STANDARD DETAIL SPECIFICATIONS
FOR
SANITARY AND STORM SEWER AND WATERMAIN SYSTEMS
EXCAVATION, INSTALLATION AND NON-PAVEMENT RESTORATION PROCEDURES *

CITY OF EDEN PRAIRIE, MINNESOTA

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* See Standard Detail Specifications for street construction, walkways and pavement restoration.

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CITY OF EDEN PRAIRIE, MINNESOTA

1. STAKING AND PROJECT REPRESENTATION

The City of Eden Prairie Engineering Division (or consultant) shall provide staking and project representation for work under this Contract. The Contractor shall give 48-hour notice when survey stakes are needed.

2. PRE-CONSTRUCTION CONFERENCE

Prior to the start of any work, there will be a pre-construction conference arranged by the Engineer. Representatives of the City, the Contractor, project foreman and utility companies will be notified to be present at this meeting.

At least 1-week prior to this meeting, the Contractor shall submit in writing to the Engineer for approval, a schedule of procedure which shall essentially indicate the number of crews to be employed, locations of work for each crew, contract time schedule and sequence of moves

3. TEMPORARY EROSION CONTROL

This work shall consist of furnishing material and equipment for the construction and maintenance of temporary erosion control for the prevention of erosion and siltation during construction operations. This work shall be performed in accordance with the provisions of MnDOT 1803.5, Detail Drawing R-17, and to the satisfaction of the Engineer and shall also comply with all federal, state and local laws and regulations.

All temporary erosion and pollution control measures which, in the opinion of the Engineer, are necessitated by the Contractor's carelessness, negligence or failure to properly coordinate the installation of permanent erosion controls shall be performed as ordered by the Engineer as incidental work for which no direct compensation will be made.

Other temporary erosion control work ordered by the Engineer or performed by the Contractor with the Engineer's approval will be paid for at the Contract unit price for similar work, or as Extra Work in the absence of comparable items of work.

Performance of temporary erosion control work will not relieve the Contractor of their responsibility toward any damage claims which may arise because of erosion or siltation.

The unit of measurement will be indicated in the contract documents. Payment will be made at the Contract price per unit listed, which price shall be compensation in full for all cost installed complete in place and incidental thereto, including but not limited to; snow fence, filter fabric, stakes, hay bales, etc.

All erosion control items, (hay or straw bales, stakes, snow fence, filter fabric, etc.) shall be removed upon completion of this Contract with no compensation thereof.

4. CONSTRUCTION IDENTIFICATION SIGNS

The Contractor shall furnish, install and maintain signs at entrance points to the public streets and avenues where construction is underway and until work is accepted by the City.

These signs (2) will remain the property of the Contractor and are to be removed by him upon said acceptance.

Signs may be on 4" x 4" posts, about 3' x 5' and should read as follows:

CITY OF EDEN PRAIRIE
Department of Public Works
Improvement Contract (Number)
Utility Construction

TRAVEL WITH CAUTION
(Contractor's Name)
(Address)
(Local Phone Number)

These signs shall be placed on City right-of-way in a manner to be easily noticed by traffic entering or detouring the construction zone. These signs do not replace the Contractor's obligation to protect the public by other appropriate signs, flares, warning devices and flagmen as necessary or required by law. The cost of these signs will be incidental to the project.

5. CLEARING AND GRUBBING

All clearing and grubbing shall be in accordance with MnDOT Specification 2101. All trees clearly marked by the Engineer for removal shall be cleared, grubbed, and disposed of by the Contractor. The Contractor shall dispose of elm wood timber as per City ordinances.

6. SOIL BORINGS

If available, soil boring logs are bound in the back of this Specification. The City of Eden Prairie makes no warrants, either expressed or implied, that the information contained in the boring logs will be the conditions encountered during construction. The logs are for the Contractor's information and are not considered part of the Contract.

7. COLD WEATHER OPERATION

No pipe shall be laid in open cut trench in temperatures below 15 degrees Fahrenheit without approval of the Engineer.

8. DISPOSAL SITES

The Contractor will be required to dispose of all bituminous, concrete and other undesirable debris to an approved landfill located outside the project limits, with no direct compensation made therefore.

9. ALIGNMENT AND GRADE

The Engineer will furnish all the necessary line and grade stakes, bench marks, or other necessary control. It is the responsibility of the Contractor to protect these stakes, and any replacement stakes shall be at the expense of the Contractor.

The Engineer will provide horizontal and vertical control construction stakes to allow the Contractor to construct the improvements as follows:

1. Offset stakes placed at 25-foot intervals for the first 100 feet out of each manhole, then 100-foot intervals thereafter for sanitary or storm sewer, with a cut sheet indicating horizontal and vertical distances from the stake to the pipe invert.
2. Offset stakes placed at 50-foot intervals, including changes in direction and appurtenances for watermain construction.

10. EXISTING OVERHEAD AND UNDERGROUND UTILITIES

The location and location quality level of overhead and underground utilities will be shown on the Plans, as reported by the various utility companies and the City, but this does not relieve the Contractor of the responsibility of determining the accuracy or completeness of said locations. The Contractor shall determine the location of all power lines, ducts, culverts, conduits, pipes, or structures which will be affected by their excavation, and shall coordinate their construction schedule with the affected utility operator. In those instances where their relocation or reconstruction is impractical, a deviation from line and grade will be ordered by the Engineer. To prevent any delay concerning the Contractor's schedule and the established completion date, the Contractor shall program this work with the utility company involved.

Where culverts are damaged during construction, they shall be replaced with new pipe at the Contractor's expense unless specific pay items are included in the Proposal Form for such replacements. Replacement with damaged or used material will not be permitted.

All costs of investigation and any necessary protection, support, removal, relocation, or replacement of said structures shall be included in the Contract bid price of laying pipe.

The Contractor shall verify all utility locations by calling Gopher State One-Call (Phone 454-0002) at least 48 hours (excluding weekends, holidays and emergencies) prior to the start of any proposed excavating operations.

11. SHEETING AND BRACING

The Contractor, to prevent the disturbing or settlement of adjacent road surfaces, foundations, structures, or railroad tracks or other improvements, shall furnish and place all sheeting and bracing necessary for good working conditions acceptable to the Engineer and to prevent damage and delay to the work. The Contractor shall be responsible for the strength and sufficiency of all sheeting and bracing.

Bracing shall be so arranged as to provide ample working space and so as not to interfere with the work and so as not to place any strain on the structures being constructed until such structures are of ample strength to withstand such strain. All sheeting and bracing, unless otherwise specified or ordered to be left in place by the Engineer, shall be installed and removed from the work at no additional compensation.

Any damage to work under this Contract or to adjacent structures or property caused by settlement, water or

earth pressures, slides, caves, or other causes due to failure or lack of sheeting and bracing or improper bracing through negligence or fault of the Contractor in any manner shall be repaired by the Contractor without delay at their expense.

12. JACKING OPERATIONS

All crossings of the roadbeds of State and County trunk highways and all railroad crossings shall be completed by jacking the pipe into place, unless otherwise specified. The auger shall not lead the casing pipe by more than one (1) inch.

Casings shall be made of steel conforming to the details on the Plans and/or Specifications. After the jacking operations have been completed, the annular space between the casing and carrier pipe shall be filled with sand or pea rock and the ends sealed with cement mortar. Cathodic protection shall be used on all casings.

All voids caused by jacking or boring shall be filled at the Contractor's expense by pressure grouting. The grout material shall consist of a cement-sand slurry of at least two (2) sacks of cement per cubic yard and a minimum of water to assure satisfactory placement.

If tunneling or jacking of watermain building services is required, the method used shall be approved by the Engineer.

13. CLASSIFICATION OF EXCAVATED MATERIALS

No classification of excavated materials will be made except for the top three (3) feet of street subgrade material. Excavation and trenching work shall include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the Contract work, regardless of the type, character, composition or condition thereof.

14. PILING

If the Engineer shall order piling to be placed, the Contractor shall furnish, drive and place all said piles and test piles as required and directed by the Engineer. Piles shall be driven vertically in exact position at locations given by Engineer. Piles which may become shifted must be removed and good piles driven in their places, or additional piles put in as directed by the Engineer, without additional expense to the City.

All timber piling shall be in conformance with the latest revision of Minnesota Department of Transportation and shall be pressure treated in conformance with the latest revision of Minnesota Department of Transportation.

15. TRENCHING

The Contractor may use any means consistent with efficient, accepted methods to excavate to the proper depth and width necessary for the construction of the conduit according to the Plans and Specifications. The maximum width of the excavation at the top of the pipe shall be the outside diameter of the pipe plus 36 inches. If the Contractor chooses to excavate to widths greater than the above, they must get approval of the Engineer and supply pipe with adequate strength to support the increased pipe loading.

Prior to excavating on easements crossing open or cultivated fields, existing topsoil in the area to be disturbed by construction shall be windrowed to the side opposite the proposed trench spoil bank and replaced after the trench backfill is completed.

The trench shall be dug in advance of the pipe installation, only so far as the Engineer may permit. Trenches

shall be refilled or barricaded at the end of each days work. The sides of the trench shall be sloped and/or braced and the trench drained so that workmen can work safely and efficiently. All discharge water shall be drained in accordance with the NPDES permit.

During utility placement, the Contractor will be required to take suitable precautions to ensure that all trenches and excavated trench materials are maintained in a dry and stable condition.

If, in the opinion of the Engineer, the Contractor performing the work is not satisfactorily maintaining dry and stable conditions, the utility placement or trench backfilling work will be terminated until these conditions are met.

Any and all ground water encountered during trench excavation, utility placement and trench backfilling shall be removed completely for the duration of utility placement and trench backfilling. Removal of all trench ground water shall be accomplished as the Contractor deems appropriate, but at no time shall the Contractor permit the backfill material to absorb moisture due to careless workmanship during trench water removal. Specifically, when native soil materials are to be used for trench backfill, the removal of trench water with the excavation machine along with native soil materials, thereby creating a saturated or highly elevated soil moisture content is prohibited.

Removal of trench ground water and replacement of any backfill material containing moisture caused by careless workmanship which is deemed unsuitable by the Engineer shall be the Contractor's responsibility and no direct compensation will be made. Replacement material must be approved by the Engineer prior to its use.

16. INSTALLING PIPE AND APPURTENANCES

Pipe and other materials shall be unloaded and distributed on the job in a manner approved by the Engineer. In no case shall materials be thrown or dumped from the truck. All materials shall be examined by the Engineer and approved. The Contractor shall furnish the necessary assistance in such examination of materials.

All pipe materials offloaded and stored onsite shall be carefully stacked on dunnage, oriented in the direction of installation (bell-end toward the direction of installation), and pipe stored onsite shall be protected from soil intrusion by capping or plugging the ends until pipe is lowered into the trench. Care shall be taken to avoid the introduction of soil into the pipe barrel during storage or assembly. Under no circumstances shall pipe be drug across another pipe during removal from the truck or stacking at the site. All pipe shall be carefully lowered into the trench piece by piece. Metallic pipe shall be supported by fabric cinch-straps or rope, but the use of wire rope (cable) or chains in direct contact with the metallic pipe is prohibited. Ductile iron pipe shall be handled in such a manner as to prevent damage to materials and protective coatings and interior lining. Under no circumstances shall pipe materials be dumped into the trench. Damaged coatings, whether caused by the contractor or through shipping and handling prior to offloading shall be repaired, or the pipe replaced prior to installation. Damaged interior coatings must be inspected by the engineer before any repair is authorized. At the engineer’s discretion, pipe may be rejected for damage to the interior coating.

The Contractor shall provide, without additional compensation, suitable temporary channels for any water that may flow along or across the site of the work. The excavated material shall be placed on one side of the trench except when permitted by the Engineer to use both sides. All material shall be so placed as not to obstruct any drain or gutter, or to unnecessarily obstruct any passageway.

17. PIPE BEDDING

As shown on the attached Detail Drawings for pipe bedding, all pipe shall be laid upon sound, granular soil

(min. 6") cut true and even so that the barrel of the pipe will have a bearing for its full length. Bell holes shall be dug at the ends of each length of pipe to permit proper jointing.

If the Contractor encounters unstable soil not suitable for bedding of pipe, or for trench backfill, they shall notify the Engineer. All unstable material shall be removed and replaced with stabilization material as may be ordered by the Engineer. There will be no extra compensation for such additional excavation but payment for stabilization material will be made based upon the appropriate unit bid price.

The material for base stabilization as described above shall be granular material or stabilizing aggregate, as described in these Specifications. The type of material to be used will be specified by the Engineer.

18. GRANULAR BEDDING 3149.2F

This material shall be used for pipe bedding and/or trench backfill wherever peat, clay or other unsuitable bearing material is encountered as determined by the Engineer. The material shall be composed such that proper compaction under the "Specified Density Method" is achieved.

The material shall be placed to a depth as determined by the Engineer, with a minimum depth of 6" below the bottom of the pipe and extending at least one (1) foot beyond the sides of the pipe and one (1) foot above the pipe. Payment shall be for cubic yards compacted in place.

The unit price bid for granular bedding shall include the cost of all excavation and compacting required to place the material and also the cost to dispose of any undesirable material as replaced, unless specified otherwise in the Special Conditions

19. STABILIZING AGGREGATE

Stabilizing aggregate shall consist of durable crushed stone or graded aggregate. All materials shall pass a 1-1/2 inch sieve and shall be retained on a 3/4 inch sieve. This material shall be used for pipe bedding and/or roadway restoration as directed by the Engineer. Payment shall be for cubic yards compacted and placed. The unit price bid for stabilizing aggregate shall include the cost of all excavation and compacting required to place the material and also the cost to dispose of any undesirable material as replaced, unless specified otherwise in the Special Conditions.

Maximum quantities allowed for payment for stabilization rock will be based on the actual depth ordered by the Engineer and the width of a standard trench box required for the size of pipe being installed. The standard box width shall be outside diameter of the pipe plus two (2) feet or in accordance with O.S.H.A. regulations. Any rock used for the convenience of the Contractor or used due to the Contractor's decision to do extra excavation in lieu of using a box, shall be the responsibility of the Contractor, with no direct compensation therefore.

20. PUMPING AND BAILING TRENCH WATER

The Contractor shall, at their own expense, pump or otherwise remove any water which may exist in the trenches and shall form all dams or other works necessary for keeping the excavation clear of water during progress of the work. In case of running sand or other bad ground, the work shall proceed day and night if the Engineer so directs. (The Contractor will not be paid for crushed rock or other material which is used for maintaining a dry trench.)

If any private water supply shall become interrupted, either temporarily or permanently, solely as a result of the Contractor's approved de-watering procedure, the Contractor may be held responsible for claims thereof.

No pipe or fittings shall be laid in water or when the trench conditions are unsuitable for such work, except with written permission of the Engineer.

The Contractor shall, at their own expense, control all erosion at the outfall and downstream of the dewatering pipe. The Contractor shall also be responsible for applying for and obtaining any dewatering permit that may be required from any agency, such as the DNR, with no direct compensation therefore.

21. BACKFILLING PROCEDURES

All trench areas shall be backfilled to the original ground surface or to such other grade as may be shown on the Plans and/or specified in the Special Conditions. The backfill shall be placed as soon as practical after the pipe installation.

Granular bedding, free from rocks, boulders or frozen material, shall be deposited in the trench simultaneously on both sides of the pipe for the full width of the trench to a minimum height of twelve (12) inches above the top of the pipe (pipe zone). The material shall be shovel-placed and hand-tamped to fill completely all spaces under and adjacent to the pipe. Granular bedding placement shall be to the spring line on pipes 8" and larger for the first lift and to the top of pipe on the 2nd lift. Compact the material in no more than 6" lifts to the top of the pipe zone (12" above the pipe).

If suitable granular material for this portion of the backfill is not available from the trench excavation as determined by the Engineer, the Contractor shall provide and place an approved granular bedding or stabilizing aggregate material as described in these Specifications.

Succeeding layers of backfill from twelve (12) inches above the pipe to the surface may contain coarse materials, but shall be free from large pieces of rock, frozen materials, concrete, blacktop, wood, roots, stumps, sod, rubbish and other similar articles greater than 6-inches in diameter whose presence in the backfill, in the opinion of the Engineer, would cause excessive settlement of the trench or damage to the pipe.

If, in the opinion of the Engineer, the native trench material is unsuitable for any portion of the trench backfill, it shall be considered surplus material and disposal shall be as previously described. The Contractor, during the excavation operations, shall make a reasonable attempt to segregate all undesirable materials encountered from suitable materials. Any additional suitable material needed for backfilling shall be furnished and installed by the Contractor. It shall be granular bedding material as described in these Specifications.

22. COMPACTION REQUIREMENTS

Where density tests are taken to evaluate the compaction, the fill or trench backfill shall be compacted by mechanical means until it meets the requirements of MnDOT Specification2106.3G "Specified Density Method". The fill and trench backfill shall be compacted to a minimum of 100% of standard proctor density (ASTM D698) in the upper three (3) feet of the embankment and a minimum of 95% of standard proctor density below the upper three (3) feet. With the exception of the upper three (3) feet, if the existing moisture content of the backfill material is greater than 3% above the optimum moisture content, the soil shall be compacted to a minimum density of three (3) pounds per cubic foot less than the standard proctor curve at that moisture content. However, at no time shall the density be less than 90% of the standard proctor density.

Trench backfill compaction around all utility structures shall be accomplished as follows:

> Within three (3) feet of all utility structures, backfill compaction by mechanical roller vibrators will not be allowed, but shall be accomplished by using whatever mechanical means the Contractor deems appropriate, and shall be compacted in layers with material not to exceed one (1) foot in depth for

entirety of the trench. See Detail S-12 for bedding and compaction requirements around pipe.

23. DUST CONTROL

The application of water for dust control shall be in accordance with MnDOT 2130. If blowing dust becomes a nuisance, as determined by the Engineer, the Contractor shall apply water from a tank truck to all contributing areas. The rate of application shall be as directed by the Engineer. Water application for dust control shall continue as needed until the final road surface and all seeding and/or sodding is completed and acceptable.

24. TOPSOIL - SOD- SEED

A minimum of six (6) inches of MnDOT specified topsoil (as applicable) and either seed or cultured sod shall be placed where grassed areas have been disturbed by construction, as directed by the Engineer. Sod shall be placed and maintained in accordance with MnDOT 2575 specifications. Sod, seed and topsoil types shall be determined by the Engineer and follow the requirements of MnDOT 3877 and 3878.

All areas adjacent to proposed street construction (ex. boulevards and island areas) requiring seed shall be seeded with (salt resistant) MnDOT Seed Mixture No. 25-131 or 25-151 spread at a rate applicable to MnDOT 2575.

In other seeded areas, the standard seed mix shall be determined by engineer and spread at a rate applicable to MnDOT 2575. In areas where there is high erosion potential, wood fiber blanket meeting the requirements of MnDOT 3885 shall also be used.

Mulch shall be either MnDOT (2575) Type 1 spread at a rate applicable to MnDOT 2575 standards and disc anchored or a matrix type approved by the Engineer.

The Contract pay items for establishing turf will include all labor, materials, equipment and other incidentals to complete the work. The contract pay item will include maintenance, replacement and repair when required by Contract.

25. MISCELLANEOUS RESTORATION

The Contractor shall restore to a condition equal to or better than existing, as determined by the Engineer, all other structures not specifically mentioned above which are disturbed because of this construction, including fences, irrigation systems, clothes posts, mailboxes, yard lights, entrance markers, etc. There will be no additional compensation for this miscellaneous restoration unless specified otherwise in the Special Conditions.

26. INSULATION BOARD

Where called for on the Plans, the Contractor shall install polystyrene insulation board meeting the requirements of MnDOT 3760. Minimum thickness is two (2) inches and minimum width is four (4) feet, placed one (1) foot from top of pipe.

The insulation board shall be formed by the expansion of polystyrene base resin in an extrusion process and shall be homogeneous, and essentially multicellular. The surface of the boards shall be extruded, with skins. The material shall conform to the following requirements:

Compressive strength, at yield or 5% deflection ..... 35 psi minimum

Flammability .....self-extinguishing
Water absorption after 24 hours immersion, by volume .....0.25% maximum
Thermal Conductivity, at mean temperature of 75 deg. F ..... 0.23 maximum

27. SETTLEMENT

The Contractor shall be responsible for all settlement of backfill, fills and embankment which may occur within two (2) years after final acceptance of the completed work. Acceptable levels of settlement as determined by the City Engineer.

The Contractor shall make, or cause to be made, all repairs or replacements made necessary by settlement within 30 days after notice from the Engineer or Owner.

End of Section