

SPECIFICATIONS
FOR
GRADING AND LANDSCAPPING
CITY OF MAPLE GROVE, MINNESOTA
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Revised April 2015

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**SPECIFICATIONS
FOR
GRADING AND LANDSCAPING
CITY OF MAPLE GROVE, MINNESOTA**

Revised January 2015

1. DESCRIPTION

This work shall consist of the excavation, backfilling, and restoration of existing surface improvements for the purposes of installing new and/or relocating or adjusting existing underground utilities.

Use of the term "Plans, Specifications and Special Provisions" within this specification shall be construed to mean those documents which compliment, modify, or clarify these specifications and are accepted as an enforceable component of the Contract or Contract Documents. All references to MnDOT Specifications shall mean the latest published edition of the Minnesota Department of Transportation Standard Specifications for Construction, as modified by any MnDOT Supplemental Specification edition published prior to the date of advertisement for bids. All reference to other Specifications of AASHTO, ASTM, ANSI, AWWA, etc. shall mean the latest published edition available on the date of advertisement for bids.

2. MATERIALS

a. SELECT GRANULAR MATERIAL

Use Mn/DOT Specification 3149.2B aggregate for select granular material and specified under the pipe bedding classification or an equivalent natural granular soil.

b. FINE GRANULAR FILL MATERIAL

Material shall consist of sound durable particles without cohesion of clean sand and/or well rounded gravel. The largest size of gravel used shall depend upon the size of the pipe used. Use a maximum of three-eighths inch (3/8") gravel when the pipe diameter exceeds 24".

c. CLASS 4 AND CLASS 5 SAND AND GRAVEL

Class 4 and Class 5 sand and gravel shall be in conformance with Mn/DOT Specification 3138.

d. CRUSHED ROCK

The material shall consist of durable crushed quarry rock which 100% passes a two inch (2") sieve and which 95% is retained on a #4 sieve size. It shall not contain soil overburden, sod, roots, plants, and other organic matter, or other materials considered objectionable by the Engineer.

e. PIT RUN GRAVEL

The material shall consist of sound, durable particles of gravel and sand which may include limited amounts of fine soil particles as binding material, and which 100% passes a two inch (2") sieve and which 90% is retained on the #200 sieve size. It shall not contain sod, roots, plants and other organic matter, or other objectionable materials.

f. CRUSHED ROCK OR PEA GRAVEL

Coarse granular pipe bedding material shall be a well graded crushed rock or pea gravel which 100% passes a three-eighth inch (3/8") sieve and a maximum of 5% passes a #10 sieve. It shall not contain sod, roots, plants and other organic matter, or other objectionable materials.

g. ROCK STABILIZATION

Rock placed shall meet the requirements of MN/Dot 3137. The rock specified shall conform to the gradation CA-1 in Table 3137-1. Install rock used to stabilize the trench foundation installed at the discretion of the Engineer.

h. LIGHTWEIGHT AGGREGATE

Lightweight aggregate shall consist of aggregate having a density of 48 to 54 pounds per cubic foot installed in the trench bottom at the direction of the Engineer.

i. TREATED TIMBER PILING

Treated timber piling shall conform to Mn/DOT Specification 3471.

j. GRANULAR MATERIALS

Granular materials furnished for foundation, bedding, encasement, backfill, or other purposes as may be specified shall consist of any natural or synthetic mineral aggregate such as sand, gravel, crushed rock, crushed stone, or slag, that shall be so graded as to meet the gradation requirements specified herein for each particular use by the material manufacturer or as indicated in the Plans, Specifications, or Special Provisions.

k. GRANULAR MATERIAL GRADATION CLASSIFICATION

Granular materials furnished for use in Foundation, Bedding, Encasement, or Backfill construction shall conform to the following requirements:

Foundation materials shall have 100 percent by weight passing the 1-1/2 inch sieve and a maximum of 10 percent by weight passing the No. 4 sieve.

Backfill materials shall consist of existing trench materials, except as otherwise specified in this specification or in the Special Provisions.

Bedding and encasement materials for flexible pipe, where improved pipe foundation is not required, shall meet the requirements of MnDOT Specification 3149.2B.1, Granular Borrow, except that 100 percent by weight shall pass the one-inch sieve.

A gradation report from an approved Independent Testing laboratory of the proposed granular materials shall be furnished to the Engineer before any of the granular materials are delivered to the project.

l. GRANULAR MATERIAL USE DESIGNATION

Granular materials provided for Foundation, Bedding, Encasement, or Backfill use as required by the Plans, Specifications, and Special Provisions, either as part of the pipe item work unit or as a separate contract item, shall be classified as to use in accordance with the following:

Material Use Designation Zone Designation

- i. Granular Foundation --- Placed below the bottom of pipe grade as replacement for unsuitable or unstable soils, to achieve better foundation support.
- ii. Granular Bedding --- Placed below the pipe midpoint, prior to pipe installation, to facilitate proper shaping and to achieve uniform pipe support.
- iii. Granular Encasement --- Placed below an elevation one foot above the top of pipe, after pipe installation, for protection of the pipe and to assure proper filling of voids or thorough consolidation of backfill.
- iv. Granular Backfill --- Placed below the surface base course, if any, as the second stage of backfill, to minimize trench settlement and provide support for surface improvements.

In each case above, unless otherwise indicated, the lower limits of any particular zone shall be the top surface of the next lower course as constructed. The upper limits of each zone are established to define variable needs for material gradation and compaction or void content, taking into consideration the sequence of construction and other conditions. The material use and zone designations described above shall only serve to fulfill the objectives and shall not be construed to restrict the use of any particular material in other zones where the gradation requirements are met.

m. 3" MINUS STABILIZATION AGGREGATE

3-inch minus aggregate material shall meet the gradation as shown in the table below. The material shall consist of crushed limestone aggregate or recycled concrete but not bituminous asphalt.

Sieve	Percent Passing (%)
3 inch	100
2 inch	90-60
1 inch	80-45
3/4 inch	55-30
#200	3-12

n. PILING

Piling shall be constructed in accordance with the provisions of MnDOT Specification 2452 and special plan details relating to piling.

o. INSULATION

Main Insulation shall be extruded rigid board material having a thermal conductivity of 0.23 BTU/hour/square foot/degree Fahrenheit/per inch thickness, maximum, at 40°F mean, a comprehensive strength of 35 psi minimum, and water absorption of 0.25 percent by volume minimum. Unless otherwise specified in the Plans, specifications, or Special Provisions, board dimensions shall measure 8 feet long, 2 or 4 feet wide, and 1, 1-1/2, 2, or 3 inches thick.

p. GEOTEXTILE FABRIC

Geotextile fabric shall meet the requirements of MnDOT Specification 3733 and be used as required by the Plans, Specifications, and Special Provisions.

3. (2211) AGGREGATE BASE

The provisions of MnDOT 2211 are supplemented and/or modified with the following:

Salvaged crushed concrete aggregate or crushed bituminous/concrete mixture meeting the Class 5 aggregate gradation as per Section 3138 of the current Minnesota Department of Transportation Standard Specification and as approved by the Engineer must be used in lieu of Class 5 aggregate for the street base material.

Add the following at the end of Section 2211.3C, Spreading and Compacting:

In conjunction with the construction, blade-mixing the material shall be required as necessary to produce a substantially uniform gradation and moisture content.

The method of compaction for Aggregate Base, shall be the Quality Compaction Method.

The Contractor shall produce a reclaimed aggregate base by pulverizing the existing bituminous pavement utilizing machine (cold) process to provide a blended aggregate mixture of existing bituminous and aggregate and/or approved granular subgrade material. The pulverizing

operation shall produce an aggregate base Class 5 material meeting the provisions of MnDOT Table 3138-4. A Class 5 specifications with maximum bitumen content of 3.5 percent by mass (weight) shall be allowed per Table 3138-2. The pulverizing operation shall be performed to the thickness through the entire depth of bituminous and gravel base. The Contractor will need to make judgment on what that depth should be as field conditions may vary from soil boring reports. The machine speed shall be controlled to produce the required aggregate blend. Excessive oversized particles shall be removed by the Contractor. The line and grade shall be controlled to minimize incorporating undesirable sub grade materials into the reclaim aggregate base. The reclaimed material shall be compacted to provide a temporary driving surface.

“Full Depth Reclamation (various depths),” per square yard (S.Y.) shall include all labor and equipment to pulverize together the existing bituminous and gravel base in a single operation in place. When reclaiming operations are not feasible as determined by the Engineer due to a lack of existing gravel base or other suitable sub grade material, the Contractor shall suspend reclaiming operations and remove and salvage the existing pavement by milling. Whichever method is used, the work shall be measured on the square yard basis and paid for at the bid unit price for reclaimed aggregate base production. All associated work items shall be considered incidental. Contractor shall provide for periodic gradation testing of reclaimed aggregate base material as directed by the Engineer at the sole expense of the Contractor. Removal or reclaiming of bituminous curbing if present, shall be considered incidental to this item

“Reclaim Aggregate Base Class 5 Salvaged and Placed (CV)” per cubic yard (C.Y.) shall include all labor and equipment for excavating, handling, transporting, stockpiling, placing, shaping, necessary compacting operations, and aggregate base placement. All work shall be considered a single operation and incidental.

Excess reclaimed aggregate base not incorporated with the project as indicated in other sections shall become the property of the Contractor and be disposed of off site. All excess reclaim material shall be used before importing Class 5 material to the project.

Aggregate base, Class 5, required to be imported to the project shall be recycled aggregate base that meets the Class 5 specification indicated in MnDOT Table 3138-4, or as approved by the Engineer.

Priorities for the use of reclaimed aggregate material shall be determined in the field by the engineer. Typical priorities include:

1. Maintenance of roadway during the project
2. Sewer and watermain pipe bedding
3. Trench backfill
4. Subgrade correction
5. Roadway aggregate base
6. Driveway aggregate base

Reclaimed aggregate material shall only be used for driveway aggregate base if it has been strictly verified to meet the Class 5 specification indicated in MnDOT Table 3138-4 gradation.

4. EXCAVATION AND EMBANKMENT

Section 2105 is hereby amended and supplemented to include the following:

All excavation shall be classified as "Common Excavation" unless otherwise stated in the bid proposal.

a. DISPOSITION OF EXCAVATED MATERIAL

Topsoil shall be stripped, stockpiled and used as slope dressing to the minimum depths as shown on the plans and as directed by the Engineer.

The Contractor shall dispose of all excess excavated material at the disposal areas as designated on the plans. The disposal areas shall be kept leveled and suitable for dumping by the Contractor. If no disposal area is indicated on the plans, the excavated material shall become the property of the Contractor and removed from the project limits. Any stockpiling or re-handling of these materials shall be considered incidental to the Contract with no direct compensation therefore.

Excess excavation shall not be deposited on private property without the permission of the Engineer and until a Permission to Fill form has been executed by the property owner. The Contractor shall not be expected to finish grade material dumped on private property as part of this Contract.

b. METHOD OF MEASUREMENT

Common excavation shall be paid for by cross section measure. This item shall include topsoil stripping, as well as excavation required for roadway and walk construction. If designated (P) it shall be paid at plan quantity. Excavation designated (LV) shall be paid for by vehicle measure loose volume. All other excavation shall be assumed excavated volume (EV) based on the cross section measure.

c. EXCAVATION MATERIAL

No payment shall be made for embankment construction behind the curb. Only the excavated material that is cut to line and grade shall be considered for payment. For payment by loose volume (LV) measure, each truck shall be measured by the Engineer and no payment shall be made if the Engineer does not receive a load count each day. All embankments shall be completed before any excess suitable material is disposed of.

All sub-cuts shall be backfilled as indicated on the plans. The backfill shall be placed in accordance with the "Quality Compaction" as specified in MnDOT 2211.

Excavation shall be paid for at the bid price per cubic yard (cross section measure) for sub grade excavation.

All necessary excavation required for the placement of a uniform depth of slope dressing and sod shall be paid for at the unit price per cubic yard of excavation, which includes bank sloping.

During construction, all excavations shall be maintained in such a condition that they will be well drained at all times. Temporary ditches or gutters shall be constructed when necessary to maintain drainage and avoid damage to the roadway. No excavated materials shall be placed or stockpiled in such a manner as to restrict free surface drainage of the sub grade or base courses.

5. PROOF ROLLING

The provisions of MnDOT 2111 are supplemented and/or modified with the following:

Prior to the placement of any geotextile fabric, sub-base material, or aggregate base material, the Engineer will require a proof roll of the existing sub-grade. Proof rolling shall consist of driving a fully loaded dump truck, capable of delivering a minimum 9-ton axle load, over the existing in place sub-grade. This procedure shall be observed by the Project Engineer. The sub-grade shall be considered unstable if any deflection or rutting exceeds set limits defined within the provisions of MnDOT 2111.

All unstable areas shall be corrected and test rolled until the sub-grade meets the requirements or as directed by the Engineer. If there is any measurable precipitation between the original test roll and before any geotextile fabric or aggregate base is placed, if requested by the Engineer, the contractor will be required to re-test roll the sub-grade and make any corrections needed prior to placement of geotextile fabric or aggregate base. All test rolling is considered incidental and no direct compensation shall be made.

Test rolling will be performed no more than 24 hours prior to pavement being placed. If within that time the project receives any measurable precipitation, the contractor will need to conduct another test roll at no extra cost to the Owner, if requested by the Project Engineer. Any additional corrections will need to be corrected and test rolled prior to bituminous being placed.

6. NOTIFICATION TO PROPERTY OWNER

The Contractor shall provide 24 hour notice to the property owner before any driveway is blocked, mailboxes being removed, pavement being placed or any utility work that would disrupt their day to day lives. The contractor shall give the homeowner sufficient time to move their vehicles out of the driveway and park in a location determined by the contractor. No driveway shall be blocked longer than necessary for construction and only as approved by Engineer.

Access to existing businesses shall be maintained at all times. When construction is directly impacting business driveways and entrances, work shall be done continuously and as promptly as possible to return the driveway entrance to a finished surface. The contractor shall exercise care to minimize impacts to business parking facilities.

7. PROTECTION OF UTILITIES

The Contractor is required to protect all Utilities per the General Conditions. Special care shall be taken in crossing of underground gas, electric and telephone conduits.

The Contractor shall cooperate with the private utility company concerned in protecting and supporting conduits for uninterrupted service. The utility company shall be notified immediately of any damage to conduits.

In the event it is necessary to cut any gas line to perform the necessary grading, such cutting shall be performed by the utility company, at no expense to the Contractor. Any accidental breakage of gas lines shall be the responsibility of the Contractor; such breakage shall be repaired by the utility company. The Contractor shall contact the utility company prior to excavating in any street.

8. PROTECTION OF EXISTING DRIVEWAYS, CURBS AND SIDEWALKS

Any concrete, blacktop, crushed rock, or other type of driveway material carelessly disturbed by the Contractor during construction shall be replaced or rebuilt to a condition at least equal to its condition at time of removal. There shall be no compensation allowed for this item.

Existing concrete curb or sidewalk not scheduled for removal and replacement that is carelessly damaged by the Contractor during any construction activities will be replaced at no cost to the City.

9. PROTECTION OF IRRIGATION AND PET CONTAINMENT SYSTEMS

Care must be taken to ensure that existing irrigation and underground pet containment systems in place at start of construction are protected from unnecessary damage. The Contractor shall provide irrigation and pet containment system repairs to systems that were damaged during normal construction operations.

This work includes removing existing pipe, irrigation heads, valves, tees, valve boxes, pet containment wiring, conduit, blowing out the system prior to winter freeze up, verifying the system functions the following spring if repairs occurred late in the construction season, etc. related to these systems and reinstalling salvaged items or installing new items such that the system is returned to its pre-construction condition. All wiring and piping shall be made water tight with industry approved materials.

Irrigation heads shall match the style of the existing systems unless otherwise approved by the Engineer.

The Contractor shall verify all irrigation head and line locations prior to construction operations so as to protect the portions of the systems that will not be affected by construction. Unnecessary damage caused to the existing system inside or outside the construction limits shall be repaired at the Contractor's expense.

Damage occurring to systems as approved by the Engineer during normal construction activities shall be paid at the contract unit price for irrigation system repair and pet containment system repair and shall include all labor, equipment, and materials associated with these repairs.

10. CLEANING OF CATCH BASINS, MANHOLES AND GATE VALVES

The Contractor shall prevent dirt, concrete, or any other material from entering existing manholes, catch basins, or water valve boxes. All removal of such material from the sewers or repairs caused by such negligence shall be made at the expense of the Contractor.

11. DUST CONTROL

The Contractor shall be required to adequately control dust on the streets at all times. When directed by the Engineer, the Contractor shall provide one tank truck, adequate size, with spray bar or other suitable equipment for sprinkling streets, which shall be available at all times for dust control. It shall be the specific requirement that dust control measures are strictly adhered to and a regular watering schedule be implemented when directed by the Engineer (e.g. once in the morning, once mid-day and once late afternoon). The Owner shall furnish the water free of cost, but reserves the right to indicate the source of supply. The Contractor shall acquire one water meter per project from the Owner for use by the Contractor and all sub-contractors at a cost of \$1200. A pay item shall be designated for this item.

Saw cut operations shall utilize wet sawing techniques or approved equal to reduce the amount of dust created by sawing operations of both concrete and bituminous pavements.

The Contractor shall be required to respond to any verbal notice from the Engineer regarding dust control and respond appropriately within one (1) hour from the time of notification. If the Contractor fails to take appropriate action as indicated, the Engineer shall have corrections made and assess \$500.00 damage plus costs incurred in correcting the

violation. Damages shall be assessed for each violation or repeat violation and appropriate deductions shall be made to the final Contract payment.

12. TURF ESTABLISHMENT

The contractor shall be responsible to distribute the "Caring for your new sod fact sheet – 2105" to all existing homes within the project during the installation of the sod or immediately upon completion of the sodding. This letter can be found as Exhibit J in the Conditions of the Contract page 67 or ask the City of Maple Grove for a copy.

a. SOD AND SEED

Unless specifically indicated in the Contract, the sod and seed provided for this project and the procedure for sodding shall conform to the requirements of MnDOT Specifications 2575, 3876, 3877 and 3878 and as modified herein:

Sod shall be level and blend into the existing sod smoothly. Where sod is blended into existing sod, this edge shall be cut with a sod cutter to a depth equal to the thickness of the new sod.

Determination of seed application during MnDOT blackout dates from June 1 to July 20 and after September 20 shall be as directed by the Engineer. This shall include watering and other maintenance items. Rural seed mixture 250 and Urban seed mixture 260

All sod and seed areas shall be maintained for a period of 30 growing days from the date of installation. Maintenance includes watering, weeding, fertilizing and mowing to establish turf and create an adequate root system on the sod and seeded areas. The Engineer will then make the final inspection and consider acceptance of the sod and seed.

Apply fertilizer, analysis 12-0-12, to all sod and seed areas at the rate of 200 lbs. /acre.

For seeded areas, bare spots which persist after three weeks of favorable growing weather shall be re-cultivated and re-seeded as many times as necessary until acceptable turf is established. Acceptable turf shall contain no erosion washes, no bare spots greater than 0.5 square foot, no bare areas comprising more than 0.5% of any given 1,000 square foot area, and no deformation of turf areas caused by mowing or other Contractor equipment.

b. LANDSCAPING

Landscaping shall be done in locations designated on the plans or at other locations as directed by the Engineer. The work shall include the replacement of all sod which has been disturbed or uprooted by other phases of the Contract.

c. HYDRO-SEEDING

Hydro-seeding application shall be completed from two different directions to ensure even application and reduce shadow areas. The Contractor shall protect existing driveways, curb and gutter, landscaping, plantings, walls, and all other in place items from hydro-seed overspray. Any overspray shall be removed by the Contractor within 24-hrs of receiving notice from the Engineer.

d. WATERING

Water use permits must be obtained from the Utility Department at 9030 Forestview Lane prior to using water. Draw water from hydrant designated by the Utility Department on that particular project only. Watering equipment shall be inspected by Utility Department personnel prior to issuing a permit. The permit will be issued at no cost to the Contractor. The Contractor shall provide all the labor and equipment for the application of water in turf restoration areas for the duration of the maintenance period. If no pay item is designated for watering for turf establishment then this shall be considered incidental.

Watering shall be required throughout the growing period/maintenance including the period from June 1 to July 20. A growing day is any calendar day between April 15 to November 1. If the maintenance period does not conclude by Nov. 1, the remaining balance on the warranty will carry over to begin on April 15 of the following year.

e. TOPSOIL

Topsoil shall be pulverized and free of heavy clay, peat, stones, plants, roots, sticks and other foreign materials. The topsoil borrow material shall be a light and friable loam, be black in color appearance and meet the requirements in accordance with MnDOT Specification 3877.2.D. but shall have a minimum 6% organic content. The topsoil shall be tilled by disking, rototilling, or

other approved method of tillage to a minimum average depth of 3.0 inches, and shall be leveled and raked to prepare a smooth and even seedbed with a loose and open surface. Stones and other debris over 1.5 inches in diameter shall be removed from the soil surface. A uniform grade shall be established so that no depressions or elevations are present, and so that the safe and effective operation of mowing equipment shall not be hindered after the turf grass is established.

Contractor shall furnish test results and samples prior to delivery of the material to the project.

Prior to placing any topsoil the slopes shall be cut uniformly such that the finished sodded slope shall conform to the designated section. Topsoil shall be placed to a minimum depth of 6" for both seeding and sodding operations. The topsoil shall be raked and all lumps and irregularities removed prior to placing the sod or seed. Operations to remove lumps or irregularities shall be incidental to topsoil placement. The topsoil shall not be too loose whereby footprints greater than 1.0 inches are observed, nor shall it be too dense whereby only footprints less than one-eighths of an inch are observed.

Care shall be taken to insure that the topsoil does not contaminate the subgrade or base of the roadway. Grading stakes, stones, trash, root masses, and other debris which may hinder the distribution of fertilizer, compost, seed, or seed mulch during seeding operations shall be removed from the site when seedbed preparation operations are completed. Soil, fertilizer, compost and seed shall be removed from paved areas as soon as possible after seedbed tilling, grading, and seeding operations are completed.

It shall be the responsibility of the contractor to ensure that the soil of the seedbed preparation area is not blown or washed from the site and that nearby areas are protected from soil, fertilizer, compost, etc. In the event of heavy rain or wind that causes damage to the site which may have been anticipated and prevented by the contractor, then the contractor shall repair the damaged areas so they are restored to a condition acceptable under the specifications; when soil or other material is moved from the site and deposited on nearby areas the contractor shall restore those areas to a condition substantially similar to that which prevailed before the damaging event. Watering of seeded areas shall be done with equipment necessary to prevent seed from being displaced from its original location.

Do not place topsoil until the Engineer has inspected the area and approved the subgrade preparation and topsoil materials.

Do not complete topsoil fine grading more than 24 hours prior to the sod laying operation. Remove topsoil placed on unapproved areas or topsoil which does not meet Mn/DOT Spec. No. 3877 with removal being done at the Contractor's expense.

f. APPLICATION RATES

Seed Mixture 25-151: 300 lbs/AC

Fertilizer Type 3 (22-5-10): 450 lbs/AC

Hydraulic Soil Stabilizer Type Fiber Reinforced Matrix (FRM) Flexterra HP-FGM by Profile Products LLC or approved equal as approved by the Engineer: 2,500 lbs/AC (100% Coverage)

g. STREET SWEEPING

Sweep the streets following the completion of the sodding and seeding operations. Complete sweeping within seven (7) calendar days after completion of the sodding and seeding operation. This sweeping shall be with a pick-up power sweeper and continue until loose material is cleaned up to the satisfaction of the City Engineer. Also clean catch basins to the Engineer's satisfaction within the same time requirements stated above.

13. TREE REMOVAL

The trees encountered shall be cleared and grubbed as directed by the Owner and disposed of outside of the City of Maple Grove City limits.

Where trees are not marked for removal, the Contractor shall protect these trees in accordance with MnDOT Spec. 2572. The Contractor shall take special care to preserve existing trees and shrubs wherever possible. This may include careful grading operations, slight adjustments of slopes, and placing silt fence at tree drip lines. Protection of trees not identified to be removed shall be incidental.

Current and pertinent government regulations concerning disposal of elm trees or other types of trees shall be adhered to.

Cleared trees may be claimed by the abutting property owner, and if so, they shall be trimmed, cut into sixteen inch (16") lengths and piled on private property. All other material shall be disposed of by the contractor.

14. CLEAN ROOT CUTTING

Where trees are not marked for removal, but root systems interfere with the construction of curb and gutter or sump drain, Contractor shall clean cut the roots in accordance with MnDOT Spec 2572.3A.2.

15. LANDSCAPE ROCK

This work shall include all work necessary to furnish and install the landscape rock. The type and size of landscaping rock shall be of similar size, shape and color of the existing landscaping rock. The work shall include, but not be limited to, all equipment, labor, fabric barrier between the sub grade soil and the landscape rock, backfilling, landscape edging and other materials necessary to complete the work. The work shall be coordinated with the Engineer and property owners prior to removal and installation.

16. MAIL BOXES

The Contractor shall relocate mailboxes as necessary. Mail boxes shall be set 41" to 45" up from top of curb to the bottom of box and front of mail box shall be 6" to 8" from back of curb. Mailbox relocations (both temporary and permanent) shall be accomplished so there will be no interruption of mail service. This work shall be considered incidental and no direct compensation shall be provided unless a specific bid item is included in the Contract for such work.

17. TRAFFIC SIGNS AND DEVICES

Traffic Signs and Devices shall be constructed in accordance with MnDOT 2564, except as follows:

a. MATERIALS

i. Sign Panels:

Provide in accordance with the latest MnDOT Standard Signs Manual, the Minnesota Traffic Engineering Manual, the MMUTCD, the plans, MnDOT 2564, and as follows.

All Traffic signs will be Type C DG-3 Diamond Grade.

Fabricate in accordance with the following

- a. Sign base material: Sheet aluminum conforming to material requirements of MnDOT 3352.2A1a.
- b. Sign face material: Reflective sheeting conforming to MnDOT 3352.2A.2.a.
- c. Sign legend material: "Direct Applied" conforming to the requirements of MnDOT 3352.2A.5.c or 3352.2A.5.d.

ii. Traffic sign posts:

Provide 3.0 pounds/foot flanged channel Ribbed Back Galvanized sign posts conforming to MnDOT 3401.

Provide quantity of Galvanized sign posts at each installation in accordance with the Plans.

Provide sign structural components for mounting sign panels (including posts, knee braces, etc.) in accordance with the applicable provisions of the Plans, the Minnesota Traffic Engineering Manual and with the details enclosed in these Special Provisions/the Plans

Determine length of Galvanized sign posts in accordance with the following sign panel mounting height guidelines provided in these Specification. All Galvanized sign posts must be installed 4 feet below finished grade.

Where Type C Signs are to be installed on street name sign posts, permanent barricades, or on traffic signal poles, mounting hardware required to mount sign panels shall be approved by Engineer prior to installation.

iii. Fabrication Stickers

Screen a fabrication sticker and affix to backside of each new Type C sign panel in lower right-hand corner (when facing the back of the sign.)

Provide full size mock-up (minimum 1-1/2 inches by 3 inches) of sticker to Engineer for written approval prior to producing any stickers for the Project.

Produce fabrication sticker in accordance with the following:

Colors shall be black legend on white reflectorized background.

Month and year of fabrication of the sign panel shall be punched out prior to installation of sticker on sign panel.

Fabrication sticker shall be similar to example shown below, unless otherwise approved by the Engineer.

Sign Company Name

Address

Month 1 2 3 4 5 6 7 8 9 10 11 12

Year 14 15 16 17 18

iv. Street Name Signs:

The Owner will provide street name signs for the Contractor to pick up from Public works. Contractor must coordinate work with Engineer on site and give a minimum of a 72 hour notice before picking up.

Contractor will need to supply the 2 3/8" outside diameter galvanized steel post for all street name signs and all other materials need for installation. This includes but not limited to nuts, bolts, installing steel plate, rivet and all labor.

1. Post:

Provide round galvanized steel pipe as follows:

2-3/8-inch outside diameter

12 gauge minimum diameter

Tubular post to have hole drilled or blown through 8" from bottom for insertion of pin. Pin to be 10" x 1/2" or greater diameter rebar or similar material. Pin through post to prevent rotation of post in the event of cracked or failed footing.

2. Mounting Hardware:

Provide steel assembly units as follows:

Post cap with 5/16-inch bolts and 3/16" Aluminum rivets and 1/4" Stainless Steel rivets to secure.

When only one street name is to be installed the Contractor will need to use a Lyle E-250 bracket. When there are 2 or more street signs, the Contractor must use a Lyle E-450 bracket for installation.

Bracket assembly shall be Lyle E-450 for post mounted assemblies, Lyle E-450 OLP for street light pole mounted assemblies, or Engineer approved equal. Street light pole assemblies shall be mounted using stainless steel straps.

All remounting hardware shall be galvanized or aluminum.

[END OF GRADING AND LANDSCAPING]