

PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH COUNTY

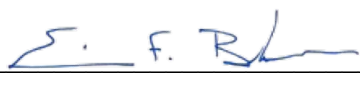
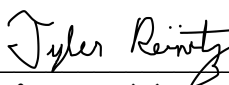
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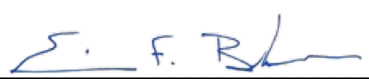
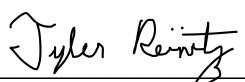
SPECIFICATION NO. 2313

REVISION NO. 11

**TITLE: STANDARD SPECIFICATION FOR TRANSMISSION
AND DISTRIBUTION LINE CONSTRUCTION**

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1.0 DEFINITIONS

1. "Contract Time" - The period of time for Final Completion of the Work, expressed in calendar days, in accordance with the requirements set forth in the Agreement.
2. "Crew Foreman" - shall be the CONTRACTOR's Qualified Electrical Employee and lead worker. The individual shall be familiar and knowledgeable in the construction and operation of the electric power generation, transmission, and distribution equipment involved, and such lines and/or equipment that concerns his/her position and who is fully aware of the hazards connected therewith and one who has passed a journey status examination for the particular branch of the electrical trades with which he/she may be connected.
3. "General Foreman" - shall be the CONTRACTOR's Qualified Electrical Employee and lead worker when two or more line crews are at work. The individual shall be familiar and knowledgeable in the construction and operation of the electric power generation, transmission, and distribution equipment involved, and such lines and/or equipment that concerns his/her position and who is fully aware of the hazards connected therewith and one who has passed a journey status examination for the particular branch of the electrical trades with which he/she may be connected. General Foreman shall confine his/her activities to supervising the work.
4. "Inspector" - shall be the DISTRICT'S representative who inspects to ensure conformance with the DISTRICT'S Specifications and Standards.
5. "Primary Trenches" shall be any trench where the highest voltage cable in the trench is over 600 volts.
6. "Project Engineer" - shall be the DISTRICT'S representative responsible for advising the DISTRICT'S Project Leader regarding the design, testing, and engineering aspects of the construction project.
7. "Project Leader" - shall be the DISTRICT'S representative who administers the construction project and provides decisions on all Contract questions.
8. "Project Manager" - shall be the CONTRACTOR's qualified individual directly responsible for the day-to-day management and administration of the Project. He or she is responsible for coordinating time, equipment, invoices, tasks and people for the Project.
9. "Secondary Trenches" - shall be any trench where the highest voltage cable in the trench is 600 volts or less.

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10. "Superintendent" - shall be the CONTRACTOR's qualified lead worker. The individual shall provide on-site coordination for all aspects of the Project, including coordinating subcontractor, material and equipment, ensuring that specifications are being strictly followed, and that work is proceeding on schedule. A Crew Foreman may act as Superintendent.
11. "Work Day" - shall be each calendar day Monday through Friday, excluding DISTRICT holidays. Holidays which fall on Saturdays are observed on the preceding Friday; those falling on Sundays are observed on the following Monday. DISTRICT holidays are as follows unless changed by the current list of DISTRICT holidays which the CONTRACTOR shall obtain from the DISTRICT prior to commencing any work:
 - (1) New Year's Day
 - (2) Martin Luther King JR's Birthday
 - (3) Presidents Day
 - (4) Memorial Day
 - (5) Independence Day
 - (6) Labor Day
 - (7) Veteran's Day
 - (8) Thanksgiving Day
 - (9) Day after Thanksgiving Day
 - (10) Christmas Day
12. "Waste Poles and Crossarms" - shall be all sections of wood poles topped off above the communications or otherwise cut into sections or pieces, and all wood poles and wood crossarms removed during construction with either no identifiable brand or a brand indicating the pole or crossarm was manufactured more than fifteen (15) years before the Notice to Proceed of the Contract.
13. "Best Management Practices (BMP's)" - are defined as practices detailed or referenced in this Specification to implement when performing excavation, trenching, backfilling and paving work. These practices will allow the CONTRACTOR to manage project water runoff and soil erosion.

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2.0 RECORD DRAWINGS

1. The CONTRACTOR shall maintain a set of Record Drawings showing all field changes with explanation as to the reason for change (e.g., Contract Amendments, DISTRICT'S instructions, Engineering Change Directives, etc.).
2. The Record Drawings shall be a clean set of Contract Drawings with changes clearly marked and updated daily.
3. Prior to the DISTRICT'S acceptance of the work, the CONTRACTOR shall furnish the DISTRICT with the set of Record Drawings.
4. The DISTRICT'S Project Leader and/or Inspector will review the Record Drawings weekly to assure the Record Drawings are kept up-to-date on a daily basis. If the Record Drawings are not kept up-to-date, the DISTRICT may require an amendment reducing the payment for the Record Drawings.

3.0 MATERIALS AND EQUIPMENT

1. The DISTRICT will furnish the standard materials and system equipment necessary to complete the work, which are stocked and managed by the warehouse staff, including but not limited to poles, transformers, switches, regulators, capacitors, reclosers, pedestals, vaults, hand holes, hardware, and conductors.
2. The CONTRACTOR shall supply all backfill, restoration, boring, BMP materials, and any other materials specified in the Contract Drawings/Documents).
3. The CONTRACTOR will be responsible for the costs of additional materials or equipment required to repair damage caused by the CONTRACTOR during the course of the work, including materials and equipment lost by or stolen from the CONTRACTOR while under their control after pick-up at the DISTRICT warehouse and before returns to the DISTRICT.
4. The CONTRACTOR shall provide all labor, trucks and other labor-related equipment, cranes, tools, material pans, and instruments necessary to perform all work described in the Contract Drawings/Documents.

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5. All hardware, insulators and associated materials furnished by the DISTRICT shall be picked up by the CONTRACTOR upon approval by the Project Leader, Inspector, or designated representative between the hours of 9:00 a.m. to 12:00 p.m. and 12:30 p.m. to 3:30 p.m. at the DISTRICT'S Operations Center Warehouse, located at 1802 75th Street Southwest, Everett, Washington, 98203 or at a place directed by the Project Leader. All poles, crossarms, transformers, vaults (except 6'-8" x 12'-8" x 8'-0" and larger), conduit and conductors shall be picked up by the CONTRACTOR at the DISTRICT'S Operations Center Pole Yard or at a place directed by the Project Leader. The 6'-8" x 12'-8" x 8'-0" and larger vaults will be delivered to the CONTRACTOR at the job site by the vault manufacturer. The CONTRACTOR shall use the North Gate at the Operations Center for ingress and egress. During times of heightened security, the CONTRACTOR must be escorted by a DISTRICT representative while on DISTRICT property.
6. All DISTRICT-furnished materials must be inspected and receipted for by the CONTRACTOR on delivery, and the CONTRACTOR shall be responsible for the proper use and safeguarding of all such materials until final acceptance of the work by the DISTRICT. If, at any time, the CONTRACTOR discovers any defect in materials furnished by the DISTRICT, the CONTRACTOR shall immediately notify and submit to the DISTRICT a written report describing such defect. The CONTRACTOR shall immediately cease to use such defective items pending receipt of instructions from the DISTRICT.
7. Upon completion of the project, all DISTRICT-furnished materials not used in connection with the work and removed materials (except "waste poles and crossarms" and other waste, as described in Section 3.4) shall be returned to the rear of the DISTRICT'S Operations Center Warehouse, during normal business hours specified in Section 3. Such materials shall be identified with the applicable work order and task number. The cost of all unaccounted-for material, i.e., material furnished to the CONTRACTOR which is not either used for the work or returned to the DISTRICT, shall be deducted from amounts due the CONTRACTOR under this Contract.

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8. The CONTRACTOR shall dispose of all waste generated as part of the project in full compliance with all applicable regulations and DISTRICT procedures. During the course of the work, the CONTRACTOR shall remove and take possession of all waste poles and crossarms as defined in Section 1.0, Item 7. These wastes shall immediately become the CONTRACTOR'S responsibility. The CONTRACTOR must remove waste poles and crossarms from the job site upon completion of work in a particular area. Waste poles and crossarms are to be cut into lengths not to exceed six feet in length and disposed of as municipal solid waste at a permitted Snohomish County Solid Waste Facility. All wood poles and crossarms that are not considered to be waste poles and crossarms as defined in Section 1.0, Item 7 are to be returned to the DISTRICT'S Operations Center Pole Yard. No poles or crossarms are to be given to the public or to the CONTRACTOR'S employees. Upon request, the CONTRACTOR will provide the DISTRICT with evidence that all waste has been disposed of in compliance with all applicable regulations and DISTRICT procedures.
9. All returned material (except as described in Section 3.6 and 3.7) will be separated into the groupings listed below and placed in or on metal bins, cages, pallets, or reels (available from the DISTRICT'S Operations Center Warehouse), as appropriate. All removed material will be properly identified and tagged with **Work Order and Task Number**. All material will specify either over-issued, salvage, scrap, or retired, as appropriate.
 - Bare Aluminum Wire
 - Insulated Aluminum Wire
 - Iron - Guy Insulators and Guards removed and sorted separately
 - Meters
 - Brass
 - Bare Copper Wire and Solids
 - Insulated Copper Wire
 - Glass or Porcelain - Insulators
 - Scrap Crossarms - all hardware removed and sorted separately
 - Scrap Pole-all hardware removed and returned to the Pole Yard
 - Nuts, Bolts, Washers
 - PVC lengths Schedule 80 ten (10) feet or more, Schedule 40 twenty (20) feet or more
 - Other returned materials

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10. All new cable which exceeds the lengths set forth in the table below, shall be placed on individual reels, tagged by type of wire, Work Order and Task Number and returned to the DISTRICT'S Operations Center Pole Yard for reuse by the DISTRICT.
 - #2 Primary, jacketed 200'
 - 1/0 Primary, jacketed 200'
 - 350 KCM Primary 300'
 - 1100 KCM Primary 300'
 - All other wire 300'
11. All Schedule 80 conduit greater than 10 (10) feet and Schedule 40 conduit greater than twenty (20) feet in length shall be tagged with a Work Order and Task Number and returned to the DISTRICT'S Operations Center Pole Yard for reuse by the DISTRICT.
12. All overhead transformers removed from poles shall have wire leads removed. Equipment Records Reports (Form #1510 - blank copies will be furnished with the contract package by the Project Leader or Inspector) shall be completed in detail and turned in with each transformer.

4.0 CONSTRUCTION AND ERECTION

1. Handling and Transportation of Materials: All materials shall be handled and transported by the CONTRACTOR with all due care and in such a manner as to preserve their true shapes and values. Material handling pans shall be supplied by the CONTRACTOR and used during the process of construction. The CONTRACTOR shall be responsible for all materials stored at the construction site, and the DISTRICT shall have no responsibility or liability in connection therewith.
2. Equipment and Methods:
 - a. Assembly and erection of structures, equipment and materials shall be conducted in such a manner and by use of such equipment as not to cause damage to any part of the structures, equipment or materials. Care shall be taken to maintain the true geometric shapes of the structures, equipment and materials.
 - b. The use of force which would distort members or damage galvanizing or paint is prohibited.
 - c. Wrenches used shall be the correct type and size for the job that will not deform nuts and/or cut or flake galvanizing.

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- d. When lifting structures, equipment and materials, care shall be taken to prevent damage or injury to existing conductors, property and persons.

5.0 STAKING

1. The locations of structures and/or equipment to be installed hereunder shall be staked or painted by the DISTRICT prior to the CONTRACTOR starting work, but no guarantee is made that such stakes will remain in place.
2. It shall be the CONTRACTOR'S responsibility to verify that all necessary location markers are in place and in the proper location prior to starting construction.
3. The CONTRACTOR shall give the DISTRICT at least twenty-four (24) hours prior notice of the need for location markers to be reviewed and/or replaced.
4. Pole, vault, transformer, street light and secondary pedestal locations will be marked with thirty (30) inch white stakes (or PK Nails in hard surfacing) with pink flagging where possible. When a stake or PK Nails cannot be driven into the ground, white paint will be applied to mark locations.
5. Anchor stakes will mark the location of the anchor rod eye and will also be thirty (30) inch white stakes (or PK Nails in hard surfacing) marked "ANCHOR" with pink flagging where possible. When a stake cannot be driven into the ground, white paint will be applied to mark locations.

6.0 EXCAVATION, TRENCHING, AND BACKFILL

1. The CONTRACTOR shall comply with all applicable laws, regulations and other requirements of state and local authorities including, but not limited to, the State of Washington Standard Specification for Road and Bridge Construction (hereinafter referred to as the State of Washington Specification), the Snohomish County Public Works Engineering Design & Development Standards, Title 30, Snohomish County Unified Development Code, which includes Grading (SCC30.63B) and Drainage (SCC30.63A) Ordinances (hereinafter referred to as the Snohomish County Standards) and the Stormwater Management Manual for Western Washington including the BMP's referenced in that document when performing excavation, trenching, backfilling and paving work under or pursuant to this Specification.

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2. Trenching shall be performed according to this Specification and the Contract Drawings/Documents. All trenches shall be excavated to true and smooth bottom grades and shall provide uniform support for each length of conduit, equipment or device to be installed.
3. The CONTRACTOR shall perform trench excavation to the depth indicated in this Specification and the Contract Drawings/Documents. notwithstanding the nature of the material encountered during such excavation. If field conditions prohibit the specified trench geometry, other configurations may be acceptable with prior District approval. All primary trenches shall have a minimum depth of thirty-six (36) inches of cover and all secondary trenches shall have a minimum depth of twenty- four (24) inches of cover. The width of trench will be as specified in the applicable Contract Drawings/Documents.
4. Except as otherwise provided by law, regulation, Paragraph 5 (below) or any other applicable requirement of state or local authorities, and except as otherwise provided in this Specification, all trenches (both primary and secondary) shall be backfilled with suitable backfill material compacted to at least 80 percent of the maximum dry density. Backfill in trench sections located either (i) beneath existing roadways, sidewalks or driveways, or (ii) in areas which the Contract Drawings/Documents, stakes or other markings indicate will be used for roadway, sidewalk or driveway purposes, shall be compacted with suitable backfill material to 95 percent of the maximum dry density, unless otherwise provided by Chapter 10 of the Snohomish County Standards, or any other law, regulation or other applicable requirement of state or local authorities.

Notwithstanding the foregoing, the CONTRACTOR shall, in any area which is required to be trenched and backfilled by the CONTRACTOR under this Contract, be required to compact backfill material only to the same percentage density as was provided by the Developer in such area prior to the commencement of work under this Contract (as determined by compaction testing in accordance with the provisions of this Contract). In the event of any uncertainty as to the compaction requirement applying in any area, it shall be the responsibility of the CONTRACTOR to inquire of the DISTRICT as to the applicable requirement. Suitable backfill material is defined as soil which is free of roots, bark, peat, soft clay, quicksand, mud, broken bituminous surfacing, soft organic material, stones larger than four (4) inches in breadth, junk, garbage, and other unsuitable debris. If suitable backfill material is not available within the limits of the project, the CONTRACTOR shall furnish suitable material meeting the DISTRICT'S requirements, at the CONTRACTOR'S sole expense.

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5. All DISTRICT 6" feeder cable ducts and other ducts when specified in the Contract Drawings/Documents shall be encased in red Fluidized Thermal Backfill (FTB) which provides mechanical protection and uniform thermal characteristics. DISTRICT URD or communication ducts may be encased if required for supplemental protection or by the permitting agency. Fluidized Thermal Backfill is a concrete mixture that is designed to conduct heat and allows power cables to run at higher ampacities than cables backfilled with concrete or CDF. See DISTRICT Material Standard 10021182.1 for mixture requirements.
6. For any excavation and trenching where the depth will exceed four (4) feet, the CONTRACTOR shall provide adequate safety systems, meeting the requirements of the Washington Industrial Safety and Health Act, RCW Chapter 49.17. The CONTRACTOR shall furnish the DISTRICT with a separate bid cost for all required safety systems as set out in the Proposal.
7. The CONTRACTOR shall remove, transport and dispose of, at an appropriate waste site, any material that does not meet the definition of suitable backfill material, as specified in Section 6.4 above. Such material shall be removed, transported and disposed of in accordance with all applicable requirements of state and local laws and regulations. All unsuitable material removed from the job site shall become the responsibility of the CONTRACTOR.
8. After all trenching has been backfilled, the CONTRACTOR shall, in the presence of the DISTRICT'S Project Leader or designated representative, verify the integrity of any conduit installed for future facilities by running a mandrel through the conduit, installing 1/2" minimum polyester pulling tape and plumbing/sealing/capping/mark the ends of the conduit as required by the DISTRICT. All equipment and materials necessary to accomplish this work shall be provided by the CONTRACTOR at the CONTRACTOR'S sole expense (except for pulling tape and end caps).
9. The CONTRACTOR shall place all pavement patches per Section 5-04 of the State of Washington Specification. Pavement patches shall be a minimum 4-inch depth HMA C1 1/2" PG64-22(or as required by the permitting agency), and machine rolled flush with existing pavement. All joints shall be sealed with sealant.

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10. If so directed by the DISTRICT, the CONTRACTOR shall provide backfill compaction tests performed by a DISTRICT-approved testing laboratory. The quantity and location of these tests shall be as specified by the DISTRICT. The DISTRICT will, pursuant to a Contract Amendment executed by the CONTRACTOR and the DISTRICT, reimburse the CONTRACTOR for the reasonable costs of any completed tests that demonstrate that the CONTRACTOR'S backfill compaction meets all applicable requirements of this Specification. However, if a compaction test demonstrates that any backfill compaction does not meet any applicable requirements of this Specification, the CONTRACTOR shall be responsible for all of the costs and expenses of such test and the DISTRICT shall have no responsibility therefore or liability in connection therewith.
11. The CONTRACTOR shall replace, in their entirety, any driveway aprons and ADA ramps that are damaged, sawed through, etc. during construction. CONTRACTOR may be required to upgrade replaced ADA ramps to current ADA and local agency requirements by the local agency. Mailboxes moved during construction shall be replaced in approximately the same location as before construction. Damaged drainage lines shall be replaced to the standards and specifications of the city or county involved. Damaged lawns and grass areas shall be restored with sod. Reseeding is not acceptable except under direct request from the property owner. The CONTRACTOR shall replace damaged trees or shrubs with the same type as existing, to the satisfaction of the customer, city and all others concerned. The CONTRACTOR shall leave streets, roads, driveways and private property in a condition satisfactory to the DISTRICT'S Project Leader, city or county engineer, property owners, and others concerned upon completion of the work.
12. Other utilities, such as gas, telephone, and/or TV, may desire to install their facilities in the new trench. This would be described as a Joint Trench. Details of the Joint Trench will be worked out with the other utilities at the Pre-Construction meeting. The DISTRICT will notify the CONTRACTOR of said utilities' joint participation. It shall be the CONTRACTOR'S responsibility to notify the other utilities of the CONTRACTOR'S work dates and to coordinate activities with such other utilities at no additional cost to the DISTRICT.

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7.0 TRANSFORMERS, VAULTS, PEDESTALS, AND CONDUIT

1. Transformers, vaults, pedestals, and conduit shall be installed in accordance with the DISTRICT'S Construction Standards and this Specification. The locations of such facilities shall be staked by the DISTRICT and shall not be relocated without the DISTRICT'S prior approval. Transformers, vaults and pedestals shall not be placed over another utility installation. It shall be the CONTRACTOR'S responsibility to notify the DISTRICT of any conflict in the field with other utilities. Relocation, if necessary, shall be as directed by the Project Lead through an Engineering Change Directive (ECD) – see Section 13.0 of the General Conditions.
2. All vault covers shall be set level to within one (1) inch in ten (10) feet of the grade as staked outside of a traveled way and flush and level to the grade as staked when inside of a traveled way.
3. Handholes used for padmount transformers shall be set level to within one (1) inch in ten (10) feet of the grade as staked outside of a traveled way and flush and level to the grade as staked when inside of a traveled way.
4. All grounding shall be installed in accordance with the DISTRICT'S Construction Standards
5. Vault Safety

The CONTRACTOR and its employees shall comply with the following Safe Work Practice:

Guidelines for Working In or From Outside Energized Vaults

Scope

This guideline covers safe work practices when using proper tools and equipment for working on de-energized underground electrical cable(s)/equipment from in or outside a vault containing energized primary conductors. This guideline does not change current DISTRICT practice for employees using live line tools to perform work without the need for an outage on energized cable(s)/equipment from outside an energized vault when deemed safe (i.e. switching).

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References

November 3, 2004 Memorandum to Assistant General Manager of Distribution Services Division from the Joint Safety Committee, Guidelines for Working In or From Outside Energized Vaults. This guideline is provided in addition to what is covered by WAC 296-45, WAC 296-45-215, WAC 296-45-255 (3&4), the DISTRICT'S Accident Prevention Manual - Underground Section, and NESC 323 (B).

Definitions

Vaults not intended for full physical entry:

- Vaults less than 6 feet from floor to inside roof.
- If circular in shape, less than 6 feet in diameter.
- If square, less than 6 feet from wall to wall.

Vaults intended for full physical entry:

- All other vaults and vault rooms.

Approach and Responsibility

- a. Taking an outage before employees physically work on cable(s)/equipment from in or outside of an energized vault is the preferred work practice. This guideline would only apply if the Foreman and crew can determine and agree upon a method to perform the task safely based on the following guideline. In all cases, the Foreman has the responsibility to stop the job if it cannot continue to be accomplished safely.
- b. The DISTRICT and the CONTRACTOR will provide the necessary tools, equipment and training for their respective line crew(s) to perform work in accordance with this guideline.
- c. Each job should be evaluated according to the conditions that exist. When the job can be done safely, work will be performed in or from outside energized vault(s). This position is supported by the Washington Administrative Code (WAC 296-45-215).
- d. An outage would not be required when:
 - i. Your work can be done safely and the vault is determined safe to work in by qualified employees.

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- ii. The work can be done in a way that will allow for proper future operation of the cable(s)/equipment.
 - iii. The work is performed by at least two qualified electrical workers with Journeyman status.
- e. Vaults not intended for full physical entry:
- i. When safe and proper protection can be provided, employees may reach into an energized vault to perform work.
- f. Vaults intended for full physical entry:
- i. Proper protection (to include all confined space entry requirements) shall be provided and clearances observed for employees to perform work on cable(s)/equipment from in or outside of a vault having exposed energized equipment.

Unless proper protection is installed to cover the bottom of the energized switchgear with exposed electrical components to protect the employee from both electrical and fault exposures, an employee cannot stand or perform work directly beneath the energized switchgear.
 - ii. Racking of cables and terminating cables in larger vaults would depend on the size of cable and arrangement of cables/equipment in the vault. Safe and proper protection shall be provided.
 - iii. Live front padmount switchgear must be de-energized before any work can be done on the equipment inside the switchgear with the exception of switching, placing and removing protective barriers, testing, and grounding the equipment.
- g. When appropriate, employees must install protection to prevent physical contact with energized cable(s)/equipment. Contact can be made between the de-energized cable(s) and energized cable(s)/equipment provided the cable(s)/equipment are properly insulated for the rated voltage. Rubber gloves can be worn as a secondary form of personal protection.

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6. Conduit installed by non-qualified electrical workers shall hold short a **minimum** of five (5) feet from any energized vault. Conduit shall enter vaults through the preformed knock-out locations provided in the vault, and shall be placed in such a way as not to interfere with other conduits. All conduits entering vaults shall be sealed with concrete grout or DISTRICT-approved equal and shall be allowed to cure prior to backfilling around the vault.
7. Conduit installed in open trenches shall be fitted, glued together, placed in spacers and installed in the trench with an average minimum clearance of 1.5" between the conduits and the sides and bottom of the trench prior to backfilling, to allow for smooth and easy flow of backfill and adequate compaction around all conduits.
8. CONTRACTOR shall make sure that conduits are near round and not made oval either at the factory in the case of supplied HDPE conduit, or in the field due to insufficient conduit spacing, bedding, and compaction to support the conduits while being backfilled.
9. The CONTRACTOR shall prove all conduits using the following steps:
 - a. The CONTRACTOR shall conduits by pulling a mandrel and tightly fitted brush or swab through each conduit.
 - b. The mandrel shall be one-fourth (1/4) inch smaller diameter than the conduit and twelve (12) inches long, having a sharp shouldered ferrule at each end.
 - c. The CONTRACTOR shall connect a rope to the front and back of the mandrel and attached brushes to permit re-pulling if an obstruction is met.
 - d. The mandrel shall be pulled with the brush following through each conduit once in each direction to ensure there are no obstructions. All mandrelling shall be done in the presence of a DISTRICT Inspector and shall be done after the conduit trench is backfilled and compacted.
 - e. Failure of any duct to pass the mandrel test is sufficient reason to reject the entire duct run, which shall be corrected at the CONTRACTOR'S expense.
 - f. After the cleaning operation the CONTRACTOR shall install and secure a pulling rope in the conduit and shall immediately and effectively plug all ducts to keep dirt and foreign matter out the conduit.

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10. Conduit Installation via Directional Bore

- a. The CONTRACTOR shall supply all Bore Materials unless otherwise specified. Said materials shall meet or exceed DISTRICT standards. Conduit shall terminate at locations determined and marked by the DISTRICT. Conduit shall be proved and a pull rope shall be installed in each conduit run and the conduit ends plugged per DISTRICT standards. All open bore pits and trenches shall be backfilled and conduit ends marked with approved conduit markers.
- b. If the DISTRICT determines that the conduit shall terminate inside an energized vault, the CONTRACTOR shall coordinate with the DISTRICT to have a DISTRICT crew on site to plumb the conduit into the energized vault.
- c. The CONTRACTOR shall be responsible for the restoration of all surfaces disturbed in association with the directional boring work. This includes paving, concrete and landscaping. All restoration work shall be per the DISTRICT standards and/or the associated jurisdiction's asphalt and concrete restoration requirements.
- d. The CONTRACTOR shall de-bead all conduit welds.
- e. The CONTRACTOR shall provide as-built documents that provide information about the conduit location and bore profile.

8.0 UNDERGROUND CONDUCTORS

1. Conductors to be direct-buried shall be hand-shaded prior to final backfill and compaction.
2. Conductors to be pulled in conduits shall be lubricated and pulled from the direction indicated on the Contract Drawings/Documents, and shall not exceed DISTRICT-approved pulling tensions.
3. 750-1100 KCM conductors shall not be kinked or bent to less than a thirty-six (36) inch radius when handling and racking cables in DISTRICT vaults and equipment.
4. 1/0 primary, #2 primary, 1/0 secondary, 4/0 secondary, and 350 KCM secondary conductors shall not be kinked or bent to less than a twenty-four (24) inch radius.

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5. All primary and secondary cable terminations (i.e., stress cones, elbows, splices, and compression terminals) shall be installed per the manufacturer's instructions and the DISTRICT'S Construction Standards.
6. Any damage to the new and existing conductor shall be called to the attention of the DISTRICT and shall be dressed, repaired, or the damaged section removed to the satisfaction of the DISTRICT.

This work shall be completed at the CONTRACTOR'S expense using DISTRICT materials paid for by the CONTRACTOR, unless it can be clearly shown that such damage was caused by the DISTRICT, in which event the work shall be completed with DISTRICT materials at the DISTRICT'S expense.

9.0 OVERHEAD CONDUCTORS

1. Stringing Conductor:
 - a) The handling, stringing, sagging and clipping-in or tying-in of the conductor shall be by methods which will prevent damage to the conductors and line structures in any way. Prevailing safety regulations and practices of the DISTRICT, the State of Washington and the National Electrical Safety Code shall be observed where they apply. The conductor shall not be permitted to contact the ground at any time, nor to contact any other wires or cables (whether energized or de-energized) or any poles, guard structures, etc., which may damage the conductors and line structures in any way. Stringing shall be by the tension method, applied so that the conductor will be installed without damage, and stringing tension shall not exceed the sagging tension for the section of the line involved.
 - b) Stringing sheaves shall run freely and be of sufficient strength to withstand, without damage, the loads imposed upon them. The sheaves shall be sized according to the conductor they are used for and shall be subject to approval by the DISTRICT'S authorized representative.
 - c) Stringing sheaves shall support the conductors at the same elevation as their final position on the insulator, unless otherwise directed by the DISTRICT.
 - d) Come-a-longs and other gripping devices shall be approved as suitable for size and strength of the conductor being installed by the DISTRICT'S authorized representative.

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- e) Any damage to the new and existing conductor shall be called to the attention of the DISTRICT and shall be dressed, repaired, or the damaged section removed to the satisfaction of the DISTRICT. This work shall be completed at the CONTRACTOR'S expense using DISTRICT materials paid for by the CONTRACTOR, unless it can be clearly shown that such damage was caused by the DISTRICT, in which event the work shall be completed with DISTRICT materials at the DISTRICT'S expense.
 - f) Stringing lines shall be connected to the conductor with a swivel connection and a stocking-type grip approved by the DISTRICT. Tail wires of the grip shall be taped so that the grip will run freely in and not damage the sheave.
 - g) Adequate guard structures of a material which will not damage the conductors shall be supplied by the CONTRACTOR under the direction of the DISTRICT to provide protection for crossing over electric supply and communications lines, railroads, roads and highways. Guard structures shall be removed following stringing, sagging and clipping-in. The CONTRACTOR shall give (5) five working days notice to the DISTRICT and to the owner of any facility being crossed prior to the stringing. Supply lines with a potential of 2300 volts or above shall be guarded or de-energized. All lines de-energized for crossing shall be short-circuited and grounded at the site of the crossing.
 - h) All work shall be done in a manner to protect the general public, other workers and DISTRICT employees who may be working on lines crossed over or on other tasks in the general area.
2. Placing of Insulators and Insulator Hardware:
- a) The insulators and insulator hardware shall be carefully handled while being transported, assembled and installed.
 - b) All insulators shall be thoroughly cleaned of all foreign material immediately before being installed.
 - c) Chipped or cracked insulators shall not be installed. All defective insulators shall be tagged bad order and returned to the DISTRICT'S Warehouse under direction of the DISTRICT.
 - d) Hardware shall be handled to prevent contact with the ground, and shall be clean when installed.
 - e) Suspension and deadend insulator assemblies shall be lifted near

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one end of the assembly only.

3. Sagging Conductors:

- a) Conductors shall be sagged within seventy-two (72) hours of stringing by the CONTRACTOR in spans approved by the DISTRICT and in accordance with the sag tables on the Contract Drawings/Documents or in Construction Standards 4-8-4.0 through 4-8-5.0.
- b) Sagging operations shall not be conducted when, in the opinion of the DISTRICT, wind or other physical condition may prevent satisfactory sagging. Any delay shall be at no additional cost to the DISTRICT.
- c) Snubs and tensioning equipment shall be located far enough from structures to avoid overloading of crossarms or insulators. Anchoring of snubs to any structure will be permitted only with the DISTRICT'S prior approval.
- d) Conductors shall be sagged by a method approved by the DISTRICT. The CONTRACTOR shall provide one sagger for each span in which sags are to be measured. The CONTRACTOR shall provide accurate sagging instruments acceptable to the DISTRICT and shall complete and sign the appropriate DISTRICT conductor sagging record.
- e) Conductors shall be sagged in one operation between dead-ends where, in the opinion of the DISTRICT, the length of the deadend section will permit attainment of the correct sag. All conductors in a section between the dead-ends shall be treated uniformly with respect to tension and time intervals during stringing and sagging.

4. Tying-in/Clipping-in:

- a) Conductors shall be tied-in/clipped-in following sagging and dead-ending, preferably the same day as sagging, but not later than the third calendar day following sagging.
- b) Suspension clamps shall be installed so that the insulator strings, if used, shall hang in a vertical plane through the points of insulator string attachment to the structure with the structure properly aligned.

5. All-aluminum and ACSR Conductor Splices and Compression Dead ends:

- a) The DISTRICT'S Inspector shall be given two (2) hours prior notice

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that the CONTRACTOR is installing all-aluminum or ACSR splices and compression dead-ends so the DISTRICT'S Inspector may be present if desired.

- b) The DISTRICT will furnish the splice material. The CONTRACTOR shall furnish compressor, tools and dies and shall be responsible to see that they are suitable for the conductor and splices.
- c) Unless otherwise specified by the DISTRICT, all conductor splices shall be at least twenty-five (25) feet from supports after conductor is clipped-in and shall be at least fifty (50) feet with respect to distribution, and one hundred (100) feet with respect to transmission, from any compression fittings. Splices shall be avoided in crossing over major communication lines, railroads and highways.
- d) Before making a splice, the conductor shall be laid out in a straight line for twenty-five (25) feet on either side of the splice. No splice shall be made within fifteen (15) feet of any cable grip holding the conductor in full or partial tension.
- e) The ends of the conductor shall be cut back beyond any damaged or missing strands. Loose strands shall be tightened by twisting the outer layer in the direction of the lay and shall be seized with aluminum wire to prevent unraveling. The bore of all-aluminum sleeves and the surface of the conductor shall be thoroughly cleaned with a wire brush immediately prior to compression.
- f) The tension splices and dead-ends shall be installed and compressed in accordance with the manufacturer's printed instructions, and in accordance with the following:
 - i. Lay the conductor alongside the splice or dead-end and mark the conductor with tape at the proper length so that when the conductor is inserted into the splice or dead-end up to the tape, the conductor will completely fill the body.
 - ii. Inject filler compound into the barrel of the aluminum dead-end or splice body, using a caulking gun, until the filler shows at the end of the body. Slight bends in the aluminum sleeve may be straightened by hammering, using a hardwood block to protect the barrel from direct hammer blows.
- g) Jumper terminals and connectors shall be installed in accordance with the manufacturer's printed instructions and according to the instructions specified by the DISTRICT. Prior to bolting the terminal dead-end connection, both tongues shall be thoroughly cleaned with

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a wire brush, coated with joint compound and again abraded with a wire brush through the compound. Aluminum bolts shall be tightened with a torque wrench to torque standards as shown in the DISTRICT'S Construction Standard No. 4-10-8.0.

- h) At the completion of pressing operations, all wrapping, binding and excess grease or compound shall be removed. All corners, sharp projections and indentations resulting from the compression shall be carefully rounded. All other edges and corners of the fittings that have been damaged shall be carefully rounded to their original radius. Nicked or abraded surfaces shall be carefully smoothed.
- 6. The existing conductors to be removed shall not be used to pull in the new conductors unless approved by the DISTRICT.

10.0 ANCHORING AND GUYING

- 1. A minimum of one (1) cubic yard of concrete, provided and installed by the CONTRACTOR, shall be used for each plate anchor unless otherwise specified. The CONTRACTOR shall tamp all other backfill to a uniform compaction with pneumatic tamping equipment. See details in the DISTRICT'S Construction Standard No. 4-6-2.0.
- 2. When necessary to break a concrete or asphalt surface, said surface shall be replaced or patched in a workman-like manner as detailed in the Contract Drawings/Documents and to the satisfaction of the DISTRICT.
- 3. When necessary to install anchors in seeded or grassy areas, these areas shall be restored, as nearly as possible, to their original condition and in a professional, quality manner as detailed in the Contract Drawings/Documents and to the satisfaction of the DISTRICT.
- 4. Helix anchors shall be driven into the ground to a depth, which will attain the required holding power. The CONTRACTOR'S equipment must be able to provide torque up to 8,000 foot-pounds when installing these anchors and must be equipped to use a torque indicator tool. The DISTRICT will approve the anchor installations, which shall be installed per the DISTRICT'S Construction Standard No. 4-6-1.0 through 4-6-3.0.
- 5. When the CONTRACTOR properly installs a helix anchor and submits proof in writing that the requirements of section 10.4 were completely met, but does not achieve adequate depth as determined by the DISTRICT'S Inspector, the Project Leader or Designee may direct the CONTRACTOR to remove the helix anchor and install a plate anchor. In such case, the DISTRICT shall pay the CONTRACTOR both unit prices for the anchor installations.

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6. Anchor leads are shown on the Contract Drawings/Documents and shall be measured along the ground from the pole center to anchor rod eye.
7. The CONTRACTOR shall not apply tension to anchor rods or helix shafts that will damage their holding capabilities.
8. All guys shall be assembled and installed in accordance with the details shown on the Compatible Unit drawings in the DISTRICT'S Construction Standards.
9. Anchors set in solid rock shall extend into the rock a minimum of three (3) feet. The holes drilled in rock shall be completely filled with concrete grout or DISTRICT-approved equal and thoroughly rodded to fill all voids.

**11.0 DRILLING AND BACKFILL OF WOOD POLE, STEEL POLE, AND
ANCHOR HOLES**

1. All pole holes shall be drilled with straight sides eight (8) to ten (10) inches larger in diameter than the butts of the poles or as specified on the Contract Drawings/Documents and to the proper depth as noted in the DISTRICT'S Construction Standards or as specified on the Contract Drawings/Documents. Loose material shall be removed from the hole as much as practical.
2. Pole holes shall not be accomplished with a backhoe or similar equipment except in specific locations where, in the judgment of the DISTRICT, soil conditions make forming holes by pole hole digger or by hand impractical. The CONTRACTOR shall obtain the DISTRICT'S approval before forming pole holes with a backhoe or other similar equipment.
3. Methods of drilling in rock shall be as approved by the DISTRICT.
4. After a pole is set into position, the suitable backfill as defined in section 6.4 shall be thoroughly tamped. Tamping of backfill shall be done in four (4) inch lifts when hand tamping and in six (6) inch lifts when using hydraulic tampers. Excess soil shall be banked around the base of the pole to compensate for settling to a maximum height of ten(10) inches.
5. Upon completion of the work, the CONTRACTOR shall leave streets, alleys, roads, driveways and private property in a condition satisfactory to the city or county engineer, property owners and the DISTRICT.
6. Concrete backfill with a minimum strength of 3,000 psi shall be provided and installed by the CONTRACTOR when specified on the Contract Drawings/Documents.

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7. BMP's shall be used to properly drain any water from the construction sites, as referenced in Section 6.1 of this Specification.

12.0 WOOD/LAMINATED POLES

1. Poles shall be set and framed according to the Contract Drawings/Documents and DISTRICT'S Construction Standards. Poles shall be set at the locations specified, truly perpendicular within the following tolerances:
 - a) The CONTRACTOR shall set each pole within four (4) inches of the correct location along the line or three (3) inches across the line.
 - b) The CONTRACTOR shall set each pole within four (4) inches of perpendicular, except as noted below.
 - c) Poles or structures supporting conductor angles or angle dead-ends shall be raked one and one-half (1.5) inches per ten (10) feet of pole length or as directed by the DISTRICT'S Engineer. Raking shall not be accomplished by pulling guys.
2. Poles shall be handled with care to prevent damage to the wood or the preservative treatment. Cant hooks, peaveys or pole tongs shall not be used in the butt area to three (3) feet above the groundline.
3. Setting depths and framing of poles shall be according to the DISTRICT'S Contract Drawings/Documents and DISTRICT Standards.
4. All poles shall be properly aligned within the tolerances specified above, both before and after stringing and clipping-in or tying-in the conductor.
5. All drilled holes and all cuts exposing untreated wood shall be treated generously with applications of DISTRICT-approved preservative, and unused holes in the pole shall be tightly plugged with treated wood plugs. The DISTRICT-approved treatment and wood plugs shall be furnished by the DISTRICT.
6. Straightening existing poles shall be done by methods acceptable to the DISTRICT. Generally, poles shall be straightened by excavating around the butt, then re-tamping with select backfill.
7. The CONTRACTOR shall identify each pole with permanent metal letters and numbers (supplied by the DISTRICT). This shall be completed in accordance with the Contract Drawings/Documents and DISTRICT Construction Standard No. 4-5-1.0.

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8. The CONTRACTOR shall manage all waste poles and crossarms and all returnable poles and crossarms in accordance with Section 3.0.

13.0 CONCRETE FOUNDATION CONSTRUCTION

1. General:

This section establishes the requirements for concrete foundation construction. The work includes excavations, concrete requirements, reinforcing steel, anchor bolts, concrete placement, testing, curing and protection as well as labor, transportation and other means required to construct the concrete piers for the Project in strict accordance with the Contract Drawings/Documents.

2. Concrete Material Specification:

- a) Ready-Mixed Concrete: Ready-mixed concrete shall conform to ASTM C 94, Standard Specification for Ready-Mixed Concrete.
- b) Cement: Portland Cement shall conform to the Standard Specifications for Portland Cement, ASTM C 150, Type I.
- c) Fly ash shall conform to the requirements of pozzolan Class C or Class F of ASTM C 618 except that the maximum loss on ignition for Class F pozzolan shall be six (6) percent. Additionally, both Class C and Class F pozzolan shall have a maximum allowable free carbon content not to exceed three (3) percent as determined by ASTM E 30. Either class of fly ash shall not contain more than one and one-half (1.5) percent of available alkalis as Na₂O. Fly ash shall be protected, stored, handled, and sampled in the same manner as described above for Portland Cement.
- d) Aggregate: Fine and coarse aggregates shall conform to the Specifications for Concrete Aggregates, ASTM C 33. The nominal maximum size for concrete aggregate shall be three-fourths (3/4) inch No. 67. Fine aggregate shall be crushed rock, sand-gravel, coarse sand or a mixture of these materials.
- e) Admixture: Chemical compounds shall be used as an admixture to entrain air, control plastic shrinkage and improve workability of the concrete as discharged from the mixer. The admixtures shall contain no chlorides, fluorides or nitrates and shall be formulated by the Manufacturer for the job area and weather conditions to control setting time. Admixtures shall conform to ASTM Specifications C 260 and C 494. Water Reducing and Retarding Admixtures, if approved

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by the DISTRICT, shall conform to ASTM C 494, Type A or D, except that calcium chloride shall not be used.

- f) Water: Water shall be clean, potable and free from injurious amounts of oil, acids, salts, alkalis or organic materials. Mixing water that contains more than one-quarter (0.25) percent total solids by weight shall not be used.
 - g) Curing Compound: As specified by or meeting ASTM standards.
 - h) Polyethylene Film: White in color and four (4) mils thick.
3. Concrete Mix Design:
- a) All concrete mix designs shall be air-entrained concrete consisting of aggregate, Portland Cement, water, and approved admixtures, and, to the extent approved by the Project Engineer, fly ash.
 - b) The concrete mix design(s) for each batch plant shall be submitted to the Project Leader, for approval, two (2) weeks prior to the placement of concrete of that mix design. The concrete mix design shall include admixtures, aggregate gradations and certified reports of material tests on which the design is based. All admixtures including air-entraining admixtures shall be approved by the DISTRICT prior to use.
 - c) The concrete shall develop a minimum compressive strength of 3,500 psi at twenty (28) days.
 - d) The concrete shall have a maximum water to cement ratio of forty-seven-one hundredths (0.47).
 - e) The concrete shall have a slump of four (4) inches to six (6) inches. Concrete to be placed under water or slurry, shall have slump of seven (7) inches to nine (9) inches.
 - f) The concrete shall have between three (3) percent and five (5) percent air entrainment by volume.
 - g) The concrete mix shall be designed to allow adding one (1) gallon of water per cubic yard at the job site without reducing the strength below the specified level. In no case, however, shall the total amount of water added to the mix at the batch plant be less than the amount included in the mix design, minus one (1) gallon per cubic yard. This one (1) gallon per cubic yard is reserved for adjustment of the slump

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at the job site.

4. Reinforcing Steel:

- a) Steel Reinforcing bars shall be placed in the concrete as shown on the Contract Drawings. Measurements made in placing the bars shall be to the centerlines of the bars unless otherwise shown on the Drawings or directed by the DISTRICT.
- b) Before the reinforcing bars are placed, the surfaces of the bars and the surfaces of any metal bar supports shall be cleaned of heavy, flaky rust loose mill scale, dirt, grease or other foreign substances. After being placed, the reinforcing bars shall be maintained in a clean condition until they are completely embedded in the concrete.
- c) Reinforcing bars shall be accurately placed and secured in position so that they will not be displaced during the placing of the concrete, and special care shall be exercised to prevent any disturbance of the reinforcing bars in concrete that has already been placed. Precast concrete blocks may be used for supporting reinforcing bars.
- d) Lateral ties shall be secured to anchor bolts or vertical reinforcing with wire ties. Welded connections shall not be allowed.

5. Anchor Bolts:

- a) Anchor bolts will be galvanized as shown on the Contract Drawings, complete with three (3) galvanized nuts per bolt. Anchor bolts will be caged and tagged with the part numbers assigned on the Contract Drawings.
- b) Top and bottom anchor bolt templates will be supplied for each foundation.
- c) Anchor bolts shall be accurately positioned. It shall be the CONTRACTOR'S responsibility to accurately set the bolts initially and to maintain the required position until after the concrete has set. It shall be the CONTRACTOR'S responsibility to supply all necessary supporting and bracing materials.
- d) Prior to setting, the threads on the upper end of each anchor bolt shall be protected to prevent the adherence of concrete. When installed, the bolts shall be clean and the portions to be embedded in concrete shall be free of oil and other detrimental substances which would adversely affect the bond between the bolts and concrete. Anchor bolts shall be in position and at the specified

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projection height prior to the pouring of concrete.

- e) Deviations from specified positions of anchor bolts after concrete has set shall not exceed the following:
 - i. Elevation of the top of the lowest anchor bolt in a set shall not be less than specified, and that of the highest bolt shall not exceed the specified elevation by more than one-fourth (1/4) inch.
 - ii. The alignment of the top template shall not deviate from the bisector and the line perpendicular to the bisector by more than one-fourth (1/4) inch when measured at the alignment marks (V-notches and drilled holes).
 - iii. With the foundation completed, the anchor bolts at each foundation shall not deviate more than one-half (1/2) inch from its specified position on the foundation.
 - iv. Anchor bolts shall be located in the excavation such that the minimum distance from any anchor bolt to the side of excavation is six (6) inches. Concrete shall not be placed until after the DISTRICT has approved the excavation and placement of the anchor bolts.
- f) Any foundation that does not satisfy the specified requirements for line and grade shall be rejected. No payment shall be made for any such defective work until the CONTRACTOR has completed, to the satisfaction of the DISTRICT, the necessary corrective work. The CONTRACTOR shall bear the full expense of all such corrective work.

6. Excavation and Site Work:

- a) Excavations shall be completed to the depths and dimensions indicated on the Contract Drawings. Disturbance of the surrounding natural terrain and vegetation at each structure site shall be minimized to the maximum extent possible.
- b) The CONTRACTOR shall perform all grading and earth moving necessary to prevent the accumulation of surface water in the excavation. All excavations are to be kept free of water until all foundations have been installed. BMP's shall be used to properly drain the water.
- c) The CONTRACTOR shall notify the DISTRICT should an obstruction be encountered which prohibits using normal techniques and tools,

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and shall proceed as directed by the DISTRICT.

- d) Foundation excavations, when unattended, shall be covered and properly barricaded to prevent injury to humans, livestock or wildlife. Excavations subject to caving shall be properly shored before allowing workmen to enter and shall all be in accordance with Section 6.5 above.
- e) The structure site shall be graded reasonably smooth. Structure sites shall be shaped to drain away from the foundations. The cost of such grading and shaping shall be incidental to the appropriate bid units. BMP's shall be used to properly drain any water from the project site as referenced in Section 6.1 of this Specification.
- f) The excavated materials shall be hauled away and disposed of by the CONTRACTOR at a location approved by the DISTRICT. Selection and procurement of sites for the disposal of waste materials, not used on the right-of-way in the vicinity of the structure site, shall be the responsibility of the CONTRACTOR subject to the approval of the DISTRICT.

7. Drilled Piers:

- a) Dry drilling is the required method of excavation. The excavation shall be completed in a continuous operation (except as otherwise provided below) and the concrete shall be placed without undue delay. To the extent the CONTRACTOR encounters rock or other obstructions which prevent the CONTRACTOR from completing the excavation in a continuous operation, the Project Leader shall be promptly notified and the excavation operation shall be halted until arrangements are made for appropriate special equipment and/or construction methods (including but not limited to casings, shoring, core drilling, jack hammering or slurry placement) necessary to complete the excavation. All such special equipment and methods shall be approved in advance, in writing by the Project Leader.
- b) If any such delays to the excavation operation will subject the excavation to caving, the CONTRACTOR, if directed by the DISTRICT, shall backfill the excavation until the DISTRICT approves the necessary special equipment and/or technique and authorizes the CONTRACTOR to proceed with the excavation.
- c) All costs associated with any such delay of excavation (including backfilling operations) will be at the sole cost of the CONTRACTOR and at no cost to the DISTRICT. However, the CONTRACTOR may request, in writing, an extension to the Time for Completion to the

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extent necessary to reflect such delay, in accordance with Section 8.3 of the Contract General Conditions. The written request shall include the type of obstruction, equipment and/or techniques required to complete excavation, and the time duration of the delay (in hours).

- d) The excavation shall be protected to prevent caving until the concrete has been placed.
 - i. The location and dimensions of the drilled piers shall be as exact as possible to the locations shown on the Contract Drawings. The maximum allowable tolerances shall be as follows:
 - ii. Maximum deviation of a single drilled pier from a location shown on the Contract Drawings shall not exceed two (2) inches in any direction.
 - iii. The tops of the drilled piers shall be at least ten (10) inches and not more than twenty (20) inches above ground grade unless directed otherwise by the DISTRICT.
 - iv. The elevation of the bottoms of the drilled piers shall not be less than as shown on the Contract Drawings.
 - v. Maximum deviation of the axis of the hole from the vertical shall be no more than one (1) inch in eight (8) feet.
 - vi. The variation in diameter of any drilled piers shall be from minus zero (-0) to plus six (+6) inches.
- e) Holes shall be drilled with drilling equipment that will produce the excavation shown on the Contract Drawings. Drill rigs which do not run true shall not be allowed.

8. Casing:

- a) Temporary casings may be used at locations where the soil will not stand without support or where, because of ground water conditions, sloughing of the sides of the excavation may seriously delay or endanger the satisfactory completion of excavation and placement of concrete.
- b) The DISTRICT'S authorized representative will observe the entire operation from excavation through placement of concrete and

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removal of casings.

- c) CONTRACTOR shall have available for immediate use on the job an ample supply of casing of each foundation size and shall provide additional amounts, if required, to ensure orderly progress of the excavation.
- d) Such metal casing may be in short pieces but with jointing devices of sufficient strength that assembled sections of casing may be pulled complete as concrete is placed or immediately thereafter. The casing shall also be of such strength and rigidity as to maintain the required excavation lines against the pressure of sloughing material from the sides of the excavation.
- e) All temporary casing shall be removed from piers as concrete is placed, or immediately thereafter, and in such a manner as to prevent sloughing material from dropping to the bottom of piers or falling on top of freshly placed concrete. A sufficient head of concrete shall be maintained to prevent intrusion of soil into or on top of fresh concrete. The CONTRACTOR shall notify the DISTRICT immediately if intrusion appears to occur.
- f) The vertical reinforcing steel will likely move from the set position during the casing extraction process. The final position of the vertical reinforcement shall not vary from the Contract Drawings by more than one (1) inch.
- g) The outside diameter of the casing shall not be less than the specified diameter of the drilled shaft. The length of the casing shall be sufficient to allow the construction of a good-quality shaft.

9. Concrete Placed By Tremie:

- a) Concrete may be placed in an excavated shaft which contains standing water by means of a tremie pipe, as set forth below.
- b) Concrete shall not be placed by tremie without the approval of the DISTRICT. The DISTRICT shall also approve the tremie procedure and equipment to be used. The DISTRICT shall observe the entire procedure from excavation through placement of concrete.
- c) Concrete placed by tremie shall be a 3500 psi mix with an additional ten (10) percent of cement added. The concrete shall also have a seven (7) inch to nine (9) inch slump. The slump shall be checked by the CONTRACTOR on each concrete truck prior to placement.

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- d) The tremie pipe shall be ten (10) inches in diameter unless otherwise stipulated by the DISTRICT. Sections of the tremie pipe shall be joined together in such a manner as to avoid leakage. The tremie pipe shall be supported in such a manner that it shall always be centered in the excavation. Use of aluminum tremie pipe shall not be permitted.
- e) Positive provision must be made on the tremie for a sealed bottom. The DISTRICT may, at its option, require the CONTRACTOR to establish to the satisfaction of the DISTRICT that the tremie is sealed and dry before the introduction of concrete. The DISTRICT may also, at its option, require the CONTRACTOR to establish to the satisfaction of the DISTRICT that the excavation is straight and true before placing the tremie.
- f) The tremie and tremie hopper shall be completely full of concrete at the start of placement and remain full during the entire placing operation. Once placement has started, the discharge end of the tremie shall remain completely sealed in the fresh concrete. The CONTRACTOR shall keep the flow of concrete continuous and the flow shall not be interrupted until placing of concrete is complete.
- g) If during the tremie operation, the surface of the concrete in the excavation is breached, the CONTRACTOR shall retrieve and seal the tremie. The bottom of the tremie shall then be placed fifteen (15) feet below the top of concrete and the tremie operation resumed.

10. Concrete Placed By Slurry Displacement:

- a) The slurry displacement method may be used at locations where the soil will not stand without support or where, because of ground water conditions, sloughing of the sides of piers may seriously delay or endanger the satisfactory completion of the excavation and placement of concrete.
- b) The slurry displacement method shall not be used without the prior, written approval of the DISTRICT. The DISTRICT shall also approve the slurring procedure. The DISTRICT shall observe the entire procedure from excavation through placement of concrete.
- c) Concrete placed by the slurry displacement method shall have a seven (7) inch to nine (9) inch slump. The slump shall be checked by the CONTRACTOR on each concrete truck prior to placement.
- d) Bentonite shall not be used to stabilize excavations.

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11. Bottom of Excavation:

- a) The CONTRACTOR shall clean the bottom of the excavation so that no more than twenty-five (25) percent of the bearing area is covered with a maximum of two (2) inches of loose, disturbed material.
- b) Immediately prior to the placement of concrete, the excavation shall be cleared of debris or other materials, including ice, clods and piles of loose earth. Water in the bottoms of excavations must be removed or absorbed, except for tremie concrete.

12. Forming:

- a) Forms shall conform to the shapes, lines and dimensions of the concrete as shown on the Contract Drawings/Documents. Forms shall be sufficiently strong to carry the dead weight of the concrete without undue deflection or bulging and sufficiently tight to prevent leakage of mortar. Forms shall be properly braced and tied together so as to maintain position and shape.

Forms shall not be disturbed until the concrete has hardened sufficiently to support any loads that may be imposed upon them.

- b) When stripping forms, metal wedges or tools shall not be used to pry panels loose. If wedging is necessary, it shall be done with wood wedges lightly rapped to break adhesion between the concrete and form.
- c) Any misshapen concrete resulting from form slippage shall be replaced at the CONTRACTOR'S expense.
- d) The bottom of the forms for drilled pier caps shall extend a minimum of six (6) inches below final grade, or as indicated on the Contract Drawings/Documents.
- e) Forms shall be treated with a non-staining release agent, such as form oil, to facilitate removal.

13. Mixing:

- a) Ready-mixed concrete shall conform to ASTM C 94. Mixing and delivery of the concrete shall conform to ASTM C 94, Part 10.
- b) All concrete shall be sufficiently mixed to ensure complete uniformity

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of the batch. The volume of the batch shall not exceed the Manufacturer's rating of the drum capacity. Rotating speed of the drum shall not exceed its rated speed.

- c) Concrete shall be mixed, delivered and discharged within one and one-half (1.5) hours from introduction of water to cement.
- d) The mixer shall be equipped with a water storage and measuring device which can be locked and also a suitable charging hopper.
- e) The contents of the drum shall be completely discharged before receiving materials for a new batch.
- f) Water in excess of the one (1) gallon per cubic yard allowed at the job site shall not be added to the mix after initial batching without the approval of the DISTRICT. Any concrete retained in the truck mixer long enough to require additional water to permit satisfactory placing shall be disposed of at the CONTRACTOR'S expense.
- g) Prior to discharging a batch of concrete into an excavation, the driver of the concrete truck shall deliver a copy of the ticket to the DISTRICT'S Inspector on site. Each ticket shall include:
 - i. The name of the concrete supplier and batch plant.
 - ii. The date and time batched, recorded by an electric time stamp.
 - iii. Pounds of cement, coarse aggregate and fine aggregate, gallons of water and ounces of admixtures.
 - iv. Cubic yards delivered.
 - v. Driver shall record the time of discharge at the excavation site.

14. Concrete Placement:

- a) Equipment required on site, prior to concrete placement, shall include a pump and two (2) vibrators in good working condition, hoppers and elephant trunks for directing the flow of concrete down the center of the excavation, and an ample supply of sacked cement for use in drying up the bottoms of the excavations.
- b) The concrete shall be conveyed from the mixer to the place of final deposit by methods that will prevent the separation loss of material.
- c) Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to handling or transporting.

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- d) The CONTRACTOR shall not place any concrete until the form work, excavation and embedded items are inspected by the DISTRICT. Concrete shall be placed only in the presence of the DISTRICT.
- e) Concrete shall be placed in the drilled piers within as soon as possible after excavation. Concrete shall be deposited continuously and as rapidly as possible until the unit being poured is complete. Construction joints shall not be allowed without the approval of the DISTRICT.
- f) No concrete shall be placed in standing or running water, without permission of the DISTRICT, following approval of a depositing method.
- g) Immediately prior to concrete placement, all metal surfaces against which concrete will be placed shall be free of any dried concrete, mud or other foreign matter.
- h) Surfaces against which new concrete will be placed, shall also be wetted with water immediately prior to placement.
- i) In order to prevent concrete from falling against the sides of the excavation, a trunk or tremie shall be used to transport concrete to the foundation bottom.
- j) Concrete requiring re-tempering shall be disposed of at the CONTRACTOR'S expense.
- k) Vibration shall not be allowed if slump is greater than six (6) inches. Rodding shall be allowed near pier cap forms to prevent honeycombing.

15. Finishing:

- a) Initial finishing shall be performed before bleed water can accumulate on the surface.
- b) No further finishing shall be performed until bleed water has evaporated.
- c) Smooth, solid concrete surfaces are required throughout the work. The top surface of the concrete foundation shall be finished to conform to the details shown on the Contract Drawings. A trowel finish on the concrete is required. Care shall be taken during troweling to prevent bringing excessive fine material to the surface. Top

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edges of concrete shall be finished neatly with an edging tool. Radius of curvature of tooled edges shall not be greater than one-fourth (1/4) inch. Finishing of concrete surfaces shall be performed only by appropriately trained and qualified workers.

- d) The top of piers shall be domed a maximum of one (1) inch to facilitate water drainage.
- e) All exposed concrete shall be properly cured for seven (7) days by the moist curing method using wetted burlap, Kraft paper or polyethylene sheets to prevent evaporation, or by spray application of a liquid membrane-forming compound conforming to ASTM C 309, Type 1. The membrane shall be applied according to the Manufacturer's recommendations. Surface defects shall be filled prior to application of membrane curing compound. All concrete surfaces on which curing compound has been applied shall be adequately protected, for the duration of the curing period, from any cause which would disrupt the continuity of the curing membrane. No curing compound shall be used on surfaces requiring subsequent bonding.
- f) After form removal, all fins, small projections or other irregularities shall be removed. Honeycombed areas shall be removed and patched with grout. The grout shall consist of one (1) part Portland Cement, one (1) part fine sand (passing a No. 30 sieve), and water sufficient to attain a creamy consistency. The area shall be dampened before grout is brushed on. Shallow patches shall be filled with stiff mortar and finished. Deep patches shall be of formed concrete, doveled to the hardened concrete as required by the DISTRICT.

16. Cold Weather Concreting:

- a) Concrete poured with ambient air temperature below forty (40) degrees Fahrenheit shall conform to the recommendations set forth in ACI Publication 306, Cold Weather Concreting. No concrete shall be placed against a frozen surface. Protection shall be provided as necessary to protect any portion of the above-ground or drilled excavation from freezing prior to concrete placement.

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- b) The temperature and duration chart for concrete is shown below:

<u>Ambient Temperature</u>	<u>Mix Temperature</u>	<u>Placed and Maintained</u>	<u>Temperature Duration</u>
Above 30 F	50 F	45 F	72 hrs.
0 to 30 F	55 F	45 F	72 hrs.
Below 0 F	60 F	45 F	72 hrs.

- c) Protection from freezing shall continue for five (5) days following the initial seventy-two (72) hour period. The CONTRACTOR shall monitor concrete temperatures and immediately report any discrepancy to the DISTRICT.
- d) Concrete temperatures shall be controlled by heating mix water and/or aggregate.
- e) Test cylinders shall be held in an insulated curing box at temperatures between sixty (60) degrees Fahrenheit and eighty (80) degrees Fahrenheit for a period of twenty-four (24) hours before being moved or transported. Molds shall be stripped after twenty-four (24) hours and the cylinders sealed in plastic wrap until delivered to the testing laboratory.
- f) Forms shall remain on concrete, whenever possible, to aid in heat retention.
- g) Indirect-fired heaters sufficiently vented may be used to maintain required placed-concrete temperatures. Rapid cooling, following heating, shall be prevented. Moisture must be provided during heating to allow proper curing.
- h) Insulation blankets or bats shall be used, as required to maintain the temperatures specified above.

17. Hot Weather Concreting:

- a) All concrete work completed when the ambient air temperature is above eight-five (85) degrees Fahrenheit (or forecasted to rise above this temperature within twenty-four (24) hours after concrete placement) shall be in conformance with the following:
- b) (24) hours after concrete placement) shall be in conformance with the following:
- c) Mixing water shall be kept cool.

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- d) Aggregate stockpiles shall be saturated and the surfaces kept moist by intermittent sprinkling or by a continuous fog spray.
- e) The basic water-cement ratio of the original concrete batch placed shall be maintained.
- f) Forms, reinforcing, and subgrades shall be wetted just before concrete is placed, including the areas immediately surrounding the work area.
- g) The temperature of the concrete when placed shall not exceed eighty-five (85) degrees Fahrenheit, except as provided below.
- h) When weather conditions require concrete to be placed with a temperature greater than eighty-five (85) degrees Fahrenheit, the CONTRACTOR shall submit to the DISTRICT a concrete mix design which allows high temperature placement. This high temperature concrete may include lasticizers and retarding admixtures to meet the concrete specification as described above. The CONTRACTOR shall secure the Project Engineer's approval of any changes in the standard mix design prior to use.

18. Testing and Logs:

Field tests of concrete being placed shall be conducted under the direction of the DISTRICT'S Inspector. The quality of the concrete being produced shall be judged by the compressive strength developed within a given period and by other tests as set forth below.

- a) The CONTRACTOR, under the direction of the DISTRICT'S Inspector, shall be required to sample a set of compressive test specimens, each set of concrete samples consisting of six (6) cylinders made and cured in accordance with ASTM C 31 and C 172. One set of compressive test specimens shall be made for each of the following cases which apply, excluding duplication of cases:
 - For each seventy-five (75) yards of concrete placed
 - Each structure location
 - Once each day
- b) Testing of the cylinders shall be provided by the CONTRACTOR through a qualified testing laboratory and the cost of testing shall be borne by the CONTRACTOR. The CONTRACTOR shall require the laboratory to send three (3) copies of the compressive test reports to the DISTRICT. Two (2)

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samples of each set of six (6) shall be tested at seven (7) days, and two (2) at twenty-eight (28) days, and two (2) extra samples shall be held for additional testing at forty-five (45) days in the event of a low value compressive test break.

- c) In cases where the strength of the test cylinder (cast by the CONTRACTOR) for any portion of the work falls below the requirements as set forth in the specification, the DISTRICT may require the CONTRACTOR to secure test specimens of the hardened concrete represented by such cylinder. Specimens shall be secured and tested in accordance with ASTM C 42. If the specimen test further substantiates that the concrete represented by the cylinders and specimens is below the strength requirements as set forth in this Specification, the DISTRICT may order such concrete removed and replaced at the expense of the CONTRACTOR.
- d) The CONTRACTOR shall also perform testing to determine the temperature (ASTM C 1064), slump (ASTM C 143) and air entrainment (ASTM C 231) in accordance with the referenced ASTM designations as set forth in this Specification. The CONTRACTOR shall complete these tests at the same time the test cylinders are cast. The CONTRACTOR shall furnish the concrete required to prepare test specimens and shall complete slump, temperature and air entrainment tests at the CONTRACTOR'S expense.
- e) The DISTRICT reserves the right to sample compressive test specimens (ASTM C 31 and C 172), and conduct temperature (ASTM C 1064), slump (ASTM C 143) and air entrainment (ASTM C 231) tests at any time for independent testing.

14.0 VIBRATORY CAISSONS

- 1. Vibratory caissons shall be installed at locations as shown on the Contract Drawings/Documents.
- 2. The CONTRACTOR shall submit to the DISTRICT for the DISTRICT'S approval, the installation procedures, schedule and proposed equipment to be used for installing the vibratory caissons. The CONTRACTOR shall obtain the DISTRICT'S approval for the installation procedures, schedule and equipment prior to installing any vibratory caissons. The DISTRICT shall observe the installation of all vibratory caissons.
- 3. The location and dimensions of the vibratory caissons shall be as exact as possible to the locations shown on the Contract Drawings/Documents. The maximum allowable tolerances shall be as follows:
 - a. Maximum deviation of a single vibratory caisson from the location

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shown on the Contract Drawings/Documents shall not exceed four (4) inches.

- b. The tops of the vibratory caissons shall be at least ten (10) inches and not more than fourteen (14) inches above ground grade, unless authorized by the DISTRICT.
 - c. Maximum deviation of the axis of the steel caisson from the vertical shall be no more than one (1) inch in twelve (12) feet.
4. Vibratory caissons shall be driven to depth in one continuous operation. If a vibratory caisson meets refusal before reaching the final depth, the CONTRACTOR shall remove the caisson and drill a pilot hole to facilitate installation to the final depth.

15.0 STEEL POLE STRUCTURE INSTALLATION

1. General:

- a. The installation and erection of the structures shall be in accordance with the Contract Drawings/Documents and the manufacturer's drawings, specifications and instructions provided by the DISTRICT.
- b. The term "structures" in this section of the Specification shall mean tubular steel pole structures.
- c. All work shall be done in a neat and workmanlike manner. Special care shall be taken to ensure that all crossarms, braces, fittings, hardware and other fixed metalwork are installed in their correct positions. Structures shall be placed accurately and in the correct position of alignment and grade.
- d. The DISTRICT shall inspect each structure, and all deficiencies noted shall be corrected by the CONTRACTOR prior to conductor, messenger wire and fiber optic wire installation.
- e. Setting depths and framing of poles shall be according to the DISTRICT'S Contract Drawings/Documents and Standards.

2. Tubular Steel Poles:

- a. Installation will consist of all equipment and structures and/or other structural items required for a complete facility as shown on the Contract Drawings/Documents. The CONTRACTOR shall assemble and install the structures in accordance with the manufacturer's "Assembly and Erection Information", the Contract

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Drawings/Documents and Standards, the procedures set forth below, and other applicable provisions of this Specification.

b. Structure Assembly:

- i. The structures may be assembled on the ground and erected as a complete unit. The sections of the pole should be aligned on the ground and supported, typically with wood blocks, in such a manner that they will readily fit together. Care shall be taken to prevent dirt, stones, etc. from getting trapped between the mating surfaces.
- ii. As an alternative, structures may be assembled in the air.
- iii. All steel shall be handled with care to avoid damage to galvanizing and paint or distortion of pole sections, arms and bracing. Slings for picking up structures shall be of such material or protected in such a manner as to avoid cutting or damaging the sections, arms or bracing, or their finishes.

The CONTRACTOR shall utilize lifting attachments where provided on the structures.

- iv. The CONTRACTOR shall be responsible for any damage caused during assembly of the pole sections, whether assembly takes place on the ground or in the air.

c. Structure Erection:

- i. No steel pole erection shall be permitted until the DISTRICT has reviewed and approved the CONTRACTOR'S steel pole erection methods at least one (1) week prior to installation.
- ii. All temporary bracing, guys and bolts as may be necessary to assure the safety of the structures until permanent connections have been made shall be provided by the CONTRACTOR. Structures shall be bolted up as erection progresses to withstand all design wind and dead loads and erection stresses.
- iii. The structure must be attached to the crane:
 - a) Above the center of gravity of the entire assembly including the weight of all equipment mounted on the structure before erection.
 - b) By the main pole member(s).
 - c) As high as possible since higher attachment will result in

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more nearly vertical alignment of the assembly while suspended above the foundations.

- d) Care shall be taken to operate the crane smoothly and to minimize impact loads which could damage some portion of the assembly. Any damaged pole section, arm or bracing shall be promptly refinished or replaced by the CONTRACTOR at the CONTRACTOR'S expense.
- e) Structures with baseplate and anchor bolts shall be set with the baseplate level to within one-tenth (0.1) inch.
- f) Directly embedded structures shall be placed in the excavated holes and held plumb and at the proper elevation until concrete has been placed and cured. Prior to being placed in the hole, the portion to be embedded shall be thoroughly inspected for any damage to the protective coating. Any damaged areas shall be repaired by the CONTRACTOR and approved by the DISTRICT'S Inspector prior to the pole stub being placed in the hole.
- g) No loads from conductor or equipment shall be imposed on the structure for at least three (3) days after concrete is placed.
- h) Structures shall not be erected on concrete piers until seven (7) days after the concrete has been poured and the compressive strength of the concrete has reached 3,000 psi unless approved by the DISTRICT'S Project Engineer. Wire shall not be strung on the structures until thirty (30) days after concrete has been poured and the compressive strength of the concrete has reached 3,500 psi unless approved by the DISTRICT'S Project Engineer.
- i) The CONTRACTOR shall erect all tangent steel pole structures plumb and the crossarms level. The structures will be considered plumb and level if the vertical axis through the center of the structure (centerline) is not out of plumb more than one-half (1/2) inch for every forty (40) feet of height. All angle and dead-end steel pole structures shall be raked in accordance to pole manufacturer's instruction furnished by the DISTRICT. All temporary braces and guys necessary for erection and plumbing shall be furnished by the CONTRACTOR. Any work involving erection of poles which is not in accordance with this Specification shall be promptly corrected by the CONTRACTOR at no additional

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cost to the DISTRICT.

- j) The CONTRACTOR shall identify each pole with permanent painted letters and numbers. This shall be completed in accordance with the construction data sheets located on the Contract Drawings/Documents, and DISTRICT Construction Standard No. 4-5-1.0.

d. Structure Slip Joint Assembly:

The CONTRACTOR shall follow the pole manufacturer's instructions, as furnished by the DISTRICT, for joining slip jointed pole sections. Permanent match marks shall be provided on the pole sections by the pole manufacturer to indicate when the joint is properly aligned and mated. All structures with slip joints shall be jacked together by a jacking device that shall conform to the specification of the pole manufacturer and approved by the DISTRICT. The jacking device shall be provided by the CONTRACTOR.

e. Structure Bolted Joints:

- i. No loads from conductors, or equipment shall be imposed on the structures until all bolts have been properly tightened.
- ii. Multiple-bolt, moment connections (e.g. arm-to-pole connections, flange connections): These bolts shall be tightened in accordance with all applicable AISC and manufacturer's guidelines.
- iii. Single-bolt, pinned connections (e.g. swing brackets, cross-bracing, pinned crossarms): These bolts shall be tightened until the bolt head and nut are snug against the outer plates and the nut locking device is fully engaged. All plates do not need to be in contact.
- iv. Cantilever arms: Before tightening the arm attachment bolts, the arm shall be rotated toward the base of the structure to the extent necessary to remove all play in the connection. While tightening the bolts, care shall be taken to ensure that the arms all remain in the same place.
- v. Anchor bolts: After leveling the baseplate, all nuts on the top side of the baseplate shall be brought to a "snug tight" condition, then the nuts on the bottom side of the baseplate shall be brought to a "snug tight" condition and checked to make sure that they are bearing completely against the baseplate. The bottom nuts under the baseplate shall be

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tightened. Final tightening of the nuts shall proceed per the "turn of the nut" method. "Snug tight" and "turn of the nut" shall be as defined in the applicable AISC standards.

- vi. Connection or erection bolts will be seated to the head and installed with nuts to the outside of the member.
 - vii. The structural nuts will be locked into place with split type lockwashers and tightened to recommended torque values per bolt diameter and material, as set forth in the applicable AISC standards.
 - viii. Beveled washers will be used on sloping or beveled surfaces where required to provide a proper fit.
 - ix. Only wrenches approved by the DISTRICT will be used on the work, and the use of any wrench, which may deform the nut, will not be permitted.
 - x. All structural metals will be handled with care to avoid bending or damaging. Pieces bent in handling may be used only if they are straightened in accordance with procedures set forth by the Manufacturer and are approved by the DISTRICT.
 - xi. All structures will be assembled, aligned and all bolts tightened and/or torqued as required by applicable standards set forth in the AISC Code of Standard Practice. After final tightening and before any attachment is made to the structures, the alignment will be checked by the Inspector and corrected if necessary.
- f. Field welds shall not be made unless authorized by the DISTRICT and if deemed necessary, shall be performed by a welder approved by the DISTRICT. Field welds shall be completed to the Manufacturer's Specifications.
- g. All field drilled holes and all exposed galvanized steel shall be treated with galvanizing compound and touch-up paint approved by the DISTRICT. The DISTRICT-approved compound shall be furnished by the CONTRACTOR. The touch-up paint shall be furnished by the DISTRICT.

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16.0 FIBER-OPTIC CABLE

1. General:

- a. All fiber will be strung according to DISTRICT standards and in accordance with the fiber stringing tables. Fiber stringing tables will be provided by the DISTRICT at the Pre-construction Meeting. Special stringing tables will be provided on the construction drawings when required. Any modifications to these specifications need to be approved by the DISTRICT prior to construction.
- b. The CONTRACTOR shall install the Fiber-Optic cable according to the applicable safety rules and practices of the DISTRICT, the State of Washington, and the National Electrical Safety Code. During installation the cable shall not be permitted to contact the ground or any object which may damage it. Stringing shall be by the tension method, applied so that the cable will be installed without damage.
- c. The CONTRACTOR is responsible for observing the fiber optic cable as it is being strung. Should the CONTRACTOR become aware of any damage to the fiber cable or fiber cable jacket during any aspect of stringing or pulling the CONTRACTOR will immediately cease the stringing or pulling operation, note the location of the damage and notify the DISTRICT.
- d. Fiber cable splicers need to be certified per the Electronics Technicians Association (ETA) or equivalent and have a minimum of three (3) years' experience splicing and terminating outdoor ADSS fiber optic cables.
- e. Underground Fiber Optic Cable shall be installed with a locatable tape or line.

2. Testing:

- a. The CONTRACTOR shall test all fiber spools upon receipt at the DISTRICT warehouse before transporting the cable to the CONTRACTOR's warehouse. Test shall be made using an Optical Time Domain Reflectometer (OTDR). The maximum attenuation allowed is 0.35 dB/km @ 1310 nm or 0.25 dB/km @ 1550 nm. Once verified that the fiber meets this performance standard it shall be the CONTRACTORS responsibility to protect the fiber from any damage. All costs associated with said testing shall be at the CONTRACTOR'S expense.
- b. Once the fiber is strung and all splices have been made the CONTRACTOR must ensure that all fibers can be accessed for testing

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at the beginning and end of the test section, usually the substation and/or DISTRICT offices with Fiber Distribution panels with ST Connections on each end. End to End loss testing and OTDR tests each direction will be performed on the test section.

- c. The maximum attenuation allowed is 0.35 dB/km @ 1310 nm or 0.25 dB/km @ 1550 nm plus 0.5 dB for each connector plus 0.1 dB for each splice. The fiber section's maximum link loss can be calculated as follows:

Maximum Link Loss = (fiber length (km) x fiber attenuation per km)
+ (0.5 dB x # connectors) + (0.1 dB x # splices)

- d. Hard copies of these tests will be provided to the DISTRICT. Two (2) days prior to any testing, notification will be made to the DISTRICT to allow for DISTRICT review of the actual testing of the fiber.

17.0 EXISTING DISTRIBUTION AND TRANSMISSION SYSTEM

1. All work done on the DISTRICT'S system shall be completed without power outages to customers, whenever possible.
2. If it becomes necessary to schedule an outage, outage time shall be kept to a minimum and advance approval from the DISTRICT'S authorized representative shall be obtained; for 115kV outage, at least fifteen (15) working days prior and for 12.5kV outage, at least forty-eight (48) hours prior to such outage.
3. Upon approval, the CONTRACTOR shall give proper notice to the DISTRICT'S customers, as specified by the DISTRICT.
4. The outage and associated work may be required to be performed on a weekend or as night work to minimize impacts to the customer.
5. Residential outages longer than two (2) hours in length shall not be scheduled when the ambient temperature falls below 36°F or the temperature will be above 98°F unless the DISTRICT waives the requirement.

18.0 CONTRACTOR RESPONSIBILITIES

1. At the award of this Contract, the CONTRACTOR shall obtain from the DISTRICT one (1) copy of the DISTRICT'S current Construction Standards. All work shall be done in a workman-like manner and be performed in accordance with such Standards and this Specification. Additional copies of the current Construction Standards can be obtained at a cost of \$50.00 per set.

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2. Two (2) copies of all Contract Documents will be provided by Contracts and Purchasing (DISTRICT) to the CONTRACTOR. It shall be the duty of the CONTRACTOR to immediately bring to the attention of the DISTRICT any omissions, inconsistencies or conflicts in any drawing, the DISTRICT'S Construction Standards, and/or in this Specification.
3. The CONTRACTOR shall, during the progress of the Contract, employ and assign a competent Project Manager, Crew Foreman, Superintendent and General Foreman and (see 1.0 Definitions) along with any necessary assistants to the Project. The aforementioned personnel shall represent the CONTRACTOR for the Project. All communications given the aforementioned personnel shall be as binding as if given to the CONTRACTOR. The CONTRACTOR's Superintendent shall not be employed on any other project during the course of the Work unless approved by the DISTRICT.
4. Identification of Project Management Personnel: The CONTRACTOR shall inform the DISTRICT in writing of the name, authority, business address and telephone number of all project management personnel. Said personnel shall not be changed without the written consent of the DISTRICT, unless the Project Manager, Superintendent, General Foreman or Crew Foreman ceases to be employed by the CONTRACTOR. In such case, the CONTRACTOR shall notify the DISTRICT and propose an alternate qualified individual deemed acceptable to the DISTRICT.
5. The CONTRACTOR shall, if requested to do so by the DISTRICT and without increase to the Contract Amount or Contract Time, remove any Project Manager, Superintendent, General Foreman/Crew Foreman or other assistant or employee whom the DISTRICT believes to be incompetent, dishonest, careless, negligent, uncooperative or unsatisfactory. Failure to comply with such request shall be sufficient grounds for termination of the Contract for cause.
6. Authorized Site Representation: At all times during the progress of the Contract, the superintendent shall be available to the Project Leader or present at the Project site, or be duly represented by someone with the experience and knowledge to act in the superintendent's stead. The superintendent shall have authority to make binding and enforceable decisions in the name of the CONTRACTOR. All requirements, instructions and other communications given to the superintendent or the superintendent's site representative by the DISTRICT shall be binding as if given to the CONTRACTOR, and shall be confirmed in writing upon the CONTRACTOR's request.
7. If there are two or more crews doing electrical line work, The CONTRACTOR shall, during the progress of the pre-qualified line work, have a qualified

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journeyman lineman acting as General Foreman having journeyman status for a minimum of five years. This applies to any work being done under the A. "Overhead Line Construction (12kV and 115kV) and B. "Underground Line Construction (12kV and 115kV)". The General Foreman is expected to be on site for all planning, switching and present at all meetings.

8. If there is only one (1) crew doing electrical line work, the CONTRACTOR shall have a qualified journeyman lineman acting as General Foreman having journeyman status for a minimum of five (5) years, on site for all planning, switching and present at all meetings.
9. Prior to any work beginning, the CONTRACTOR shall provide the District the name, phone number and brief resume of the General Foreman. The resume should include, but not be limited to, the following:
 - Number of years the employee has been journeyman lineman
 - Time working for the CONTRACTOR
 - List of recent projects and employee's role in project
10. The CONTRACTOR shall at all times provide the following minimum crew structure in accordance with District line crew composition guidelines:

"A" CREW – FOUR PERSON CREW	
CREW	1 – Foreman 2 – Lineman 1 – Equipment Operator or Lineman
ALLOWED WORK	#1 All related transmission and distribution line work #2 Respond to all overhead call outs

"B" CREW – THREE PERSON CREW WITH APPRENTICE OR HELPER OR EQUIPMENT OPERATOR	
CREW	1 – Foreman 1 – Lineman 1 – Lineman or Equipment Operator or Hot Apprentice or Line Helper (upgraded) 1 – Apprentice Lineman or Line Helper or Equipment Operator

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ALLOWED WORK	All items #1 through #10 same as “C” Crew, in addition: #1 Hang single phase transformers in energized three phase*** #2 Dead-end and energize three phase laterals off energized three phase** (2 Lineman or 1 Lineman and 1 Hot Apprentice) #3 Pole setting and transferring in energized three phase, three phase bucks or corners*** (2 Lineman or 1 Lineman and 1 Hot Apprentice) #4 Work three phase transformer banks and three phase line apparatus, including installation and removal*** (2 Lineman or 1 Lineman and 1 Hot Apprentice) #5 De-energize and ground in accordance with District Safety policy/State Law** NOTE: Shall not have two (2) Apprentices on same crew
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Note: A Hot Apprentice is an apprentice in their 5th, 6th or 7th step.
References refer to “A”, “B”, “C” and “D” Crew classifications:

* Requires boom truck for transformers

** Requires manlift for work in the primary zone (2-foot area, WAC 296-45-65027-Table 14)

*** Requires both boom truck and manlift

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"C" CREW – THREE PERSON CREW	
CREW	1 – Foreman 1 – Lineman 1 – Lineman or Equipment Operator or Hot Apprentice or Line Helper (upgraded)
ALLOWED WORK	#1 Hang and install transformers in energized one, two and three phase*** #2 Dead-end and de-energized single phase laterals and energize; in energized three phase** #3 De-energize and ground in accordance with District Safety policy/State law** #4 All related secondary work #5 All underground work with the exception: 1 additional crew member (minimum of 4) for wire pulls in or out of hot vaults #6 Line cover in energized three phase** #7 Line cut-outs in energized three phase** #8 Respond to underground primary callouts (1 Foreman and 2 Linemen) #9 All underground secondary call outs #10 Distribution line maintenance within scope of "C" and "D" Crew as described herein NOTE: If a 4 th person is necessary for underground primary callout, an Equipment Operator or upgraded Line Helper will be called

Note: A Hot Apprentice is an apprentice in their 5th, 6th or 7th step.
References refer to "A", "B", "C" and "D" Crew classifications:

* Requires boom truck for transformers

** Requires manlift for work in the primary zone (2-foot area, WAC 296-45-65027-Table 14)

*** Requires both boom truck and manlift

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"D" CREW – TWO PERSON CREW	
CREW	1 – Journeyman-In-Charge or Foreman 1 – Lineman or Apprentice or Equipment Operator or Line Helper
ALLOWED WORK	#1 Dig and install conduit in trench (with Equipment Operator or upgraded Line Helper) #2 Install underground services #3 Install and make up terminations in single-phase de-energized padmount transformers and vaults* (New construction only) #4 Switch underground elbows in plats (2 Lineman) #5 Make up terminations in de-energized switchcabinets and transformers (2 Lineman) Note: It is assumed the cables are installed and racked in the switchcabinet vault – no vault entry #6 Installation, removal and repair of service poles, meter poles and streetlight poles up to a maximum of 35'* #7 De-energize and ground in accordance with District Safety policy/State Law** (2 Linemen) (no work to be performed) #8 Install secondary risers on poles (requires manlift)** #9 All related secondary work in accordance with District Safety policy/State Law #10 Respond to underground secondary callouts that do not require a backhoe (Foreman and Lineman) #11 Line cover in energized three-phase** (2 Linemen) (no work to be performed) NOTES: ▪ If a 3rd person is necessary for underground secondary callout, an Equipment Operator or upgraded Line Helper will be called

Note: A Hot Apprentice is an apprentice in their 5th, 6th or 7th step.
References refer to "A", "B", "C" and "D" Crew classifications:

* Requires boom truck for transformers

** Requires manlift for work in the primary zone (2-foot area, WAC 296-45-65027-Table 14)

*** Requires both boom truck and manlift

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11. The CONTRACTOR shall schedule a Pre-Construction meeting with all interested parties within ten (10) calendar days of written notification of the award of the Contract, unless otherwise specified by the DISTRICT, for the purpose of coordinating scheduling, reviewing work responsibilities and discussing any other items of significance that could affect the progress of the work. For purposes of this paragraph, "interested parties" shall include the following to the extent applicable to this project: the CONTRACTOR'S General Foreman or Crew Foreman, or other equivalent personnel with responsibility for supervising the work; any subcontractors; the DISTRICT'S Project Leader or designated representative; the developer; representatives of any affected utilities; representatives of any state or local governmental subdivisions or agencies having jurisdiction over any portion of the work, including a Tulalip Tribes' TERO (Tribal Employment Rights Office) representative if any portion of the work will be performed on the Tulalip Indian Reservation; and any other parties specifically designated by the DISTRICT'S Project Leader. CONTRACTOR shall thoroughly brief the new Crew Foreman on the status and progress of the work.
12. The CONTRACTOR shall be responsible for all damage and injury caused by the CONTRACTOR'S employees, agents or subcontractors to persons or property during the course of the work including, but not limited to, roads, lawns, landscaping, agricultural crops, and animals, and the DISTRICT shall have no responsibility or liability therefore or in connection therewith. Any damage to roads or other property must be corrected and the property restored to its original condition by the CONTRACTOR at the CONTRACTOR'S expense.
13. It is understood that any information concerning utilities or obstructions given to the CONTRACTOR by the DISTRICT, and/or shown on the Contract Drawings/Documents, is made available to the CONTRACTOR for informational purposes only and is not represented or warranted by the DISTRICT to be complete or accurate. Any incompleteness or error in such information shall not be cause for any claim for extra payment under this Contract. Prior to bidding, the CONTRACTOR shall visit the construction site to acquire knowledge and familiarize itself with reasonably available information relative to construction conditions.
14. At least 48 hours before doing any excavation, the CONTRACTOR shall contact Dial Dig (811) to determine the location of underground facilities. In addition, the CONTRACTOR shall locate and contact any utility which may not subscribe to Dial Dig and which may have facilities in the area of the trench. The CONTRACTOR shall be responsible for, and shall repair at its sole cost and expense, any and all damage to other utility facilities (sewer clean outs, water services TV cable, telephone cable, gas lines, etc.) caused by, resulting from or arising out of the acts or omissions of the CONTRACTOR or any subcontractor. The CONTRACTOR shall meet the

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requirements of the DISTRICT'S Construction Standards, Specifications, and other Contract Drawings/Documents in maintaining proper clearances between the DISTRICT'S electrical facilities and other utilities.

15. The DISTRICT has secured easements or permits (unless otherwise noted in the Special Provisions) over all portions of the right-of-way affected in connection with the work under this Contract, and for ingress and egress over adjacent lands. However, it shall be the CONTRACTOR'S responsibility to make any other necessary and appropriate arrangements with affected property owners in connection with the work including, but not limited to, access to property for construction work, property restoration, and scheduling of outages. The DISTRICT will mark the boundaries of the construction easements, if requested by the CONTRACTOR, but the DISTRICT makes no representation or warranty that any such boundary marking will remain in place.
16. The CONTRACTOR shall leave streets, roads, driveways and private property in a condition acceptable to the city or county engineer, property owners, and the DISTRICT, as appropriate, upon completion of the work. The CONTRACTOR shall be responsible for the removal and proper disposal of construction spoils and all other waste generated as part of the project.
17. It shall be the responsibility of the CONTRACTOR to coordinate the CONTRACTOR'S work with the work of all public agencies and private companies in the area. The CONTRACTOR shall coordinate its work with the local agency inspector having jurisdiction in the area, the local fire and school district, and any cities involved whenever the CONTRACTOR blocks a public road.
18. The CONTRACTOR shall be solely responsible for coordinating its work with other utilities and CATV companies; provided, however, that all conflicts shall be resolved to the satisfaction of the DISTRICT at no additional cost to the DISTRICT.
19. The CONTRACTOR shall be responsible for providing a secure location for holding all material and equipment received from the DISTRICT or removed from the assigned project until installation or return to the DISTRICT. If multiple job orders are involved, materials shall be stored and labeled by work orders to prevent mix up and confusion. The CONTRACTOR shall provide covered storage for all materials issued in cardboard boxes, and secured building storage for all copper materials issued. The CONTRACTOR will be required to re-box materials (issued in cardboard boxes) that are returned with their boxes having been destroyed from improper storage or handling. Removed or unused material must be

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returned to the DISTRICT warehouse under the Work Order and Task Number specified on the Contract Drawings/Documents.

20. The CONTRACTOR shall provide flag personnel and traffic control in accordance with all applicable local, county and state regulations. Provisions shall be made for appropriate clearance for emergency vehicles. Costs of this traffic control shall be considered incidental and shall be included within the Contract price.
21. It shall be the CONTRACTOR'S responsibility to coordinate work with DISTRICT tree trimming or clearing contractors that may be working in the area. To the extent such coordination results in an unavoidable delay or work interruption to the CONTRACTOR, the DISTRICT may in its sole discretion adjust the Contract completion date pursuant to Section 8.3.2 of the Contract General Conditions, provided, however, in no event shall the CONTRACTOR receive extra costs under this Contract due to delays resulting from such coordination.
22. The CONTRACTOR shall observe all holidays recognized by the DISTRICT.
23. Unless otherwise specified by the DISTRICT, the work schedule under this Contract shall be based on the CONTRACTOR working either eight (8) hours per day, five (5) days per week except holidays observed by the DISTRICT or ten (10) hours per day, four (4) days per week except holidays observed by the DISTRICT. The CONTRACTOR'S working hours shall be between 8:00 a.m. and 4:30 p.m. Monday through Friday, excluding DISTRICT holidays, or between 7:00 a.m. and 5:30 p.m. Monday through Thursday, excluding DISTRICT holidays, **unless prior approval of a variance therefrom is obtained from the Project Leader.**
24. When the CONTRACTOR is requesting hours that are not within the DISTRICT'S "normal working hours", the CONTRACTOR shall be charged for the additional expenses incurred by the DISTRICT to support the request. The CONTRACTOR shall not be charged for the additional expenses incurred by the DISTRICT when the DISTRICT requires the CONTRACTOR to work other than the standard work hours.
25. The Tulalip Tribes of Washington has informed the DISTRICT that a Tribal Employment Rights Ordinance provides, in part, that every employer performing work on the Tulalip Tribes Reservation must:
 - a. Consult with the Tribal Employment Rights Office (TERO) Commission about meeting obligations under the Ordinance before commencing work;
 - b. Give preference to tribal members in hiring, promotion, training and

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all other aspects of employment, contracting or subcontracting;

- c. Give preference in the award of contracts or subcontracts to Tribally-owned business; and
 - d. File any collective bargaining agreements which the employer has with a union representing employees to establish that the unions will grant a preference to tribal members in job referrals and will establish training programs.
 - e. With respect to each project/contract or subcontract of \$10,000.00 or more, pay a TERO tax equal to 1.75% of the total project/contract cost (i.e., equipment, labor, materials and operations), including any increase thereof.
 - f. In the event that the CONTRACTOR will be performing work on the Tulalip Tribes Reservation, the CONTRACTOR shall independently determine whether the Tulalip Tribes of Washington have any rules, regulations or requirements, including those set forth above and, specifically, the imposition of a TERO tax, the correct amount of any such tax, any applicable increases in such tax due to change orders, and any applicable interest or penalty amounts. The CONTRACTOR shall independently determine the validity of any such rules, regulations or requirements and the effect upon the CONTRACTOR'S performance if the Tulalip Tribes enforce, or attempt to enforce in any way, any such rules, regulations or requirements.
 - g. The DISTRICT makes no representation as to the existence of any such rules, regulations or requirements other than as set forth above, nor as to the validity or enforceability thereof.
26. In the event that any artifacts, historical or cultural features are uncovered during construction, it shall be the CONTRACTOR'S responsibility to immediately stop work and notify the Project Lead. The Project Lead will notify and coordinate with the appropriate authority in Snohomish County, State of Washington, Tribal Authorities, Federal Agencies and the DISTRICT. The CONTRACTOR shall resume work in other locations that are not affected by such discovery at no extra costs to the DISTRICT. To the extent such coordination results in an unavoidable delay or work interruption to the CONTRACTOR, the DISTRICT may, in its sole discretion, adjust the Contract completion date.

When it has been determined that the CONTRACTOR is entitled to an extension of time, the amount of extension shall be only to compensate for direct delay and shall be based upon the CONTRACTOR energetically

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pursuing completion of the work at a rate not less than that which would have been necessary to complete the basic contract on time. In determining the amount of extension, the DISTRICT shall be entitled to assume that the CONTRACTOR is applying effort simultaneously on the several parts of the work to the maximum extent practicable.

No extension shall be made for delay occurring more than ten (10) calendar days before a claim therefore is made in writing to the DISTRICT'S Project Leader. In the case of a continuing cause of delay, only one claim is necessary. In no event shall the CONTRACTOR receive extra costs under this Contract due to delays resulting from such coordination.

In the event that suspension of work is necessary, the DISTRICT may, in its sole discretion, suspend the work, or any part thereof, by giving notice to the CONTRACTOR in writing. The work shall be resumed by the CONTRACTOR as soon as possible, but no later than ten (10) calendar days after the date fixed in the notice to resume work. The DISTRICT shall reimburse the CONTRACTOR for appropriate and reasonable expenses incurred by the CONTRACTOR as a result of such suspension, but the CONTRACTOR shall take all necessary steps to minimize such expenses.

27. The CONTRACTOR shall provide qualified personnel to switch and verify de-energized conditions of the DISTRICT'S facilities and re-energize upon completion. The CONTRACTOR shall obtain a copy of the DISTRICT'S Switching and Clearance Procedure Manual along with a nineteen (19) question review. The CONTRACTOR shall review the manual with contract employee(s) that will need to hold a safe work clearance to conduct the work outlined in this contract. The CONTRACTOR shall provide the necessary training and ensure that such employee(s) completes the nineteen (19) question review by answering all nineteen (19) questions correctly. Prior to starting work the CONTRACTOR shall provide the DISTRICT'S Project Leader with a list of the CONTRACTOR'S employee(s) that are trained to hold the DISTRICT'S Safe Work Clearance and a copy of the completed review. This list must be provided on the CONTRACTOR'S letterhead documenting that the clearance holders have completed the training on the DISTRICT'S Switching and Clearance procedure manual and have correctly answered all nineteen (19) questions. The CONTRACTOR shall maintain records containing the results of said training to the CONTRACTOR'S employees. The CONTRACTOR shall be responsible for updating these records if additional clearance holders are needed. Said personnel shall be familiar with the DISTRICT'S underground distribution, overhead distribution and transmission system.
28. The CONTRACTOR shall adhere to the Steel/Concrete Pole Guidelines as detailed in the DISTRICT Construction Standard 4-20-20.0.

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29. The CONTRACTOR shall adhere to the Phase Verification and Tagging of Primary Underground Cables as detailed in the DISTRICT Construction Standard 4-24-5.0.
30. The DISTRICT is providing the CONTRACTOR with the DISTRICT'S available system fault current by voltage class in amps to assist the CONTRACTOR to be in compliance with WAC 295-45-325,c.

Transmission	Primary Distribution	Secondary
1,000 to 38,000	5,000 to 26,000	1,000 to 90,000

Minimum/Maximum Available Fault Current by Voltage Class In Amps

31. The CONTRACTOR and its employees shall comply with the applicable Burlington Northern Santa Fe Railroad (BNSF) requirements and shall obtain their railroad safety course certification including their photo identification badge before performing work on BNSF property if required for this contract. The wallet-sized safety course completion card and the BNSF photo identification badge shall be in each employee's possession at all times while performing work on BNSF property.
32. The CONTRACTOR shall be responsible for all costs associated with certification, coordinating work activities, including flagging with BNSF. All necessary information for completing the safety course and obtaining a badge can be obtained on-line at <http://www.contractororientation.com/>.

19.0 EMERGENCY AND STORM WORK

1. During storms or other exigent circumstances requiring prompt DISTRICT action in order to restore power following outages caused or expected to be caused by such circumstances, CONTRACTOR crews performing work under this contract, at the time such work is required, shall be considered available to the DISTRICT and may be reassigned by the CONTRACTOR to other utilities only after release by the DISTRICT'S Project Leader or designated representative.
2. The DISTRICT will pay standby time, as specified in the Proposal Form, in order to retain assigned crews during the period of time required to obtain a reassignment decision.

20.0 BREAKAGE AND LOSS ALLOWED

- 1) Allowable breakage and loss of materials during handling and installation shall be limited to two (2) percent of the DISTRICT'S cost of such materials. Breakage and loss in excess of two (2) percent shall be at the CONTRACTOR'S sole expense.
 - Loss due to vandalism shall be the CONTRACTOR'S sole expense.

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21.0 QUALITY AND COMPLETION OF WORK

1. All work shall be performed in a workmanlike manner and shall comply with the DISTRICT'S Construction Standards, Specifications, and other Contract Drawing/Documents. At the completion of the work, the CONTRACTOR shall insure that the work area is clear of any construction-related debris and that all material has been properly managed and all waste properly disposed of in accordance with applicable regulations and the terms of this Specification.
2. The DISTRICT may elect to suspend work by the CONTRACTOR'S crew, equipment or individual when such crew, equipment or individual is deemed to be operating in an unsafe, hazardous, or incompetent manner, in the sole discretion of the DISTRICT. When work has been suspended, payment shall be made only for work satisfactorily completed prior to the suspension.
3. The work required to be performed by the CONTRACTOR hereunder shall not be considered complete until such work and the entire contract has been inspected and accepted by the DISTRICT.
4. All work, including, but not limited to, all testing performed under this Specification shall comply with the latest revisions of all applicable regulations, safety codes, specifications and standards, including accepted applicable technical definitions as acknowledged and accepted in the industry as of the date of this Contract, which shall include but not be limited to, applicable specifications, standards and requirements issued by the following entities:
 - ANSI American National Standards Institute
 - NEMA National Electrical Manufacturer's Association
 - ASTM American Society for Testing and Materials
 - NESC National Electrical Safety Code
5. When the CONTRACTOR has completed the work, the CONTRACTOR will notify the DISTRICT'S Project Leader or Inspector that work has been completed and is ready for final inspection. The assigned DISTRICT inspector, engineer and/or other authorized representative will then proceed to perform a final inspection of the work and if the work is found satisfactory, will process the final payment and initiate the process to recommend acceptance of this work to the DISTRICT'S Board of Commissioners. If the work is not found satisfactory, in the sole discretion of the DISTRICT, the DISTRICT will indicate in writing the problems requiring correction and the CONTRACTOR will use its best effort to remedy such problems as promptly as possible.

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22.0 SUBMITTALS

1. Construction Schedule
 - a. The CONTRACTOR shall submit a Construction Schedule to the DISTRICT within seven (7) calendar days after the applicable commencement date set forth in the DISTRICT'S written Notice to Proceed (unless otherwise noted in the Special Provisions).
 - b. The Construction Schedule shall include all major activities involved in the project such as wood pole installation, wire stringing, etc.
 - c. The Construction Schedule shall identify any and all activities that will be performed by others aside from the CONTRACTOR and that may have an impact on the schedule.
 - d. The Construction Schedule shall be in the form of an arrow diagram developed under the Critical Path Method (CPM) supplemented by the activity listing used in its preparation. This schedule shall include the following minimum data for each activity or as required by the DISTRICT'S Project Leader.
 - Activity beginning and ending date.
 - Estimated duration.
 - Activity description.
 - Early start date.
 - Early finish date.
 - Latest allowable start date.
 - Latest allowable finish date.
 - Status (whether critical or not).
 - Total days of float time.
2. The CONTRACTOR shall update and re-submit such Construction Schedule on a monthly basis, beginning one (1) month after the applicable commencement date set forth in the DISTRICT'S written Notice to Proceed for all contracts over sixty (60) days in length.
3. The CONTRACTOR shall submit a safety plan in writing prior to beginning construction detailing traffic control and any other safety measures that will be undertaken on this project. No construction work shall start until such plan has been reviewed by the DISTRICT.

23.0 AVAILABILITY OF PERSONNEL AND EQUIPMENT

1. Bidders shall be required to furnish to the DISTRICT evidence of ability to

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complete this Contract by submission of a list of available, skilled personnel and major equipment required for the performance of this Contract. Such information may be requested after the bid opening as a part of the bid evaluation.

2. At the request of the DISTRICT, Bidders shall inform the DISTRICT of other jobs they have scheduled to occur during the calendar time required for this Contract.

24.0 COORDINATION

1. The CONTRACTOR'S supervising representative shall become thoroughly acquainted with the DISTRICT'S work practices and procedures prior to commencing work. The CONTRACTOR'S supervising representative shall be furnished with DISTRICT-supplied and installed vehicle communications equipment. Such supervising representative shall maintain constant contact with DISTRICT representatives as required. Each crew shall be furnished with DISTRICT-supplied and installed vehicle communications equipment.
2. The CONTRACTOR shall be responsible to return all DISTRICT supplied equipment to the DISTRICT at the completion of the CONTRACT. The equipment shall be in the same condition as when assigned to the CONTRACTOR, reasonable wear and tear excepted. The CONTRACTOR will be responsible to replace any lost or damaged equipment with equivalent equipment.
3. In addition to the DISTRICT-supplied communications equipment described above, the CONTRACTOR shall provide each crew foreman and supervising representative with a cellular telephone to be used for coordination of DISTRICT work. During DISTRICT work hours, storms and emergency work the cellular telephone shall be on and operational. All costs associated with obtaining, maintaining and operating such cellular telephones shall be the responsibility of the CONTRACTOR.

25.0 CUSTOMER RELATIONS

It is understood that the CONTRACTOR does not represent the DISTRICT and has no authority to obligate the DISTRICT for any reason or benefit of any kind to any person.

26.0 BIDDING

Bidders shall bid unit prices for work items as described in the Bidder's Proposal. Such prices shall include all expenditures incidental to the satisfaction of the requirements of the Contract, unless otherwise

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specifically provided in writing by the DISTRICT, including but not limited to all costs and expenses for labor, tools, equipment, materials, transportation and services not set forth as a separate Bid Item herein.

1. The quantities specified in the Proposal Form are estimates of the quantities of work which will be awarded under this Contract and are shown for the purpose of comparing bids. Actual quantities of work may vary from the quantities specified in the Proposal Form. The total amount of work to be performed under this Contract is the amount which the DISTRICT requires, in its sole discretion. Therefore, the DISTRICT makes no representation or guarantee as to the amount of work that will be paid for under this Contract.
2. The Bidder's Proposal must include a listing of any items which do not comply with this Specification, including details of any substitution or deviation from this Specification. If such a list is not provided, it shall be assumed that the CONTRACTOR will satisfy each and all of the requirements of this Specification.
3. The unit prices shown on the Proposal shall include: (1) all operational and labor costs, fuel and fueling, oil, grease, and maintenance upkeep and repairs to the equipment; and (2) all taxes (except sales and TERO tax), deductions, overhead and profit. No separate payment shall be made for these items. Sales and TERO tax will be added to each invoice as separate items.

27.0 ADDITIONAL HOURLY WORK

1. During the course of the work, the DISTRICT may identify additional work not described herein and which is not covered by any bid item. The DISTRICT may negotiate a lump sum cost or a unit price cost or shall direct the CONTRACTOR to charge for such work using an hourly rate bid item, which shall include all necessary labor, tools, transportation, equipment, and incidentals required to complete the work. Any and all work under this item must be authorized by written Contract Amendment or Engineering Change Directive before the work is begun and signed by both the DISTRICT and the CONTRACTOR.
2. On the Proposal Form, the CONTRACTOR shall identify the labor classifications and equipment types to make up the specified crew configurations and then specify the hourly rates for each.