

## SECTION 7 - GENERAL CONSTRUCTION STANDARDS

### 7.1.1 Summary of Work

- A. Work covered consists of providing all work indicated on Construction Drawings approved for the project.

### 7.1.2 Special Project Procedures

- A. Construction operations in public streets, roads or alleys, shall be confined to as small a space as is practicable and shall be subject at all times to the approval of the Virginia Department of Transportation (VDOT). Unless otherwise directed by the County Engineer or VDOT, the Contractor shall perform the proposed construction as follows:
  1. Contractor shall apply for and obtain all construction permits required. Contractor shall obtain same from the Virginia Department of Transportation.
  2. Notify the County Engineer not less than 48 hours before work is to start.
  3. Use proper warning signs and barricades at all times. Provide flagman on heavily traveled streets and roads and when required by the Virginia Department of Transportation. Drawings shall include traffic control drawings in accordance with VDOT requirements for traffic control.
  4. Maintain one-way traffic at all times unless otherwise permitted.
  5. Open no more than 100 feet of trench at any one time and block no more than one intersection. Allow not more than 15 feet of ditch to remain open overnight and then only when approved by the Virginia Department of Transportation.
  6. If, in the opinion of the Virginia Department of Transportation, the material taken from the trench is not suitable for backfilling, it shall be removed, and an acceptable material used for backfilling trenches within 1 foot of the edge of pavement. The top 9 inches of the trench shall be VDOT approved crushed stone material compacted and surface treated.
  7. All trenches crossing the pavement, trenches running parallel, or nearly so, and lines within a street intersection, shall be backfilled with VDOT approved crushed material. House lateral trenches shall be mechanically tamped.

8. Use calcium chloride to settle dust whenever necessary and required by the County Engineer.
9. Sweep all loose material from hard surface immediately after backfilling. All roadway surfaces shall be swept clean at the end of each work day.
10. Watch all trenches closely for settlement during rainy periods. If an emergency situation occurs, repairs will be made at the Contractor's expense.
11. Use only machines equipped with pneumatic tires for backfilling and cleaning up on surface treated or paved areas.
12. Provide VDOT approved base material to a minimum of 9 inches compacted depth on top of regular trench backfill when the trench is in the pavement, or is parallel to the pavement and disturbs the road shoulder within two feet of the pavement. Any trench dug parallel to the pavement which disturbs the road shoulder two or more feet from the pavement or is dug in graveled streets shall be backfilled with the same or equal material to that which was removed from the trench.
13. Notify the Virginia Department of Transportation prior to replacing bitumen surfaces. Either a plant mix or a double surface treatment of tar and gravel may be used except on roadways that are already surfaced with plant mix. On these roadways, plant mix shall be provided to the same or greater compacted depth as in the existing pavement. The entire disturbed area shall be resurfaced when the excavation disturbs the shoulder within one foot of the pavement. The approval of the Virginia Department of Transportation is required as to type of treatment, material, width and depth and method replacement.
14. All trenches and repaved areas shall be maintained for a period of 12 months, and shall be repaired upon request of the Virginia Department of Transportation.
15. The Contractor shall restore all street and road shoulders and ditches to their original side slopes and flow grades, and shall replace all stabilized materials and ditch linings disturbed or removed along the lines of construction. Any damage to or removal of grasses, plants or shrubs, and the like, that have been planted or landscaping or for the prevention of soil erosion shall be replaced by the Contractor. The Contractor shall also be responsible for maintaining such until the Virginia Department of

Transportation states its approval of the cleaning up and rebuilding of road shoulders and ditches. Property owners will be notified by the Contractor to remove all shrubs, etc., located within the limits of constructions. Contractor shall strip and restore sod on established lawns or replace with sod of equal quality.

- 16. The Contractor shall keep all private driveways, walkways and surface drains open for use of the property owner except when an agreement between the property Owner and the Contractor permits temporary closing. In any event, the driveways, walkways and drains shall be returned to their original condition. The backfill in driveways and walkways shall be tamped with mechanical equipment, from trench bottom to existing ground surface, to the same density as existed before removal. Surface treatments shall be replaced to original appearance and quality.
- 17. In the event that these conditions are not complied with after reasonable written notice has been given, the County will correct the defective work at the Contractor's expense.
- 18. VDOT approved crushed material of 9 inches of compacted depth shall be placed on top of regular trench backfills when any trench dug parallel with pavement disturbs the road shoulder within 2 feet from the edge of the pavement. Any trench dug parallel with the pavement which disturbs the road shoulder two or more feet from the edge of the pavement may be refilled with the same material, when determined to be suitable by the County Engineer and VDOT, that was removed from the trench and crushed material will not be required. When crushed material is required, VDOT Standard 21A, or approved equal, shall be used per the following gradation requirements:

<u>Sieve Designation</u>	<u>Percentage by Weight Passing Square Mesh Sieve</u>
2 inch	100 percent
1 inch	94-100 percent
3/8 inch	63-72 percent
No. 10	32-41 percent
No. 40	14-24 percent
No. 200	6-12 percent

- 19. Contractor shall maintain trenches for a period of 12 months from the completion of work unless sooner relieved by the County Engineer.

20. Contractor shall Video tape all work areas and adjacent areas before starting work. All walks, driveways, lawns shall be maintained and restored to their original condition by the applicant and maintained for the 12 month period unless sooner relieved by the County Engineer or the interested property owner.
21. All paving made necessary by the Construction work must be restored and approved by the County Engineer and VDOT as listed below. The installation of utilities within the roadway bed of any public street will require the roadway to be milled and repaved for the entire length of construction activities. This repaving would be completed under the following pavement criteria:
  - a) All paving shall be saw cut. All final pavement elevations shall match the existing pavement elevations prior to work starting. Pavement shall be milled as required to accomplish this. Where new pavement meets existing pavement the existing pavement shall be cut to a depth not less than 2". No feathering of the pavement shall be allowed.
  - b) All utilities which are installed within the paved surface parallel to the centerline will provide a pavement overlay for the entire length of construction activities and the entire width of the roadway unless the County Engineer or VDOT establishes alternative repaving.
  - c) Any multiple installation of utilities perpendicular to the roadway centerline will be required to provide repaving of the entire width of the roadway for the distance between the first and last multiple utility cut.
  - d) Installation of a single utility perpendicular to the roadway centerline will be required to provide repaving by placing the BM-2 asphalt even with the existing base pavement. The SM-2A asphalt will be extended 10 feet on each side of the pavement cut for the trench by milling to a minimum depth of 2" and rolled down so that no ridges or bumps remain.
  - e) If the subject street has curb and gutter and is an asphalt street, it will be necessary to remove two inches of asphalt prior to the repaving requirement of the permit.
  - f) This resurfacing required does not eliminate any other requirements such as full depth of BM and SM as required by the VDOT permit.

- g) Approval of the paving does not relieve the contractor of the responsibility of the damage due to settlement during the 12 month period.
- 22. All trenches within 1 foot of the edge of the pavement shall not only be backfilled as outlined above, but shall be surface treated to prevent weakening the original pavement using 0.40 gallons of CRS-2 liquid asphalt per square yard of surface covered with 28 lb. of #778 stone per square yard.
- 23. Pavement on plant mix streets shall be replaced with eleven inches of BM-2 and two inches of SM-2A or the depth of the existing pavement, whichever is greater.

### 7.1.3 Coordination

- A. Phases of the construction which involve the temporary interruption of essential services shall be scheduled in consultation with the Utility Provider, Property Owners or Utility Users and the County or their representative and shall not be of longer duration than essential to accomplish the purpose for such interruptions. Liaison in this matter shall be required before beginning any work. The Contractor shall notify the County not less than 48 hours in advance of commencing work. The Contractor shall give not less than 48 hours notice in advance of the time and date of making any connections to the existing water or sewer system. The County may disapprove the time and date of any and all connections and will advise the Contractor as to a suitable time and date.
- B. The contractor shall not operate any valves on the County system or make connections to existing sewer and water lines before proper notification is made to the County so that inspection of this work can be made.

### 7.1.4 Field Engineering

- A. Grades, Lines and Levels
  - 1. The Design Engineer shall established baseline and control points. From these points the Contractor shall furnish necessary personnel and equipment to establish line and grade as required for the work. The Contractor shall furnish detailed construction documents to the County before beginning construction. The data on the documents shall include all information as specified in these specifications but as a minimum shall include, but not be limited to, centerline elevations (existing and proposed), centerline cut, centerline invert, manhole locations, manhole top and invert elevations, grade

between manholes, and bench mark locations and elevations. Stationing intervals shall be every 50 feet.

2. The Contractor shall be responsible for the preservation of all stakes and marks established by the Design Engineer, and if any of the stakes and marks are carelessly or willfully disturbed, the cost of replacing them shall be charged against the Contractor.
3. Design Engineer shall certify that all streets, including curb and Gutter, are to the correct finish grade prior to acceptance of utility construction by the County.

#### 7.1.5 Measurement and Payment Definitions

- A. For purposes of measurement and payment the following terms shall have the meaning assigned to each.
  1. Main Trench: A trench essentially parallel to rights-of-way or property lines and in which the proposed utility lines are to be installed.
  2. Service Trench: A trench essentially perpendicular to main trenches and in which the proposed utility service pipes are to be installed.
- B. Classified Excavation: The removal and disposal of earth, hardpan or rock materials according to the following:
  1. Earth Excavation: The removal and disposal of pavement, less than 4 inches thick, underground structures and utilities indicated to be demolished and removed, and all other materials encountered not classified as hardpan or rock excavation.
  2. Hardpan Excavation: The removal and disposal of material that cannot be removed from the trench without the use of an air spade or blasting. Indurated clay, shale or sand with cementitious materials is typical of this material.
  3. Rock Excavation: The removal and disposal of all solid rock that cannot be excavated without continuous and systematic drilling and blasting or continuous use of rock excavation equipment. Boulders 1/2 cu. yd. or more in volume, solid rock, and rock in ledges are typical of this material.
  4. Hand Excavation: Excavation made with hand tools when in the opinion of the Engineer such excavation is necessary. Hand

excavation where called for on the drawings will be considered part of the contract and will not be paid for under unit prices. Hand excavation shall be performed under the drip line of trees, at curb and gutters, pipe crossing utilities, sidewalks, driveways, utility poles and any other place where the contractor must hand dig to prevent damage to existing utilities or structures or for the safety of personnel.

5. Test Hole Excavation: Excavation made at the direction of the Engineer for any purpose related to work.
6. Concrete Paving Removal: Removal of paving greater than 4 inches thick, including concrete curbs, gutters and sidewalks.

C. Measurement and Payments for Excavation:

1. Hardpan and Rock: Main line trench and force main trench shall be computed and paid for according to the actual depth of the hardpan or rock to the invert of the pipe plus the 6 inch bedding material and the actual length of the trench, and, for main line trench and force main trench, the actual width of the trench not to exceed the nominal pipe diameter plus 24" for pipes up to 30 inches and less in diameter. The width of the service trench shall be 2 feet. For pipe 36 inches, or greater in nominal diameter, the trench width shall be the outside diameter plus 36 inches and trench depth shall be based on the depth of rock to the outside barrel of the pipe plus 6 inches. Where the trench width is not calculated to a foot or half-foot, the measurement shall be rounded to the next 6 inches. Manhole and structure excavation shall be for the depth encountered including the base and 6 inch cushion of bedding material. The horizontal dimensions shall assume a square extending 1 foot beyond the exterior walls of the structure when forming is not required and 2 feet when forming is required. Payment for rock excavation in the pipe trench will not be allowed for this distance.
2. Earth: Main line trench, force main trench and service trench, when payment is to be computed on a volumetric basis shall be computed as set forth for hardpan and rock, except that the depth shall be in accordance with the cut sheet, which is the bottom of the pipe for force mains and the invert of the pipe for gravity lines. When excavation payments are on a depth basis, measurements shall be from the ground surface at the centerline of the trench to the invert of the pipeline.

3. Bedding in rock, hardpan or earth: Bedding required for pipe laid in rock, hardpan, or earth shall be included in the unit excavation price for these items.
  4. For trenches, the pay width for single pipe excavation shall be the nominal diameter of the pipe, plus 12 inches or a minimum width of 24 inches. When two or more pipes are laid in the same trench, the trench width shall be the sum of the nominal diameters of the pipe plus 12 inches plus 6 inches for each space between the pipes. For lowering or raising mains, the trench width shall be 48 inches. When pay width is not an even foot or half foot it shall be increased to the nearest foot or half foot.
  5. Unauthorized excavation consists of removal of materials beyond indicated elevations or specified widths, without written approval of Engineer. Unauthorized excavation shall be replaced at Contractor's expense.
  6. Hardpan or rock excavation shall not be backfilled until Engineer has verified that such excavation was required and has determined the hardpan or rock profile.
- D. Lowering excavation: Excavation made to permit the lowering or raising of water main and accessories.
- E. Water main accessories shall consist of all valves, retainer glands, fittings, boxes and the like, other than pipe that are a part of the water system.
- F. Shoring consists of sheeting and/or braces used to prevent earth movement. The County or Property Owner reserves the right to require shoring to protect existing building or facilities.
1. Sheeting and braces left in place shall be paid for in accordance with unit price contained in "Force Account Items" included in the Project Manual and shall be cut off at least 18 inches below finished surface.
- G. Standard payment items shall be computed as follows:
1. Hardpan Excavation and Rock Excavation: Price per cubic yard of hardpan excavation defined under classified excavation above. Pay depth for water lines, force main, and gravity sewers shall be depth to invert plus 6 inches. The payment for hardpan excavation, whether in main or service trenches shall include the specified bedding of crusher run stone or gravel, furnishing and placing of

approved select backfill material, and disposal of unapproved material.

2. Hand Excavation: Price per cubic yard for hand excavation when specifically authorized by the Engineer. Work done under this item will be limited to unforeseen items not shown on the contract drawings that would otherwise be damaged or removed during the course of machine excavation. No allowance shall be made under this item for hand excavation necessary to locate or protect culverts and underground utilities.
3. Shoring Left in Place: Price per thousand board feet (MBM) for shoring ordered left in place. This item shall include all of the cost of furnishing, placing and cutting the sheeting as well as the braces. The entire cost of placing and removing ordinary sheeting and/or bracing installed primarily to protect workmen or existing structures and to facilitate construction, not ordered left in place shall be at the Contractor's expense.
4. Removal of Unstable Soil and Replacement with Select Material: Price per cubic yard of select material provided as directed by the Engineer. Payment under this item shall include the removal of unsuitable material and replacement with select material because of unstable foundation below the pipeline as well as material provided because the excavated material is unsuitable for proper backfilling of the trench. Surplus excavation from other portions of the project will be compensated for under this item only when the haul distance exceeds 1000 feet. Payment for select material required when pipe is laid in rock and/or hardpan and for backfill because of the inability to use hardpan or rock removed from the trench shall be included in the price bid for hardpan and/or rock. Payment shall be based upon the quantity of select material required for a trench with pay width as specified for hardpan excavation trenches for same depth and pipe diameter, and a select material depth as provided.
5. Replacement of Road Base: Price per linear foot of pipeline trench. Work under this item shall consist of providing 9 inches of compacted crushed road base material. The application of surface treatment is not a part of this item.
6. Crusher Run Stone on Road Shoulders, Private Entrances, and Driveways: Price per linear foot of pipeline trench, surfaced with approved crusher run stone. Stone shall be placed to the same depth as the original, with a minimum of 4 inches.

7. Replacement of plant mix pavement, State highways, and driveways: Price per linear foot of pipe line trench for the replacement of State highways and driveways surfaced with plant mix pavement in accordance with the conditions existing prior to construction.
8. Replacement of Plant Mix Pavement - County Roads: Price per linear foot of pipe line trench for replacement of roadway surfacing with plant mix pavement consisting of 11 inches of BM-2 and 1 inch of SM-2A or the depth of the existing pavement, whichever is greater.
9. Replacement of Surface Treated Pavement on Private Entrances and Driveways: Price per linear foot of pipeline trench for the restoration of surface treated pavement on private entrances and driveways. Price shall include the furnishing and installation of a double surface treatment.
10. Replacement of Cement Concrete Pavement: Price per linear foot of pipeline trench for the restoration of such pavement disturbed. Depth of pavement and of surfacing shall be in accordance with conditions existing prior to construction. Width of replacement shall extend 12 inches on each side of trench.
11. Concrete for Replacement of Sidewalks, Curbs, Gutters, etc.: Price per cubic yard of concrete furnished and used for replacing such structures removed during construction.
12. Concrete for Encasement, Trench Beds, and Utility Anchors: Price per cubic yard of concrete furnished and use for constructing such structures.
13. Furnish and Install (each size) Steel Casing Pipe: Price per linear foot to furnish and install steel casing pipe for the installation of pipe lines under State highways, railroads or other obstructions. Price per linear foot includes bore pit and receiving pit. Pipe shall be installed in strict compliance with applicable regulations. Payment shall be made under this item regardless of the method employed in placing the casing pipe.
14. Permanent Grading, Topsoiling, Seeding, and Strawing of Trenches: Price per linear foot of pipeline trench for permanent grading, topsoiling, seeding (including fertilizing and liming), and strawing. No separate payment will be made for temporary grading, topsoiling, seeding, and strawing. Topsoil and its

placement shall comply with the requirements of Section 10 – “Seeding.”

H. Water line payment items shall be computed as follows:

1. Furnish and Install (each size) Water Main Including Excavation and Accessories: Price per linear foot of water main furnished and installed, including excavation and backfill, testing and sterilization, and the furnishing and installation of all accessories, including valves, valve boxes and fittings. Excavation shall be unclassified unless stated otherwise in contract documents.
2. Locate and Connect to Existing Cast or Ductile Iron, PVC or HDPE Mains: Price for each connection made to existing mains. The price shall include the location of the line, as well as excavation necessary for making the connection. When the connection is made by means of a tapping sleeve and valve, the Contractor will receive all compensation for his work under this item. The tapping sleeve, valve, valve box and stem extension shall be furnished and installed by the Contractor.
3. Furnish and Install Fire Hydrants: Price for each fire hydrant furnished and installed, including the furnishing and installation of vertical extensions as required by the depth of bury. The 6 inch hydrant service line will be paid for under furnishing and installing pipe of this size. The furnishing and installing of concrete anchors will be paid for under “Concrete for Encasement, Trench Beds, and Utility Anchors.”
4. Furnish and Install Accessories for (each size) Water Services: Price for each water service accessory furnished and installed. Payment will include furnishing and installing the corporation stop, meter box and meter yoke.
5. Furnish and Install (each size) Water Service Pipe, Including Excavation: Price per linear foot for furnishing and installing service pipe, including excavation and backfill.
6. Furnish and Install (each size) Water Service Pipe Pushed, Directionally Drilled or Bored in Place: Price per linear foot of water service pipe furnished shall include steel casing pipe, (if used) and receiving pit and boring pit, and any other incidental work.
7. Casing pipe: Casing pipe where required shall be paid by the linear foot installed and shall include boring pit and receiving pit.

8. Directional Drilled pipe shall be paid for by the linear foot installed and shall include the boring rig and receiving pit.
- I. Sewer Line Payment Items Shall Be Computed as Follows:
1. Furnish and Install (each size) Sewer Pipe: Price per linear foot of sewer line for ductile iron, or PVC pipe, as specified, including furnishing, installing and testing the pipe. Payment for excavation and backfill shall be included.
  2. Furnish and Install (each size pipe) by 4- or 6-Inch Service Tees: Price for each service tee installed. Payment under this item shall be in addition to the footage payment for the main line pipe.
  3. Furnish and Install 4- or 6-Inch Pipe for Service Connections: Price per linear foot of service connections installed, including an adequate plug and marker at the upper end of the connection. The length of the connection shall be the horizontal distance from the centerline of the main sewer to the upper end of the connection, plus the length of vertical pipe installed for stacked connections. Payment for excavation and backfill shall be included.
  4. Excavation and Backfill for 8-Inch, 10-Inch, and 12-Inch Pipe: Price per linear foot of trench according to the actual depth classifications. Payment under this item shall include the bedding specified for sewer lines, since no additional payment will be allowed for bedding. Depth for payment shall be measured to the invert of the pipe.
  5. Excavation and Backfill for (each size) Pipe 15-Inch and Greater: Price per linear foot, with payment computed as set forth above for 8-inch, 10-inch, and 12-inch pipes.
  6. Excavation and Backfill for Service Connection: Price shall be for linear foot installed both horizontal and vertical including excavation and backfill Payment under this item shall include earth excavation and backfill; rock excavation or hardpan excavation will be paid for under appropriate item.
  7. Furnish and Install (each size) Ductile Iron Sewer Pipe: Price per linear foot of ductile iron sewer pipe furnished and installed in lieu of PVC pipe as specified. Price to include excavation and backfill.

8. Furnish and Install (each size) Ductile Iron Force Main: Price per linear foot of ductile iron pipe furnished and installed, including excavation, backfill, accessories, and testing.
9. Standard Manholes: Price per vertical foot of standard manholes. Depth for payment purposes shall be actual depth to the invert of the sewer line, plus the 8-inch concrete base. No extra payment shall be allowed for bedding when rock excavation is encountered, nor will an extra allowance be allowed for deep manholes requiring thicker walls.
10. Drop Connections: Price as shown in Standard Drawings.
11. Large Standard Manholes: Price per vertical foot for each diameter manhole, with payment as set forth above for standard manholes.
12. Special Design Manholes: Lump sum price for special design manholes in accordance with drawings and specifications, complete in place.
13. Casing pipe: Casing pipe where required shall be paid by the linear foot installed and shall include boring pit and receiving pit.
14. Directional Drilled pipe shall be paid for by the linear foot installed and shall include the boring rig and receiving pit.

#### 7.1.6 Project Meetings

- A. A preconstruction conference with the County and the Contractor shall be scheduled before beginning any work.
- B. Progress meets shall be held at a minimum of once a month. County, Design Engineer, Contractor and all subcontractors shall be present as a minimum. Minutes shall be taken and distributed by the Design Engineer.

#### 7.1.7 Submittals

- A. Construction Schedules
  1. Contractor shall submit a detailed construction schedule prior to the preconstruction conference. Construction schedule shall be reviewed at the monthly progress meeting and updated as required.
- B. Shop Drawings as Described Below in 7.1.8

### 7.1.8 Shop Drawings

- A. Shop drawings shall be submitted for all materials and equipment furnished and installed under the contract.
- B. The Contractor shall provide samples and shop drawings as requested under the specifications in accordance with the following requirements. When the Work of the Project is divided into separate Contracts, each Prime Contractor shall provide submittals directly to the Engineer. No materials shall be used in the work which do not equal the approved samples or shop drawings.
- C. Materials or appliances requiring approval must not be fabricated or incorporated into the work until approval has been given. The approval or acceptance of samples shall not preclude the rejection of any material upon the discovery of defects prior to the final acceptance of the complete work.
- D. After a material has been approved, no change in brand or manufacturer will be permitted unless satisfactory written evidence is presented to, and approved by the Engineer, that the manufacturer cannot make scheduled delivery of approved material, or that other conditions are apparent which indicate the approval of such substitute materials to be in the best interest of the Owner.
- E. Samples, shop drawings, material lists, manufacturers' literature, and other required information shall be submitted in sufficient time, and clearly marked, to permit proper consideration and action before any materials which such samples, shop drawings, and information represent are delivered to the site. The Contractor shall be held responsible for any delay in the progress of the Work which may be due to his failure to observe these requirements.
- F. Shop drawings and samples shall be submitted to the Engineer in sufficient quantity to permit the Engineer to retain four (4) copies and return the number of copies required by the Contractor.
- G. Any submittal which requires the selection of color by the Engineer shall be submitted such that all color selections can be made at the same time. Submittals shall be held by the Contractor for a single submittal of all items requiring color choice or sufficient time will be allowed for the Engineer to receive all submittals to prepare a comprehensive color selection.
- H. Shop drawings shall include installation instructions and long and short term storage requirements.

- I. No payment shall be made for unapproved materials or equipment purchased or installed by the Contractor even if the materials or equipment meet all the requirements of the specifications and/or is the named product or equipment.
- J. Submittal should include manufacturer's installation requirements and instructions.
- K. Submission of shop drawings shall comply with the following requirements:
  - 1. The shop drawings shall be clearly marked and submitted sufficiently in advance of the work which they cover to afford ample time for checking, correcting, and rechecking if necessary. No claim for delay will be granted to the Contractor if caused by his failure to comply with the requirements of this Section.
  - 2. Before submitting for approval, the Contractor shall check all shop drawings, including those submitted by subcontractors, for accuracy and to ascertain that all work contiguous with and having bearing on other work shown on the shop drawings is accurately drawn, and that the work shown is in conformity with the contract requirements.
  - 3. Shop drawings submitted for approval shall bear the Contractor's stamp of approval as evidence that such drawings and details have been checked by the Contractor. The submission of shop drawings (in either the original submission or when resubmitted with corrections) constitutes evidence that the Contractor has checked all information therein, and that he accepts and is willing to perform the work, as shown, in a workmanlike manner and in accordance with the best standard practices.
  - 4. No claim for an extra shall be based on work shown on the shop drawings, unless such claim is noted on the Contractor's transmittal letter accompanying the shop drawings.

5. The Contractor's approval stamp shall contain the following statement:

*"The equipment and material shown and marked in this submittal is that proposed to be incorporated into this Project, and has been checked for and is in compliance with the Contract Documents unless otherwise shown in bold face type or lettering and listed on a page or pages headed "DEPARTURES FROM CONTRACT DOCUMENTS," and can be installed in the allocated spaces.*

Checked By: \_\_\_\_\_

Date: \_\_\_\_\_

6. The person signing the stamp shall be one designated in writing by the Contractor as having that authority. The signature shall be handwritten in ink. Stamped signatures are not acceptable.
7. The Engineer's approval of shop drawings and schedules shall not relieve the Contractor from responsibility for deviation from drawings and specifications unless he has in writing called the Engineer's attention to such deviations at the time of submission. The Engineer's approval shall not relieve Contractor from responsibility for errors of any sort on shop drawings or schedules.

L. Engineer's Action:

1. Review is only for conformance with the design concept of the project. Markings or comments do not relieve the CONTRACTOR from compliance with the contract documents nor allows departure there from. The CONTRACTOR remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, for technique of assembly, for coordination of the work with all trades, and for performing this work in compliance with the contract documents.
2. Where action and return is required or requested, ENGINEER will review each submittal, mark with "Action".
3. Final Unrestricted Release: Work may proceed, provided it complies with Contract Documents, when submittal is returned with the following marking:

"No Exceptions Taken"

4. Final-But-Restricted Release: Work may proceed, provided it complies with notations and corrections on submittal and with Contract Documents, when submittal is returned with the following marking:

"Make Changes Noted"

5. Returned for Re-submittal: Do not proceed with work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking. Do not allow submittals with the following marking (or unmarked submittals where a marking is required) to be used in connection with performance of the work:

"Revise and Resubmit"

6. Returned for Non-Compliance: Do not proceed with work. Product submitted does not comply with Contract Documents. Resubmit for product complying with the requirements of the Contract Documents. Do not allow submittals with the following marking to be used in connection with performance of the work:

"Not Approved" or "Rejected"

#### 7.1.9 Samples

- A. Samples and mock-ups shall be submitted in duplicate except where a greater number is specifically required by the specifications.
- B. Samples and manufacturers' literature shall be forwarded (prepaid) to Engineer's office accompanied with a transmittal letter containing the following information: name of project, contractor, description of product, manufacturer, model number, ASTM or Federal Specification number where applicable. Catalogs shall be marked to indicate specific items submitted for approval.
- C. Samples which are rejected by the Engineer must be re-submitted as soon as possible after notification of rejection and shall be marked "Re-submitted Sample" in addition to other required information.
- D. The right shall be reserved to require submission of samples of any material or any material lists, whether or not particularly mentioned in the Specifications.

#### 7.1.10 Quality Control

- A. Testing Laboratory Services: Tests called for other than public authorities shall be made by approved independent laboratories with the full cooperation of the Contractor. The laboratory charges shall be borne by the Contractor unless otherwise specified.
  - 1. Testing services other than those called for in these Contract Documents may be called for by the Owner to check compliance with specification requirements. When tests indicate compliance with specifications, the testing service charges will be borne by the Owner, but when non-compliance with specifications is indicated, the testing service charges will be deducted from the contract sum.

#### 7.1.11 Temporary Facilities and Controls

- A. Temporary Electricity: The Contractor shall make all necessary arrangements for obtaining electric power for construction purposes. No separate payment for electric power for construction purposes or testing shall be made.
- B. Temporary Sanitary Facilities: Contractor shall provide and maintain in a neat and sanitary condition such accommodations for the use of his employees to comply with all governing laws and regulations.

#### 7.1.12 Materials and Equipment

- A. Quality: Material and equipment incorporated into the work shall be new and unused and:
  - 1. Conform to applicable specifications and standards.
  - 2. Comply with size, make, type and quality specified or as specifically approved in writing by the County Engineer.
  - 3. Manufactured and fabricated products:
    - a) Design, fabricate and assemble in accord with the best Engineering and shop practices.
    - b) Manufacture like parts of duplicate units to standard size and gages, to be interchangeable.
    - c) Two or more items of the same kind shall be identical, by the same manufacturer.

- d) Products shall be suitable for service conditions.
  - e) Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
4. Do not use material or equipment for any purpose other than that for which it is designed or specified.
  5. Except as specifically indicated or specified, materials and equipment removed from the existing structure shall not be used in the completed work.
  6. For material and equipment specifically indicated or specified to be reused in the work:
    - a) Use special care in removal, handling, storage and reinstallation, to assure proper function in the completed work.
    - b) Arrange for transportation, storage and handling of products which require off-site storage, restoration or renovation. Pay all costs for such work.
  7. For all materials and equipment designated to be turned over to the County, the Contractor shall remove all items carefully, clean and transport to an area on site or to a storage facility designated by the County. All sewer service materials or equipment shall be disinfected before turning over to the County. This shall be done at no cost to the County.
  8. Manufacturer's Instructions
    - a) All installation of work shall comply with manufacturer's printed instructions. Obtain and distribute copies of such instructions to parties involved in the installation, including two copies to the County Engineer.
    - b) Manufacturer's installation instructions shall be on the project site and distributed to all concerned parties before the installation of said materials and equipment.
      - (1) Maintain one set of complete instructions at the job site during installation and until completion.

- c) Handle, install, connect, clean, condition and adjust products in strict accordance with such instructions and in conformity with specified requirements.
  - (1) Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.
  - (2) Do not proceed with work without clear instructions.
- d) Perform work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted.

B. Transportation and Handling:

- 1. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site.
  - a) Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
  - b) Immediately on delivery, inspect shipments to assure compliance with requirements and approved submittals, and that products are properly protected and undamaged.
- 2. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

C. Storage and Protections:

- 1. Store products in accordance with manufacturer's long and short term requirements with seals and labels intact and legible.
  - a) Storage products subject to damage by the elements in weather tight enclosures.
  - b) Maintain temperature and humidity within the ranges required by manufacturer's instructions.

2. Exterior Storage.
  - a) Store fabricated products above the ground on blocking skids, prevent soiling and staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.
  - b) Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
  - c) Protect all products from sunlight when required by the manufacturer.
3. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.
4. Protection After Installation: Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.
5. Payment for stored materials
  - a) No payment shall be made for materials stored offsite.
  - b) Materials stored on site will be paid for with the monthly project pay request. Materials must be stored in strict accordance with the manufacturer's long and short term requirements.
  - c) Contractor shall provide proof of payment for the materials before payment will be approved. Retainage will be held from the payment as per the terms of the Agreement.

### 7.1.13 Warranties and Guarantees

- A. Contractor shall provide Warranties and Guarantees on all materials, equipment, workmanship, installations, labor and operation items provided and /or installed by the Contractor or any of its subcontractors and /or suppliers.
- B. Warranties and Guarantees shall be for a period of one year after:
  - 1. Being placed in service by owner for the owner's use before substantial completion of the project.
  - 2. Date of substantial completion of the project.
  - 3. Being installed and put in service after substantial completion of the project.
  - 4. Equipment installed does not constitute being "in service".
- C. Guarantee: CONTRACTOR warrants the equipment and/or materials delivered and installed under the AGREEMENT are free from defects in design, material or workmanship, and against damage caused prior to final inspection.
- D. Prompt Repair: CONTRACTOR shall promptly repair or replace all defective or damaged items delivered under the AGREEMENT.
- E. CONTRACTOR may elect to have any replaced item returned to its plant at its sole expense.
- F. Owner's Option: In the event of equipment and/or materials failure, during such time or in such a location that immediate repairs are mandatory, CONTRACTOR shall respond promptly, regardless of time. If CONTRACTOR is not available, OWNER personnel or other contractors, secured by OWNER, will conduct repairs. CONTRACTOR shall then reimburse OWNER for parts and labor and/or other contractors costs necessary to correct deficiencies as defined within the warranty clause and time.
- G. This specification shall apply to all sections of the specifications as applicable whether mentioned in a specific specification or not. Should the specific specification section have additional requirements or more stringent requirements that this section the more stringent shall apply.

- H. The warranty shall not cover any item that has been subjected to external damage, disassembled and/or repaired by unauthorized persons, flooded or otherwise mistreated. Items normally consumed in service such as grease, oil, v-belts, fuses, filters, seals, etc., shall not be warranted.

#### 7.1.14 Startup

- A. All equipment shall be inspected by the manufacturer's certified service personnel after installation and the manufacturer's service personnel shall supervise the equipment startup. Contractor shall provide a written document from the manufacturer on manufacturer's letterhead of all equipment installed and/or provided by the contractor that their equipment has been installed correctly and all warranties and guarantees are in effect. Sales representatives are not considered manufacturer's certified service personnel.
- B. Startup shall be performed under typical service operating conditions.
- C. Written documentation shall contain various check off items as recommended by the manufacturer and include but not be limited to:
  - 1. Ampere readings on all electrical motors
  - 2. Megger readings on all electric motors and circuits
  - 3. Correct lubrication
  - 4. Correct operating temperatures and pressures
  - 5. Correct vibration levels
  - 6. Coupling alignment
  - 7. Correct supports
  - 8. Correct flange loadings (equipment piping or attachments shall be disconnected from equipment and affirmed that the piping is supported independent from equipment).
- D. In the event one or more components fail to perform as specified or is proven defective in service during the guarantee period, the Contractor shall provide replacement parts and labor to make all repairs without cost to the Owner.

#### 7.1.15 Training

- A. Contractor shall include manufacturer's training for all equipment. Training time duration shall be as reasonable required for the complexity of the equipment and shall be in accordance with the manufacturer's recommendations. Training times and requirements are usually specified in each equipment section in these specifications; however, if they are not specifically mentioned the contractor is still required to include training.
- B. Training shall be separate from startup and shall be scheduled separately from startup.
- C. Owner may, at his option, choose to video tape training.
- D. This specification shall apply to all sections of the specifications as applicable whether mentioned in a specific specification or not. Should the specific specification section have additional requirements or more stringent requirements that this section the more stringent shall apply.

END OF SECTION 7