

CITY
OF
BLOOMINGTON
MINNESOTA

STANDARD SPECIFICATIONS

FOR

CONSTRUCTION

.

Revised March 5, 2010

CITY OF BLOOMINGTON
STANDARD SPECIFICATIONS
FOR
CONSTRUCTION
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STANDARD SPECIFICATIONS
FOR
CONSTRUCTION

1. GOVERNING SPECIFICATIONS

The City of Bloomington General Specifications shall apply to all work and material furnished under these Standard Specifications.

In the following Specifications, reference is made to "Mn/DOT SPECIFICATIONS" which shall mean the "STANDARD SPECIFICATIONS FOR CONSTRUCTION" of the Department of Transportation of the State of Minnesota, 2005 edition including all supplemental specifications and other updates. All materials and methods shall comply with that Specification and Supplemental Specifications unless modified in these documents.

The City of Bloomington's General Specifications, the Standard Utility Specifications for Sanitary Sewer and Storm Sewer Installation and the Standard Utility Specifications for Watermain and Service Line Installation as prepared by the City Engineers Association of Minnesota (current editions) shall apply to all work and material to be furnished under this Project except as modified by these Supplemental Specifications and the Special Provisions.

Copies of the Standard Utilities Specifications are available from the City Engineers Association of Minnesota. To obtain a copy visit their web site at www.CEAM.org.

Numbers following the various specification section refer to Mn/DOT specification numbers except for the sewer system sections (2621) and the water system (2611) which refer to CEAM specification section.

2. ACCESS TO DRIVEWAYS AND ADJACENT STREETS

Construction of adjacent streets in residential areas shall be scheduled to provide continuous access for residents, delivery, emergency traffic, mail service, and garbage pick-up. Streets where surface reconstruction and/or utility installation will take place will require special work by the Contractor to provide ramps into driveways for access. Class 5 Aggregate Base (paid at the unit price bid) shall be used to provide these temporary ramps. If the Contractor elects to use suitable on-site material for temporary ramps, the construction, maintenance and removal of these ramps shall be incidental. The Contractor shall maintain these ramps, including nightly reshaping, until the bituminous base (and/or binder course) is in-place, at no additional compensation.

At locations where residents with mobility challenges reside, as identified by the Engineer, the concrete curb and gutter through the driveway opening section shall be formed and poured one-half at a time to allow access to the driveway at all times. This work shall be incidental.

3. SHOP DRAWINGS

Shop drawings will be accepted and reviewed by the City. The acceptance, review and/or subsequent comments shall not be construed as approval of the shop drawings. The responsibility of

the Contractor to supply materials that comply with the specifications and plans lies entirely with the Contractor.

4. VIBRATION

The Contractor may need to make adjustments to their construction practices if damage to adjacent facilities may result from their operations. It is the responsibility of the Contractor to monitor and make necessary changes if any are needed. Any monitoring or changes in operations will be at the Contractor's expense.

5. SUPERVISION BY CONTRACTOR (1506)

Supervision by the Contractor shall be in accordance with the provision of 1506 and the following:

The Contractor shall designate in writing the competent superintendent and the competent individual (ie: construction team leader or foreperson) will be for the Project. These persons can only be changed during the Project by submission of a written authorization request to the Engineer by the Contractor. The submittal of information (including a personal resume and listing of other projects of similar magnitude where each has worked in a position of similar responsibility and current contact information for a direct supervisor on the projects listed) regarding these persons and one back-up individual shall be submitted at the preconstruction conference. These persons shall not be an operator or laborer. The competent individual shall be available to the Project at all times and the competent superintendent will be required to be on the site at least daily while working days are being assessed. The Engineer may decide to require the Superintendent to be on the site more frequently if necessary.

The Contractor shall furnish names, addresses, and phone numbers of at least three individuals responsible for all aspects of maintenance (including traffic control devices) on the Project. These individuals shall be "on call" 24 hours per day, seven days per week. The individual "on call" upon receiving notification of any deficiency shall dispatch people, materials, and equipment to correct the deficiency within one hour of notification.

All of the above information shall be submitted to the Engineer at the Pre-Construction Conference.

6. GAS SERVICE (1507)

In the event it is necessary to cut any gas line or remove a section to perform the necessary street grading, such cutting shall be performed by the gas company at no expense to the Contractor provided this work is not for the convenience of the contractor. The cost of repairing any accidental breakage or damage to gas lines caused by the Contractor's operation shall be the responsibility of the Contractor. The gas company shall perform all repair work, no matter how slight. The Contractor shall call the gas company immediately upon causing any damage to the integrity of the coating on any gas line.

7. EXISTING UNDERGROUND UTILITIES (1507)

The plan will indicate the quality level of the subsurface utility information according to the guidelines of CI/ASCE 38-2 entitled "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data." If no quality level is indicated the Contractor shall assume it is quality level D. Every effort has been made to position and dimension all existing underground utilities on the

Plans. This information was obtained from the respective utility companies and the City record plans. The City of Bloomington does not guarantee the locations as shown on the Plans. It is the Contractor's responsibility to ascertain the final location of these utilities (including municipal water and sewer lines and appurtenances) and to notify the utility companies when construction commences in each area. The Contractor shall contact Gopher State One-Call (651-454-0002) at least 48 hours (excluding Saturdays, Sundays and holidays) prior to any excavation.

The Contractor is responsible for the protection of all underground utilities, which are located in the field or are shown on the Plans. The Contractor shall adjust all manhole and catch basin castings, water valve boxes, and curb stop boxes, which require such adjustment. After adjustment, all manholes, valve boxes and curb boxes shall be 1/4" below finished grade and in proper working order. Curb boxes and valve boxes must be plumb and concentric about the operating nut. Storm and sanitary sewers and water valve boxes must be carefully protected. Any sand or debris caused by the Contractor's operations must be immediately removed from the manholes, pipes, and valve boxes.

Before the Contractor removes manhole castings or lowers gate valve boxes, it shall be the Contractor's responsibility to make location ties for these structures so they can be relocated accurately after the base course is constructed, and in case of emergency use of these facilities. Copies of the ties shall be promptly furnished to the City.

The Contractor shall report to the Engineer in writing any undesirable conditions, such as sand in manholes, damaged valve boxes, broken castings, etc. prior to commencing work on any street. Once excavation or utility construction has commenced, it will be assumed that all damage to underground installations except that reported as noted above, has been caused by the Contractor's operations and it will be the contractor's responsibility to make the necessary repairs.

Wherever existing utility structures or branch connections leading to mains or other conduits, ducts, pipe or structures present obstructions to the grade and alignment of the pipe which would require a change in plans or revision to the existing utility, the Engineer will provide new grades for the new utility or a plan for revising the existing utility within 48 hours of the location of the existing utility. If the Contractor elects not to uncover existing utilities and a conflict between utilities occurs, the Contractor shall be required to relay pipe or revise the existing utility, as directed by the Engineer, with no additional compensation allowed therefore.

The removal of portions of abandoned utility lines and pipes when required for the new construction will be considered incidental work and no direct compensation will be made therefore. Disposal shall be by the respective utility company.

The Contractor is responsible to locate, protect, alter and restore the existing sprinkler systems. Before construction work begins the Contractor shall locate the elements of the system and plug only those sections in the construction area. During construction the remaining portion of the system (outside the limits of construction) shall continue to operate. After construction is complete and before sod is replaced, the system shall be restored to water all turf as it did prior to construction. If the contractor fails to allow the system outside the construction area to operate the cost of replacement of turf and landscaping shall be entirely at the contractor's expense.

The cost of restoring irrigation systems shall be considered force account work as specified in Article No. 7 of the General Specifications unless a specific pay item is included in the special provisions.

8. CONSTRUCTION STAKES - ALIGNMENT AND GRADES (1508)

The following is added to the fourth paragraph of Mn/DOT 1508:

"The cost of replacing stakes and marks will be based on the actual number of hours of field and office worked based on time and materials spent with an overhead markup.

9. TRENCH EXCAVATION AND BACKFILL/SURFACE RESTORATION (1704)

The Contractor is directed to Chapter 14, Article I and Section 17.71 of the City of Bloomington’s Code (amended by ordinance No. 98-54). This article and code section references certain street pavement restoration requirements for work in the right-of-way, and are made a part of this contract. To obtain a copy, contact City Offices or visit the City’s web site at www.ci.bloomington.mn.us.

Restoration Standards for the City of Bloomington streets are divided into four categories: Red, Black, Blue and Green. The following table shows the restoration requirements for each category.

	Red (Pavement 0 to 5 yrs old)		Black (Pavement 5 yrs old to 5 yrs project plan)		Blue (In 5 year project plan)		Green (Current year project plan)	
	Trench	Hole	Trench	Hole	Trench	Hole	Trench	Hole
Restoration Std. Plate No.	1 or 2	7	3 or 4	8	5	9	6	10
Length of Restoration	Nearest crack or 2’ overcut (City Option)	Nearest crack or 2’ overcut (City Option)	Nearest crack or 2’ overcut (City Option)	Nearest crack or 2’ overcut (City Option)	2’ overcut	2’ overcut	Trench length only	Hole length only
Width of Restoration	Lane width to nearest curb, joint or crown	Lane width to nearest curb, joint or crown	Lane width to nearest curb, joint or crown	Lane width to nearest curb, joint or crown	2’ overcut	2’ overcut	Trench Width only	Hole Width only
Special Modifications	Sealcoat curb to curb for one block*	Sealcoat curb to curb for one block*	None	None	None	None	None	None

*The Contractor may elect to forgo the sealcoat and pay the fee to the City for the City Maintenance Forces to perform this seal coat.

The compaction test requirement for all categories shall be one (1) test for any portion of the initial 50 SF of excavated area and one (1) test for each 250 SF (or part thereof) beyond the initial 50 SF. The test shall be performed once for every four (4) feet vertical zone depth from the bottom.

All edges shall be saw cut with a tack coat applied prior to the installation of plant mixed bituminous pavement meeting the requirements elsewhere in this specification.

The maximum width of any of these restoration items shall be the outside diameter of the pipe laid, plus two feet plus three times the depth to the pipe invert or as modified by the Engineer. This modification, if required, will be included in the Special Provisions for the Project. The existing pavement shall be cut back two feet behind the edge of the trench except on Green streets. Restoration outside this specified area shall be at the Contractor's expense.

Adjustment of all manholes castings, catchbasin castings, water valve boxes, curb stop boxes and other iron shall be raised prior to the installation of the final lift of bituminous. Any street where **any** iron has not been brought to the appropriate grade prior to paving will be subject to a seal coat restoration fee.

Payment for furnishing, placing, and shaping street patches shall be at the unit price bid unless noted as incidental.

Contact the City of Bloomington at (952) 563-4551 for a current copy of the map showing the current color category status of each street.

10. EMPLOYEE HEALTH AND WELFARE (1706)

The provisions of Mn/DOT 1706 are supplemented with the following:

All construction operations shall be conducted in compliance with applicable laws, regulations and industry standards as described in Mn/DOT 1706. The Contractor shall be considered to be fully responsible for the development, implementation and enforcement of all safety requirements on the Project, notwithstanding any actions the City of Bloomington may take to help ensure compliance with those requirements.

A copy of the Contractor's written safety program shall be submitted for review at the Pre-Construction Conference. At a minimum, the Contractor must have an established AWAIR/Safety Program containing the following:

- Right to Know
- Personal Protective Equipment
- Respiratory Protection
- Hearing Conservation
- Lockout/Tagout
- Permit-Required Confined Space Entry
- Fire Protection
- Blood Borne Pathogens
- Trenching & Excavating
- Mobile Earth Moving Equipment

This safety program shall contain name(s) of person(s) responsible for all safety requirements and/or the Contractor's Designee(s) shall be available at all times that work is being performed. The Contractor's designee(s) shall be responsible for correcting violations on the Project as observed by the Engineer or his/her representative

The Contractor is hereby advised that the City of Bloomington has determined that all existing manholes, catch basins, and similar type enclosed structures on storm sewer systems, water distribution systems, and sanitary sewer systems contained within the right of way of all roadways and within the construction limits of this Project are confined spaces and access into them shall be in accordance with the MINN.RULE 5207.0300-0304. All new structures of the same type and function of the aforesaid which are to be constructed as a part of this Project shall also be considered confined spaces and access into them shall be in accordance with the OSHA Regulation 29 CFR 1910. Further, the Contractor shall be required to abide by the Permit-Required Confined Space Policy and Contractor Safety and Health Policy of the City of Bloomington, in addition to the 29 CFR 1910 Occupational Safety & Health Administration (OSHA) and Minnesota Rules 5207.

It shall be the sole responsibility of the Contractor to have a confined entry program which complies with OSHA. The Contractor's program shall address, but need not be limited to, access into manholes, catch basins, and similar type enclosed structures on storm sewers, water distribution systems, and sanitary sewer systems that are to be constructed, reconstructed, adjusted, repaired, or otherwise modified as part of this Project. The Contractor's program shall establish acceptable entry conditions for the various classifications of confined spaces (e.g. CLASS I, CLASS II.) identified in OSHA Regulation 29 CFR 1910.146. The Contractor shall have an adequately trained individual who shall be responsible for classifying each confined space in accordance with the Contractor's confined space entry program, and ensuring compliance with same by all of the Contractor's employees and all other individuals within the Contractor's control entering confined spaces on this Project. The Contractor shall develop and implement site-specific procedures to coordinate entry operations when employees of more than one employer are or will be working simultaneously in a confined space.

The Contractor's confined entry program shall clearly address its applicability to all subcontractors and their employees that will be utilized for this Project. It shall be the Contractor's responsibility to ensure compliance with OSHA by all subcontractors and their employees on this Project either through the Contractor's own program or through separate programs established by the subcontractors working on this Project.

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions required in connection with their work on this Project, including regulations of the Occupational Safety and Health Administration (OSHA) and other regulatory and governing agencies.

The City of Bloomington assumes no responsibility or liability for the Contractor's compliance with applicable federal and state regulations and safe work practices. The Contractor shall remain at all times solely responsible for the sufficiency of its safety program and its compliance with applicable federal and state regulations

The Contractor shall not use any motor vehicle equipment on this Project having an obstructed view to the rear unless:

- (A) The vehicle has a reverse signal alarm which is audible above the surrounding noise level; or
- (B) The vehicle is backed up only when an observer signals that it is safe to do so.

A \$500.00 monetary deduction (per incident) will be assessed by City of Bloomington Safety Officer for violations of safety standards and requirements that have the potential for loss of life and/or

limb of Project personnel or the public. The areas of special concern include, but are not limited to excavation stability protection, fall protection, protection from overhead hazards, vehicle backup protection, confined space safety, blasting operations, and personal safety devices.

None of the monetary deductions listed above shall be considered by the Contractor as allowance of noncompliance incidents of these safety requirements on this Project.

11. MAINTENANCE OF TRAFFIC (1404), PUBLIC CONVENIENCE AND SAFETY (1707) AND TRAFFIC CONTROL(2563)

The Contractor shall furnish, install, maintain, and remove all traffic control devices required to provide safe movement of vehicular and/or pedestrian traffic passing through the work zone during the life of the Contract from the start of Contract operations to the final completion thereof. The Engineer will have the right to modify the requirements for traffic control as deemed necessary due to existing field conditions.

Traffic control devices include, but are not limited to, barricades, warning signs, trailers, flashers, cones, drums, pavement markings and flaggers as required and sufficient barricade weights to maintain barricade stability. Type III barricades shall have full reflectors on both sides of the barrier and 2 flashers. All barriers shall have reflective coatings on all sides of the barricade.

The Contractor shall, at the pre-construction conference, designate a Work Zone Safety Coordinator who shall be responsible for safety and traffic control management in the Project work zone. The Work Zone Safety Coordinator shall be either an employee of the Contractor such as a superintendent or a foreman, or an employee of a firm which has a subcontract for overall work zone safety and traffic control management for the Project. The responsibilities of the Work Zone Safety Coordinator shall include, but not be limited to:

- Coordinating all work zone traffic control operations of the Project, including those of the Contractor, subcontractors and suppliers.
- Establishing contact with local school district, transit agency, government, law enforcement, and emergency response agencies affected by construction before work begins.
- Maintaining a record of all known crashes within a work zone. This record should include all available information, such as: time of day, probable cause, location, pictures, sketches, weather conditions, interferences to traffic, etc. These records shall be made available to the Engineer upon request.

The Contractor shall inspect, on a daily basis, all traffic control devices, which the Contractor has furnished and installed, and verify that the devices are placed in accordance with the Traffic Control Layouts, these Special Provisions, and/or the MN MUTCD. Any discrepancy between the placement and the required placement shall be immediately corrected. The person performing the inspection shall be required to make a daily log (See Section B below for requirements of log)

Traffic control devices shall be provided in accordance with the provisions of MnDOT Specification 1710 and the Minnesota Manual on Uniform Traffic Control Devices (MMUTCD) and the Field Manual for Temporary Traffic Control Zone Layouts, latest edition.

Unless otherwise noted in the plans or specifications, the Contractor shall keep the street and sidewalks under construction open to all traffic and in safe operating condition. This work shall be incidental and no direct compensation shall be made therefore. The work shall be scheduled to maintain access to the maximum extent possible to and from nearby properties.

Specific traffic control layouts may not be shown in the plan. The contractor shall submit traffic control plans to the Engineer for approval two weeks prior to installing any traffic control device. Any work by the contractor that will close any street shall warrant a signed detour unless otherwise approved by the Engineer. This detour, like any other traffic control layout, shall be submitted to the Engineer for approval. At least 24 hours prior to placement, all traffic control devices shall be available on the Project for inspection by the Engineer. The Contractor shall modify their proposed traffic control layout and/or devices as deemed necessary by the Engineer.

All detours required shall be approved by the Engineer two weeks prior to use. Detour signs and barricades shall conform to the requirements of the Minnesota Manual on Uniform Traffic Control Devices and illustrations in the Plans, if applicable. Placement shall be as approved by the Engineer. All barricades and signing used to close any facility shall have flashers at each end. Properly equipped flaggers shall be used as required in order to facilitate good construction and provide safe driving conditions. Barricades and detour signs that are not in use shall be promptly removed from the construction area.

Maintenance of the streets and sidewalks under construction, detours, bypasses and equipment yards used in conjunction with the Project shall be the responsibility of the Contractor. Said maintenance shall include keeping the streets and sidewalks free of obstacles, parked equipment, barricades which are not in use, maintaining the traveled ways, and controlling the dust in the construction area; and replacing signs and barricades during and after storms, high winds and damage caused by traffic. Streets and sidewalks in the area, not under construction shall be kept free of construction materials, dirt, or other undesirable material. All traffic control devices shall be clearly marked with 24 hour/7 day contact phone number and company name.

When dust becomes or appears to be becoming a nuisance or problem to the area or nearby residents, it shall be the responsibility of the Contractor to immediately alleviate the undesirable condition. The maintenance responsibility herein described shall be inherent to the Contractor and shall be applicable at all times, including weekends, throughout the construction period. The Contractor shall provide the names and telephone numbers of employees who can be contacted at all times. The Contractor shall make daily inspections of the Project, particularly during and after storms, to maintain flashers and barricades, provide dust control and general maintenance. If the Contractor is negligent in this respect, the City reserves the right to perform this work with its own forces at overtime rates. The cost of such work shall be charged to the Contractor.

Disregard of this provision shall be cause for suspension of the Project until the Contractor can show evidence that employees have been hired specifically to perform the above work and will be available at all times.

The Contractor shall furnish names, addresses and phone numbers of at least three (3) individuals responsible for the placement and maintenance of traffic control devices. At least one of those individuals shall be "on call" 24 hours per day, seven days per week, during the times any traffic control devices, furnished and installed by the Contractor, are in place or when any areas are under construction. Any traffic control devices in-place overnight shall have MMUTCD approved warning

lights. Type III barricades shall have full reflectors on both sides of the barrier and 2 flashers when they are used for closures (roads, sidewalks, or other facilities). All barriers shall have reflective coatings on all sides of the barricade. The Contractor shall have at least 20 sandbags, 5 extra barricades, 5 barrels, 5 Type III barricades with 2 flashers, and 5 Type I barricades with flashers stored at a convenient on site location for use in an emergency.

In some areas the Engineer may provide Type C "Contact Bloomington" informational signs with posts for the Contractor to install at sites to be determined during the construction. The Contractor shall be responsible to make the "one call" for utility locations and properly install these signs without any additional compensation.

A. General Requirements:

All portable sign assemblies shall be perpendicular to the ground. No traffic control device (signs, channelizing devices, arrowboards, etc.) shall be weighted so they become hazardous to motorists and workers. The approved ballast system for devices mounted on temporary portable supports is sandbags, unless it is designed, crash tested, and approved for the specific device. When signs will remain in the same location for more than 14 consecutive days the signs shall be post mounted. This would not include portable signs which are set up and taken down at the beginning and end of each work shift. Sandbags will be the only acceptable weight to stabilize traffic control devices. During freezing conditions, the sand for bags shall be mixed with a de-icer to prevent the sand from freezing. The sandbags shall be placed and maintained at the base of the traffic control device to the satisfaction of the Engineer.

When signs are installed, they shall be mounted on posts driven into the ground at the proper height and lateral offset as detailed in the MN MUTCD. When signs are removed, the sign posts and stub posts shall also be removed from the Right of Way within two (2) weeks.

The Contractor shall be required to cover or remove all traffic control devices which may be inconsistent with traffic patterns during all traffic switches.

Open excavations adjacent to the existing pavement will not be permitted on opposite sides of the roadway at the same time.

The Contractor shall provide protective devices, including concrete barriers, necessary to protect traffic from excavations, drop-offs, falling objects, splatter or other hazards that may exist during construction. This work shall be an incidental cost to the Contractor, unless otherwise specifically called out on the plan.

The Contractor will not be permitted to park vehicles or construction equipment so as to obstruct any traffic control device. The parking of workers' private vehicles will not be allowed within the Project limits unless so approved by the Engineer.

The Contractor will not be allowed to store materials or equipment within 10 m [**30 feet**] of through traffic unless approved by the Engineer. If materials or equipment must be stored within 10 m [**30 feet**] of through traffic, the Contractor shall provide barricades or barriers, as directed by the Engineer, to warn and protect traffic.

When work will be performed between the official hours of sunset and sunrise, all appropriate practices for night work will apply.

The Contractor shall provide sufficient numbers of light plants to adequately illuminate the work area as determined by the Engineer. All costs incurred to provide such light plants shall be incidental to the lump sum traffic control.

During reclaiming, or pavement removal operations proper lane closures shall be set up well in advance of the operations. "Uneven pavement" signing shall be in place, in addition to all other traffic control as specified in the MMUTCD, until paving of the wear course takes place.

Street identification signage shall be maintained at all times. Where the only existing signs are small city or county signs located at the intersection, street names and address numbers shall be maintained by temporary installations as required by the Engineer. This is necessary to maintain the 911 emergency system.

The Contractor shall be required to supply manpower to assist City of Bloomington personnel in pavement marking related projects such as, but not inclusive to, collecting data from in place lane lines and marking final pavement marking alignments. This shall also include any lane closures or traffic control necessary to complete these projects safely. Payment for said pavement marking related projects shall be incidental to the pavement marking items for which no direct compensation will be made.

B. High Visibility Personal Protective Equipment Specification

Each worker exposed to or working adjacent to moving motor vehicles as part of the workers assigned job shall be provided with and required to wear a high visibility warning vest or other high visibility garment. A high visibility garment is defined as being a Class 2 garment or greater as specified by ANSI/ISEA Standard 107-1999.

If the high visibility personal protective equipment becomes faded, torn, dirty, worn, or defaced, reducing the equipment's performance below the manufacturer's recommendations, the high visibility personal equipment shall be immediately removed from service and replaced.

The Contractor will be subject to a non-compliant charge for failure to adhere to the clothing requirements as listed above. Non-compliant charges, for each incident, will be assessed at a rate of \$500.00 per incident that the Engineer determines that the Contractor has not complied.

C. Milling, Sealcoating, And Paving Operations

The Contractor shall schedule milling and bituminous paving operations such that milled areas will be covered with a wear course within 24 hours of completion of the milling, except for delays caused by inclement weather.

When traffic is allowed to drive on the milled surface, the Contractor shall furnish and install "GROOVED PAVEMENT" and "BUMP" signs with "Advisory Speed" plates at locations determined by the Engineer. Payment for these signs shall be included in the lump sum payment for traffic control.

Any drop-off where traffic will cross from or to the in place surface, or from or to the milled surface, shall be tapered and/or chamfered so as to provide for the safe passage of traffic.

The Contractor shall schedule construction operations so as to minimize traffic exposure to uneven lanes, milled edges, and edge drop-offs. Only after every attempt has been made to avoid these conditions and one or more of them are deemed necessary, the Contractor shall provide and maintain the appropriate traffic control in accordance with MnDOT "DROP OFF GUIDELINES".

The Contractor shall not mill any notches for surfacing tapers until immediately prior to paving, except that with the Engineer's permission, the Contractor may mill the notches and install and maintain temporary bituminous tapers to provide for the safe passage of traffic until the surfacing taper is installed.

The Contractor shall maintain traffic with a minimum of delay during milling and paving operations at intersections controlled by signals or by all-way stop signs. The Contractor shall provide off-duty police officers, at no expense to the City, to direct and control traffic around and through milling and paving operations at those intersections. "Police officer" means every officer authorized to direct or regulate traffic or to make arrests for violations of traffic rules.

The Contractor may close intersecting streets to traffic, other than at intersections controlled by signals or "All Way Stop" signs during milling and paving operations in the intersection, but only if there are adequate alternate routes for the intersecting street traffic. The Contractor shall not close adjacent intersecting streets to traffic concurrently. The Contractor shall notify the City of its schedule to close intersecting streets 48 hours in advance of the closure.

D. Traffic Flow and Access

Traffic flow shall be maintained to the fullest extent possible, especially during morning and afternoon rush hours. Access to abutting properties will be required on all streets. On any project where excavation adjacent to existing curb and gutter will cause a barrier to residents, delivery and emergency vehicles that may need access to driveways, the Contractor shall provide ramps or other means of access during construction. A minimum of one 11-foot wide lane of traffic shall remain open on streets. Some streets require two (2)-11' lanes to be operable. Areas where excavated crossings of the street surface disrupt traffic, the existing street structure shall be restored within 24 hours of completion of the work excluding the wearing course.

The Contractor shall furnish and erect signs and barricades before work commences on any street, and shall maintain the signs and barricades along the route in accordance with these specifications, the MMUTCD, and as approved by the Engineer. In areas designated by the Engineer, speed advisory signs will be required as a part of construction signing.

The Engineer and residents shall be kept informed of the work schedule in a written format and the work shall be scheduled to maintain access to the maximum extent possible.

As a precautionary measure from a soils standpoint, traffic lanes to be used during construction must be delineated to keep vehicles a safe distance away from the adjacent excavation. The delineation should coincide with points established by projecting 1:2 (rise:run) or greater (flatter) slope between the edge of the traffic surface and the bottom of the excavation. In areas of muck excavation, use 1:30 or flatter. Where sheeting is in place 2:1 (rise:run) can be used.

If hauling operations create hazards for the traveling public, the Contractor will be required to provide additional flaggers, as directed by the Engineer. All costs incurred to provide the additional flaggers shall be incidental to the lump sum traffic control.

Pedestrian traffic shall be maintained and guided through the Project at all times.

The Contractor may ban parking within the construction limits with the approval of the Engineer. All necessary signing is the responsibility of the Contractor and shall be installed, as directed by the Engineer, 24 hours prior to the parking ban. The Contractor shall remove that signing as soon as the work, or that part of the work, in the area has been completed.

E. Traffic Control Inspection Log

During the time that any traffic control devices, furnished and installed by the Contractor, are in place, the Contractor shall provide a person on a daily basis to inspect and ensure that all traffic control devices required are installed properly and conform to the MMUTCD. Any discrepancy between the actual devices in use and the required devices shall be immediately rectified.

This log shall also include the date and time any changes in the stages, phases, or portions thereof go into effect. The log shall identify the location and verify that the devices are placed as directed or corrected in accordance with the Plan. All entries in the log shall include the date and time of the entry and be signed by the person making the inspection. The person or persons performing this inspection shall be required to make a daily log (including weekends and holidays) of these inspections.

Copies of these logs must be submitted to the Engineer each Monday while there is traffic control on the Project. No payment for Traffic Control will be made until these logs have been received and approved by the Engineer.

F. Traffic Control Maintenance

The Contractor shall be responsible for the immediate repair or replacement of all traffic control devices that become damaged, moved or destroyed, of all lights that cease to function properly, and of all barricade weights that are damaged, destroyed, or otherwise fail to stabilize the barricades. The Contractor shall further provide sufficient surveillance of all traffic control devices at least once every 24 hours.

In the event of severe weather conditions, the Contractor shall provide additional personnel and equipment to maintain all traffic control devices.

The Contractor shall be required to respond to any call from the City Engineer, Engineer or other City Staff concerning any request for improving or correcting traffic control devices within one (1) hour from the time of notification.

The Contractor shall maintain all traffic control at all times but particularly after storms, at night, and on weekends with or without notice by the Engineer.

G. Vehicle Warning Light Specification

All Contractors', subcontractors' and suppliers' mobile equipment, which are working in the lane closure or within 4.5 m [15 feet] of the lane closure, shall be equipped with operable warning lights which meet the appropriate requirements of the SAE specifications. This would include any vehicle which enters the traveled roadway at any time. The SAE specification requirements are as follows:

360 Degree Rotating Lights - SAE Specification J845

Flashing Lights - SAE Specification J595

Flashing Strobe Lights - SAE Specification J1318

Lights shall be mounted so that at least one light is visible at all times when at eye level from a 18 m [**60 foot**] radius about the equipment. This specification is to be used for both day and night time operations. All costs incurred to provide warning lights shall be at no cost to the Department. These warning lights shall be operating and visible when a vehicle decelerates to enter a construction work zone and again when a vehicle leaves the work zone and enters the traveled traffic lane.

Any warning lights shall be on the list of approved lights which may be obtained by contacting:

Vehicle Warning Lights
Office of Construction MS650
Transportation Bldg. OR by calling: (651)296-3126
395 John Ireland Blvd.
St. Paul, MN 55155

This list is updated periodically. Warning light suppliers and manufactures may contact the above for information on adding new products to the list.

H. Flag Person (Flaggers)

Any person acting as a flagger on this Project shall have attended a training session taught by a Contractor's qualified trainer. The Contractor's qualified trainer shall have completed a "Mn/DOT Flagger Train the Trainer Session" in the five years previous to the start date of this Contract and shall be on file as a qualified flagger trainer with the Department. The Flagger Trainer's name and Qualification Number shall be furnished by the Contractor at the pre-construction meeting. The Contractor shall provide all flaggers with the Mn/DOT Flagger Handbook and shall observe the rules and regulations contained therein. This handbook shall be in the possession of all flaggers while flagging on the Project. The Contractor shall obtain handbooks from the Department. Flaggers shall not be assigned other duties while working as authorized flaggers. The "Checklist for Flagger training" form shall be furnished to the Engineer any time a new flagger reports to work on the Project. The "Checklist for Flagger Training" form can be found at: <http://www.dot.state.mn.us/const/wzs/flaggerchecklist%20.pdf>.

The Contractor shall furnish flag persons as required to adequately control traffic on local streets. Flag persons shall conform to the requirements set forth in the MN MUTCD. All costs incurred to provide such flag persons shall be incidental to the lump sum traffic control.

The Contractor shall provide two-way radios for flag persons.

Flag persons shall wear high visibility retroreflective safety vests, pants and hats at all times while actively flagging on the Project. High visibility apparel shall comply with current Minnesota OSHA Rules 5207.0100 and 5207.1000. The flag persons clothing shall be considered an incidental expense for which no direct compensation will be made.

Flag persons shall be equipped with a "Stop-Slow" paddle while directing traffic.

The Contractor will be subject to a non-compliant charge for failure to adhere to the clothing requirements as listed above. Non-compliance charges, for each incident, will be assessed at a rate of \$500.00 per incident that the Engineer determines that the Contractor has not complied.

Except as otherwise authorized by the Engineer, the maximum length of the flagging operation shall be no more than 1.6 km [1 mile].

The Contractor shall coordinate the flagging operations in a manner which causes as little delay to the traveling public as possible, and at no time shall the delay exceed five (5) minutes. In the event that the Contractor is unable to meet the maximum delay requirements, operations shall shut down until such time a new traffic control plan is developed which does meet the maximum delay requirement.

If hauling operations create hazards for the traveling public, the Contractor will be required to provide additional flaggers, as directed by the Engineer. All costs incurred to provide the additional flaggers shall be incidental to the lump sum traffic control.

The Contractor shall furnish off-duty police officers in uniform with cars and an orange reflectorized vest to direct traffic if deemed necessary and so ordered by the Engineer. "Police Officer" means every officer authorized to direct or regulate traffic or to make arrests for violations of traffic rules. No direct payment for police officers will be made, this work shall be incidental to the lump sum traffic control.

The Engineer will have the right to waive the above requirements.

I. Temporary Lane Closure Requirements:

Unless otherwise authorized by the Engineer, any temporary lane closure extending to or beyond 300 m [1000 feet] shall have a minimum of one Type III barricade placed in the closed lane for every 300 m [1000 feet] of extension.

All temporary lane closures used at night shall have plastic drum-like channelizers, Type I or Type II barricade or Direction Indicator Barricade in the lane closure taper and also in any shifts in traffic alignment.

Temporary lane closures will not be permitted during inclement weather, nor any other time when, in the opinion of the Engineer, the lane closure will be a greater than normal hazard to traffic.

Temporary lane closures or other restrictions by the Contractor, during work hours and consistent with the time restrictions, will be permitted during those hours and at those locations approved by the Engineer. Requests for temporary lane closures shall be made at least 24 hours prior to such closures. When a temporary lane closure is used by the Contractor, the closure shall be incidental work and no direct compensation will be made therefore.

If the Contractor requests to close the road and the Engineer approves that it is necessary to temporarily detour traffic in order to remove or set the structures, the Contractor shall furnish the detour as directed by the Engineer. Such requests shall be submitted to the Engineer, for approval, at least fourteen (14) days prior to the proposed road closure. The temporary detour shall be incidental work for which no direct compensation will be made

J. Signal And Lighting Systems

The Contractor shall not interfere with the operation of any traffic signal system, except as required by the Contract. The Contractor shall notify the Engineer at least 48 hours prior to beginning any work that will interfere with any traffic signal system or its detectors.

During the period when the signal system is de-energized and the new signal system is energized, the Contractor shall furnish, erect, and maintain "Stop Ahead" signs and "Stop" signs. The quantity and size of the temporary signs as well as their placement in the field shall be as directed by the Engineer. The Contractor shall furnish and install materials to keep these signs upright and stationary. The signs shall remain the property of the Contractor.

The Contractor shall maintain street lighting by means of the in place lights, the newly constructed lights, or a combination thereof, except as otherwise authorized in writing by the Engineer.

K. Measurement and Payment

No measurement will be made of the various Items that constitute Traffic Control but all such work will be construed to be included in the single Lump Sum payment under Item 2563.601 (Traffic Control).

Traffic Control will be measured and paid for as follows:

Payment for furnishing, installing, maintaining, relocating and subsequently removing traffic control devices (including flagpersons) as required will be made as a lump sum under Item 2563.601 (Traffic Control) and according to the following schedule:

- 1) When 5 percent of the Contract amount is earned, 25 percent of the amount bid for traffic control will be paid.
- 2) When 10 percent, or more, of the Contract amount is earned, an additional 15 percent of the amount bid for traffic control will be paid.
- 3) When 20 percent, or more, of the Contract amount is earned, an additional 15 percent of the amount bid for traffic control will be paid.
- 4) When 30 percent, or more, of the Contract amount is earned, an additional 15 percent of the amount bid for traffic control will be paid.
- 5) When 50 percent, or more, of the Contract amount is earned, an additional 15 percent of the amount bid for traffic control will be paid.

- 6) When 80 percent, or more, of the Contract amount is earned, an additional 10 percent of the amount bid for traffic control will be paid.
- 7) The remaining 5 percent bid for traffic control will be paid when all work has been completed and accepted.
- 8) In all items above, the original Contract amount shall be the total value of all Contract Items including the traffic control item, but the percentage earned in each case shall be exclusive of the traffic control item.

The lump sum payment(s) shall be compensation in full for all costs of furnishing, installing, maintaining, relocating, and removing the individual traffic control devices as shown on the Traffic Control Layouts in the Plans and/or as specified in the Special Provisions. The lump sum shall also include any extra signing needed to facilitate traffic.

If the Contractor requests changes in traffic control as shown on the Traffic Control Layout(s), and these changes are implemented, there will be no increase or decrease in the lump sum payment(s) for the stage(s) of traffic control.

Deductions in payment due to lack of maintenance records, poor maintenance, poor device quality, or any other reason the Engineer deems reasonable are at the discretion of the Engineer.

12. PROTECTION & RESTORATION OF PROPERTY AND LANDSCAPE (1712)

The Contractor shall shore up, brace, underpin, secure and protect, as may be necessary, all foundations and other parts of in-place structures adjacent to, adjoining, and in the vicinity of the Project, which may be in any way affected by the excavations or other operations connected with the construction of the improvements required under this Contract. The Contractor shall indemnify and hold harmless the City and its Engineer from any damages for which City and/or its Engineer may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

Street patches shall meet the requirements of the trench excavation and backfill/surface restoration outline in Section 6 of this Specification. Restoration of sodded and seeded areas shall be in compliance with this specification. Where included as a pay item in the Plans or Specifications, payment for replacing curb and gutter shall be at the unit price bid.

When excavation for any reason is required near any trees, that excavation must be done by hand methods so the damage to the roots is held to a minimum.

The Engineer may direct the Contractor to protect trees that remain in place within the construction area with snow fencing placed at the outer limits of the branches (drip line) before work begins.

If any roots are damaged they must be cut off cleanly and smoothly, and immediately painted with an approved tree paint. If the trunk or limb of a tree is inadvertently damaged, it must be immediately repaired as directed by the Engineer.

All work for tree protection shall be incidental to the other items in this Project and no direct compensation will be made therefore.

13. AIR, LAND AND WATER POLLUTION (1717)

Pollution of natural resources of air, land and water by operations under this Contract shall be prevented, controlled, and abated in accordance with the rules, regulations, and standards adopted and established by the Minnesota Pollution Control Agency (M.P.C.A.), and in accordance with the provisions of Mn/DOT 1717, 1803.5 and the following:

Discovery of Contaminated Materials and Regulated Wastes

If during the course of the Project, the Contractor unexpectedly encounters any of the following conditions indicating the possible presence of contaminated soil, contaminated water, or regulated waste, the Contractor shall immediately stop work in the vicinity, notify the Engineer, and request suspension of work in the vicinity of the discovery area, in accordance with Mn/DOT 1803.4.

A documented inspection and evaluation will be conducted prior to the resumption of work. The Contractor shall not resume work in the suspected area without authorization by the Engineer.

- A. Indicators of contaminated soil, ground water or surface water include, but are not limited to the following:
 - 1. Odor including gasoline, diesel, creosote (odor of railroad ties), mothballs, or other chemical odor.
 - 2. Soil stained green or black (but not because of organic content), or with a dark, oily appearance, or any unusual soil color or texture.
 - 3. A rainbow color (sheen) on surface water or soil.

- B. Indicators of regulated wastes include, but are not limited to the following:
 - 1. Cans, bottles, glass, scrap metal, wood (indicators of solid waste and a possible dump)
 - 2. Concrete and asphalt rubble (indicators of demolition waste).
 - 3. Roofing materials, shingles, siding, vermiculite, floor tiles, transite or any fibrous material (indicators of demolition waste that could contain asbestos, lead or other chemicals).
 - 4. Culverts or other pipes with tar-like coating, insulation or transite (indicators of asbestos).
 - 5. Ash (ash from burning of regulated materials may contain lead, asbestos or other chemicals).
 - 6. Sandblast residue (could contain lead).
 - 7. Treated wood including, but not limited to products referred to as green treat, brown treat and creosote (treated wood disposal is regulated).
 - 8. Chemical containers such as storage tanks, drums, filters and other containers (possible sources of chemical contaminants).
 - 9. Old basements with intact floor tiles or insulation (could contain asbestos), sumps (could contain chemical waste), waste traps (could contain oily wastes) and cesspools (could contain chemical or oily wastes).

Mn/DOT 1717.2 is hereby supplemented with the following:

If this Project meets the criteria established by the Minnesota Pollution Control Agency (MPCA) for requiring a General Permit Authorization to Discharge Storm Water Associated with a Construction Activity under the National Pollutant Discharge Elimination System/State Disposal System Permit Program (herein after referred to as the "MPCA Construction Activity Permit") a permit will need to be obtained. Bidders are advised that upon award of the Contract and prior to the commencement

of any construction activities, the successful bidder will be required to sign, as a co-permittee, Part V (General Contractor Certification) of the Application for General Storm Water Permit for Construction Activity. All application fees associated with this permit shall be paid by the City. In addition, the Contractor will be named in the Stormwater Pollution Prevention Plan (SWPPP) and be responsible for conducting regular inspections, maintaining the Best Management Practices (BMPs) by adequately trained individuals and provide copies of the documentation to the City of Bloomington. The City will prepare the SWPPP for submittal to the MPCA.

The Contractor shall furnish, install and maintain temporary and permanent erosion and sediment control devices in accordance with the provisions of 2105.5, 2573, 2575, as shown in the Plans, in accordance with the provisions of the Special Provisions Attachment "Minnesota Pollution Control Agency General Permit, Authorization to Discharge Storm Water", and the following:

The Contractor shall be solely responsible for complying with the requirements of General Permit where Contractor is referenced in Part II.B.2: Permittee(s) for Parts II.B, II.C and IV.

The Contractor shall be responsible for providing all inspections, documentation, record keeping, maintenance, remedial actions, repairs required by the permit. All inspections, maintenance, and records required in the General Permit Part IV.E, Inspections and Maintenance, shall be the sole responsibility of the Contractor. The word "Permittee" in these referenced paragraphs shall mean "Contractor". Standard forms for logging all required inspection and maintenance activities shall be used by the Contractor. All inspection and maintenance forms used on this Project shall be turned over to the Engineer every week for retention in accordance with Part IV.E, Inspections and Maintenance of the permit.

The Contractor shall have all logs, documentation, inspection reports on site for Engineer's review and shall post the permit and MPCA's letter of coverage on site. The Contractor shall immediately rectify any shortcomings noted by the Engineer. All meetings with the MPCA, Watershed District, WMO, or any local authority shall be attended by both the Engineer and the Contractor or their representatives. No work required by said entities, and for which the Contractor would request additional compensation, shall be started without approval from the Engineer. No work required by said entities and for which the changes will impact the design or requirements of the Contract documents or impact traffic shall be started without approval from the Engineer.

The Contractor shall immediately notify the Engineer of any site visits by Local Permitting Authorities performed in accordance with Part V.H, Inspection and Entry.

If the Contractor fails to perform the requirements as listed herein, the Engineer will issue a Work Order detailing the required action. The Contractor shall start the required action within twenty-four (24) hour of receipt of the Work Order and continue the required action until the Project is brought into compliance with the permit. Failure to perform the required action as specified, shall subject the Contractor to a \$1000/calendar day deduction.

The Contractor shall review and abide by the instructions contained in the permit package. The Contractor shall hold the City harmless for any fines or sanctions caused by the Contractor's actions or inactions regarding compliance with the permit or erosion control provisions of the Contract Documents.

Emergency Best Management Practices must be enacted to help minimize turbidity of surface waters and relieve runoff from extreme weather events. It is required to notify the MPCA Regional Contact Person within 2 days of an uncontrolled storm water release. The names and phone

numbers of the MPCA Regional Contract personnel can be found at:
<http://www.pca.state.mn.us/water/stormwater/stormwater-c.html>. The Contractor is reminded that during emergency situations involving uncontrolled storm water releases that the State Duty Officer must be contacted immediately at 1-800-422-0798 or 1-651-649-5451.

The Contractor is advised that Section 1 of the NPDES application form makes reference to a Storm Water Pollution Prevention Plan (SWPPP). This Projects' SWPPP is addressed throughout Mn/DOT's Standard Specifications for Construction, as well as this Project's Plan and these Special Provisions. The following table identifies NPDES permit requirements and cross-references where this Contract addresses each requirement.

NPDES Permit Requirements	Cross-Reference within this Contract
Obtain NPDES Permit; Permit Compliance; Submit Notice of Termination	Mn/DOT 1701, 1702; and 1717 Special Provisions: 1717 (Air, Land & Water Pollution), 1717 (National Pollutant Discharge Elimination System (NPDES) Permit)
Certified Personnel in Erosion / Sediment Control Site Management Develop a Chain of Command	Mn/DOT 1506, 1717, and 2573; Special Provisions: 1717 (Air, Land & Water Pollution), and 1717 (National Pollutant Discharge Elimination System (NPDES) Permit)
Project / Weekly Schedule (for Erosion / Sediment Control) Completing Inspection / Maintenance Log / Records	Mn/DOT 1717 and 2573; Special Provisions: 1717 (Air, Land & Water Pollution), and 1717 (National Pollutant Discharge Elimination System (NPDES) Permit); and
Project Specific Construction Staging	The Plans; Mn/DOT 1717; Special Provisions: 1717 (Air, Land & Water Pollution), 1717 (National Pollutant Discharge Elimination System (NPDES) Permit); and 1806 (Determination and Extension of Contract Time)
Temporary Erosion / Sediment Control	The Plans; Mn/DOT 2573 and 2575
Maintenance of Devices / Sediment removal Removal or Tracked Sediment Removal of Devices	The Plans; Mn/DOT 1717 and 2573; Special Provisions: 1514 (Maintenance During Construction), 1717 (Air, Land & Water Pollution), and 1717 (National Pollutant Discharge Elimination System (NPDES) Permit)
Dewatering	Mn/DOT 2105.3B and 2451.3C; May also require DNR Permit
Temporary work not shown in the Plans Grading areas (unfinished acres exposed to erosion)	Mn/DOT 1717, 2573, and 2575; Special Provisions: 1717 (Air, Land & Water Pollution), and 1717 (National Pollutant Discharge Elimination System (NPDES) Permit)
Permanent Erosion / Sediment Control and Turf Establishment	The Plans; Mn/DOT 1717, 2573, and 2575; Special Provisions: 1717 (Air, Land & Water Pollution), and 1717 (National Pollutant Discharge Elimination System (NPDES) Permit)

Mn/DOT 1717.2 A2 is hereby deleted and replaced with the following:

A2 During Construction

The Contractor shall implement the Project's Storm Water Pollution Prevention Plan. The Contractor shall schedule and install temporary and permanent sediment and erosion control measures, construct ponds and drainage facilities, finish earth work operations, place topsoil, establish turf, and conduct other Contract work in a timely manner to minimize erosion and sedimentation.

All exposed soil areas with continuous positive slopes that are within 60 m (**200 feet**) of a surface water shall have temporary or permanent erosion protection within 24 hours after the construction activity in that portion of the site has temporarily or permanently ceased and connection is established to the existing surface water. All other positive slopes to constructed surface waters, such as permanent storm water treatment ponds, curb and gutter systems, storm sewer inlets, temporary or permanent drainage ditches, or other storm water conveyance systems, shall have temporary erosion protection or permanent cover for the exposed soil areas as soon as practicable but no later than 14 days after construction activity has temporarily or permanently ceased in that area. For those drainage areas that have a discharge point within 1 mile and flows to an impaired or Special Waters shall have temporary erosion protection or permanent cover for the exposed soil areas as soon as practicable but no later than 7 days after construction activity has temporarily or permanently ceased in that area. Impaired and Special Waters are defined as those listed and referenced in the NPDES Permit.

Positive slopes adjacent to public waters and wetlands will be stabilized at the close of each day when weather forecasts for rain that evening, and/or overnight including weekends. Once work is completed it will be stabilized permanently as soon as practical but no later than seven days from date of completion.

Exposed soil areas do not include; stockpiles or surcharge areas of sand, gravel, aggregate, concrete, bituminous, or road bed and surfacing material. A perimeter sediment barrier may be necessary to minimize loss when these are within the 60 m (**200 feet**) of existing surface waters or the property edge.

The normally wet perimeter of temporary or permanent drainage ditches or swales constructed to drain water from a construction site must be stabilized with erosion control measures for the last 60 m (**200 feet**), or more when conditions warrant, from the property edge or from the point of discharge to any existing surface water. Stabilization shall be completed within 24 hours after the construction activity in that portion of the ditch has temporarily or permanently ceased. Ditch stabilization will continue concurrently with construction activities but no later than 14 days after construction activities have permanently or temporarily ceased. Any, culvert pipe or storm sewer pipe that is within the cumulative distance is not part of this distance. Ditch checks may be provided where necessary to slow water flow and capture sediment.

Temporary or permanent ditches used as treatment systems will not need to be stabilized but must provide the proper Best Management Practices for the treatment system.

Pipe outlets shall be provided with temporary or permanent energy dissipation within 24 hours of connecting the pipe to any constructed or existing surface waters.

The Contractor shall limit the surface area of erodible soil that can be exposed to possible erosion at any one time when the permanent erosion control features are not completed and operative.

All liquid and solid wastes generated by concrete washout operations must be contained and not have the opportunity to come in contact with the surface waters or ground water. This includes the ditches, slopes to ditches, curb and gutter/storm sewer systems, and ponds. Areas where there are sandy soils, karsts, and high ground water the washout facility must have an impermeable liner. Liquid and solid wastes must be disposed of properly. A concrete washout sign must be installed adjacent to each washout facility to notify personnel.

Mn/DOT 1717.2E is hereby deleted and replaced with the following:

E Site Plans

The Engineer may require the Contractor to submit a site plan, in writing, detailing proposed erosion control and sediment control measures and a schedule indicating starting and completion times for construction operations working in water bodies and/or in direct proximity to waters of the state.

Contractor shall not start work in the affected areas until the schedule and site plan have been accepted by the Engineer and all materials and equipment for the activity are on site.

By signing this bid form, the bidder will be deemed to have stipulated as follows:

(1) That any facility to be utilized in the performance of this Contract, unless such Contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub. L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub. L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 C.F.R. Part 15), is not listed on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 C.F.R. 15.20.

(2) That the City of Bloomington shall be promptly notified prior to Contract award of the receipt by the bidder of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility to be utilized for the Contract is under consideration to be listed on the EPA List of Violating Facilities.

14. EROSION AND SEDIMENT CONTROL (1717.2) AND STORM WATER MANAGEMENT (2573)

The Contractor shall exercise care to provide erosion and sediment protection on slopes to be disturbed by construction particularly adjacent to ponds, marshes and waterways before construction begins. These areas shall be protected by properly installed silt fence or other means as approved by the Engineer. Erosion and sediment control facilities, in place when work is started, shall be properly maintained unless the Engineer approves removal.

The Contractor shall prevent sediment from leaving the disturbed area. Should the Contractor fail in preventing sediment leaving the disturbed area, such sediment that becomes deposited elsewhere in streets, storm sewers, ponds, or marshes downstream shall be removed at the Contractor's expense. Any and all work that may result from the ineffectual maintenance of erosion or sediment control shall be at the Contractor's expense. This may include, but is not limited to storm sewer cleaning, sod replacement, street cleaning, curb and gutter replacement and sedimentation removal.

The Minnesota Erosion Control Association (651-351-0630) updates their reference guide yearly, which includes a list of erosion control suppliers and Contractors. Also, Mn/DOT maintains a list of approved Erosion & Sediment Control products at <http://mnroad.dot.state.mn.us/materials/appchart.asp>.

The Contractor shall report to the Engineer, in writing, any undesirable conditions: such as sand in manholes or pipes, sedimentation in ponds, faulty erosion & sediment control measures, etc. prior to commencing work in any area. Once excavation or utility work has commenced it will be assumed that all damage to erosion & sediment control provisions or sedimentation, except that reported above, has been caused by the Contractor's operations, and it shall be the responsibility of such Contractor to make the necessary repairs.

The Contractor shall exercise particular care to provide effective early erosion protection on slopes disturbed by construction adjacent to ponds, marshes, and waterways. These areas shall be protected as approved by the Engineer.

Unless pay items are included for erosion & sediment control measures, such costs shall be incidental to the Project.

When a bid item for erosion or sediment control measures such as silt fence is included in the proposal, the unit price shall include all labor and materials to install, maintain and remove the erosion control measures. Payment will not be made for replacing damaged, stolen or otherwise non-functional erosion & sediment control measures. Once installed, the Contractor shall maintain the erosion & sediment control system and keep the upstream settlement areas clean. The erosion control measures shall be checked and repaired after each rain.

All erosion & sediment control measures shall be installed by the Contractor and checked by the Engineer before any construction activities can start on a site.

If an occurrence of a rain event greater than a 10 year frequency should happen while erosion & sediment control measures are in place, the City will pay the appropriate bid item (if included in the contract) for the reinstallation if the failure is due to the greater than 10 year rain event. The 10 year rain event will be determined by the City Engineer using the US Weather Bureau Technical Paper 40 Precipitation Frequency Curve Date for the Twin Cities Area. In order for the Contractor to be eligible for the payment, all erosion & sediment control inspection logs and maintenance will need to be in compliance with the SWPPP and this specification. If for any reason the Contractor is not in compliance with the erosion and sediment control measures, the costs of reinstallation due to the rain event will be borne by the Contractor.

A. Inlet Protection

Storm sewer inlets shall be protected by the various options as detailed in the plans. Options listed therein are: Sediment Filter Sacks (available from Northern Water Works Supply 800-437-4362), and Metal Basket Type (available from WIMCO 952-233-3055). Other Engineer approved means may be used to prevent the entry of eroded material into the storm sewer system; however, the Contractor must obtain approval for an alternate option and also before installing any erosion control.

Payment for "Inlet Protection", whether it be one of the above listed options or another Engineer approved product, per each, shall be compensation in full, regardless of shape or size needed, for installing, maintaining, cleaning, and removing the erosion control device.

B. Erosion & Sediment Control Inspection Log and Maintenance

During construction, all erosion & sediment control measures and best management practices will be the responsibility of the Contractor, including the inspection and maintenance to meet the requirements of the Storm Water Pollution Prevention Plan (SWPPP). This implementation will be ensured by site inspections performed by the City of Bloomington Engineering Division and will remain in effect until the entire site has undergone final stabilization and a Notice of Termination has been submitted to the MPCA.

Inspections will be performed once every seven days during construction and within 24 hours after a rainfall event greater than 0.5 inches in 24 hours. Inspections must include stabilized areas, erosion prevention and sediment control BMPs, and infiltration areas.

All erosion & sediment control devices will require maintenance while they are installed. The Contractor shall routinely check these devices for sediment buildup, vandalism, and general operability. The Contractor is responsible for assuring these devices are operating properly, letting drainage through and trapping sediment, on a regular basis and especially during and after inclement weather. Maintenance, cleaning, sediment removal, and final removal of the erosion & sediment control device are incidental.

The Contractor must maintain and/or replace that portion of the erosion & sediment control program that may be disturbed for construction purposes at no additional compensation.

All entries in the log shall include the date and time of the inspection, corrections or modifications to erosion & sediment control, and be signed by the person making the inspection and copies of these logs must be submitted to the Engineer each Monday until the entire site has undergone final stabilization and a Notice of Termination has been submitted to the MPCA. No payment for Erosion & Sediment Control will be made until these logs have been received and approved by the Engineer.

C. Concrete washout facility

Temporary concrete washout facilities shall be constructed, maintained, and later removed at the locations shown on the approved Storm Water Pollution Prevention Plan in conformance with these specifications. If no device is shown on the plans, the contractor will be responsible for providing a portable washout system.

The contractor may choose to either construct a concrete washout facility and line it with a plastic liner, use a proprietary device designed for this application or require that all concrete trucks used for the Project be equipped with on-board washout system.

At least 10 days prior to start of concrete operations, the Contractor shall submit in writing a *method* statement outlining the design and installation of a concrete washout structure that will contain washout from concrete placement operations or mobile unit procedures. Work on a temporary concrete washout structure shall not begin until written acceptance is provided by the Engineer nor shall any concrete be delivered to the site without this approval.

The structure shall meet the following requirements:

1. Structure shall contain all washout water.
2. Stormwater shall not carry wastes from washout/disposal location.
3. The site shall be signed as "Concrete washout".
4. Each concrete truck driver/pumper operator shall be aware of site locations.
5. The site shall be accessible to appropriate vehicles.
6. The bottom of any excavation shall be a minimum of five feet vertical above groundwater and the excavation must be lined with an impermeable synthetic liner that is designed to control seepage to a maximum rate of 10-6 centimeters per second.
7. Freeboard capacity shall be included into structure design to reasonably ensure the structure will not overtop during or because of a precipitation event.
8. All measures shall be taken to prevent tracking of washout material onto roadway surface.
9. Adding solvents, flocculents, or acid to washwater is prohibited.

The structure shall be fenced with orange plastic construction fencing or equivalent fencing material to provide a barrier to construction equipment and to aid in identification of the concrete washout area.

The concrete washout structure shall be completed and ready for use prior to concrete placement operations.

Waste material from concrete washout operations shall be removed and disposed of in accordance with applicable governmental regulations when it has accumulated to two-thirds of the wet storage capacity of the structure.

If the contractor chooses to construct a concrete washout structure, the plastic liner shall be single ply, new polyethylene sheeting, a minimum of 0.25-mm {10 mils} thick and shall be free of holes, punctures, tears or other defects that compromise the impermeability of the material. Plastic liner shall not have seams or overlapping joints.

Temporary concrete washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 300 mm {12 inches}. Maintaining temporary concrete washout facilities shall include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials shall be removed and disposed of in conformance with government regulations. Holes, rips, and voids in the plastic liner shall be patched and repaired by taping or the plastic liner shall be replaced. Plastic liner shall be replaced when patches or repairs compromise the impermeability of the material as determined by the Engineer.

Temporary concrete washout facility shall be repaired or replaced on the same day when the damage occurs. Damage or wear/deterioration to the temporary concrete washout facility shall be repaired at the Contractor's expense.

When temporary concrete washout facilities are no longer required for the work, as determined by the Engineer, the hardened concrete and liquid residue shall be removed and disposed of in conformance with applicable governmental regulations. Ground disturbance, including holes and depressions, caused by the installation and removal of the temporary concrete washout facilities shall be backfilled and repaired.

D. Method of Payment

The contract unit price paid for temporary concrete washout facility shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in constructing temporary concrete washout facility, complete in place, including excavation and backfill, maintenance, and removal of temporary concrete washout facility, as shown on the plans, and as directed by the Engineer. If an on board unit is used for concrete washout, no direct payment will be made.

15. COORDINATION OF PLANS AND SPECIFICATIONS (1504)

Replace the second paragraph of 1504 with the following " In case of discrepancy, calculated dimensions will govern over scaled dimensions; Special Provisions will govern over City of Bloomington General Specifications and Standard Specifications, MnDOT Standard and supplemental Specifications and Plans; Plans will govern over City of Bloomington General Specifications and Standard Specifications, MnDOT Standard and supplemental Specifications; City of Bloomington General Specifications will govern over City of Bloomington Standard Specifications, MnDOT Standard and supplemental Specifications; City of Bloomington Standard Specifications will govern over MnDOT Standard and supplemental Specifications; supplemental Specifications will govern over MnDOT Standard Specifications."

16. PROSECUTION OF WORK (1803)

The first sentence of the third paragraph of 1803.3 shall hereby be deleted and replaced with 'No work shall be performed on Sundays or Legal Holidays of the City of Bloomington without permission from the Engineer.'

17. CLEARING AND GRUBBING (2101)

A. Definition

Clearing shall be construed as the complete removal and disposal of all portions of a tree, which exist above ground except stumps. Grubbing shall be construed as the removal and disposal of the portions of a tree, which exist below ground and stumps.

B. Construction Requirements

No tree shall be cut or removed until the City Engineer has approved such removal in writing and it has been marked in the field.

Clearing shall be accomplished by removing the tree in a safe and considerate manner. Grubbing shall ordinarily be accomplished by excavation and removal. This includes removing the entire root mass out to a minimum of the drip line of the tree. However, with the permission of the Engineer, grubbing may be accomplished with a grinding device. Inadequate grubbing that results in uneven ground or subsequent tree sprout-ups within one (1) year after grubbing shall be reground, topsoiled and sodded without additional compensation to the Contractor. All roots and stumps shall be removed to a depth of not less than 12 inches below the original ground surface or the street excavation, whichever is lower.

The Engineer may direct that boulevard slopes be adjusted or varied in the field to save trees.

All trees and shrubs shall be protected from injury or defacement during construction operations, unless written permission is given for their removal by the Engineer.

Trees shall be felled in a direction and manner as to not cause harm to the adjacent property or City right-of-way. The Engineer reserves the right to modify the tree clearing operations if it is deemed unsafe, hazardous or if damage is likely to occur.

Current and pertinent government regulations concerning disposal of trees shall be obeyed. The abutting property owner may claim the cleared trees provided the tree is not diseased. If so, the Contractor shall trim the trees and cut the trunks or logs into 8' lengths and neatly pile them on the private property. When a tree has been cut down it shall be removed within 24 hours unless it is infected and removal would further the spread of the infestation/disease. Elm and oak tree debris for disposal must be removed from the site between April 1 and September 30. Between October 1 and March 31 the Contractor has until May 1 to remove the debris unless otherwise directed by the Engineer. Ash tree debris for disposal must be removed from the site between May 1 and August 31. Between September 1 and April 30 the contractor shall not remove any debris in order to prevent the spread of the Emerald Ash Borer without approval from the Engineer. All other material shall be disposed of as "Removal of Miscellaneous Structures and Excess Materials." (Article 19 of these specifications).

C. Method of Payment

Clearing or grubbing shall be paid per each. The diameter of the tree or stump included on the plan is for reference only and was measured approximately 4 feet above the existing ground level, but above the ground swell. Trees with a diameter of 4 inches or less will be considered incidental unless the plan indicates otherwise and no payment will be made. Payment for grubbing existing stumps less than 4 feet in height shall be per each. No payment will be made for clearing trees that have previously been cut off.

Other methods of payment for clearing and grubbing shall be as described in the contract "Special Provisions".

If the Contract does not include any separate items for clearing and grubbing, then all clearing and grubbing within the proposed construction limits shall be considered incidental to other items of the Contract.

18. PAVEMENT MARKING REMOVAL (2102)

A. The provisions of Mn/DOT 2102 are modified and/or supplemented with the following:

The second sentence of Mn/DOT 2102.1 is changed to read as follows:

"The markings will usually be in the form of 100 mm (**4 inch**) wide widths, in solid line or skip line lengths, but may include other patterns or widths and the type will be as (one) of the following:

- (A) Pavement Marking Removal: this work shall consist of the removal of non-durable pavement markings such as paint type markings as commonly used by City strippers."

B. Lead Exposure

In addition to the requirements above, the Contractor is responsible for determining what work areas have lead concentration above OSHA's Permissible Exposure Limit. That information is to be provided to the Project Engineer and the City's Inspectors.

1. Site access:

To ensure that no one is accidentally exposed to lead, people are not permitted into areas of high lead concentration without protection. Signs are used to indicate where unprotected people must not go. The signs shall say:

Warning. Lead Work Area. Poison. No Smoking or Eating.

2. Protective Clothing:

The Contractor must provide protective clothing for City inspectors in any area with lead exposure above 30 µg/m³ or where the lead concentration is unknown. The clothing can be disposable or reusable. It must include coveralls or equivalent, shoe covers, and head covers. The Contractor is responsible for laundering the clothing and for providing clean clothing at least weekly or for daily disposal of the clothing. If the contaminated clothing can be reused, the Contractor is responsible for storing it.

3. Wash facilities:

The Contractor must provide soap, water, and towels to enable City's inspectors to wash at the site. If showers are provided for the Contractor's employees, they must be available for City's inspectors, too.

The Contractor must provide a means to remove surface contamination from the inspector's clothing. That may be a HEPA vacuum, a downdraft booth (with the exhaust captured and cleaned), or other effective means that do not increase the concentration of airborne lead.

4. Inspection Delay:

City's inspectors will not enter a blasting containment area until at least fifteen minutes after blasting and other lead dust-producing activities have stopped, to permit the dust to settle. There will be no extra payment or penalty against the City for this delay.

C. Method of Payment

This item is incidental to Traffic Control.

19. REMOVAL OF MISCELLANEOUS STRUCTURES AND EXCESS MATERIALS (2104)

This work shall consist of removing structures, such as pipe culverts, pavements, curbs, gutters, sidewalks, guard rails, fences, mailboxes, sewer and draitline lines, manholes, catch basins, and other miscellaneous structures.

Mailboxes, which must be disturbed by construction, shall be relocated immediately in a temporary position as directed by the Engineer and as per United States Postal requirements. The Contractor shall install the mailboxes in their final location as directed by the Engineer as soon as appropriate. All mailbox salvage, temporary installation and permanent reinstallation is considered incidental to the Project. If any mailbox is damaged during the salvage operation, and determined by the Engineer that it cannot be reused; then the Contractor shall dispose of the damaged mailbox and furnish a new mailbox of similar style at no cost to the City.

The Contractor shall remove and replace any fence within the construction limits of this Contract. This may involve, but is not limited to, relocating an existing fence and footings to a new alignment to accommodate existing right-of-way, easements or clear view triangles. All fences shall be replaced in a condition at least equal to that which existed before construction and comply with Section 21.301.08 of the City of Bloomington Code.

“Remove Casting” shall include removing and replacing all existing adjusting rings down to the precast or concrete block structure of the manhole or catch basin. The existing casting and assembly except for oversized manhole castings and assemblies shall become the property of the Contractor. The oversized manhole castings and assembly shall be salvaged and delivered to the Bloomington’s Western Maintenance area as detailed below. The City, at their discretion, may choose not to accept the frame. If this is the case, the Contractor will be responsible for disposal of the frame. The Contract unit price per each shall include all costs associated with the complete removal or salvage of the casting

All material specified to be salvaged and not reinstalled on the Project shall be carefully removed and hauled to the City of Bloomington property at 10500 Hampshire Avenue South within 24 hours of removal. It is required that a City of Bloomington Engineering Division Representative be present when items are delivered to verify delivery, storage location, and handling care of the Contractor. If an item specified to be salvaged and reinstalled cannot be reused due to damaged caused by the Contractor, the Contractor shall notify the Engineer before proceeding with the reinstallation.

All traffic signs requiring removal due to construction operations shall be neatly stored and protected on site by the Contractor and remain until reinstalled by the Contractor. If the Contractor damages any sign during the salvage operation, and the Engineer determines that the damaged sign cannot be reused, the Contractor shall dispose of the damaged sign and furnish a new replacement sign in accordance with the applicable fabrication specifications at no cost to the City. No payment will be made for either the salvaging or reinstallation of the signs unless specifically listed as a pay item.

The Contractor shall dispose of all waste material and debris, and shall notify the Engineer of the disposal area prior to the work. No waste material or debris shall be deposited on any public property or private property within the City limits of Bloomington without the written permission of the Engineer. Waste material and debris shall include, but not be limited to, trees, stumps, pipe, concrete, asphalt concrete, cans, or other waste material from the construction operations.

When excess suitable material is mixed with waste material, the Contractor shall segregate these materials and dispose of them separately when directed by the Engineer or as other guidelines govern.

The cost of removal and disposal of all miscellaneous structures and excess materials and all costs connected therewith shall be considered incidental to the Contract for payment purposes unless specifically noted as a pay item in the Plans or Special Provisions, in which case there will be a pay item and a unit of measure listed in the Bid Proposal.

20. EXCAVATION (2105)

A. Definition

In general, excavation shall be performed in accordance with Mn/DOT Specification 2105.

Excavation shall consist of removing, to the designated subgrade as shown on the Plans, existing material including soil, gravel, previously constructed surface, trees not paid as "Clearing and Grubbing," shrubbery, and any other material not specifically noted as a pay item in the Bid Proposal.

Bituminous pavement, curb and gutter and concrete walk have been excluded from the Common Excavation quantity. These removals will be paid for at the amount bid for each respective pay items (topsoil removal and disposal is included in sodding and seeding). Excavation for sod removal is incidental.

The Contractor is encouraged to segregate and recycle bituminous removed during excavation.

Payment at the contract unit price bid per ton for "Aggregate Base Class 5", "Granular Borrow", and "Common Excavation" shall be compensation in full for all costs of labor and materials for scarifying, reshaping, compacting, moisture conditioning, moisture abatement (farming), and proof rolling the subgrade and aggregate base as specified.

B. Optimum Moisture

Optimum moisture content is a requirement during compaction operations of this Project. The Contractor is responsible for moisture content in the subgrade. It may require the addition of water or farming the material to dry it out. The Contractor is also responsible to provide access to adjacent properties during construction. These Contractor responsibilities may require that construction be scheduled during periods when the long-range weather forecast is for dry weather. The Contractor shall prepare a schedule that anticipates installation of base and bituminous immediately following the compaction of subgrade.

C. Suitable Material and Subcuts

Subcuts shall be backfilled with Suitable Material. Suitable Material, subject to the Engineer's approval, shall consist of reclaimed bituminous material, bituminous millings and/or "Granular Borrow," as specified in MnDOT 3149.2.B, which shall be used to supplement and mix with the existing soils to restore proper grade. Suitable Material for use in subcut areas will be paid for at the price bid per cubic yard for Granular Borrow whether the material is reclaimed bituminous

material, bituminous millings, aggregate, or Granular Borrow. Reclaimed bituminous material or millings do not need to be produced from the Project or be from within the City of Bloomington. Borrow material shall be paid based on measurement of the volume of the excavation; no "shrinkage factor" shall be applied to this quantity for payment.

It may be determined that a subcut is not needed in certain location. If a subcut is not needed, the contractor will be paid only for work actually performed (i.e., no additional compensation because a subcut was not taken).

Ramping into and out of subcut areas for mixing purposes shall not be less than 1V:12H slopes. Backfill shall be compacted by "quality compaction (visual inspection) methods."

D. Construction Requirements

All sod and vegetation shall be removed from the original ground within the construction limits as directed. Suitable topsoil which is encountered during excavation may be stockpiled and used as backfill material behind the curb where required. Stockpile locations are to be provided by the Contractor with the approval of the Engineer. No additional compensation will be made for stockpiling material. No stockpiles are allowed in the right of way or on City property unless so approved by the Engineer. Stockpiled topsoil must meet requirements of Article 24 of the Specifications.

Materials suitable for the construction of subgrade and embankments, as determined by the Engineer, shall be placed as provided in these Specifications. Materials, which the Engineer considers unsuitable, shall be removed and replaced with material suitable for subgrade and embankments.

Slopes shall be cut as shown on the Plans and shall be neatly bladed and raked. Every effort will be made by the City to obtain the required easements prior to initial construction; however, it may be necessary for the Contractor to resume grading operations after easements are obtained. No compensation will be made for this inconvenience. However, the Project completion dates(s) may be modified.

Private driveways shall be graded as directed by the Engineer. Before fine grading for curb and gutter, all existing driveways shall be excavated or filled to the proposed subgrade elevation and opened for access at all times. Driveways shall be constructed with material as similar as possible to that existing prior to start of construction.

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

All subgrade and embankments shall be completed before any excess suitable material from any part of the Project, regardless of haul distance, is wasted. No additional compensation will be made for stockpiling suitable material unless otherwise specified.

E. Method of Payment

1. Common Excavation

"Common Excavation" will be paid for at the Contract unit price per cubic yard, and shall include all excavation, compacting, disposal of excess materials, and maintenance work. Excavation will be measured in its original position by the cross-section method, and the volume computed by the method of average end areas without shrinkage or expansion factors.

2. Subgrade Preparation

Where noted in the Plans, subgrade preparation will be paid in lieu of Common Excavation. At those locations existing grade will be within six (6) inches of proposed subgrade prior to this construction. This work shall consist of grading the roadway, boulevards, sidewalk berms and/or bikeway berms to proposed subgrade. It shall also include driveway excavation and minor grading behind the curb, sidewalk, or bikeway to blend the new construction neatly into the surrounding terrain and compacting the roadway and berms prior to construction of base, sidewalk, or bikeway.

Subgrade preparation will be paid at the Contract unit price per square yard and will be measured as the area between one foot outside the back of curb on one side of the street and one foot outside the back of the curb on the opposite side, or when sidewalk and/or bikeway is being constructed under the same contract, one foot outside the sidewalk or bikeway.

Common excavation and subgrade preparation will not be paid for at the same location unless it is determined by the Engineer that subcuts below the proposed subgrade elevation are required due to unsuitable subgrade material. Such subcuts will be paid as Common Excavation.

21. EMBANKMENT AND OTHER SPECIFIED FILL (2105)

A. Materials

In general, subgrade and embankment material shall be obtained from excavations on the Project.

Granular borrow shall conform to the requirements of Mn/DOT Specification 3149.2A. Other material for embankment, subgrade or other purposes shall be as specified in the Special Provisions.

The Contractor shall provide the Engineer with a written notice of the source of embankment material and a 30-pound representative sample of the material not less than five working days in advance of the planned starting time for placement of the material.

B. Construction Requirements

Embankments, subgrades or other specified fills shall be constructed in accordance with provisions of Mn/DOT Specification 2105. Embankments, subgrades or other specified fills shall

be thoroughly compacted by the quality compaction method unless otherwise noted in the Special Provisions.

C. Method of Payment

When payment is made for the excavation of the materials used in embankments, subgrades or other specified fills no additional compensation will be made for the fill material used in embankment, subgrade or other specified fills construction. When material for construction is specified to be obtained from sources outside of the Project rights-of-way, there will be in the Bid Proposal a pay item entitled, "Granular Borrow (CV)" and the unit of measure will be "Cubic Yard." Payment will then be made on the compacted in place, volume of the embankment material as determined by vehicular measurements of the volume filled. Payment for "Granular Borrow (CV)" shall be compensation in full for obtaining the material and constructing the embankment, subgrade or other specified fill except for the water applied.

22. BASE PREPARATION AND TEST ROLLING (2105, 2111)

A. Construction Requirements

Base preparation and test rolling shall be done prior to curb and gutter construction, placing of gravel base, sand-gravel sub-base, or plant mixed bituminous base on all streets unless otherwise noted on the Plans.

The street shall be graded, rolled, compacted and shaped to the section as shown on the Plans. The area between one foot outside of the back of curbs shall then be test rolled before the aggregate base is placed. .

Once the prepared subgrade is ready, the area between the curbs or the graded width shall be "proof rolled" with a full (legally) loaded (level full to the top of the box or sideboards) tandem dump truck. Proof rolling shall be completed when each part of the area of the graded width or the area between the concrete curbs comes in contact with one of the tires at least once. The speed shall range between 2.5 and 5 mph.

The roadbed will be considered unstable if, under the operations of the roller, the surface shows yielding or rutting of more than one inch, measured from the original surface to the bottom of the rut, or as determined by the Engineer or pumping of the subgrade soils.

The Engineer shall be notified at least four hours in advance of the proof rolling so that this test may be observed. A minimum of 330 linear feet must be available at the time of testrolling.

The Contractor shall take any steps necessary to protect underground pipe or utility installations during these operations. Any underground installations damaged shall be replaced at the Contractor's expense.

Any soft spots or displacement, which appear during test rolling shall be corrected by scarifying, drying, aerating, or watering and recompacting as required to obtain stability or by excavating to solid material and backfilling with material suitable (see Article [20](#)) for base construction. Subcuts (paid as "Common Excavation") will vary in size and depth (0'-3') and will be marked/determined in the field by the Engineer. Unsuitable material, such as vegetation,

rubbish, large stones, peat, and wet clay shall be removed and disposed of as directed by the Engineer. After correction, the area shall be test rolled as directed by the Engineer.

B. Method of Payment

Base preparation and test rolling shall be incidental to the other items in this contract. Any excavation and embankment or specified fill (see Article 20) required to repair the roadbed will be paid for at the Contract unit price for such work, except at utility trenches constructed under this Contract. After a roadway has been compacted, shaped and determined satisfactory, subsequent failure due to inclement weather or other factors shall be repaired at no additional compensation.

23. GEOTEXTILE FABRIC

The Contractor shall furnish and install Geotextile Fabric Type V as a material separator under the Select Granular Borrow in the street structure in accordance with the Mn/DOT Specifications 2105 and 3733. Joints shall be lapped by three (3) feet. The Engineer shall determine where the fabric shall be used.

The prepared surface shall be relatively smooth and free of stones, sticks, or other debris or irregularities that would tend to puncture or tear the geotextile. Unless otherwise directed or approved by the Engineer, the geotextile shall be placed with the highest strength direction (usually the "machine" or roll direction) oriented in the direction of the greatest expected field stress. (This will usually be at right angles to the centerline of the construction.)

The geotextile shall be adequately secured so that it is not displaced during subsequent construction. No traffic or construction equipment will be permitted to operate directly on the geotextile. Any damaged geotextile shall be repaired to the satisfaction of the Engineer by patching and sewing or, when appropriate, a 36 inch [900 mm] overlap on all sides without sewing.

The Geotextile shall be paid for at the unit price bid per square yard of "Geotextile Fabric, Type V" for fabric measured in place as detailed in the plan (no payment will be made for required overlapping) which shall be compensation in full for all cost of furnishing and installing the fabric.

24. SELECT TOPSOIL BORROW (2105)

Select topsoil borrow shall be in accordance with the provisions of 2105 and the following:

Topsoil shall meet the requirements of Mn/DOT Specification 3877 for Select Topsoil Borrow. In addition, topsoil shall be pulverized and free of heavy clay, coarse sand, stones, plants, roots, sticks and other foreign materials.

A test report from an approved reputable testing company will be required prior to delivery of any topsoil and shall include an analysis of soil nutrient levels and recommendations for plant nutrient applications (the University of Minnesota Soils Testing Laboratory provides an excellent nutrient analysis and recommendation). The analysis and recommendations shall include soil gradation and texture, pH, percent of organic matter, extractable Phosphorous (P2O5) (lbs./acre), exchangeable Potassium (K2O) (lbs./acre) and soluble salts (Mhos). Imported topsoil not meeting pH requirements will not be accepted.

Fertilizers (incidental) shall be applied and tilled into the 4" of topsoil, as required by the test report, in place before sodding. No sod shall be placed on chemically treated soil until sufficient time has elapsed to permit dissipation of all toxic material.

Topsoil salvaged on site for use on this Project shall meet all the requirements set forth herein for Select Topsoil Borrow. Even if salvaged topsoil is used, the Contractor shall be paid the plan quantity for Select Topsoil Borrow, given that it passes the requirements specified herein.

25. DUST CONTROL (2130)

At times sweeping and cleaning operations may be needed on a daily basis and other times less frequent needs will exist. The contractor is hereby advised that for public relation reasons, as well as others, not all dust control related activities requested by the Engineer may be directly related to this Project. When appropriate, a sweeping and cleaning schedule may be developed to ensure adequate debris removal from the roadways on a timely basis. The dust control measures may be accomplished by street sweeping, application of calcium chloride or another approved method.

A. Street Sweeper (with Pickup Broom)

This work shall consist of removing aggregate, leaves, soil sediments from paved portions of the Project, or adjacent roadways, open to the traveling public. Removal shall be accomplished with self-propelled street sweeping equipment. All materials shall be collected and retained within the sweeping equipment as they are swept. Disposal of the swept material shall be in accordance with 2104.3C.

Under no circumstances will brooms be allowed on site that does not have the ability to contain dust and pick up materials that are swept up. Removal shall be accomplished with self-propelled street sweeping equipment. All materials shall be collected and retained within the sweeping equipment as they are swept. Disposal of the swept material shall be in accordance with Mn/DOT 2104.3C.

The Contractor shall respond to any request by the Engineer for street sweeping within 6 hours.

The Contractor shall provide any necessary flagmen and traffic control (incidental).

Sweeping shall be accomplished as needed, as directed by the Engineer and/or in accordance with any applicable permits obtained for the construction of the Project. The Contractor shall have the responsibility to inform the Engineer, or designated representative, of any roadways within or adjacent to the Project which are experiencing aggregate or soil deposits due to the Project construction activities.

The need for roadway sweeping and cleaning is directly related to the construction activities being performed on the Project. At times sweeping and cleaning operations may be needed on a daily basis and other times less frequent needs will exist.

Records of sweeping shall be submitted no later than 72 hours after sweeping or no payment shall be made.

Payment under Item 2123.610 Street Sweeper (with Pickup Broom) will only be for those hours as measured to the nearest one-half hour of sweeping, of sweeping necessary to keep the Project roadways and adjacent roadways clean from construction debris as approved by the Engineer and shall be compensation in full for all costs incidental thereto, including but not limited to labor, equipment, water and debris disposal. No additional compensation shall be paid for overtime labor, which may be required to complete all necessary sweeping. . No payment will be made for sweeping normally required to construct the Project as specified, such as between bituminous lifts, prior to curb and gutter construction on bituminous base, prior to placement of traffic markings, etc. No payment will be made under this item for sweeping done by "kickoff brooms." Brooms without a mechanism to pick up debris are not allowed in Bloomington.

B. Calcium Chloride Solution

In conjunction with streets under construction, the City may require that calcium chloride solution be applied on the compacted base for dust control.

Calcium chloride solution shall conform to the requirements of Mn/DOT Specification 3911. The application shall comply with Mn/DOT Specification 2131. The calcium chloride solution shall be applied at the rate of 0.50 gallon per square yard.

The payment for "Calcium Chloride Solution" will be by the Contract unit price per gallon of mixed solution, and shall be compensation for furnishing, mixing, and applying the material as specified or ordered. The quantity of calcium chloride solution shall be excluded from Article 8 of the General Specifications.

26. WATER (2130)

The Contractor must make arrangements with the Utilities Division of the City of Bloomington before using any municipal water. All valves connected to hydrants shall be operated in accordance with furnished instructions.

The Contractor shall use a tank truck with an approved backflow prevention device (air gap). The tank truck must be inspected and approved by a representative of the Utilities Division as part of processing the construction water permit.

Water for testing and flushing of mains is available from the municipal distribution system. The Contractor will not be charged for the water used for testing and flushing. There will be no payment to the Contractor for this water.

Water for construction purposes and that applied to the work shall be metered with a meter obtained from the Utility Division of the City. Payment for water shall be at the Contract unit price per 1000 gallons (M.Gal.), which shall be compensation in full for supplying and application of all water required by this Project except for landscaping. The quantity of water may vary from that estimated and this item is excluded from Article 8, General Specifications, "Estimate of Quantities." The quantity of water each day shall be recorded and this information supplied to the Inspector on a weekly basis.

During the period the Contractor has a City of Bloomington hydrant meter checked out, a minimum monthly water charge and a service charge will be billed to the Contractor. The current minimum

billing and the responsibilities of the Contractor for hydrant use is available from the Utilities Division at the City of Bloomington.

The Engineer may exercise authority regarding the amount of water used for any purpose, and the Contractor shall, when directed by the Engineer, use more or less as directed.

All water used for turf establishment shall be considered incidental to other items. Water for dust control, and obtaining optimum moisture for compaction shall be paid for at the unit price bid. An original water use ticket must be submitted to the Engineer within 72 hours after any water is used on the Project for dust control or obtaining optimum moisture for compaction with the street plainly marked on each ticket, otherwise, no payment shall be made. No copies of tickets will be accepted. Water for any use other than dust control and obtaining optimum moisture shall be incidental.

A. Construction Water Permits/Hydrant Meters

The following is a clarification of the procedure regulating the use of hydrants in the City of Bloomington:

- A permit is required for use of any City Hydrant.
- The Contractor is responsible for any construction meter fees. Schedule of current construction meter fees is available at 952 563-8777.
- Permits will be for a maximum of ninety (90) days' use.
- A monthly bill will be sent and is due upon receipt. Final billing will include an adjustment for total water use.
- Accounts must be kept current or new permits will not be issued.
- User is responsible for hydrant damage occurring during its use for construction water purposes.
- User is responsible for the meter and associated equipment including operation of the equipment, damage occurring during its use, and limited maintenance due to the use of the metering equipment.
- User is cautioned against leaving meters or hydrant wrenches on hydrants where they can be damaged or stolen or the hydrant operated by unauthorized persons.
- In operating the hydrant, the hydrant valve shall be completely open or completely closed. An auxiliary valve shall control the flow of water. Valve is included in hydrant meter assembly.

27. AGGREGATE BASE (2211)

A. Materials

Materials shall conform to the requirements of Mn/DOT Specification 3138. The class of aggregate will be shown on the Bid Proposal.

The Contractor shall furnish the Engineer with a written statement as to the source of the material and at the request of the Engineer shall deliver a 30-pound representative sample of the intended furnished material, not less than five working days in advance of placement of said material. Change of source shall not be made without approval of the Engineer.

B. Construction Requirements

The subgrade shall be prepared in accordance with Article 20 of these Specifications.

Aggregate base shall be constructed in lifts not to exceed six inches in compacted thickness. Each course shall be shaped and compacted separately. The Contractor shall avoid segregation of aggregate due to excess movement during shaping operations.

After the material is placed on the roadway, it shall be shaped approximately to the grade and cross-section as shown on the Plans. No aggregate shall be placed on the roadway that cannot be compacted within 24 hours.

Compaction shall be done with an approved vibratory compactor capable of imparting a compactive force of at least 15 tons, and shall continue until there is no evidence of further compaction. Water shall be added, as approved by the Engineer, to obtain maximum compaction.

Each pass of the roller shall overlap the preceding pass by at least one-half the width of the roller and shall terminate at least three feet in advance or to the rear of the termination of the preceding pass.

The entire surface shall be compacted as specified in Mn/DOT Specification 2211.3C2 "Quality Compaction Method."

After compaction, the surface of the base shall be smooth and true to crown and grade as shown on the Plans. The thickness shall not vary more than one-half inch from that shown on the Plans.

C. Method of Payment

"Aggregate Base" of each class specified shall be paid for at the Contract unit price per cubic yard of compacted base, which shall be compensation in full for base preparation and test rolling, obtaining the material, and constructing the base. Measurement will be made on the cubic yard basis for the volume of compacted base as determined by the depth and width as shown on the typical section, and the length as shown on the Plans.

Aggregate base may also be measured by weight in tons if indicated on the Proposal. Weight slips will then be required. Aggregate material shall be weighed on an approved scale and the weights recorded on a weight ticket approved by the Engineer. The contractor shall furnish the scale person. A copy of the scale weight tickets for the day's run shall be furnished to the Engineer at the end of each working day and shall indicate the street or streets on which the material was placed, the class of material and the date. No payment for Aggregate Base will be made until these tickets have been received and approved by the Engineer. Periodic checks of the Contractor's scale may be made by weighing batch trucks on an independent scale to be specified by the Engineer. The cost of using the independent scale is to be paid by the City. Weight of the trucks shall be controlled so that no damage will be inflicted on the work, adjacent streets or any haul road. The contractor shall be responsible for the damage due to hauling material.

28. CRUSHED ROCK FOR DRIVEWAYS (2211)

A. Materials

Crushed rock for driveway surfacing shall match the material existing in the driveway as nearly as possible and a sample of the material proposed for use be approved by the Engineer before any material is hauled.

B. Method of Payment

Crushed rock material will be paid for at the Contract unit price per ton. Certified weight tickets furnished by the Contractor will determine weights. If no bid item is provided, the Contractor shall be paid at the unit price bid for "Aggregate Base".

29. RECLAIM BITUMINOUS STABILIZED BASE (BSB) (2331)

Field mixed bituminous pavement or bituminous stabilized base (BSB) was used on some street sections during their original construction. The BSB shall stay on the street from which it was taken and be placed below the Class 5 aggregate base layer. Excavation down to the bottom of the new pavement section (which would be to the bottom of the new pavement structure and the subcut to bury the BSB, including the new bituminous, Class 5 aggregates and the BSB) shall be paid as common excavation. Removal of the bituminous pavement shall be paid at the appropriate unit bid price. Excavation down to the bottom of the in place BSB shall be paid as Reclaim BSB and shall include, among other items stated herein, both the removal and placement of the BSB. The BSB shall be reclaimed, milled, ground or otherwise pulverized to eliminate any pieces larger than 3". Reclaiming/mixing of the existing plant mixed bituminous pavement with the BSB, thereby generating a larger quantity of BSB material is expressly forbidden. Costs associated with the movement of the BSB material to meet the required profile and cross-section shall be included in the reclaim BSB bid price.

The Contractor shall refer to the Standard Detail for a depiction of the pay items related to BSB. Payment for the item of "Reclaim Bituminous Stabilized Base (CV)" at the contract unit price bid for mixture produced shall be compensation in full for all costs of removing, pulverizing, placing and shall be at the unit price bid per square yard of material regardless of thickness.

30. PLANT-MIXED ASPHALT PAVEMENT (2360)

This work shall conform to the requirements of Mn/DOT Specification 2360 except as modified or clarified herein.

A. Construction Requirements

1. Restriction

Bituminous mixtures shall not be placed when, in the opinion of the Engineer, the weather or roadway conditions are unfavorable as determined by the Engineer.

Notice of placement of bituminous must occur prior to 2:00 pm on the day prior to installation. The notice must include the plant to be used, the number of tons and the mix design. Placement will not be permitted without this notification.

Bituminous surface shall be placed only during the hours of daylight (except as noted below) and when the road surface is dry. Mixtures may be placed when the air temperature is 33 degrees F. or more and rising, but shall not be placed when the air temperature is 40 degrees F. or less and falling. These conditions are not specific to calendar dates as stated in the MnDOT Specifications. The Engineer will not accept contractor's request from warranty releast with regards to MnDOT's pre-determined paving dates.

2. Preparation of the Base

When sweeping streets prior to any paving, the sweeping shall be performed with a pickup sweeper or in a manner, which precludes dust and debris being deposited on the boulevard or lawn. This sweeping shall be incidental.

Tack coat shall be applied between all layers regardless of the time between lifts in accordance with Mn/DOT Specification 2357.

3. Mixture Proportions for the Job Mix Formula

All mixtures shall meet the mixture design requirements of Mn/DOT Specification 2360

4. Pavement Density and Compaction

All pavements will be compacted in accordance with Mn/DOT Specification Section 2360.6B Maximum Density Method unless otherwise specified in the Contract special provisions or for situations as noted in Mn/DOT Specification Section 2360.6C Ordinary Compaction Method. The use of vibratory rollers will be permitted by written authorization of the Engineer as an alternate to any of the above described procedures or equipment where equivalent results can be obtained. After compaction, the surface shall be smooth and true to crown and grade as shown on the Plans.

5. Miscellaneous Details of Construction

Transverse joints in adjacent strips shall be separated a minimum of five feet. When material is placed in more than one layer, longitudinal joints shall be separated a minimum of one foot. Traffic shall not be permitted over an unmatched longitudinal joint except at locations directed by the Engineer.

When making a connection to an existing bituminous stabilized surface, the plant-mixed bituminous surface shall be tapered to provide a smooth connection as directed by the Engineer. When connecting to an existing asphaltic concrete mat, the joint shall be made vertical and painted with a uniform coat of SC or RC bituminous material.

Unless otherwise directed by the Engineer, the construction of each pavement course shall start at the point farthest away from the mixing plant and progress toward the plant, so that no hauling will be done over freshly laid pavement.

Bituminous material shall not normally be deposited on the road if the rolling cannot be completed before dark.

Bituminous material shall be weighed on an approved scale at the plant and the weights recorded on an original weight ticket approved by the Engineer. The Contractor shall furnish the scale person. A copy of the scale weight tickets for the day's run shall be furnished to the Engineer at the end of each working day and shall indicate the street or streets on which the material was placed, type of material and date. A running total for each day's run shall be recorded on the weight tickets. No payment for the bituminous material will be made until these tickets have been received and approved by the Engineer. Periodic checks of the Contractor's scale may be made by weighing batch trucks on an independent scale to be specified by the Engineer. The cost of using the independent test scale is to be paid by the City.

Weight of the trucks shall be controlled so that no damage will be inflicted upon the base or any haul road.

B. Method of Payment

1. Plant-Mixed Bituminous Pavement

The plant-mixed bituminous pavement shall be paid for at the Contract unit price per ton in place, which shall be compensation in full for all costs incidental to the construction including bituminous materials used in the mixture.

In all cases the unit of measurement shall be tons and the weight determined on a scale approved by the Minnesota State Bureau of Weights and Measures.

2. Tack Coat

Bituminous material for tack coat shall be paid for at the Contract unit price per gallon, which shall be compensation in full for all costs incidental to construction. Bituminous material will be paid for by using the volume at 60 degrees F. Tables found in the MnDOT Bituminous Manual section 5-693.240 will be used to calculate the necessary correction factors to covert gallons of bitumen at any temperature to gallons at 60 degrees F.

31. CONCRETE STEPS (2411.607)

This work shall consist of furnishing and installing concrete steps in accordance with the applicable specification of Mn/DOT 2411, Technical Memorandum No. 01-17-MRR-03, as directed by the Engineer, and the following:

The concrete steps shall be constructed in the locations and to the configuration as approved by the Engineer. The concrete steps shall match existing steps in tread width and length and have a height between 5 inches and 7 inches. In areas where more than one step is required the height shall be divided to provide equal step height for all new steps. The Engineer shall have the right to alter the location to improve constructability and aesthetics.

The Contractor shall tie the new concrete step work to the existing steps by a method approved by the Engineer.

The steps shall use a concrete mix designation of 3Y43 and shall have a light broom finish.

All structural excavation, granular backfill material, and reinforcement bars shall be considered incidental to the unit price for the concrete steps.

Removal of any existing portion of the concrete steps to facilitate construction shall be considered incidental to the unit price for the concrete steps.

The quantity included in the bid proposal form is for contingencies purposes only. Actual quantity of work performed will be as approved by the Engineer in the field.

The Contractor shall be responsible for notifying the resident regarding the work to take place a minimum of seven (7) days prior to any work on the stairs.

Payment made under item "2411.607 Concrete Steps" at the Contract unit price bid per cubic yard shall be compensation in full for all labor, equipment and materials required to design and construct the concrete steps complete in place at the locations as direct by the Engineer.

32. MODULAR BLOCK RETAINING WALL (2411)

This work shall consist of furnishing and installing precast concrete wall units, geotextile reinforcement, draitile, and related materials as noted in the plans and details, in accordance with the applicable specifications of MN/DOT 2411. All segmented block walls shall meet the requirements of MN/DOT Technical Memorandum No. 08-06-MRR-03, dated April 7, 2008, and the following:

The walls shall be constructed in the location and configuration as shown on the Plans. The Engineer reserves the right to alter this alignment to improve constructability and aesthetics.

The walls shall be segmented block walls similar to those manufactured by:

- Keystone Retaining Wall Systems
- Rockwood Wall Systems
- Anchor Wall System
- Allan Block
- Versa-Lok
- or an approved equal.

The blocks shall conform to the strength and freeze/thaw requirements stated in the Technical Memorandum.

All necessary wall block materials needed for the Project shall be brought to Bloomington Western Maintenance Facility located at 10500 Hampshire Avenue South. The testing samples will be taken from this quantity and submitted for the required freeze-thaw testing as outlined in the Technical Memorandum. It is required that a City of Bloomington Engineering Division Representative be present when items are delivered to verify delivery, storage location, and handling care of the Contractor. The contractor is advised that the material testing for the modular blocks typically takes over 90 days and should schedule the work accordingly. No walls shall be built without either passing freeze-thaw test results or approval of the Engineer.

The Engineer shall approve the wall system colors. Generally, wall units shall be a tan-terracotta color. The texture of the block shall be beveled and split faced. Product information shall be supplied to the Engineer to approve the color and texture.

The wall system shall be constructed in accordance with the manufacturer's recommendations upon approval of the design methodology by the Engineer. Walls taller than four (4) feet are to be designed by a Minnesota licensed engineer, hired by the Contractor. These plans shall be submitted to the City for review and shall be signed by said, Minnesota licensed engineer.

The wall shall conform to the following specifications and typical section requirements:

The detailed drawings shall contain all the necessary information for the construction of the wall. Included shall be a typical section detailing excavation limits, geotextile locations, block embedments, leveling pad dimensions, backfill, etc. Include as many sections and other views necessary for the construction and inspection of the wall. The information on embedment, geotextile locations, and geotextile lengths as they relate to wall heights may be shown in tabular form. Also included shall be the pertinent information on the individual blocks and the geotextile material.

All plan sheets shall clearly identify the name of the responsible engineering firm and the name of the person certifying the plan. Each sheet shall be certified. Notes for Typical Section:

The minimum depth of block embedment shall be two (2) feet measured perpendicular to the slope unless a detailed analysis shows a greater depth is required (AASHTO 5.8).

The minimum reinforcement length required on walls taller than four (4) feet shall be 70 percent of the total wall height unless a detailed analysis shows a longer length is required (AASHTO 5.8).

Geotextile vertical spacing to be determined by detailed analysis.

A 4" drainage pipe, MN/DOT 3278, wrapped in Type 1 geotextile, MN/DOT 3733, is required on walls taller than four (4) feet.

The Project Engineer has the option of having additional drains placed to intercept any water-bearing soil strata discovered during construction.

Backfill shall be a minimum of two (2) feet of drainage aggregate immediately behind the wall. Aggregate material shall be no finer than clean 1" to No. 4 gradation. The drainage aggregate or (select) granular borrow if needed is incidental to the retaining wall price.

Compaction to be in accordance with 2105.3F2, Quality Compaction.

Slope determined by in-situ soils and/or OSHA regulations.

Type 1 geotextile to be placed on back side of facing blocks as shown on the detail in the plans.

The leveling pad shall be either un-reinforced concrete or compacted aggregate. The thickness shall be as determined by analysis, but in no case shall be less than 6".

Show slope and/or surcharge loading on fill being retained.

If a fence is required along the top of the wall, the wall shall be designed to include the additional loading.

When the longitudinal slope of the footing is greater than 10:1, the footing may be stepped.

Utilities shall be located outside the construction limits of the retaining wall. Any utilities needing to be located within the area shall be installed as the wall is being constructed. Once the geotextile layers are installed, neither the geotextile nor the utility shall be disturbed at any time. Any future maintenance on the utility will require dismantling the wall.

Payment for "Install Modular Block Retaining Wall" shall be payment in full for: the structural design of the retaining wall, furnishing and installing the blocks and the appurtenant features of the wall (geotextile, draitile, rock filter, sand if required etc.), and the excavation, backfilling, and compaction behind the wall needed for wall installation. Payment for "Materials On Hand" will be made once the wall blocks are delivered to Western Maintenance in accordance with General Specification Article 14.

33. SEWER SYSTEM (MnDOT 2503/CEAM 2621)

A. Materials (2621.2)

All materials required for this work shall be new material conforming to requirements of the referenced specifications for the class, kind, type, size, grade, and other details indicated in the Contract. Unless otherwise indicated, all required materials shall be furnished by the Contractor. If any options are provided for, as to type, grade, or design of the material, the choice shall be limited as may be stipulated in the Plans, Specifications, or Special Provisions.

All manufactured products shall conform in detail to such standard design drawings as may be referenced or furnished in the Plans. Otherwise, the Engineer will require advance approval of materials, suppliers, product design, or other unspecified details as it deems desirable for maintaining adopted standards or allowing any variances to the standards.

At the request of the Engineer, the Contractor shall submit in writing a list of materials and suppliers for approval. Suppliers shall submit a Certificate of Compliance that the materials furnished have been tested and are in compliance with the specifications.

All pipe furnished for main sewer and service line installations shall be of the type, kind, size and class indicated for each particular line segment as shown in the Plans and designated in the Contract Items. Wherever connection of dissimilar materials or designs is required, the method of joining and any special fittings employed shall be products specifically manufactured for this purpose and subject to approval by the Engineer.

1. Ductile Iron Pipe and Fittings (2621.2A2)

Ductile iron pipe shall be used where shown on the Plans. Cast iron pipe may not be used in lieu of ductile iron pipe.

Ductile iron pipe shall conform to the requirements of ANSI/AWWA Specification A-21.51/C151, except the minimum design thickness shall be as follows:

Pipe Metal Thickness/Depth of Cover Over Pipe								
Pipe Size	0' to 20'		20' to 30'		30' to 40'		40' to 50'	
	Thickness	Pipe Class	Thickness	Pipe Class	Thickness	Pipe Class	Thickness	Pipe Class
4"	.32"	CL 53	.32"	CL 53	.35"	CL 54	.38"	CL 55
6"	.34"	CL 53	.34"	CL 53	.37"	CL 54	.40"	CL 55
8"	.36"	CL 53	.36"	CL 53	.39"	CL 54	.42"	CL 55
10"	.38"	CL 53	.41"	CL 53	.44"	CL 55	.47"	CL 56
12"	.40"	CL 53	.46"	CL 53	.49"	CL 56	.49"	CL 56
16"	.46"	CL 53	.49"	CL 53	.49"	CL 55	.49"	CL 55

Mechanical joint pipe shall comply with ANSI/AWWA Specifications A-21.11/C111.

Fittings shall be ductile iron with mechanical joints. Fittings over 12" in diameter shall comply with the above specifications and shall be Class 53.

All pipe joints shall be an approved slip or mechanical joint with rubber gaskets. Gaskets shall be molded styrene butadiene rubber (SBR), or nitrilbutadine rubber (NBR) rings designed specifically for the joint used.

2. Reinforced Concrete Pipe and Fittings (2621.2A3)

a) General

Reinforced concrete pipe may be used for all sanitary and storm sewer pipe 12" in diameter or larger, unless otherwise specified.

Lift holes will not be permitted in pipe smaller than 54" in diameter. Pipe 54" or larger in diameter will be permitted with one lift hole, to be laid with the lift hole on top. The lift hole shall be filled with a commercially manufactured lift hole plug and non-shrinking concrete grout. The concrete grout shall have an approved bonding agent added. The grout shall completely encompass the plug to provide a bond between the pipe cross-section and plug.

b) Fittings

On sanitary sewers, if the connections are fabricated in the field, the hole shall be cut with a tapping machine and an approved saddle installed.

c) Jointing

Reinforced concrete pipe shall have neoprene or approved rubber "O"- ring joint gaskets. The material shall meet the requirements of ASTM C-443, Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible, Watertight, Rubber Gaskets. The reinforced concrete pipe joint shall be designed in accordance with ASTM Designation C-361, with dimensions approximately as shown on Mn/DOT Standard Plate No. 3006G.

When connecting pipe with gasket joints to an existing stub with standard bell, the connection section shall be constructed with standard spigot on one end and gasket joint bell on the upper end.

Pipe segments shall be a minimum of three feet in length.

3. Corrugated Steel Pipe and Fittings (2621.2A4)

Corrugated metal pipe may only be used for storm sewers where specifically indicated on the Plans or in the Special Provisions. All joints shall be made with coupling bands, which shall conform to the requirements of Mn/DOT Specification 3226.2. The coupling band shall cover at least two full corrugations on each side of the joint.

Joints shall be made soil tight by using Trumbull 5X asphalt sealer; "O"-ring gasket secured by coupling bands; or approved equal.

4. Poly-Vinyl Chloride Pipe and Fittings (2621.2A5)

Poly-Vinyl Chloride (PVC) pipe may be used as an alternate to any other pipe for either gravity sanitary or storm sewer 8" through 15" diameter with a maximum cover of 21 feet, unless otherwise specified.

PVC pipe shall conform to the requirements of ASTM D-3034, SDR 35, Type I, Grade I rigid PVC with the wall thicknesses as shown below. The pipe shall have bell and spigot with approved gasketed joints. The spigot end shall be marked so that the installer and the Inspector can determine when the pipe is properly installed.

Pipe entrances to manholes shall be sealed watertight with "O"-ring gaskets or other method approved by the Engineer.

PVC pipe shall be installed in conformance with the requirements of ASTM D-2321. Only Class I, II and III embedment materials shall be used for PVC applications. The Engineer shall approve the material used for embedment prior to construction. A minimum layer of 12 inches of embedment material shall completely surround the PVC pipe. Select material shall be used for backfill to a minimum of one foot above the top of the pipe. Embedment material shall be incidental to the cost of furnishing and installing PVC pipe as specified.

Services shall be of materials specified. Where the service material is not designed to fit the PVC pipe tee tightly, an approved commercial adapter shall be used to connect the service pipe to the PVC pipe.

The wall thickness shall be not less than those specified below, except that isolated arcs spanning no more than 15 degrees of the perimeter may not be less than 95% of the specified minimum. The average outside diameter shall not vary from that specified by more than plus or minus 0.018" for eight-inch through fifteen-inch pipe and 0.010" for four-inch and six-inch pipe.

Nominal Size	Outside Diameter	Minimum Wall Thickness
Inches	Inches	Inches
6	6.275	0.180
8	8.400	0.240
10	10.500	0.300
12	12.500	0.360
15	15.300	0.437

5. High Density Polyethylene (HDPE) Pipe and Fittings:

High Density Polyethylene Storm Sewer Pipe will only be allowed at specified locations.

The pipe shall have a nominal size between 12 to 60 inches diameter. Pipe furnished under this specification shall comply with the requirements for materials, test methods, dimensions and marking in accordance with the current issue ASTM F 2306. The pipe shall consist of a corrugated exterior and an essentially smooth interior wall. The pipe supplied shall be water tight as defined in the joint performance requirements of this specification.

Any pipe, fitting, or drainage structures with cuts, punctures, other damage on the interior or exterior, or damaged ends or joints which would prevent proper sealing of the joints, shall be rejected and replaced.

Pipe joints shall be specified per ASTM 2306 as water tight. Water tight joints must meet a 10.8 psi laboratory test per ASTM D3212 and utilize a bell and spigot design with a gasket meeting ASTM F 477. Gaskets shall be installed by the pipe manufacturer and covered with means to ensure that the gasket is free from debris. A joint lubricant supplied by the manufacturer shall be used on the basket and bell during assembly. Pipe fittings may be required to fit curvilinear alignments. Curve date if required will be provided on the plans. The cost of fittings is incidental to the unit cost of the pipe.

Pipe connections into all concrete structures shall be made with water tight materials, utilizing an A-lok or WaterStop gasket or boot, cast-in-lace rubber boot, or approved equal. Where the alignment precludes the use of the above approved watertight methods, Conseal 231 waterstop sealant, or approved equal will only be allowed as approved by the Engineer.

6. Service Pipe

The following materials may be used for sewer service pipe:

- Class 54 Ductile Iron Pipe, with fittings
- SDR 26 Polyvinyl Chloride – PVX (ASTM D3034), with fittings.

7. Manhole Castings (2621.2B)

The manhole frame shall conform to the requirements of Mn/DOT Standard Frame 700-7 (Neenah 1733-2007) or approved equal with machined bearing surface.

The sanitary sewer covers shall be self-sealing with gasket and two concealed pick-holes conforming to the dimensions of Neenah 1733-0150 or approved equal. The cover shall have a continuous machined dovetail groove in the lid seat. The groove shall contain a one-quarter inch diameter neoprene gasket. Neoprene gasket shall be oil and weather resistant, have a minimum tensile strength of 1000 PSI, allow 500% elongation, and have durometer rating of 40. The cover shall not have a lug. The cover shall have "Bloomington Sanitary Sewer" displayed in one-inch letters and shall conform to the detail in the Plans.

Storm sewer manholes shall be installed with Neenah casting R-2296 with a Type C grate or approved equal.

8. Precast Concrete Manhole and Catch Basin Sections (2621.2C)

Manholes shall not have steps, unless otherwise specified. Precast manhole joints shall be made watertight with Ram-Nek material or approved "O"-ring gasket at each joint. The Ram-Nek and primer must be used in accordance with the manufacturer's instructions.

Rubber gaskets used for precast manhole joints shall be in accordance with ASTM Designation C-443.

Water stop connectors shall meet the requirements of ASTM C-923, Resilient Connector Between Reinforced Concrete Manholes Structures, Pipe and Laterals, ASTM C-1244, Standard Test Method for Concrete Sewer Manholes by Negative Air Pressure (Vacuum) Test, and ASTM 1478, Resilient Connectors between Reinforced Concrete Storm Sewer Structures, Pipes and Laterals.

Lift holes will not be permitted in manhole sections smaller than 60" in diameter. On manholes 60" and larger in diameter, the lift holes shall be filled with a commercially-manufactured lift hole plug and non-shrink concrete grout before backfilling. The concrete grout shall have an approved bonding agent added.

Storm sewer manholes shall be sized as shown on the Plans. Catch basins shall conform to the detail in the Plans.

Precast manholes with integral bases will be allowed as specified. Reinforced integral floors shall have a minimum thickness of 6 inches. Concrete and steel reinforcement shall conform to the requirements of ASTM C-478.

The in-place or installed invert of precast integral base and first barrel manholes shall have a minimum clearance of 4 inches between the invert and the top of the manhole base.

Sewer manholes shall be built with such additional adjusting rings and short manhole sections as necessary to allow for adjustment of the manhole to the proposed grade as shown on the Plans and Details. Manhole and catch basin casting tops shall be 1/4" (0.03') and 2" (0.15') respectively, below the finished grade.

All new and reconstructed sanitary sewer manholes shall have an external chimney seal.

Manholes shall have a minimum of two adjusting rings and a maximum of six adjusting rings to finished grade. The barrel sections shall be cast in such a manner that the manhole builds will meet the aforementioned requirements

Concrete adjusting rings and castings shall be set in a full bed of mortar. The mortar shall consist of one part of Portland cement, three parts clean mortar sand and sufficient clean water for proper consistency. The entrained air content of the mortar shall be within the range of 7-10 percent obtained by approved means. Joints on the inside of structures shall be no more than 1/2 inch wide and shall be struck. The outside of the structure shall be plastered with mortar to a smooth surface.

Precast manholes with integral bases shall be set plumb and at grade on a minimum of six inches of sand or foundation material. The details on the Standard Detail Sheet shall apply.

Precast bases shall also be set on a minimum of six inches of sand or foundation material. The details on the Standard Detail Sheet shall apply.

No additional compensation will be approved for reconstruction of a rejected manhole or catch basin that does not meet specified requirements.

Where standard manhole sections cannot be used, as in junction and transition manholes, brick, manhole block, concrete block, or a combination of such materials set on a concrete base may be used with approval of the Engineer. The vertical and horizontal joints shall contain a minimum of 1/2" grout. The outside and inside of brick or block manhole sections shall be finished with Portland Cement grout as directed. Hollow concrete block will not be allowed for any manhole or catch basin construction.

Unless otherwise specified on the plans, the storm sewer covers shall have a center pick-hole conforming to the dimensions of Neenah 1733-0150 or approved equal. The cover shall not have a lug. The cover shall have "Bloomington Storm Sewer" displayed in one-inch letters and shall conform to the detail in the Plans.

Wherever possible, the sewer pipe shall be laid continuously through the manholes. The top portion shall be neatly cut out to provide a smooth invert when the manhole fillet is finished.

9. End Sections

Where shown on the plans, a standard Flared End Section shall be installed in accordance with the Standard Detail Sheet. The last three joints of the end section and pipe shall be tied per the detail.

10. Trash Guard

Where shown on the Plans, a trash guard shall be installed in accordance with the Standard Detail Sheet. The trash guard shall have 5/8" vertical galvanized steel rods placed 6" center-to-center unless otherwise specified. The guard shall be securely attached to the end section. The Contractor may submit other methods of constructing the trash guard subject to the approval of the Engineer.

11. Rip Rap

Where shown on the Plans, rip rap shall be constructed in accordance with Mn/DOT Specification 2511 for Random Rip Rap Class III unless otherwise specified. Individual stones, except those used for chinking, shall be not less than 50 pounds each, hand placed to a depth of one (1) foot.

Rip rap required for the various pipe sizes shall be as shown on the Standard Detail Sheet, unless otherwise specified.

Filter materials for rip rap shall be in conformance with the requirements of Mn/DOT Specification 3601 for granular filter or the requirements of Mn/DOT Specification 3733 for geotextile fabric. The granular filter shall be one foot in thickness unless otherwise specified.

12. External Manhole Chimney Seal

External Manhole Chimney Seals shall consist of a flexible external rubber sleeve, interlocking extensions, and stainless steel compression bands as manufactured by Cretex Specialty Products or Adaptor Inc., or a pre-approved equal conforming to the following requirements.

The seal shall remain flexible throughout a 25 year design life, allowing repeated vertical movement of the frame of not less than 2 inches and repeated horizontal movement of the frame of not less than 1/2 inch. The sleeve portion of the seal shall be capable of being mechanically locked to the frame base flange. The sleeve and/or extension shall have a minimum thickness of 1/16 inches and shall be made from a high quality rubber compound conforming to the applicable requirements of ASTM C-923, with a minimum 1500 psi tensile strength, a maximum 18% compression set, and a hardness (durometer) of 48 ± 5 . The bands shall be fabricated from minimum 20 gauge stainless steel conforming to ASTM A-240, Type 304, with no welded attachments and shall have a minimum adjustment range of 2 diameter inches. Any screws, bolts, or nuts used to lock the band in place shall be stainless steel conforming to ASTM F-593 and 594, Type 304.

B. Construction Requirements (2621.3)

Before utility work begins on new subdivisions, the Developer is scheduled to grade the street full width to subgrade, as shown on the typical sections, with no spot elevation to vary over 0.5 feet, and overall grading to within 0.2 feet. After the utilities are installed, the existing backfill material shall be compacted and reshaped to the required section as shown on the detail plan, or noted in the Special Provisions. A cross section with survey shots taken at the property line-center line-property line average can't be more than 0.2 feet or the Developer will need to regrade the street width.

Any excess material from the compacted utilities trench shall be removed from the site, if not needed on the Project. The cost of the removal shall be incidental to the pipe costs.

The Contractor shall be responsible for all property and control monuments destroyed or disturbed by work completed by such Contractor unless prior authorization is received for the

removal or disturbance of such monuments from the City Engineer or authorized representative thereof.

Mutually agreed upon terms of removal and replacement of these property and control monuments shall be established prior to construction. Without these terms in writing, the Contractor shall have full responsibility of the replacement of the monuments by a land surveyor registered in the State of Minnesota. This work shall be completed at no cost to the City of Bloomington unless prior agreement states otherwise.

After backfill has been shaped and compacted, the Contractor shall furnish and place the surface as shown on the typical sections. All excavation and shaping of these streets shall be incidental to the other items of the Contract, unless specifically included as a pay item.

All joints and connections in the storm sewer system shall be gastight and watertight. Approved resilient rubber joints must be used to make watertight connections to manholes, catchbasins, and other structures.

Any storm sewer installed over a water service will require the Contractor to expose the water service to verify the amount of cover between the proposed storm sewer location and the existing service. If the amount of cover is less than 18" between the two pipes, a minimum of 6" of insulation shall be installed.

1. Establishing Line and Grade (2621.3A2)

Adjustment of the Plan grade will not be permitted without the written consent of the Engineer.

The Contractor shall check alignment and grade with the use of a laser at 25', 50' and each station thereafter out of a manhole. No additional compensation shall be allowed the Contractor for any claims of crews being held up because of lack of line and grade stakes unless the Contractor has submitted a written request to the Engineer at least two working days in advance and is following a previously approved schedule of work.

2. Connecting to Existing Utilities

When the Plans call for a connection to an existing stub or manhole, the Contractor shall check the horizontal and vertical alignment of the existing utilities and make the Engineer aware of any discrepancy from the Plans. This may require exploration in advance to determine exact locations. This exploration will be considered incidental.

In connecting to existing manholes, as small a hole as possible shall be made to provide for the new pipe to enter and the opening shall be sealed watertight. Breaking into a manhole and making a water-tight connection is incidental to the contract.

The end of the pipe shall not extend beyond the inside wall of the manhole except for those pipes laid continuously through the manhole at the invert. Pipe entrances to manholes shall be sealed watertight with "o"-ring gaskets or other methods approved by the Engineer.

In connecting to an existing sanitary pipe of another size or type, a commercially manufactured adapter/coupling approved by the Engineer shall be used. The

adapter/coupling shall include a molded rubber sleeve conforming to ASTM C425, ASTM C1173 and a 0.012" stainless steel shear ring conforming to ASTM A240. The adapter shall have stainless steel clamps, nuts and bolts meeting ASTM A 240. The adaptor/coupling shall be "Flex-Seal Adjustable Repair Couplings" manufactured by Mission Rubber Company, "Strongback RC Series" manufactured by Fernco or approved equal. If an existing utility is damaged, the same type and size material shall be used for the repair, or as directed by the Engineer.

In connecting to an existing storm pipe of another size or type, a commercially manufactured adapter approved by the Engineer shall be used. The adapter shall be encased in 6-inches minimum of concrete. If an existing utility is damaged, the same type and size material shall be used for the repair, or as directed by the Engineer.

3. External Manhole Chimney Seal Installation

An External Manhole Chimney Seal, with External Chimney Seal Extensions when needed to cover the entire chimney area, shall be installed on all sanitary manholes in strict accordance with the manufacturer's instructions.

The pavement must be cut and removed 2' beyond the casting to ensure proper compaction of the subgrade and pavement structure. The contractor shall note that removals, sawing, aggregate base, bituminous patching etc. around the adjusted facilities is incidental to this item.

The Contractor shall make submittals of the manufacturer's literature, shop drawings, installation instructions, and other items in accordance with the provisions of the standard specifications. The contractor shall submit a notarized certification from the manhole chimney seal manufacturer stating that their product meets the design life, performance, and material requirements of this specification.

4. HDPE Pipe Installation/Backfilling

The minimum trench width shall be $1.25 \times \text{Outside Diameter} + 12"$ or a minimum of 16" plus the Outside Diameter, whichever is greater.

Areas of unstable trench bottom shall be excavated to a depth determined by the Engineer and replaced with suitable foundation material to meet the compaction requirements.

Bedding thickness shall be a minimum of 4" for pipe diameters 24" or less. Bedding thickness shall be 6" for diameters larger than 24". The bedding material shall meet the compaction requirements.

The material in the haunch/pipe zone shall be placed and compacted evenly on both sides of the pipe, from the top off the bedding elevation to the top of the pipe. The haunch/pipe zone material shall meet the compaction requirements.

The initial backfill is from the top of the haunch/pipe zone elevation to 6" above the top of the pipe. The compaction of this area shall meet the compaction requirements for the pipe, unless the pipe is installed within a road bed and then the roadway embankment requirements shall supersede the compaction requirements.

The final backfill shall meet the parameters for the subgrade of the pavement cross-section in road bed areas. In non traffic bearing areas, the final backfill shall have a minimum of 90% Standard Proctor Density, unless otherwise noted.

Compaction for all backfill and foundation material including the bedding material, haunch/pipe zone and initial backfill shall be compacted to a minimum of 90% Standard Proctor Density, unless otherwise noted.

C. Sewer Service Installation (2621.3C)

Generally, a four-inch or six-inch tee shall be used in the main line on PVC mains all molded wyes, T-wyes, Tees and service branches must be a minimum of SDR 26 wall thickness and comply with ASTM D 3034, F679 and F1336 standards. The fittings must be manufactured with a lock-in gasket and conform to the requirements of ASTM F477 or F913. Fittings shall be Multi Trench Tough SDR26 Sewer Fittings or approved equivalent.

House connections shall be kept as deep as required to serve the property, with a minimum depth of ten feet in the street and not less than nine feet at the curb line.

When new services need to be tapped into an existing, in service, sewer main, the Contractor shall expose the main sufficiently to facilitate the tap. All necessary materials, as shown in the details in the plan, shall be supplied by the contractor and paid for as "Sanitary Sewer Connection" unless otherwise noted in the contract documents.

All services shall be marked as designated in Standard Utilities Specifications as published by the City Engineers Association. The service markers shall extend to the invert at the terminus of the service. The top four feet shall be marked in one-foot increments to establish the elevation of the service.

D. Sanitary Sewer Testing (2621.3F)

Upon completion of all utility construction by this Contract and before any house services are connected, tests will be required on all sanitary sewer lines.

1. Air Test Method (2621.3F1)

The Contractor shall perform these tests with suitable equipment specifically designed for air testing sewers.

2. Inspection and Flushing

Prior to final acceptance of each section of the sewer line, the Contractor shall jet the sewer and/or by use of video inspection. Larger sewers shall be cleaned by other appropriate methods. All dirt and debris shall be prevented from entering the existing sewer system by means of watertight plugs or other suitable methods.

Upon completion of the Contract, the Engineer shall carefully inspect all sewers and appurtenances. Any unsatisfactory work shall be removed and replaced in a proper manner.

The invert of the sewer shall be left smooth, clean, and free from any obstructions throughout the entire line. This applies to both sanitary and storm sewers.

3. Deflection Test (2621.3G)

Deflection testing shall be completed per Standard Utilities Specifications as published by the City Engineers Association.

The Contractor shall supply the mandrel for deflection testing.

The mandrel shall be constructed with an outside dimension tolerance of 0.010" with maximum bar spacing of 40 degrees around the circumference. The mandrel shall be constructed of 1/2" rod or better. Each mandrel shall be stamped with the exact outside dimension.

The outside dimension of the mandrel shall be according to the following schedule:

Nominal Pipe Diameter	Mandrel O.D. For 5% Deflection ASTM D-3034, SDR 35
Inches	Feet
8	0.607
10	0.757
12	0.899
15	1.100

E. Storm Sewer Testing

At the discretion of the Engineer, post installation testing shall be conducted by the Contractor on a minimum of 10% of the storm sewer system at segments chosen by the Engineer no less than thirty days after installation. Deflections must not exceed 7.5 percent of the nominal diameter. If any segments fail post installation testing, the Engineer may require the Contractor to perform post installation testing on additional segments or all of the remaining system. Pipe failing post installation testing shall be considered unacceptable and will need to be replaced by the Contractor at the Contractor's expense.

For pipe diameters up to 24 inches, post installation testing shall be performed using a nine point mandrel approved by the Engineer or by television camera. The mandrel must be pulled through the pipe by non-mechanical means. For pipe diameters 24 inches or larger, the Contractor has the option of performing post installation testing by mandrel, physical measurement or television camera.

F. Pipeline Backfilling Operation

Backfill of all utilities shall be compacted to a minimum standard proctor density of 100% in the upper three feet. 95% of standard proctor will be required below the three-foot level. Density tests will be required. The City of Bloomington will take density tests as the Engineer deems

necessary. The standard proctor density test shall conform to the requirements of ASTM D-698-70 Method C.

Test rolling may be required under future street projects. In the event the street fails to pass test rolling, the utility Contractor shall be required to make reparations as necessary, if it is determined that the failure was caused by such Contractor's work.

G. Restoration Of Surface Improvement

Work on the Project shall be confined to the specified construction limits established by the Engineer. In all instances, restoration of any disturbed area outside the construction limits shall be at the expense of the Contractor.

That portion of the existing roadway and curb and gutter that is disturbed by this Contract shall be replaced in accordance with these specifications. The materials shall be placed on thoroughly compacted subgrade. The existing pavement section shall be cut back two feet beyond the edge of the trench.

The patching material for each location shall be as shown on the Plans or as stated in the Special Provisions.

H. Methods Of Measurement And Payment (2621.4,2621.5)

1. Sewer Pipe in Place (2621.4A)

Sewer pipe will be paid for at the Contract unit price per linear foot for each type, for each diameter of pipe furnished and installed, and according to the depth zone classification, if applicable. Increasers and reducers will be paid for at the Contract unit price per linear foot for the larger size pipe.

Unit prices bid shall be compensation in full for all costs incidental to construction, including, but not limited to, excavation, dewatering, testing, sheeting, pipe completely installed, backfilling, removal of excess fill material, necessary bends, wyes, and tee sections, unless otherwise included as a pay item.

2. Manholes and Catch Basins

Manholes and catch basins will not be paid for until the manhole construction is completed including inverts poured, rings grouted, new castings placed and pipe within the structure neatly cut with no ragged edges unless otherwise specified. Payment shall include rings, inverts and new castings. Extra depth manholes will not be paid unless specifically stated in the Special Provisions.

3. End Sections & Rip Rap

The unit price bid for flared end sections of each size shall include the cost of furnishing and installing the required amount of filter material, rip rap, tie rods(minimum 3 joints), trash guard (if required) and the end section as specified, unless otherwise included as pay items.

Where rip rap only is installed, the rip rap and filter material will be paid for at the contract unit prices bid per ton furnished and placed as specified.

4. Granular Foundation Material

Material used for refilling to pipe foundation grade to assure firm foundation for pipe shall be paid for at the Contract unit price per measured cubic yard volume in place. Payment shall be made only for the width of trench and shall not exceed the quantity of material used within the maximum allowable width of trench multiplied by the depth below the bottom of pipe. Payment shall include cost of excavation and placement.

The Engineer must approve the use of any foundation material that is to be included as a pay item.

5. Payment for Density Tests

The City of Bloomington will pay for the first group of density tests. In the event that an area fails to meet the specified density, the Contractor shall be required to correct the area in question. Additional density tests to check the corrective work shall be at the Contractor's expense.

6. Payment for External Manhole Chimney Seal

All costs for furnishing and installing the seal and where necessary, an extension or extensions along with the manhole adjustment, shall be included in the unit bid price for "External Manhole Chimney Seal".

34. WATER SYSTEM (MnDOT 2504/CEAM 2611)

A. Materials (2611.2)

1. Ductile Iron Pipe and Fittings (2611.2A1)

The minimum design thickness of ductile iron pipe shall be as follows:

Pipe Size	Depth of Cover Over Pipe					
	0' to 8.5'		8.5' to 12'		12' to 16'	
	Thickness	Pipe Class	Thickness	Pipe Class	Thickness	Pipe Class
4"	.41"	CL 56	.41"	CL 56	.41"	CL 56
6"	.40"	CL 55	.40"	CL 55	.40"	CL 55
8"	.39"	CL 54	.39"	CL 54	.39"	CL 54
12"	.40"	CL 53	.40"	CL 53	.40"	CL 53
16"	.42"	CL 52	.43"	CL 53	.46"	CL 54
20"	.45"	CL 53	.48"	CL 54	.51"	CL 55
24"	.47"	CL 53	.53"	CL 55	.56"	CL 56
30"	.55"	CL 54	.63"	CL 56	.63"	CL 56

Pipe Size	Depth of Cover Over Pipe					
	0' to 8.5'		8.5' to 12'		12' to 16'	
	Thickness	Pipe Class	Thickness	Pipe Class	Thickness	Pipe Class
36"	.63"	CL 54	.73"	CL 56	.73"	CL 56
42"	.71"	CL 54	.83"	CL 56	.83"	CL 56

All mechanical joint bolts and nuts shall be made of stainless steel.

Either standard body fittings (AWWA C110/A21.10) or short body fittings (AWWA C153/A21.53) are approved.

Fittings shall be cement mortar lined in accordance with AWWA C104/A21.4 or epoxy coated in accordance with AWWA C116/A21.16. The connections shall be mechanical joint in accordance with AWWA C111/A21.11. The glands shall also be ductile iron. Ductile iron shall be in accordance with ASTM A536 with minimum physical qualities of 70,000 psi tensile strength, 50,000 psi yield strength and 5% elongation.

All pipe joints shall be approved slip type or mechanical joint with rubber gasket. Gaskets shall be molded rubber rings designed specifically for the joint used. Slip-type restrained joint fittings are approved in addition to mechanical joint connections.

Electrical conductivity must be provided across each joint by means of metal cables or copper straps fastened across the pipe joint or an approved conductive gasket with copper inserts. The connection must be capable of withstanding 600 amperes of current and must be approved by the Engineer.

When so directed by the Engineer, the Contractor shall provide a certification showing the materials provided are manufactured to these specifications.

2. Pre-Stressed Concrete Cylinder Pipe And Fittings (2611.2A2)

The pre-stressed concrete cylinder pipe shall conform to the requirements of AWWA C-301.

All fittings shall be provided with the type of joint necessary to facilitate the connection of other types of materials now or in the future. The branches of pipe 12" in diameter and smaller shall be ductile iron mechanical joint hub ends.

If concrete cylinder pipe is to be used for jacking under highways, the outside surface shall be smooth, with no enlargement for the bell.

Electrical conductivity will not be required in pre-stressed concrete cylinder pipe unless specifically required on the Plans or in the Special Provisions.

If there are services on a pre-stressed concrete cylinder pipe main, conductivity will be required. Electrical conductivity must then be provided through the watermain and services by means of metal cable or copper straps, capable of withstanding 600 amperes of current, fastened across the joint. The Engineer must approve any such connection.

3. Fire Hydrants (2611.2B)

Hydrant bury length, measured from the bottom of the branch pipe connection to the finished ground line at the hydrant, shall be 8'-6". In the event existing underground utilities necessitate the use of a shorter hydrant, the Contractor shall furnish and install this for no extra compensation. When required by the Engineer, the Contractor shall furnish and install hydrant extensions at the unit price bid per linear foot of hydrant extension. The quantity of hydrant extensions may vary from that estimated and this item is excluded from Article 8, General Specifications, "Estimate of Quantities."

In areas where the hydrant base is installed below ground water, the drain holes shall be plugged and the hydrant marked with a metal tag to indicate the requirement to pump the hydrant after use.

The valve shall be faced with specially processed valve rubber and shall have a tapered seat for positive closure. This entire mechanism shall be removable for repairs or replacement through the barrel without excavating.

Outlet nipples shall be made of bronze, securely fastened into the nozzle section. Hose and steamer caps shall be provided with rubber gaskets, and shall be supplied without chains.

The hydrants shall be equipped with two 2 1/2 inch hose connections and one 4 1/2 inch steamer connection, all with national standard threads. The caps shall be standard nozzle caps without rocker lugs. The hydrant shall open in a counter-clockwise direction with a one and one-half inch (1.5") pentagon operating nut.

All bolts and nuts that are underground on each furnished hydrant shall be stainless steel. This shall include the bolts for the joint between the hydrant shoe and the hydrant lead.

"O"-ring seals shall be provided to prevent water from reaching the operating mechanism. Operating mechanism shall be lubricated through an opening in the operating nut or bonnet. All moving parts are to be bronze or bronze bushed.

All parts of hydrants furnished shall be interchangeable with all other hydrants of the same size, model, and make without special fittings.

Hydrants shall be painted with bright orange enamel in the factory and shall be repainted in the field if the coating has been damaged. Waterous hydrants shall be Pacer WB67-250 with standard nozzle caps. Mueller hydrants shall be the Super Centurion 200 Model A-423.

When required in the Plans and Proposal, the Contractor shall furnish a close coupled traffic model hydrant. In addition to the preceding requirements, this hydrant shall be close coupled with a 6" flanged gate valve with box and connected to a special mechanical joint tee with a flanged branch. The hydrant shall have a breakaway feature for the barrel and rod. The hydrant shall be protected by four treated cedar posts not less than 8" in diameter and at least 6 feet in length. The top 18" of the posts shall be marked with reflectorized bands 3" wide at 6" center-to-center spacing.

4. Valves and Valve Boxes (2611.2C1 and 2611.2C2)

All bolts and nuts on each furnished valve shall be stainless steel.

a) Gate Valves and Boxes

Valve boxes shall be cast iron of the three piece type suitable for a depth of 8'-0" to the top of the pipe. The internal diameter for the shaft shall be 5 1/4 inches; bases shall be oval with a minimum internal width of 20 1/2 inches; and length adjustments shall be screw type. Valve boxes shall be Tyler Series 6850-60 (utilizing a Large Valve Box Bell) # 160 (with cover bearing the word "Water" on top), or approved equal. Valves and boxes shall be considered integral units. Valve boxes shall have at least 6" adjustment above and below specified depth of pipe.

When required by the Engineer, the Contractor shall furnish and install valve box extensions at the unit price bid per linear foot of valve box extension. The minimum valve box extension shall be one foot. The valve box depth shall not exceed 10'-0" unless approved by the Engineer.

Gate valves, including all accessories, manholes or vaults, and frames and covers shall be considered as an integral unit, and the bid price shall include all these items unless stated otherwise in the Special Provisions.

b) Resilient Seat Valves

All gate valves up to and including 12" in diameter shall be resilient seat valves.

Resilient seat valves will be required on all service stubs 4 inches and larger in diameter, as called for on the Plans, in the Special Provisions, or as directed by the Engineer.

Stem sealing shall be provided by two O-ring seals. The valve interior shall be epoxy-coated.

The resilient seat valves shall be manufactured to meet all applicable requirements of AWWA C500 and all requirements of AWWA C509.

The resilient seat valves shall be Waterous, American, Clow, or Mueller (or approved equal).

c) Butterfly Valves (2611.2C3)

Butterfly valves shall be used for all 16" and larger valves unless specified in the Special Provisions of the Project.

Butterfly valves shall be manufactured in conformance with all applicable requirements of AWWA C-504 for 150 p.s.i. working pressure minimum, together with such supplementary requirements as may be covered in the Plans, Specification, and Special Provisions or the provisions hereof. Unless otherwise specified, the butterfly valves furnished shall comply with the following supplementary requirements.

The butterfly valves shall be short body of ductile iron with mechanical joint ends. The butterfly valves shall be rubber seated with ductile, non-rising stems type furnished with O-ring stem seals. The butterfly valves shall be equipped with a two-inch square operating nut opening counterclockwise. The butterfly valves shall be designed for direct burial installation. All butterfly valves shall have an open indication arrow, the manufacturer's name, pressure rating and year of manufacture on the valve bodies.

5. Water Service Pipe and Fittings (2611.2D)

a) Water Service Pipe

Water service pipe shall conform to the requirements of ASTM B 88 for Seamless Copper Water Tube, Type K, Soft Annealed temper. All copper pipe fittings shall be flared type. Service sizes allowed include 1", 1-1/2", and 2".

Services larger than 2" shall conform to the requirements for Ductile Iron Pipe as listed previously in part 2A.

b) Corporation Stops

Corporation stops shall utilize ball style valves, with a flare-type joint for the service pipe and a standard corporation stop thread on the threaded on inlet end. The smallest service allowed shall be 1". For 1" services, corporation stops shall be Mueller Company B-25000; Ford FB600; A. Y. McDonald 4701B; or approved equal.

For 1 1/2" and 2" services, corporation stops shall be, Mueller Company B25000, Ford FB600, A. Y. McDonald 4701B or approved equal.

c) Curb Stop Valves Boxes and Lids

Curb stops shall utilize ball style valves, with flared copper inlets and outlets, and they shall not include drains (or stop and waste valves). Curb stop valves shall be Mueller Company B-25154; Ford B22-333M, B22- 444M, B22-666M, B22-777M; A. Y. McDonald 6104; or approved equal. Curb stops shall include reducing nuts or adapters to transition down to a lesser size pipe on one end.

Curb stop boxes shall be western pattern and shall include a bottom section with a bolted cast iron foot piece, brass centering ring, and top section, with two-inch stack adjustable up or down 6" from 8'-0" of cover. Depending upon the curb stop size, curb stop boxes shall be A. Y. McDonald 5628B, or 5631B or approved equal.

Curb box lids shall include a lock type cover with an offset pentagon bolt. Curb box lids shall be A. Y. McDonald 5627L, or approved equal.

d) Tapping Sleeves

Tapping sleeves shall be **all** stainless steel, including the flanged outlet for connection to the tapping valve and stainless steel bolts. The tapping sleeves shall be "FAST Tapping Sleeves" as manufactured by Ford, or Smith Blair stainless steel tapping sleeve, Power

Seal stainless steel tapping sleeve Model # 3490 or approved equal. No test plug will be allowed.

6. Polyethylene Encasement (2611.2E)

All metal pipe shall be covered with a polyethylene tube with a minimum thickness of 8 mils. The polyethylene may be of natural color or black. All polyethylene encasement shall be securely taped at each overlap. All requirements of AWWA C-105/A21.5 shall be in effect for this work.

Gate valves shall be encased to the operating nut and taped at the operating stem, with hydrants being wrapped to the ground surface and taped at the ground surface. The Contractor shall cut an "X" above each weep hole of the hydrant prior to the construction of the drainage pit and backfill, unless otherwise specified by the Engineer.

B. Construction Requirements (2611.3)

1. Pipe Laying Operation (2611.3A2)

Watermains shall be installed with a minimum of 8'-0" and a maximum of 10'-0" of cover over the top of the pipe. Any watermains to be installed with less than 8'-0" must be reviewed and approved by the Engineer. In some cases this will require that the pipe be insulated with 6" of extruded polystyrene per Mn/DOT Spec 3760 as directed by the Engineer.

Watermains shall be laid at least 10 feet horizontally from any existing or proposed sanitary or storm sewer, septic system, or subsoil treatment system. The distance shall be measured edge to edge.

There shall be at least 18" of vertical separation between watermains and any storm or sanitary sewer line crossings. If conditions prevent the 18" of vertical separation the following would apply:

The sewer shall be constructed of materials equal to watermain standards at least 9 feet on either side of the watermain.

Where there is less than 18" of vertical separation between a storm sewer line and a watermain crossing, the pipe shall be insulated with 6" of extruded polystyrene per Mn/DOT Spec 3760 as directed by the Engineer.

Watermains that cross under sanitary or storm sewer lines will require the following:

- The sewer shall be constructed of materials equal to watermain standards at least 9 feet on either side of the watermain.
- There shall be at least 18" of vertical separation between the bottom of the sewer line and the top of the watermain.
- Adequate structural support (saddles) at the crossing shall be provided as directed by the Engineer.

- The length of the water pipe shall be centered on the crossing so that the joints are equidistant and as far as possible from the sewer.

Fine grading, to the bottom of the barrel, shall proceed ahead of the pipe laying; and should any over-excavation exceeding 2" be encountered, the material added shall be moistened and compacted to the satisfaction of the Engineer, or foundation material shall be added at the expense of the Contractor.

All ductile iron pipe used in this Project shall be securely taped and poly-wrapped encased in 8-mil polyethylene tube in accordance with AWWA C-105. This shall include wrapping the hydrant barrels to the ground surface and to the valves operating nut.

2. Restraining of Pipe (2611.3A4)

Metal rods, harnesses, or retainer glands shall be used only with the written approval of the Engineer. When used, they shall be treated to prevent corrosion. No timber blocking will be allowed.

For temporary restraints, some valves, tees, crosses, or other watermain appurtenances must be restrained with a Mega-Lug (or approved equal) or Fast Grip or Field Lock gaskets through the required restrained length. This is needed so some sections can be shut down and the adjacent watermain can stay active.

All new tees and bends for watermain 12" in diameter and greater shall be restrained through the required length with Mega-Lugs (or approved equal) or Fast-Grip or Field Lock gaskets. Concrete thrust blocks at tees, bends, and hydrants are required only on watermain less than 12" in diameter.

No watermain shall be rodded under any circumstance unless needed for a temporary restraint. Other approved means of restraint shall be provided for permanent restraint.

Concrete thrust blocks (for watermain less than 12" diameter), Mega-Lugs (or approved equal), Fast Grip and Field Lock gaskets, or other Engineer approved means of watermain restraint shall be incidental whether it's required for temporary construction or permanent.

Testing of lines shall not proceed until concrete thrust blocks have had sufficient time to attain design strength. High early strength concrete may be used. The minimum compressive strength shall be 4000 pounds per square inch.

Restrained joints shall meet the minimum length of the two tables below. The Engineer may field change the required length of restrained joints depending on actual conditions.

Recommended Retrained Length for each side of Bend or Plug (Feet)					
Pipe Size	Plug	90° Bend	45° Bend	22.5° Bend	11.25° Bend
6"	60	30	12	6	3
8"	79	39	16	8	4
10"	97	47	20	9	5

Recommended Retained Length for each side of Bend or Plug (Feet)					
Pipe Size	Plug	90° Bend	45° Bend	22.5° Bend	11.25° Bend
12"	115	56	23	11	6
16"	150	73	30	15	7
20"	185	89	37	18	9
24"	220	106	44	21	10

(Number is Poly Encased Length)

Recommended Retained Length for each side Tee (Feet)								
		Pipe Branch						
	Pipe Size	6"	8"	10"	12"	16"	20"	24"
Pipe Run	6"	22	-	-	-	-	-	-
	8"	9	30	-	-	-	-	-
	10"	0	31	57	-	-	-	-
	12"	0	21	50	75	-	-	-
	16"	0	2	34	62	110	-	-
	20"	0	0	17	48	100	145	-
	24"	0	0	1	34	89	137	180

* Based on a running length of 30', which is defined as the total length between first joints on either side of tee on the run.

3. Water Service Installation (2611.3C)

Residential water services shall be located at least 4 feet, measured horizontally, away from the sanitary sewer services, 10 feet from all other sewer services, and in a convenient location for the benefited property.

Copper service line shall be installed at least as deep as the main throughout its entire length with a minimum cover of 8'-0". The water services shall be one unit between corporation stop and the curb stop. Copper-to-copper connections will not be allowed in the services. Only one three-piece union will be allowed per water service. No compression couplings are permitted.

The Contractor shall install a one-foot length of copper service line on the outlet side of the curb stop as part of the service installation. The stub shall be pinched or peened closed to prevent particle intrusion at the time of sizzling the service. Payment shall be per foot of copper service line at the unit price bid.

All commercial services shall have a minimum separation of 10' from sanitary sewer services.

Typical water service line and fittings shall be 1" (inside diameter) except as otherwise noted on the Plans.

4. Connection To Existing Facilities

Forty-eight hours prior to connecting to existing watermains, the Project Inspector and the Utilities Division must be notified. Any residents who will be affected by the shutting off of water shall be given 48 hours, written advance notice by the Contractor as to when and for how long service will be interrupted, the maximum service interruption shall be eight (8) hours unless otherwise approved by the Engineer.

Prior to connecting to existing watermains, the Contractor shall have all labor, materials, and equipment ready to do the work, so as to keep the shut-off time to a minimum. As soon as possible after making the connections, the Contractor shall flush the new main to prevent any contamination of the existing facilities. New fittings or pipe shall be scrubbed with a chlorine solution of not less than 50 ppm prior to connection to existing facilities. All existing valves shall be operated by the Contractor under the supervision and approval of the Engineer.

The Contractor shall take every precaution necessary to prevent dirt or debris from entering the main.

Watermain connections shall be made under pressure where shown on the Plans.

When new copper water services or ductile watermains need to be tapped into an existing, in service, watermain, the Contractor shall expose the watermains sufficiently to facilitate the tap.

Connection to the existing facility shall be considered incidental unless a specific pay item is included.

For all projects the taps will be made by the City. The Contractor shall furnish and install the necessary materials including:

- Tapping sleeves with flanged outlet to tapping valve, valves, and valve boxes.
- Or, tapping sleeves, corp stops, curb stops, stop boxes, and copper service pipe.

Tapping sleeves shall be paid at the unit price bid per sleeve of the appropriate size. Tapping valves shall be paid as "Gate Valves and Boxes" of the appropriate size. Tapping saddles, corporation stops, curb stops, and copper service pipe and shall be paid for at the unit price bid.

For private development projects, the Contractor pays a tapping charge, which is normally collected along with the permit fees. The tapping charge is dependent upon the size of the tap and includes payment for: labor and equipment, the tapping sleeve or service saddle, the valve or corporation stop and curb stop, and the stop box or valve box.

5. Setting Hydrants (2611.3D)

New hydrants installed on the Project shall be checked by the Contractor, with the City Inspector in attendance, to be sure weep holes are open or plugged, depending on the water table elevation, and to determine that moving parts have been properly greased.

Hydrants and auxiliary valves shall be supported upon a precast concrete base 18" square and a minimum of 5" thick. Each hydrant is to be securely braced against the far end of the trench by concrete blocking, poured in place. No timber blocking will be allowed. Concrete thrust blocks shall be used on all hydrants, whether or not rodding is involved.

A drainage pit of at least one cubic yard shall be excavated below and around the hydrant base. The drainage pit shall be filled with compacted coarse rock or crushed stone (e.g. 1½"-river rock) to a level six inches above the drain outlet. (Crushed limestone shall not be used for the construction of the drainage pit.) Two layers of tar paper, 8 mil poly, or other material approved by the Engineer, shall be placed over the top of the rock to prevent backfill material from entering the voids in the drainage pit. Hydrants located in areas where groundwater is higher than the drain outlet shall have the outlet drain hole plugged, and shall be equipped with a metal tag stating, "Pump After Use".

Hydrants must maintain their position and must not be displaced out of plumb during backfilling. Any hydrant out of plumb shall be excavated, reset, rebraced, and rebackfilled. The breakaway of the hydrant must be exposed above grade.

Tops of guard posts for close-coupled traffic model hydrants should be 6" below the operating nut of the hydrant.

C. Testing

The Contractor shall test the valved sections of the watermain for pressure, conductivity, and bacteria as specified in the CEAM Standard Utility Specifications. Connections made to the existing water system beyond the new valves shall be visually inspected by the Engineer and the Contractor's representative to determine that no leaks exist.

1. Disinfection (2611.3E)

a) General

The Contractor shall disinfect and test all mains at no additional compensation as part of this Project. The Contractor shall use stick-on type chlorine tablets. Granulated chlorine will not be allowed. The Contractor shall follow AWWA requirements for determining chlorine concentration for disinfection.

b) Flushing Main

The entire line shall be flushed after the chlorine contact period specified in AWWA C651, Section 4.5, and such flushing continued until the water is free from excess chlorine. The entire line, including hydrant leads, branch lines, and dead end mains shall be flushed.

All flushing shall be done by the Contractor prior to any testing. The Contractor is responsible for any damage done due to the flushing.

Prior to flushing, the Contractor shall notify the Project Inspector.

c) Sampling and Bacteriological Test

Water from all new mains must successfully pass a bacteriological test in accordance with the requirements of AWWA C651, City of Bloomington, and Minnesota Department of Health Standards, prior to the main being placed in service.

After flushing, the watermain shall rest for 24 hours before sampling. The City will take all necessary samples of the water and provide any equipment necessary to take these samples at no cost to the Contractor. The City of Bloomington laboratory will use the Membrane Filtration Test (No. SM9222B) as a minimum test for the presence of coliform bacteria and atypical bacteria. Passing will be considered as a clean plate (i.e., no bacteria growth). The City may also test using a Heterotrophic Plate Count (HPC) at the Engineer's option. Sample results will not be available until 24 hours after sampling. The City will be responsible for the bacteriologic testing as long as tests can be taken on Mondays through Thursdays. The City will not take or read tests on weekends unless staff is available. If City staff is available on weekends, the contractor will be charged for staff overtime and overhead.

d) Rechlorination

When unsatisfactory results are obtained from bacteriological tests, the Engineer may direct the Contractor to rechlorinate the main. When rechlorination is deemed necessary, it shall be done by the Contractor, at no additional compensation, in accordance with the provisions of AWWA C651. Flushing and testing must then be redone.

2. Electrical Conductivity Testing (2611.3F, 2611.3G)

Conductivity testing shall be done before existing copper services are connected to the new watermain system.

3. Pressure And Leakage Testing (2611.3G)

The Contractor will be required to test the watermain after all parts of the new water system have been installed and bacteriological tested, including services and curb stops, but before the services are connected to water customers. Each service must be flushed before its connection to the service line and after it has passed testing.

The pressure test and leakage test may be combined in a two-hour test period. Pressure tests may not be started after 2:00 pm without approval of the Engineer.

D. Pipeline Backfilling Operations

Backfill of all utilities shall be compacted to a minimum standard proctor density of 100% in the upper 3 feet. 95% of standard proctor density will be required below the 3 foot level. Density tests will be required. The standard proctor density test shall conform to the requirements of ASTM D- 698-70 Method C. The City of Bloomington will take density tests as the Engineer deems necessary.

E. Restoration Of Surface Improvement

Work on the Project shall be confined to the specified construction limits established by the Engineer. In all instances, restoration of any disturbed area outside the construction limits shall be at the expense of the Contractor.

That portion of the existing roadway and curb and gutter that is disturbed by this Contract shall be replaced in accordance with the specifications contained elsewhere in this document. The materials shall be placed on thoroughly compacted subgrade. The existing mat shall be cut back two feet beyond the edge of the trench.

The patching material for each location shall be as shown on the Plans or as stated in the Special Provisions.

F. Replacing Existing Watermain

The Contractor shall remove and dispose of existing watermain as shown on the plan. Removal of the appurtenant items, including but not limited to, gate valves, gate valve boxes, and copper service pipe shall be incidental.

All corporation stops shall be tapped under static water pressure.

Safe conditions must be maintained throughout the construction process. The removal and replacement of watermain that is close to existing utilities or curb and gutter may require sheeting, shoring or bracing. The costs of sheeting, shoring and bracing shall be incidental to the price bid for pipe removal and installation. The cost of repairing damaged concrete curb and gutter, driveways, sod, or other items not previously marked for removal by the Engineer, due to the construction of the water system, shall be incidental to the water system. No direct payment shall be made therefore.

The contractor has two (2) options when replacing existing watermain. A temporary water main may be constructed to serve residents while the existing main is replaced, or the contractor can lay the new watermain adjacent to the existing main and then remove the existing main later in the Project. In either case, a plan must be submitted to be approved by the Engineer.

G. Temporary Water Service During Construction

The Contractor shall submit a plan to the Engineer, for approval, showing how temporary water service will be provided to all residences during construction. House to house connections will not be allowed.

It is the responsibility of the contractor to feed all affected City water customers with water during construction. The contractor is advised that some properties are equipped with backflow preventors on the outside spigot. Some backflow preventors can be easily removed, others are much more difficult. In either case, the contractor is responsible to replace any backflow preventors that are removed during construction. Other homes may have unique indoor plumbing configurations that affect how a temporary water service, fed through the spigot, would operate. The Contractor is responsible for damage to property caused by feeding a property with a temporary water service system. In order to reduce the chance of damage, the contractor shall examine the indoor plumbing of an affected property. Instead of removing backflow preventors, dealing with individual pressure reducing valves, or taking the risk of damage to property by serving the home through the outside spigot the contractor shall hook

up the temporary water service to the service pipe on the residence side of the existing curb stop. However the contractor elects to supply water to the City's customers, the work shall be incidental, any damage is the contractor's responsibility, and the contractor is responsible to replace or repair any modifications made to backflow preventors or other plumbing appurtenances.

Any plan for temporary service must include the following requirements:

- Water must be served from two hydrants, one on each end of the temporary service and outside of the valved section to be constructed.
- Minimum two-inch temporary mains must be provided. Pipe must be laid in or adjacent to the existing curb and gutter. Each service shall have its own valve. Valves on the temporary service must be placed within existing public right-of-way for each service. Temporary mainline valves must be installed at a minimum of every 600 feet and the Engineer may change this spacing at their discretion. Service lines may be connected to existing services with a double female connector. (Caution: be sure that the existing service is connected to the Bloomington potable water system and not a private well.)
- Before the temporary water service is used, the line must be flushed and tested to be sure it is potable. This will include testing of the hydrants used to supply the temporary main.
- Temporary service pipe shall be put in service in this sequence:
 1. Flush air out of the temporary service lines,
 2. Shut down the existing curb stop at the street,
 3. Connect the temporary water service line to the existing copper pipe at the residence side of the curb stop." These changes will increase the number of times that it will be necessary for the contractor to excavate at the existing curb stop. This work shall be considered incidental to the other items of the work.
 4. Turn on the temporary water service line and allow time for the Contractor and the Engineer to observe and operate the lines to determine that the service is operating properly.
- Temporary service must be completed before the existing watermain is shut down and before excavation begins.
- Schedule work so that temporary water service is not subjected to freezing conditions.

The cost of providing and maintaining temporary service during construction shall be incidental to replacing the existing watermain, no direct compensation is provided therefore.

Please Note: In some areas of Bloomington stray electrical currents have been experienced during disconnection and connection of water services. The source of these currents has not been identified, but the grounding of electrical services to City water services within the houses served is strongly suspected. The Contractor shall be aware of this potential hazard and shall have available grounding straps and rods to temporarily redirect this current to an acceptable ground on the job site. This work is incidental to the other bid items on the Project.

H. Laying New Watermain Adjacent To Existing

The Contractor may, with the Engineer's approval, submit a plan to lay the new ductile iron watermain, lateral connections at intersections and hydrant leads adjacent to and below the existing cast iron watermain and copper services.

This plan must show how residences will remain in service and how testing and reconnection of services as described in this article can be accomplished.

The new watermain must be placed so that new lateral connections and hydrant leads can be installed and tested along with the mainline and newly tapped corporation stops, copper service pipe, and curb stops. Provision must be made for the removal of the existing watermain and appurtenances without damage to the newly installed ductile iron watermain and appurtenances. The new watermain shall be installed at least 10 feet away from any existing or proposed sanitary or storm sewer mains (edge of pipe to edge of pipe).

The cost of a parallel installation of watermain as described above and any repair of existing watermain or appurtenances during the construction to maintain service to adjacent residences shall be incidental to replacing the existing watermain, no direct compensation is provided therefore.

I. Methods Of Measurement And Payment (2611.4, 2611.5)

1. Close-Coupled Traffic Model Hydrants

The price of close coupled traffic model hydrants shall include furnishing and installing the hydrant, gate valve, tee, blocking, and posts.

2. Watermain Fittings

The standard weights listed in AWWA C153/A21.53 will be used to calculate pay weights for all fittings, regardless of whether short body fittings (AWWA C153/A21.53) or standard body (AWWA C110/A21.10) fittings are actually used. If there is not a standard weight listed in the AWWA C153/A21.53 specification, the delivered weight of the fitting will be used to calculate the pay weight

Fittings for prestressed concrete cylinder pipe shall be as designated in the Special Provisions of the Project.

3. Foundation Material (Coarse Filter Aggregate)

“Foundation Material” shall meet MnDOT Specifications 3149.2H with the exception that the materials shall have 100 percent by weight passing the 1-1/2 inch versus 100 percent passing the 1” sieve. “Coarse Filter Aggregate” and “Foundation Material” shall hereby be used interchangeably and shall conform to these specifications.

Materials used for refilling to pipe foundation grade to assure firm foundation for pipe shall be paid for at the Contract unit price per measured cubic yard volume in place. Payment shall be made only for the width of trench and shall not exceed the quantity of material used within the maximum allowable width of trench multiplied by the depth below the bottom of the pipe. Payment shall include the cost of excavation and placement. The Engineer must approve the use of foundation material that is to be included as a pay item.

4. Base Material and Surfacing

The measurement and payment for base material and plant mixed bituminous surfacing,

shall conform to the requirements of the City of Bloomington Standard Specifications for Construction

5. Payment for Density Tests

The City of Bloomington will pay for the first group of density tests. In the event that the area fails to meet the specified density, the Contractor shall be required to correct the area in question. Additional density tests to check the corrective work shall be at the Contractor's expense.

6. Curb stops and Gate Valves

Payment, per each, shall include the box, adjusted to finished grade.

7. Remove existing watermain

Removing existing watermain will be paid for at the contract unit price per linear foot for "Remove Watermain" which shall be compensation in full for all labor and equipment necessary to remove and dispose of the watermain. Removal of the appurtenant items, including but not limited to, gate valves, gate valve boxes, and copper service pipe shall be incidental.

J. Miscellaneous Watermain Specifications (CEAM 2611)

Staging and construction of the new watermain will require temporary shutdowns of existing sections of watermain. The Contractor shall notify the City and affected residents, in writing, 48 hours in advance of any water shutdown. No shutdown shall be longer than 8 hours.

The Contractor shall protect existing sanitary sewer mainlines and services during this work. Any damage done by the Contractor's operations to existing facilities shall be repaired to Bloomington's standards at the Contractor's expense.

35. REVISE IRRIGATION SYSTEM (2504.602)

Before construction work begins, the Contractor shall locate the elements of the system and plug only those sections in the construction area. During construction, the remaining portion of the system (outside the limits of construction) shall continue to operate. After construction is complete and before turf is replaced, the system shall be restored and revised, as necessary, with the same brand and quality of heads and valves as existed before work began, to water all turf that is existing after the construction, the turfed area may be narrower or wider than it was before construction began. The disturbed area for each irrigation system is assumed to be approximately 2000 ft². The Contractor shall schedule this work to be done to avoid freezing weather conditions. Otherwise, it shall be the responsibility of the contractor to winterize the system, and complete the work in the spring. The City has located many of the existing irrigation systems, and noted known systems on the plans. It is likely that more will be encountered during the Project. In the quantities, the City has estimated the number of irrigation systems that will be revised.

The Contractor shall furnish all the necessary equipment and install a complete and operating irrigation system at each location that matches the manufacturer and quality of the existing system. The Contractor shall have a qualified person/company design and replace the system to water all

landscaped areas. Upon completion of each system, the Contractor shall provide as-built drawings for each system to the Engineer.

Payment shall be made at the unit price bid per each for item “(2504.602) Revise Irrigation System” that shall be payment in full for all costs of design, labor, equipment, and materials necessary to provide systems complete, in place, and operational. Only one payment shall be made for each continuous watering system per residence or business.

Partial payment will be made at a percentage of the amount bid in accordance with the following:

When existing irrigation system has been capped and remains operational outside of construction limits.	20%
When irrigation system has been fully restored, and is operational.	60%
When as-built plans have been completed and delivered to the Engineer, and the system has been accepted as final.	20%

36. WATERMAIN INSULATION (2504)

At locations where storm sewer crosses watermain or watermain services with a vertical separation of 18” or less or locations approved by the Engineer, insulation shall be installed between the sewer and water pipe. Unless noted on the plan, the insulation shall consist of slabs of 6” rigid expanded polystyrene insulation per MnDOT Specification 3760 laid parallel with and adjacent to the watermain, and extend in both directions a minimum of three (3) feet beyond the storm sewer and watermain.

In addition to use as watermain insulation, this insulation material may be used under gravel and bituminous pavement structure to separate the pavement from frost reactant soils.

The cost of insulating water pipe as specified shall be paid at the contract unit price bid per square yard which shall be compensation in full for all costs necessary to furnish and install insulation including, but not limited to, materials, excavation, labor, backfill and compaction.

37. ADJUSTMENT OF EXISTING STRUCTURES (2506)

A. Materials

Mortar shall consist of one part Portland cement, three parts clean mortar sand and sufficient water for proper consistency.

Sewer brick and adjusting rings shall conform to the requirements of Mn/DOT Specification 3616, 3621 and 3622.

Pre-cast adjusting rings shall conform to the size and shape of the frame base.

Any concrete used for structure adjustment shall have a 28-day compressive strength of at least 4000 pounds per square inch.

B. Construction Requirements

Existing manholes and catch basins shall be adjusted to meet the grades as established on the Plans by either removing or adding manhole sections or concrete adjusting rings. Castings shall be set on a full bed of mortar. Any adjustment of casting or adjusting rings on sanitary manholes shall require installation of chimney seal.

All manhole inverts shall be protected from nicks or other damage that may inhibit flow and cause backups. If damage does occur to the invert the Contractor will be responsible for pouring a new invert. The Engineer may require that Contractor install a mechanism to protect the invert such as a catchment umbrella, temporary PVC invert or other approved device in sensitive flow areas to ensure that damage to the invert does not occur while maintaining flow through the sewer. Protection and any necessary repairs to the invert will be incidental to the adjustment of the existing structure unit price.

Sewer brick or adjusting rings shall be set on a full bed of mortar as shown on the Standard Detail Sheet. No wood blocking shall be used for any purpose in adjusting manhole or catch basin castings.

Unless otherwise approved by the Engineer, when adjusting manholes, all material removed shall be replaced with base material, placed and compacted in two-inch lifts up to the bottom of the surfacing. Bituminous base shall be replaced with bituminous base. Backfilling with surfacing material shall be included in the price bid for adjustment of existing structures.

When the frame or ring casting cannot be adjusted as indicated above or the casting requires more than 12" (total) of adjusting rings, the entire top section of the manhole shall be removed and the manhole reconstructed to the plan elevation prior to constructing the base course. When it is necessary to remove part of the precast concrete catch basin section below the existing adjusting rings or frame to adjust the frame and ring casting to the proper grade, the catch basin shall be considered reconstructed. The backfill material shall be granular and thoroughly compacted in 2" layers.

After completion of the adjustment, any mortar, earth, or other debris in the manhole or catch basin must be removed immediately and the sewer invert left in a clean condition.

The Contractor shall be fully liable for any damages incurred by the public as a result of sewer stoppages due to construction operations. Upon notification of a sewer stoppage caused by the Contractor's operation, the Contractor shall be required to remove obstructions and effect repairs when notified by the City. Should the Contractor fail to respond immediately to such notification, the City will take action as necessary to restore service. The Contractor shall be charged for work performed by the City on an overtime basis.

Valve boxes shall be adjusted to the grades as shown on the Plans by turning or by replacing the riser section with a different length riser section. No inserts shall be approved.

All structures within the roadway shall be adjusted to final grade prior to constructing the bituminous wearing course. Final grade for a structure shall be 1/4" (0.03') below, and parallel to, the wearing surface. When a base course is excavated in order that a structure may be raised, the horizontal limits of said excavation shall be straight and shall not extend more than

two feet beyond the edge of the structure. The Contractor shall make location ties for all structures so they can be easily located and provide a copy to the Project Inspector.

Proper barricading and signing must be done during this operation to protect the public and to divert traffic. Signing and barricading shall be done at the Contractor's expense and with the approval of the Engineer.

1. Reconstruct Manhole (2506.503)

"Reconstruct Manhole" shall include the following:

- Removing the existing cover/lid and frame/ring casting. The old casting assembly shall become the property of the Contractor. However, if there is an oversized (32"-38") cover/lid it shall be salvaged as detailed under "REMOVAL OF MISCELLANEOUS STRUCTURES AND EXCESS MATERIALS" in Section 19.
- Removing, adjusting or adding barrel sections, top slab (27" opening), or top cone (27" opening) to fit the manhole's new height.
- Furnishing and installing a new casting assembly and adjusting rings to establish the casting to finished grade.
- Furnishing and installing concrete mortar at the invert if it needs repair. Repair of the invert will be incidental and not included in the contract per linear foot cost.

The thickness of pavement patching of the area around the excavation shall be as shown on the specific typical section for each street. The pavement must be cut and removed 2' beyond the casting to ensure proper compaction of the subgrade and pavement structure. The Contractor shall note that the removals, sawing, aggregate base, bituminous patching, etc. around adjusted facilities is incidental to this item.

Payment shall be made at the contract price bid per each for the appropriate manhole diameter. This shall be compensation in full for all labor, equipment and materials (including the new frame and ring casting assembly, rings, and mortar) required to rebuild the manhole as approved by the Engineer.

2. Reconstruct Catch basin (2506.503)

"Reconstruct CB" shall include the following:

- Removing all existing adjusting rings. If a block structure exists, blocks may need to be removed (or sawed off) to be able to install the required 4"-12" of adjusting rings.
- Furnishing and installing a 6" to 1.5' precast adjusting section for a 2' X 3' rectangular catch basin.
- Furnishing and installing adjusting rings and mortar to set the casting at the specified grade.
- Furnishing and installing concrete mortar at the invert if it needs repair.
- Furnishing and installing a new casting assembly.

No concrete shall be installed in front of the catch basin other than mortar for grade rings. Repair of the invert will be incidental and not included in the contract cost per each.

The thickness of pavement patching of the area around the excavation shall be as shown on the specific typical section for each street. The pavement must be cut and removed 2' beyond the casting to ensure proper compaction of the subgrade and pavement structure. The Contractor

shall note that the removals, sawing, aggregate base, bituminous patching, etc. around adjusted facilities is incidental to this item.

Payment shall be made at the contract price bid per each for the appropriate catchbasin size. This shall be compensation in full for all labor, equipment and materials required to rebuild the catchbasin as approved by the Engineer.

3. Adjust Frame and Ring Casting (2506.522)

Slip-in metal adjusting rings shall not be allowed without approval of the Engineer

"Adjust Frame and Ring Casting" shall include removing and replacing all existing adjusting rings down to the precast or concrete block structure of the manhole or catch basin and reuse of the existing casting assembly. This work shall be done as described in MnDOT Specification 2506.

The Contractor shall be required to remove manhole castings and gate valve boxes ahead of the milling or reclaiming operations to allow uniform milling or reconstruction of the street to the required typical section. The Contractor shall not raise manhole casting or gate valve boxes until after the base course has been paved.

The Contractor is advised that the excavation made to adjust the castings on some previous projects were backfilled with concrete to approximately 1.5 inches below the existing wearing course surface. This concrete backfill may exist on some streets on this Project.

The thickness of pavement patching of the area around adjusted castings shall be as shown on the specific typical section for each street. The pavement must be sawcut and removed 2' beyond the casting to ensure proper compaction of the subgrade and pavement structure. The Contractor shall note that the removals, sawing, aggregate base, bituminous patching, etc. around adjusted facilities is incidental to this pay item.

4. Adapt Manhole (2506.602)

"Adapt Manhole" shall include the following:

- Removing the existing cover/lid and frame/ring casting. The frame/ring shall become the property of the Contractor. However, the oversized (32"-38") cover/lid shall be salvaged as detailed under "REMOVAL OF MISCELLANEOUS STRUCTURES AND EXCESS MATERIALS" in Section 19.
- Removing all existing adjusting rings down to the precast or concrete block structure of the manhole.
- Furnishing and installing the Manhole Access Reducer (see detail in plans), adjusting rings with mortar and new casting assembly as shown on the details in the plans. The casting shall be adjusted to the proper grade.

The thickness of pavement patching of the area around the excavation shall be as shown on the specific typical section for each street. The pavement must be sawcut and removed 2' beyond the casting to ensure proper compaction of the subgrade and pavement structure. The Contractor shall note that the removals, sawing, aggregate base, bituminous patching, etc. around adjusted facilities is incidental to this item.

C. Method of Payment

Payment for adjustment of existing structures will be made on the basis of the following schedule.

<u>Item</u>	<u>Unit</u>
Adjust Frame and Ring Casting	Each
Reconstruct Manholes	Each
Reconstruct Catch Basins	Each
Adjust Water Valve Boxes	Each
Adjust Water Curb Stop Boxes	Each
Relocate Catch Basins	Each
Chimney Seal	Each

The Contract unit price shall include all labor, materials (including backfill materials), and equipment necessary to perform the work.

38. CASTING ASSEMBLIES

“Remove Casting Assembly” shall include removing and replacing all existing adjusting rings down to the precast or concrete block structure of the manhole or catch basin. The existing casting shall become the property of the Contractor.

“Casting Assembly” shall include furnishing and installing the specified casting assembly to the proper grade including rings and mortar. This item shall include incidental items as detailed under “Adjust Frame and Ring Casting” (i.e., payment for “Casting Assembly” includes an “Adjust Frame and Ring Casting”) No separate or additional compensation will be provided for adjusting a new casting since it is considered incidental to “Casting Assembly.”

39. CURB AND GUTTER, SIDEWALK AND SIDEWALK RAMPS (2521; 2531)

A. General

The sidewalk may be curved and/or raised if necessary to save trees or other improvements as determined by the Engineer.

Sidewalk ramps as detailed in the Plans shall be constructed where indicated on the Plans or as directed by the Engineer. The curb and gutter shall be removed when required to construct the sidewalk ramp as detailed. Each ramp on the existing curb and gutter shall be completed as soon as possible after curb removal. The sidewalk ramps may be modified by the Engineer to match existing conditions or to avoid obstructions. No additional compensation will be provided for these modifications.

In areas where the existing material beneath the sidewalk is not considered suitable grading material, the Contractor shall provide a minimum of 3” of sand beneath the walk. This sand material is incidental to the unit price of the walk.

Existing concrete and bituminous driveways shall be sawed at the point where the new work will abut the existing drive.

String lines or forms shall not be left in place through driveways at night, or during weekends and holidays or when workers are not present.

Notice of placement of concrete must occur prior to 2:00 pm on the day prior to installation. The notice must include the plant to be used, the number of yards and the mix design. Placement will not be permitted without this notification. If concrete arrives on site from a different plant than the one provided in the notification it will be rejected and no payment made.

B. Material and Construction Requirements

Except when otherwise noted in the Special Provision a MN/DOT Certified plant shall provide all ready-mixed concrete including small loads. All materials and construction requirements shall conform to Mn/DOT Specification and the following paragraphs:

1. Structures

The curb and gutter shall be built to fit any drainage structures, which may be encountered. Normally final adjustment of structures shall be made at the time forms are set. The transitions from the regular curb and gutter sections shall be constructed as directed by the Engineer. The exposed surface shall be finished in the same manner as the regular curb and gutter sections. No excess concrete shall be left in front of any structures. Curb and gutter shall be poured with full forms on the front; no overpour will be allowed in front of curb and gutter or catchbasins.

2. Joints

Contraction joints shall be placed in the sidewalk at five-foot intervals and shall align with like joints in the adjoining or neighboring work. Contraction joints shall be approximately 1/8" in width and shall be cut to a depth of at least 1/3 the structure thickness, but not less than 3/4".

In six-inch concrete walk for driveways, contraction joints shall be placed so that no slab is larger than 100 square feet in area.

Expansion joints shall be placed in curb and gutter and in sidewalk at the beginning and end of all radii, and shall align with like joints in adjoining work. Expansion joints shall also be placed against all existing fixed objects.

3. Placing Concrete

Hot weather placement shall follow the requirements of ACI 305R and cold weather placement shall follow the requirements of ACI 306R. Concrete shall not be placed on any foundation whose temperature is 32 degrees or less. During cold weather, concrete may be placed when the air temperature in the shade is 33 degrees F. or more and rising; concrete shall not be placed when the air temperature is below 40 degrees F. and falling. In no case shall concrete be placed upon frozen subgrade. If the concrete has been placed in accordance with the above provisions and the temperature drops to 32 degrees F. or less, the concrete shall be covered

with insulating blanket or polyethylene and a sufficient depth of straw to prevent freezing. The concrete shall be protected from any falling precipitation.

All concrete surfaces poured after October 1st shall be cured with extreme service membrane or insulation and oil-treated in accordance with Mn/DOT Specifications 2521 and 2531.

No. 4 reinforcing bars shall be placed in the concrete adjacent to manholes, catch basins and at other locations where the concrete is likely to crack, as approved and are incidental to the concrete unit price.

Curing compound shall be applied within one hour after finishing at the approximate rate of one gallon per 150 square feet of surface curing area.

4. Stamped Texture

In areas that require a stamped textures, the Contractor shall texture the concrete with a "soldier course used brick" design adjacent to the back of the curb and a "running bond used brick" design on the remainder of the width of concrete. This basic design shall be reversed around planting beds in island areas. The 4" concrete shall be isolated from the adjacent concrete surfaces with 0.5" expansion material. The stamping shall be spaced to create equal joints so that the entire width of the concrete surface is covered with the brick texture. Contraction joints shall be saw cut to a depth of 1" to encourage cracking to follow the textured pattern at ten (10) or five (5) foot intervals to match joints in the adjacent concrete curb or sidewalk. Saw joints at light poles, hand holes, gate valves, and other surface appurtenances.

The Contractor shall use a minimum of three stamping tools for the "running bond" pattern and two stamping tools in the "soldier course" pattern. These tools shall be provided by the Contractor and shall be clean and the design distinct. Approval of the stamping tools, by the Engineer, is required before work begins. The pattern shall be based on standard brick sizes (2 1/4" x 3 1/4" x 8") with concave or rodded joints. Texture samples shall be made and submitted to the Engineer for approval before any work begins.

An area shall be designated by the Contractor and approved by the Engineer for a test section of at least 50 square feet to be constructed. The texture of the design patterns must be submitted for approval before any test sections are attempted. The Engineer shall be given 24 hours advanced notice before any test sections are poured so that the method of installation can be approved. The Engineer will inspect the test strip 72 hours after its completion and determine if the stamping patterns are acceptable. If the test strip is unacceptable, the Contractor shall remove the test strip at their own expense and construct a new test strip. If the test strip is acceptable, the test strip can be left in place as part of the work.

Stamping of Sidewalk Ramps will not be permitted.

Before texturing tools are applied to the concrete surface, an approved release agent shall be applied in accordance with the manufacturer's specifications.

While the concrete is still in its plastic state, apply the tool texture pattern to the surface of the concrete. Tools shall be properly tamped into the surface to achieve the surface texture approved by the Engineer.

Around all permanent objects in the special surface treatment area (i.e. street light bases) 0.5" flexible expansion material shall be placed and a 4" "reveal" tooled to provided an edge for the stamped pattern. This tooled "reveal" shall be placed around openings for signposts and other small openings without the expansion material.

Control joints shall be cut no later than 12 hours after the concrete has been placed. Excess release agent shall also be removed at this time.

5. Color

Colored boulevards and medians may be specified in the plans The concrete for mixture with the color agent shall be Mix Number 3Y46 as specified in Mn/DOT Specification 2461. Class B or Class A aggregate must be used.

Two colors are currently in use, a red color and a dark gray color. The red color shall be Oak-4%, by Prizm Pigments or approved equal. The dark gray color shall be L.M. Scofield No. C24 Charcoal or Prizm Gun Metal P9140 Pigments or approved equal. The Engineer shall approve the shade of the color. The Contractor shall demonstrate the color on the textured sample submitted for approval. Final approval shall be based on the test section poured and textured at the job site.

Concrete shall be delivered to the site in a revolving drum agitator batch truck properly equipped with a device, which will indicate and control the number of revolutions at mixing speed.

The driver shall possess a batch ticket indicating the number of bags of Portland cement in the batch. Color shall be added to the mixture at a rate of seven pounds per bag of cement (approximately 4% mixture). The batch shall then be agitated for and additional 50 revolutions but not more than a total of 150 revolutions on any batch (i.e. no batch reading the job site may have more than 100 revolutions of agitation before color is added.)

The concrete shall be placed and screeded to grade, then floated using standard practice.

An approved color sealant shall be applied with a minimum of one coat in accordance with manufacturer's specifications.

An area shall be designated by the Contractor and approved by the Engineer for a test section of at least 50 square feet to be constructed. The color must be submitted for approval before any test sections are attempted. The Engineer will inspect the colored test strip 72 hours after its completion and determine if the color is acceptable. If the test strip is unacceptable, the Contractor shall remove the test strip at their own expense and construct a new test strip. If the test strip is acceptable, the test strip can be left in place as part of the work. If a project has a colored stamped textured area these test sections can be combined into one test area.

6. Sidewalk Ramps

This work consists of constructing sidewalk ramps with truncated dome systems (detectable warning surfaces) in compliance with the American With Disabilities Act Accessibility Guidelines (ADAAG). This work shall be in accordance with at the applicable City of Bloomington and Mn/DOT Standard Specifications, as detailed in the plan, and the following:

The truncated domes area shall be Neenah R-4984 Detectable Warning Plate or East Jordan Iron Works Truncated Dome Panel or approved equal in a cast iron natural finish. The necessary area of the detectable warning plate shall be bolted together to ensure a level seaming between the plates. The unit shall be placed using lifting springs clips and 2x4 lumber. Concrete shall be kept off the top surface of the plate at all times. The Contractor may propose use of a different detectable warning surface provided it is from the approved Mn/DOT product list for truncated dome systems that is available at: <http://www.dot.state.mn.us/products/miscmaterials/truncateddomes.html> for approval by the Engineer.

At the time of construction, all truncated dome systems are specified to be in dimensional and alignment compliance with the requirements of the ADAAG as detailed in the plan. All truncated dome systems shall be installed in strict accordance with the recommendations of the manufacturer.

Grouting of the installation holes will be necessary if the concrete does not fully contact the warning plate.

The sidewalk ramps may be modified by the Engineer to match existing conditions or to avoid obstructions. No additional compensation will be provided for these modifications.

Truncated dome surface treatment shall be the only tactile warning surface treatment allowed for pedestrian curb ramps and shall be included in the cost per each including the 6" concrete thickness. Concrete curb and gutter modified by and adjacent to the pedestrian curb ramps shall be measured separately under the appropriate curb item.

The entire truncated dome area (2 Ft x 4Ft typically) shall contrast visually from the adjacent walking surfaces.

The tolerance for elevation differences between tile and adjacent surface is 1/16". At the time of construction, all truncated dome systems are specified to be in dimensional and alignment compliance with the requirements of the ADAAG as detailed in the plan.

7. Backfill

As soon as the concrete (including, but not limited to, curb and gutter and sidewalk) has attained sufficient strength, the area in front and back of the concrete shall be backfilled with suitable material. The amount of concrete in place, but not completely backfilled at any time, shall be limited to 4000 lineal feet. The backfill material behind the concrete must be approved by the Engineer. Where sod or seed is to be installed, a minimum of four inches of topsoil must be placed. The material on the street side of the curb shall be granular material suitable for base construction. The backfill shall be graded, shaped and compacted to the section shown on the Plans. Driveways shall be regraded to a usable condition as soon as the concrete has gained sufficient strength.

8. Completion of Curb and Gutter

All sections of curb and gutter including radii and fill-ins at catch basins shall be completed within three days after the curb and gutter work has been started on a street. The Contractor may need to provide temporary erosion control before the concrete work is backfilled. This erosion control is considered incidental and no additional compensation will be provided. The method must be approved by the Engineer.

C. Method of Payment

Concrete curb and gutter will be paid for at the Contract unit price bid per lineal foot measured along the face of the curb at the gutter line. Payment shall be compensation in full for all costs incidental to construction, including (but not limited to) excavation not included in roadway excavation quantities, granular backfill when required, final adjustment of catch basin castings, expansion fillers and application of curing compound and treating oil. No additional compensation will be allowed for curb, which is curved, or for driveway and ramp openings which are constructed. Curved curb and driveway openings and ramps will be paid for as concrete curb and gutter. Concrete valley gutter (measured outside normal curb and gutter) shall be paid as eight-inch concrete valley gutter.

Concrete walk of each thickness will be measured by area and paid for at the Contract unit price per square foot which shall be compensation in full for all costs incidental to construction, including (but not limited to) excavation not included in roadway excavation quantities, granular base when required, expansion fillers, and application of curing compound.

Pedestrian ramps shall be paid at the Contract unit price per each. The ramp and truncated dome area will be included in the per each cost. The area included for payment of the pedestrian ramp is the entire area of the ramp (5'4" back from the curb) and includes both the truncated dome portion and regular 6" concrete in the pay area. Any landing area behind the pedestrian ramp will be paid for as concrete walk.

Payment for the work to construct colored stamped concrete described shall be based on the amount bid per square foot as measured in place. The amount bid shall be compensation in full for all costs including, but not limited to, labor, materials, (including colored concrete and color sealant), placing concrete, expansion material, reveal patterns at permanent objects, delivering and mixing concrete, placing test section to demonstrate color, texture and supervision.

40. TRAFFIC SIGNS AND DEVICES (2564)

Type "C" and Type "D" traffic signs and markers shall be furnished and installed in accordance with the provisions of Mn/DOT 2564 and the following:

The Contractor shall furnish and install new Type C on sign posts as indicated in the Plans. Each Type C Sign Panel shall be in accordance with the Standard Sign Drawings of the Mn/DOT Standard Signs Manual.

The sign legend for colors other than black may be screened in accordance with Mn/DOT 3352.2A5c.

The sign legend material for black legend shall be in accordance with Mn/DOT 3352.A5c or Mn/DOT 3352.2A5d.

The Contractor shall furnish and install a fabrication sticker and affix to the lower right corner of the backside of each new Type C sign panel in accordance with the following:

The sticker shall have the month and year of fabrication of the sign panel punched out prior to installation of the sticker on the sign panel. The Contractor shall provide a full size mockup (minimum 1 ½-inch x 3-inch) of the sticker (black legend on a white reflectorized background) to the Engineer for approval. No fabrication stickers shall be produced prior to written approval.

The payment for furnishing each new Type C sign panel at the locations indicated in the Plans shall be by the square footage of the sign. The payment for installation of each new Type C sign panel at the locations indicated in the Plans shall be by the each and no additional compensation shall be made therefore.

41. LANDSCAPING (2571; 2575)

A. Materials

All plant material shall conform to Mn/DOT Specification 2571. Topsoil shall meet the requirements of Mn/DOT Specification 3877 for Select Topsoil Borrow. In addition, topsoil shall be pulverized, screened and free of heavy clay, coarse sand, stones, plants, roots, sticks and other foreign materials.

A test report from an approved reputable testing company will be required from the Contractor prior to delivery of any topsoil and shall include an analysis of soil nutrient levels as specified in Mn/DOT Specification 3877 and recommendations for plant nutrient applications (the University of Minnesota Soils Testing Laboratory provides an excellent nutrient analysis and recommendation). The analysis and recommendations shall include soil gradation and texture, pH, percent of organic matter, extractable Phosphorous (P2O5) (lbs./acre), exchangeable Potassium (K20) (lbs./acre) and soluble salts (M hos). Imported topsoil not meeting pH requirements will not be accepted.

Fertilizers shall be applied and tilled into the 4 inches of topsoil, as required by the test report, in place before sodding. No sod shall be placed on chemically treated soil until sufficient time has elapsed to permit dissipation of all toxic material.

Sod shall conform to Mn/DOT Specification 3878 (Type A-Lawn). Representative samples of the sod shall be furnished and approved by the Engineer before cutting for delivery.

B. Construction Requirements

The second paragraph of MnDOT 2575.3L1 shall be deleted and replaced with the following:

The Contractor shall maintain the sod for 30 growing days. The Engineer or Inspector will then make the final inspection and consider acceptance of the sod. A growing day is any calendar day exclusive of those days from November 1 to April 15, subject to adjustments by the Contract.

The above specified dates may be adjusted by the Engineer by no more than 15 days, to shorten the excluded periods when conditions are favorable to active growth or lengthen the excluded periods when conditions are unfavorable. The contractor will also be required to maintain any replacement sod for 30 growing days.

The Contractor shall use full width rolls of sod wherever possible. No sod shall be placed less than 1.5' wide or 2.5' long. The Engineer at his or her discretion may reject a sodded area for the use of too many small pieces.

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

Prior to placing any topsoil, the slopes shall be cut uniformly such that the finished sodded slope shall conform to the designated section. The topsoil shall be raked and all lumps and irregularities removed prior to placing the sod or seed. All sod and seed shall be placed on a minimum of four inches of topsoil regardless of the previous condition of the lawn.

Care shall be taken to insure that the topsoil does not contaminate the subgrade or base of the street driving surface. Topsoil remaining on the finished street shall be cleaned up immediately following the seeding or sodding operation.

The Contractor shall, during the course of laying the sod or immediately after completing placement of each area (within 8 hours), water and compress the sod into the underlying soil by rolling or tamping. The initial watering and rolling or tamping shall be sufficient to provide firm contact and bond between underlying soil and the sod and provide a smooth, even surface free of humps and depressions. The Engineer may require additional rolling if an acceptable result is not obtained. In dry periods the Engineer may require the watering of areas to be sodded prior to sod placement.

The Contractor shall water the sod as follows:

First week: Soil on sod pads shall be kept moist at all times (this requires special attention while on pallets or in transit). In the absence of adequate rainfall, watering shall be sufficient to maintain moist soil to a depth of at least 4 inches. Watering should be done during the heat of the day to prevent wilting. The left over sod and topsoil material shall be removed from the street as soon as possible after installation.

Second and subsequent weeks: Water sod as required maintaining adequate moisture, in the upper 4" of soil, necessary for the promotion of root growth.

The duration of the sod maintenance period responsibilities shall be for 30 days unless otherwise specified.

The new sod shall be level with existing adjacent sod and the thatch or base soil shall be approximately one inch below the top of adjacent curb and/or sidewalk. Where required, sod shall be pegged such that it remains in the position originally placed.

Roadside seeding shall meet the requirements of Mn/DOT Specification 2575.3D. The seed shall be applied at the rate of 75 pounds per acre or as noted in the Special Provisions. No mulching

or fertilizing is required unless specified in the Special Provisions or Plans. The Contractor may elect to do so at no cost to the City.

C. Method of Payment

Sodding will be paid for at the Contract unit price per square yard as measured in place. The unit price bid shall include full compensation for sod, minimum of 4" of topsoil (including sampling, testing, and fertilizing), excavation of existing sod and top soil (if not included in the cross sections), water and labor involved in restoring the construction site.

Upon satisfactory placement of the original sod, the Engineer may authorize partial payment of moneys as are due for sodding, in an amount up to but not exceeding 60 percent of the contract bid price. The remaining percentage shall not become due and payable until expiration of the sod maintenance period. At that time a final inspection of the work shall be made. No payment will be made for sod which is not in an acceptable condition at the time of final inspection, in addition an amount equal to 100 per cent of the contract bid price will be deducted from any moneys due or which may become due the Contractor for each square yard of unacceptable sod.

Roadside seeding shall be paid for at the Contract unit price per square yard of or acre of area seeded. This will be compensation in full for all labor, equipment, materials, minimum of 4" of topsoil (including sampling, testing and fertilizer), seed and water.

Plant Material (2571) (including, but not limited to seed, trees, bushes, perennials, etc.) shall be paid at 80% of the contract bid price after the acceptance of initial planting operation. The final payment will be made one year after the acceptance of initial planting operation.

42. PERMANENT PAVEMENT MARKINGS (2582)

This work shall consist of furnishing and applying epoxy resin pavement markings with "beads-on" for the control and guidance of traffic in accordance with the details shown in the Plans, the "Specification for Epoxy Resin Pavement Markings" (available from MnDOT's website at <http://www.dot.state.mn.us/trafficeng/pavement/doc-storage/epoxy2006.doc>).

Traffic control for striping operations shall be executed in accordance with the "Field Manual for Temporary Traffic Control Zone Layouts".

Line pavement markings will be measured separately by length of each type placed as specified. Broken lines will be measured by the actual length of line placed and will not include the gap between the skip marks. Crosswalk markings shall be measured by the area of marking furnished and installed as specified.

All epoxy pavement markings shall be placed after a minimum of three (3) Calendar Days of the completion of the wearing course mixture on each street segment. "Stick and stomp" delineators are required to be installed by the Contractor immediately after installation of the wearing course (once the wear course has cooled to a temperature that allows installation of the "stick and stomp" delineators). The delineators shall be installed at a maximum of 100' spacing, depending on roadway curvature. These delineators and their removal are incidental. The colors of the "stick and stomp" delineators shall match the color of the proposed pavement marking.

Payment shall be compensation in full for all costs incidental thereto including, but not limited to: (1) all costs of preparing the surface, (2) controlling and protecting traffic (3) laying out the locations of the markings for the approval of the Engineer, and (4) maintaining the work, together with any other expenses incurred in completing the work that is not specifically included for payment under other Contract Items. The Engineer shall meet with the Contractor to discuss general guidelines for the layout to the pavement markings. However, it shall be the responsibility of the Contractor to lay out the specific locations of the markings for the Engineer's approval, as noted in item (3) above.

43. MONUMENTS (3667)

Mutually agreed upon terms for removal and replacement of property and control monuments shall be established prior to construction. Without these terms in writing, the Contractor shall have full responsibility for the replacement of the monuments by a land surveyor licensed in the State of Minnesota.

This work shall be completed at no cost to the City of Bloomington unless a prior agreement states otherwise.

44. EPOXY RESIN PAVEMENT MARKINGS (3590)

The provisions of Mn/DOT 3590 are supplemented and/or modified with the following:

Mixing shall be done in a static mixing tube with at least 24 elements capable of totally mixing a component with another component immediately prior to the marking application.

45. OTHER ITEMS

Crushing operations not allowed unless approved by the City Engineer in writing.