducts to drain towards pull boxes, and away from building and equipment entrances. Pitch not less than 4 in [100 mm] in 100 ft [30 M].



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

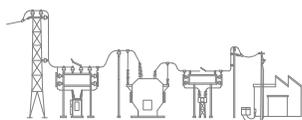
3. Underground conduit stub-ups and sweeps to equipment shall be taped galvanized rigid steel, and shall extend a minimum of 1 ft [0.3 M] outside the light pole foundation. Tops of conduits shall be minimum 3 in [76 mm] above top of light pole foundation.
 4. Install insulated grounding bushings on the terminations.
 5. Radius for turns of direction shall be sufficient to accomplish pulls without damage. Minimum radius shall be six times conduit diameter. Use manufactured long sweep bends.
 6. Additional burial depth shall be required in order to accomplish NEC-required minimum bend radius of ducts.
 7. Duct lines shall be installed no less than 12 in [300 mm] from other utility systems, such as water, sewer, and chilled water.
 8. Clearances between individual ducts:
 - a. For like services, not less than 3 in [75 mm].
 - b. For power and signal services, not less than 6 in [150 mm].
 9. Duct lines shall terminate at window openings in pull box.
 10. Couple the ducts with proper couplings.
 11. Keep ducts clean of earth, sand, or gravel, and seal with tapered plugs upon completion of each portion of the work.
 12. Seal conduits, at outdoor equipment terminations with a suitable compound to prevent entrance of moisture and gases.
- B. Direct-Burial Duct and Conduits:
1. Install direct-burial ducts and conduits for street lighting circuit. Provide direct-burial ducts only for low-voltage systems.
 2. Join and terminate ducts and conduits with fittings recommended by the conduit manufacturer.



CONSTRUCT ACCESS IMPROVEMENTS 1A

Roseburg VA Healthcare System – Roseburg, Oregon

3. Tops of ducts and conduits shall be:
 - a. Not less than 24 in [600 mm] and not less than shown on the drawings, below finished grade.
 - b. Not less than 30 in [750 mm] and not less than shown on the drawings, below roads and other paved surfaces.
4. Do not kink the ducts or conduits. Compaction shall not deform the ducts.
- C. Direct-Burial Duct and Conduit Identification: Place continuous strip of warning tape approximately 12 in [300 mm] above ducts or conduits before backfilling trenches. Warning tape shall be preprinted with proper identification.
- D. Duct and Conduit Cleaning:
 1. Upon completion of the duct installation, a standard flexible mandrel shall be pulled through each duct to loosen particles of earth, sand, or foreign material left in the duct. The mandrel shall be not less than 12 in [3600 mm] long, and shall have a diameter not less than 0.5 in [13 mm] less than the inside diameter of the duct. A brush with stiff bristles shall then be pulled through each duct to remove the loosened particles. The diameter of the brush shall be the same as, or slightly larger than, the diameter of the duct.
 2. Mandrel pulls shall be witnessed by the Engineering Technician (COTR).
- E. Duct and Conduit Sealing: Seal the ducts and conduits at outdoor terminations for equipment, with a suitable non-hardening compound to prevent the entrance of moisture and gases.
- F. Connections to Pull Boxes: For duct connections to pull boxes, break the structure wall out to the dimensions required. Provide a positive connection with the duct.
- G. Connections to Existing Ducts: Where connections to existing duct are indicated, excavate around the duct as necessary. Cut off the ducts before installing new ducts. Provide a fitting to join the ducts.



CONSTRUCT ACCESS IMPROVEMENTS 1A
Roseburg VA Healthcare System – Roseburg, Oregon

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