CITY

OF

BLOOMINGTON

MINNESOTA

STANDARD SPECIFICATIONS

FOR

CONSTRUCTION

Revised March 15, 2023

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TABLE OF CONTENTS

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1. GOVERNING SPECIFICATIONS

The Contractor shall perform all work, including providing all materials in accordance with the City of Bloomington General Specifications.

All applicable standards referenced in this specification shall conform to the latest revision of that standard or specification. This includes but is not limited to:

- Minnesota Department of Transportation (MnDOT)
- American Water Works Association (AWWA)
- American National Standards Institute (ANSI)
- Civil Engineers Association of Minnesota (CEAM)
- Occupational Health and Safety Act (OSHA)
- Minnesota Department of Health
- City of Bloomington Standards and Specification.

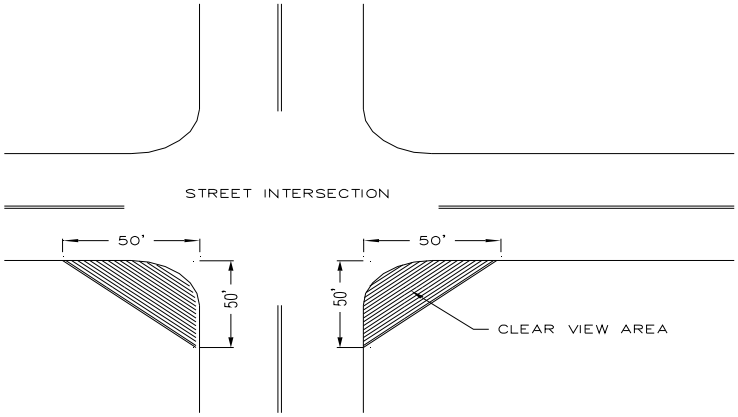
2. ACCESS TO DRIVEWAYS AND ADJACENT STREETS

The Contractor shall schedule the construction of adjacent streets in residential areas 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 temporary 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, for 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. STORAGE OF MATERIAL

On any corner formed by intersecting streets, the Contractor shall not permit the placement or storage of materials and equipment or other obstructions to a height greater than three (3) feet above the level of the center of the adjacent intersection within the area of land formed on the corner of the lot by measuring a distance of 50 feet along each curb line (or, if none, then each boundary line of the roadways) from the intersection of such lines, as shown in the figure below:



Site-specific conditions may require adjustments by the Engineer in the size and location of the clear view area as described above.

In addition, the Contractor shall not create stock pile/staging areas within the project work zone. It is the Contractor's responsibility to find an area to use for this if determined to be necessary. Any site used shall be submitted to the Engineer for approval and will be subject to all applicable code and ordinance requirements. No compensation will be provided for the stock pile/staging area and it will be considered incidental to the various contract unit prices.

4. SHOP DRAWINGS

The City will review and accept shop drawings. 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.

5. VIBRATION

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

6. SUPERVISION BY CONTRACTOR (1506)

The Contractor is responsible for meeting the provision of 1506 and the following:

The competent Superintendent and/or competent individual (if different) 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 (3) 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 (7) 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 Preconstruction Conference.

7. GAS SERVICE (1507)

If 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 if any damage is caused to the integrity of the coating on any gas line.

8. EXISTING UNDERGROUND UTILITIES (1507)

The plan will show 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 shown, the Contractor shall assume it is quality level D. Every effort is made to the position and dimension of all existing underground utilities on the Plans. This information is 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. The Contractor is responsible to ascertain the final location of these utilities (including municipal water and sewer lines and appurtenances) and to notify the utility companies when construction starts in each area. The Contractor shall contact Gopher State One-Call (651-454-0002) at least 48 hours (excluding Saturdays, Sundays and holidays) before 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 boxes, which require such adjustment. After adjustment, all manholes, valve boxes and curb boxes shall be 1/4" below finish 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. If manhole covers or castings are removed provisions shall be made to seal and protect the structures and pipes from construction debris or sediment inflow throughout the duration of the construction project. 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 will 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 all 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, pipes, damaged valve boxes, broken castings, etc. before commencing work on any street. Once excavation or utility construction has started, it will be assumed that all damage to underground installations except that reported as noted above, was caused by the Contractor's operations and is the Contractor's responsibility to repair.

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 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.

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

The Contractor shall locate, protect, alter and restore all 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 before construction. If the Contractor does not 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.

9. CONSTRUCTION STAKES – ALIGNMENT AND GRADES (1508)

The provisions of MnDOT 1508 are hereby supplemented and modified as follows:

The following is added to the fourth paragraph on Mn/DOT 1508:
"The cost of replacing stakes and marks will be based on the actual number of hours of field and office work based on time and materials spent with an overhead markup".

The Contractor shall fill out the City of Bloomington's Survey Request Form and return to the authorized project representative at least 48 hours (excluding weekends and holidays) before their needs for construction stakes or other survey work. The Contractor shall provide an unobstructed lane as required to complete the survey. The Contractor shall review any known survey needs of the project with the Engineer at the preconstruction meeting.

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

The Contractor is directed to Chapter 17, Article IV 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. These requirements are made a part of this contract. To obtain a copy, contact City Offices or visit the City's website at www.BloomingtonMN.gov.

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	Trench 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 length only	Hole length 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 sealcoat.

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 of vertical zone depth from the bottom.

All edges shall be saw cut and tack sealcoat applied before 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, catch basin castings, water valve boxes, curb stop boxes and other iron shall be raised before the installation of the final lift of bituminous. Any street where any iron has not been brought to the appropriate grade before paving will be subject to a seal coat restoration fee.

The contract unit price includes the cost for furnishing, placing, and shaping street patches unless noted as incidental.

Contact the City of Bloomington at (952) 563-4578 for a current copy of the map showing the current color category status of each street.

11. EMPLOYEE HEALTH AND WELFARE (1706)

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

The Contractor shall perform all construction operations in compliance with the 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.

The Contractor shall submit a copy of its written safety program for review at the Preconstruction 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 Bourne 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 designated representative.

The Contractor is advised that the City of Bloomington 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.RULE5207.0300-0304. 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.

The Contractor shall have the sole responsibility 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. The Contractor's responsibility will be 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 the City 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.

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

All traffic control devices shall conform and be installed in accordance with the latest version of:

- the "Minnesota Manual on Uniform Traffic Control Devices" (MN MUTCD);
- the "Field Manual for Temporary Traffic Control Zone Layouts" (Field Manual);
- the "Guide to Establishing Speed Limits in Highway Work Zones";
- the Minnesota Flagging Handbook;
- the Minnesota Standard Signs Manual;
- the Traffic Engineering Manual;

And the provisions of MnDOT 1404 and 1710, the Plan, and these Special Provisions.

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 Project and/or 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. All barriers shall have reflective coatings on all sides of the barricade.

The Contractor shall, at the Preconstruction 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 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, documentation of work zone traffic control devices, 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 MnMUTCD. 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 E below for requirements of log).

The Contractor is required to meet the traffic control device quality standards as determined in the Field Manual. The Contractor shall immediately replace traffic control devices that are deemed unacceptable. Signs that are dirty and result in a noticeable loss of reflectivity at night are also considered unacceptable and shall be cleaned or replaced. The Contractor shall be required to respond immediately to any call from the Engineer or Engineer representative concerning the notification of unacceptable traffic control devices.

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 (2) weeks before 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. A street name sign shall be placed above or incorporated into a detour (M4-9) sign to show the name of the street being detoured. At least 24 hours before 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.

If the Contractor requests to close the road and the Engineer approves that it is necessary to temporarily detour traffic 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 before the proposed road closure. The temporary detour shall be incidental work for which no direct compensation will be made.

All detours required shall be approved by the Engineer fourteen (14) days before 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 Traffic Engineer. All barricades and signing used to close any facility shall have flashers at each end. Properly equipped flaggers shall be used as required 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 phone number and company name.

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 MnMUTCD 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. All stop signs shall have a red flashing warning light. 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 location on-site 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.

General Requirements

All portable sign assemblies shall be perpendicular to the ground. No traffic device (signs, channelizing devices, arrow boards, 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. 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 will remain in the same location for more than 30 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.

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 MnMUTCD. When signs are removed, the sign posts and stub posts shall also be removed from the Right-of-Way within two (2) weeks or the Contractor shall be subject to a daily charge assessed at a rate of $100.00 per day for each day or portion thereof where the Engineer determines that the Contractor has not complied.

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 30 feet of through traffic unless approved by the Engineer. If materials or equipment must be stored within 30 feet of through traffic, the Contractor shall provide barricades or barriers, as directed by the Engineer, to warn and protect traffic.

During reclaiming, or pavement removal operations, proper lane closures shall be set up well before the operations. "Uneven pavement" signing shall be in place, in addition to all other traffic control as specified in the MnMUTCD, 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 help City of Bloomington personnel in temporary or permanent pavement marking related projects such as, but not limited 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.

<u>High Visibility Personal Protective Equipment Specification</u>

All workers within the road right-of-way who are exposed to either traffic or to construction equipment shall wear reflectorized high visibility safety apparel. High-visibility safety apparel means personal protective safety clothing that is intended to provide conspicuity during both daytime and nighttime usages, and meets the Performance Class 2 requirements of the ANSI/ISEA 107- 2004 publication entitled "American National Standard for High-Visibility Safety Apparel and Headwear."

Additional Requirements: ANSI/ISEA 107-2004 Class 3 Requirements (Class 2 Vest with Class E Long Pants)

- Flag Persons – In addition to an ANSI Class 2 hat, vest, shirt, or jacket, flaggers shall wear high visibility Class E long pants.
- Nighttime and Low Light Conditions – All workers working at night or in low light conditions shall wear high visibility Class E long pants in addition to an ANSI Class 2 vest, shirt or jacket.

All high visibility apparel must be worn in the manner for which it was designed. All apparel worn on the torso must be closed in the front to provide contiguous 360-degree visibility. If a worker's high visibility personal protective equipment becomes faded, torn, dirty, worn, or defaced, reducing the conspicuity of the apparel, the apparel shall be removed from service and replaced with new apparel.

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.

Night Work

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 illuminate the work area as determined by the Engineer. All costs incurred to provide such light plants shall be incidental.

All Contractor's personnel, except operators who will remain in their vehicles at all times, shall wear reflectively striped (approximately 33 feet [10 m] of striping), highly visible, short sleeved one or two piece coveralls, at all times while working on the Project. These coveralls shall be considered an incidental. Any Contractor's employee found on the Project not wearing the prescribed reflective coveralls will be immediately ordered off the Project by the Engineer.

The Contractor shall provide a sufficient amount of 2 inch [50 mm] wide highly reflective vehicle marking tape to be applied to Contractor vehicles and equipment, as directed by the Engineer, and as provided by the manufacturer's instructions. This tape shall be considered incidental and shall be Conspicuity Vehicle Sheeting (Type VII). Vehicle examples to be marked with tape are Contractor rollers, paver, millers and other equipment normally found in the lane closure.

The Contractor will be subject to a monetary deduction in the amount of $1000.00 for each Calendar Day or portion thereof, that the Contractor does not provide sufficient numbers of light plants. As light plants may be dedicated or otherwise made available to the Project, this assessment will be chargeable even if reasons beyond the control of the Contractor such as breakdowns, late delivery of materials, weather delays, or other unanticipated problems cause the work to be accomplished in non-daylight hours.

Milling, Seal Coating, 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 Mn/DOT “DROP OFF GUIDELINES.”

The Contractor shall not mill any notches for surfacing tapers until immediately before 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 stops 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 before the closure.

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. At least one 11-foot wide lane of traffic shall remain open on streets. Some streets require two (2)-11' lanes to be operable. On streets that require two (2) – 11' lanes to be operable, that are 40' wide or less, work will only be allowed on one side of the street at a time. 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 starts on any street, and shall maintain the signs and barricades along the route in accordance with these specifications, the MnMUTCD, and as approved by the Traffic Engineer. In areas designated by the Engineer, speed advisory signs may 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 and traffic safety 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 1:3 (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 3:1 (rise: run) can be used. Traffic surface is defined as the traffic lane plus the longitudinal buffer.

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.

Any construction vehicle (i.e. water truck) within an operable traffic lane must obey the rules of the road. If an action is needed that does not obey the rules of the road, appropriate work zone traffic control must be in place.

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

The provisions of MnDOT 1803 are supplemented and/or modified with the following:

The Contractor will be subject to an hourly charge for failure to furnish, install and/or maintain the proper Portable Concrete Barrier attenuation required on this Project. Non-compliance charges, for each incident, will be assessed at a rate of $250.00 per hour, for each or any portion thereof, which the Engineer determines that the Contractor has not complied.

SPECIAL PROJECT ADA REQUIREMENTS

All pedestrian facilities and shared trails on this Project must be constructed according to Public Rights-of-Way Accessibility Guidelines (PROWAG) which can be found at: : http://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/background/revised-draft-guidelines and the 2010 ADA Standards for Accessible Design, which can be found at: http://www.ada.gov/2010ADAstandards_index.htm. The appropriate pedestrian ramp details for each quadrant are included in the Plan. The Engineer may provide additional details to those provided in the Plan that meet the PROWAG guidelines as the need arises and field conditions dictate.

(A) The Contractor must designate a responsible person familiar with PROWAG to assess proposed sidewalk layouts at each site before work begins. Any time work the Contractor is performing concerns pedestrian facilities, the Contractor's representative shall be on site.

(B) The Contractor must construct Pedestrian facilities to meet the following criteria:

(1) Construct Pedestrian Access Routes (PAR) to meet the following:

- Minimum 4 feet width.
- A maximum cross slope of 2.0%.
- Vertical discontinuities must be less than 0.25 inches.
- Must provide positive drainage without allowing any ponding.
- All grade breaks shall be constructed perpendicular to the path of travel.

(2) Construct landings, which are part of the PAR, to meet the following:

- 4 feet by 4 feet minimum width.
- Maximum slope of 2.0% in all directions.
- Required at all locations where the PAR changes directions.
- Must be connected to the PAR.
- All grade breaks shall be constructed perpendicular to the path of travel.

(3) Construct ramps, which are part of the PAR, to meet either of the following criteria:

- Longitudinal slopes less than 5% in the direction of travel requires no landing at the top of the ramp (unless the PAR changes direction).
- Longitudinal slopes between 5 - 8.3% in the direction of travel require a landing at the top of the ramp.

(C) If the Contractor constructs any pedestrian or shared-use trail facilities that are not per Plan, do not meet the above requirements, or do not follow the agreed upon resolution, the Contractor shall be responsible for correcting the deficient facilities with no compensation paid for the corrective work. To ensure that the pedestrian facilities are constructed in compliance with PROWAG, the Contractor shall follow the following three steps:

(1) The Contractor shall use the appropriate ramp details in the Plan and identify the removal limits for the sidewalk and curb and gutter. If Contractor determines the removal limits are not adequate to meet PROWAG, the Contractor shall stop work immediately and consult the Engineer to determine the best solution. Once the Engineer and the Contractor reach agreement on how to proceed, the Contractor may finish the removals.

(2) The Contractor shall not alter any existing drainage patterns unless called for in the plans or approved by the Engineer.

Before pouring each curb and gutter segment, the Contractor must verify the zero height curb and curb transitions will be located as shown in the Plans and will provide an adequate detectable edge as shown on MnDOT Standard Plan Sheet No. 5-297.250 (Sheet 4 of 6). The Contractor shall also verify the proposed curb flow lines will provide positive drainage as well as maintain existing gutter inflows/outflows. The curb and gutter shall be constructed as detailed in the Plan with a defined flowline and no vertical discontinuities. The Contractor shall consult with the Engineer to determine a resolution if any of these conditions cannot be met. Once the Engineer and the Contractor reach agreement on how to proceed, the Contractor may proceed with pouring the curb and gutter.

(3) After the curb has been correctly poured, the Contractor has set the sidewalk forms, and before placing the concrete curb ramps/sidewalks, the Contractor shall verify all requirements will be achieved. If any of these requirements cannot be met the Contractor shall meet with the Engineer to determine the best solution. Once the Engineer and the Contractor reach agreement on how to proceed, the Contractor may proceed with the curb ramp/sidewalk pour.

(D) It shall be the responsibility of the Contractor, or Contractor's Surveyor if applicable, to layout all proposed work at each intersection in accordance with the Plan and requirements listed in the Special Provisions. The Contractor may confer with the Engineer for guidance in laying out the proposed work, but it will be the Contractor's responsibility to ensure the proposed work meets all the requirements of this section and the Special Provisions. This layout includes, but is not limited to placement of grade breaks, curb transitions, gutter flow lines, truncated dome placement, crosswalk marking placement, flares, landing limits, and ramp limits. It is important that the Contractor layout this work properly to achieve the construction of a compliant pedestrian facility. This layout work shall be incidental.
If contractor surveying is not called for in the Contract, the City's surveyor will only stake points and elevations provided in the Plan. For detail (i.e. custom) designs, other than specific dimension provided in the Plan, the Contractor shall be expected to scale dimensions from the Plan as needed to construction the facility.

(E) The Contractor shall utilize measures and methods when working near existing buildings that will avoid damaging the building's face or structure or other private property. The Contractor will be responsible for any damage to the building's face or structure, both below and above ground or other private property. Any damage resulting from Contractor operations will be repaired at the Contractor's expense to the satisfaction of the Engineer.

(F) The Contractor shall round all joints and edges of the walk with a ¼ inch radius edging tool, contraction joints shall extend to at least 30 percent of walk thickness and shall be approximately 1/8 inch wide as per MnDOT 2521. The Contractor shall also have the option of providing saw cuts to construct the sidewalk joints. This work shall be considered incidental.

(G) All pedestrian signal systems should be installed as shown in the Plan and must be constructed to meet the following criteria. The Contractor shall verify that the proposed push button locations will meet all of the following criteria before proceeding with the installation of the pedestrian push button system:

- Pedestrian push buttons shall be oriented with the button facing towards the intersection and the button face placed parallel to the outside edge of the crosswalk.
- Pedestrian push buttons shall be at least 4 feet and a maximum of 10 feet from the back of curb/edge of roadway, but may be placed 1.5 feet to 4 feet from the back of curb/edge of roadway if mounted on a signal pole as shown in the Plan or as approved by the Traffic Engineer.
- Pedestrian push buttons shall be located at the outside crosswalk edge and shall be no more than 5 feet offset from the projected outside edge of the crosswalk/outside edge of detectable warnings.
- Pedestrian push buttons shall be at least 10 feet apart, except in islands and medians, where the minimum separation is 5 feet.
- Each pedestrian push button shall have a landing immediately adjacent to the push button face with minimum dimensions of 4 feet by 4 feet and a maximum slope of 2.0% in all directions. Center the push button on the landing if possible to do so without violating any of the requirements listed in this Special Provision. The landing must be connected to the Pedestrian Access Route.
- A 6-foot wide clear distance between obstructions shall be maintained wherever it is possible to do so for snow removal purposes.
- The push buttons shall be mounted at a height of 42 inches as shown in the Plan.
- If it is possible to mount a push button on a signal pole and meet all the criteria listed in this Special Provision, then the push button shall be mounted on signal pole and the unused push button station components shall be considered surplus materials and delivered to City of Bloomington Western Maintenance Area, 10500 Hampshire Avenue. The Contractor shall notify the City of Bloomington Engineering Division at least three (3) days before the time the Contractor intends to deliver the surplus materials.
- Crosswalks shall be striped in a straight alignment between the outside edges of the detectable warnings with no kinks unless the crosswalks are shown as kinked in the Plan.
- The Contractor shall maintain all working points marked by the surveyor and use the working points to layout push button locations in accordance with the

Plans and Special Provisions. The Engineer will verify the proposed push button locations are acceptable prior to construction.

If any of these conditions cannot be met, the Contractor shall consult with the Engineer to determine a resolution. Once the Engineer and the Contractor reach an agreement on how to proceed, the Contractor may proceed. If the Contractor constructs any pedestrian push button systems or pedestrian facilities which do not meet the criteria or the agreed upon resolution, the Contractor will be responsible for correcting the deficiencies with no compensation paid for the corrective work.

To help ensure signal systems are properly constructed the Contractor must adhere to the following practices:

- All push button station bases shall be poured either concurrently with or after the adjacent sidewalk pour. These bases shall be poured flush with all adjacent sidewalk within ¼ inch maximum vertical deflection as shown in the Plans.
- Signal pole foundations which are being constructed in or adjacent to sidewalk shall be constructed in accordance with the applicable plan detail. If a push button is proposed to be mounted on a signal pole, the Contractor shall determine the finished grade of the top of proposed sidewalk before pouring the signal pole foundation. The signal pole foundation shall not be more than 8 inches above the finish grade of the sidewalk and must still meet the applicable vertical clearance requirements of MnDOT 2565 and the *Standard Specifications for Traffic Control Signal Devices*. If this is not possible, the Contractor shall consult with the Engineer to determine the appropriate solution.

13. TEMPORARY PEDESTRIAN ACCESS CONTROL (2563)

This work consists of providing a Temporary Access Control Plan. This plan shall consist of identifying a Temporary Pedestrian Accessible Route (TPAR) and features needed to assist pedestrian, bicyclists and non-motorized vehicles safe movement within and around the construction zone. Conduct this work in accordance with Contract provisions and the following:

The Contractor shall develop and provide for a continuous Temporary Pedestrian Accessible Route (TPAR) for this Project. The TPAR shall clearly address all non-motorized users in the construction zone. The Contractor shall submit this plan to the Engineer for acceptance at the Preconstruction meeting.

PEDESTRIAN ACCESS

(A) The TPAR must have a minimum width of 48 inches (4 feet) and guide pedestrians through and/or around the Project by using devices such as signage, barricades, and temporary curb ramps or blended transitions. The Contractor may provide an alternate route that is accessible and within 2 block(s) offset of the closed construction area. To the maximum extent feasible, the TPAR shall be provided on the same side of the street as the disrupted route. Where the TPAR is exposed to adjacent construction, excavation drop-offs, traffic, or other hazards, it shall be protected with a pedestrian barricade or channelizing device. All TPARs must have a smooth, level, slip-resistant surface and shall meet the applicable requirements of the Public Right-of-Way Accessibility Guidelines (PROWAG).

(B) The Contractor shall schedule and coordinate the replacement of the pedestrian access to accommodate the needs of the business and residences. Existing sidewalks shall be left in-place until it is required to remove them to accommodate new construction. Pedestrian access may be provided to businesses and homes by any public access from adjacent parking lots and side streets. Front door access must be provided to buildings without alternate public entrances. Where disrupted by construction, the Contractor must provide a continuous TPAR for all areas disrupted construction throughout all phases of construction.

(C) For technical provisions on TPAR, the Contractor is directed to the Guidelines for Accessible Public Rights-of-Way and Chapter 6D of the MnMUTCD. The pedestrian accessibility checklist is on page 6D-5 and 6D-6 of the MnMUTCD. The Contractor shall complete MnMUTCD Fig. 6D-1, "Pedestrian Accessibility Considerations in Temporary Traffic Control Zones Check List". A copy shall be provided to the Engineer at the preconstruction meeting.

(D) The Contractor shall notify the Engineer in writing at least 72 hours before the start of any construction operation that will necessitate a change in pedestrian access.

Traffic control devices must allow for an accessible route through the Project. TPAR pedestrian barricades and channelizing devices shall be continuous, stable, and non-flexible and shall consist of a wall, fence, or enclosures. The base of any traffic control devices shall be a continuous raised barrier of no more than 6 inches in height and must allow for drainage. The purpose of this barrier is to provide a continuous wayfinding device for the visually impaired, therefore the barrier shall not have any points that might catch a person who is using a cane for a guide. The Devices shall provide a continuous surface or upper rail at a minimum 3 feet above the ground or walkway surface. Support members shall not protrude into the path. Whenever possible the TPAR shall only utilize in-place street crossings. TPAR must be regularly inspected and updated depending on Project staging.

No pedestrian curb ramp or blended transition work shall occur concurrently at adjacent intersections. The idea is that the contractor will stage work so that work only occurs on one side of the street and at every other intersection.

The Contractor shall be responsible for maintaining the TPAR within this Project. The Contractor shall furnish the name, addresses, and phone number of at least one individual responsible for the placement and maintenance of TPAR. This individual shall be "on call" 24 hours per day, seven days per week during the times any devices, furnished and installed by the Contractor, are in place. The required information shall be submitted to the Engineer at the Preconstruction meeting.

The Contractor shall be expected to answer calls immediately and begin corrective measures needed within one hour. If the Contractor is negligent in correcting the deficiency within one hour of notification the Contractor shall be subject to a monetary deduction at the rate of $100.00 per hour when only one residence or location is affected and at the rate of $500.00 per hour in all other cases that the Engineer determines the Contractor has not complied.

The Contractor is advised that the corridor has Transit service. Re-locations of stops can only be made with the approval of the Engineer.

Only one side of the roadway may be disrupted at a time for pedestrian curb ramp, blended transition, or sidewalk construction. Where it is not feasible to provide a same-side TPAR and pedestrians will be detoured, the alternate route must provide a similar level of accessibility to the existing route. This may include the incorporation of accessible pedestrian signals (APS), curb ramps, or other accessibility features.

All traffic control required under this Contract for pedestrian access shall be performed as incidental work for which no direct payment will be made.

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 before 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.

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 MnMUTCD. 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 the 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.

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 be subject to an hourly charge assessed at a rate of $100.00 per hour for each hour or portion thereof where the Engineer determines that the Contractor has not responded.

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.

Vehicle Warning Light Specification

All Contractors', subcontractors' and suppliers' mobile equipment, operating within the limits of the Project with potential exposure to passing traffic, shall be equipped with operable warning lights which meet the appropriate requirements of the SAE specifications. This would include closed roads that are open to local traffic only. This also includes 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 from a height of 3.5 feet and from a 100-foot radius about the equipment. To meet the 360 degree at 100-foot radius requirement, supplemental lighting may be used in addition to the lights on the Approved Products List. All supplemental lights must be SAE Class 1 certified. This specification is to be used for both day and nighttime operations. All costs incurred to provide warning lights shall be at no cost to the City. 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 Approved Products List for Vehicle Lighting which is found at the following weblink: http://www.dot.state.mn.us/products/vehiclelighting/vehiclesafetylights.html. The list may also be obtained by contacting:

Vehicle Warning Lights
Office of Construction MS650
Transportation Bldg. OR by calling (651) 366-4216
395 John Ireland Blvd.
St. Paul, MN 55155

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

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 in the Department. The Flagger Trainer's name and Qualification Number shall be furnished by the Contractor at the preconstruction meeting. Provide all flaggers with the Mn/DOT Flagger Handbook and observe the rules and regulations listed. 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 anytime 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/documents/flaggertrainingchecklist.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 MnMUTCD. All costs incurred to provide such flag persons shall be incidental to the lump sum of traffic control. The Contractor shall provide two-way radios for flag persons.

Flag persons shall wear high visibility retro-reflective 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 on a seven-foot staff 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-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.

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 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 the 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.

Temporary Lane Closure Requirements

Unless otherwise authorized by the Engineer, any temporary lane closure extending to or beyond 300 m [1000 feet] shall have at least one (1) 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 Type B Channelizers (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 before 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.

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 before beginning any work that will interfere with any traffic signal system or its detectors.

During periods when an existing signal system is de-energized and the new signal system is energized (or existing system is re-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.

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 flag persons) 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 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 lumps 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 change 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.

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

The Contractor shall shore up, brace, underpin, secure and protect, as many as 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 9 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.

15. 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 (MPCA), and in accordance with the provisions of Mn/DOT 1717, 1804.2 and the following:

By signing the NPDES Declaration and completing the electronic online NPDES CSW permit, the Contractor is a co-permitee with the City to ensure compliance with the terms and conditions of the Construction General Storm Water Permit (MN R100001) and is responsible for those portions of the permit where the operator is referenced. This permit establishes conditions for discharging storm water to waters of the State from construction activities that disturb 1 acre (0.4 hectares] or more of total land area. A copy of the permit is available at http://www.pca.state.mn.us/water/stormwater/stormwater-c.html or by calling 651-296-3890.

The Contractor shall apply and pay for the NPDES Construction Stormwater General Permit on this Project unless otherwise stated in the Special Provisions. Payment for the application shall be incidental to the Contract. The City will provide the Contractor with the information needed for Sections 1 thru 3 and 5 thru 14 of the application form, as part of the Contract document package. The Contractor shall complete the application process, and post the Permit and MPCA's letter of coverage onsite.

A copy of the MPCA confirmation and a signed Permit Declaration form must be returned with the Contract and Bond. Submittal of the copy of the Confirmation and Permit Declaration is mandatory for Contract approval. No work which disturbs soil and/or work in waters of the state will be allowed on this Project until the NPDES Permit is in effect and the City has received the required documentation.

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 before 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), naphthalene (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 insulations (could contain asbestos), sumps (could contain chemical waste), waste traps (could contain oily wastes) and cesspools (could contain chemical or oily wastes).

The Contractor shall be solely responsible for complying with the requirements of the NPDES Construction Stormwater General Permit where Contractor is referenced in Part II.B and Part IV of the NPDES Construction Stormwater General Permit.

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 NPDES Construction Stormwater 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 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.

If the Contractor does not perform the requirements as listed, the Engineer will issue a Work Order detailing the required action. The Contractor shall start the required action within twenty-four (24) hours 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 two (2) days of an uncontrolled storm water release. The names and phone numbers of the MPCA Regional Contact 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)

NPDES Permit Requirements	Cross-Reference within this Contract
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)

16. 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 obtain the Engineer's approval for use of other means. 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. 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://www.dot.state.mn.us/products/erosioncontrolandlandscaping/index.html

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. before commencing work in any area. Once excavation or utility work has started 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 or 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.

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 any 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 NOAA Atlas 14 Precipitation-Frequency for the Minneapolis/St. Paul International Airport Station (Station ID: 21-5435) Point Precipitation Frequency Estimates. 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.

Inlet Protection

Storm sewer inlets shall be protected by the various options as detailed in the plans. Options listed are: Sediment Filter Sacks and Metal Basket Type. 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.

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, regularly 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.

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 accordance 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 before 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 at least five (5) feet vertical above groundwater and the excavation must be lined with an impermeable synthetic liner that does not allow washout liquids to enter ground water.
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, flocculants, or acid to washwater is prohibited.
10. 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 to use before 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, at least 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 accordance 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 accordance with the applicable governmental regulations. Ground disturbance, including holes and depressions, caused by the installation and removal of the temporary washout facilities shall be backfilled and repaired.

Method of Payment

The contract unit price per each temporary concrete washout facility includes the cost of 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, and as directed by the Engineer. If no contract item is included for the temporary concrete washout facility, this work shall be considered incidental. If an on board unit is used for concrete washout, no direct payments will be made.

17. COORDINATION OF PLANS AND SPECIFICATIONS

Replace the order of precedence list in the first paragraph of 1504 with the following

(1) Addenda
(2) Special Provisions
(3) Project- Specific Plan Sheets
(4) City of Bloomington General Specification
(5) City of Bloomington Standard Specifications
(6) MnDOT Supplemental Specifications
(7) MnDOT Standard Plan Sheets and Standard Plates
(8) MnDOT Standard Specifications

18. PROSECUTION OF WORK (1804)

The first and second sentences of the third paragraph of 1804.2 shall hereby be deleted and replaced with 'The Contractor shall not perform work on Sundays or Legal Holidays of the City of Bloomington without permission from the Engineer. The Contractor shall suspend construction operations for 24 hours from approximately midnight on each Sunday or legal holiday until midnight on the following day.'

19. CLEARING AND GRUBBING (2101)

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.

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 at least the drip line of the tree. However, with the permission of the Engineer, grubbing may be accomplished with a grinding device. Inadequate grubbing which results in uneven ground or subsequently 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 at least 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.

Tree Pest and Disease Compliance

Current 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 must not be trimmed or debris moved for disposal from the site between May 1 and September 30. Between May 1 and September 30 the contractor may only remove the tree or haul it away with approval from the Engineer. At a minimum this will require chipping the outer 1" of bark in two planes on site prior to movement and may require tarps and other methods to prevent the Emerald Ash Borer from flying off in search of new hosts along the haul route. All other material shall be disposed of as "Removal of Miscellaneous Structures and Excess Materials" (Article 21 of these Specifications).

This Project is located in a county that the Minnesota Department of Agriculture has placed under an Emerald Ash Borer Quarantine. Any work for this Project is subject to the following:

The Contractor shall not make ash or any non-coniferous (hardwood) species with bark attached available to the public for use as firewood from the quarantined area. The Contractor shall not transport entire ash trees, limbs, branches, logs, chips, ash lumber with bark, stumps and roots outside of a quarantined county without fulfilling the requirements of an Emerald Ash Borer Compliance Agreement with the Minnesota Department of Agriculture. Contact the Minnesota Department of Agriculture at 1-888-545-6684 or visit the Emerald Ash Borer website at http://www.mda.state.mn.us/PLANTS/PESTMANAGEMENT/EAB.ASPX to find out which counties are quarantined.

If the ash material is going to be shipped out of Minnesota, the Contractor shall contact Miyeko.F.Kimitch@aphis.usda.gov for United States Department of Agriculture joint Emerald Ash Borer Compliance Agreement approval with the Minnesota Department of Agriculture.

The Contractor shall dispose of ash trees:

a. In accordance with the Emerald Ash Borer Compliance Agreement, and
b. By utilizing the ash wood chips within the construction limits for erosion control, construction exit pads or landscaping purposes.

No direct compensation will be made for compliance with these requirements.

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 shows 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 Special Provisions.

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

20. PAVEMENT MARKING REMOVAL (2102)

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

1. Site access:
   To ensure that no one is accidentally exposed to lead, people are not permitted to areas of high lead concentration without protection. Signs are used to show where unprotected people must not go. The signs shall say:
   Warning. Lead Work Area. Poison. No Smoking or Eating.

2. Protective Clothing:
   Provide protective clothing for City Inspectors in any area with lead exposure above 30 $\mu g/m^3$ 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. Launder the clothing and provide 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:
   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.

   Provide a means to remove surface contamination from the Inspector's clothing. That may be a HEPA vacuum, a downdraft booth (with 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.

The following is hereby added to the end of MnDOT 2102.3

> All pavement marking removal shall be done utilizing either sandblasting or grinder type cutting head equipment. Waterblasting shall not be used for pavement marking removal without permission from the Engineer.

Method of Payment

This Item is incidental to Traffic Control.

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

This work consists of removing structures, such as pipe culverts, pavements, curbs, gutters, sidewalks, guardrails, fences, mailboxes, sewer and draintile lines, manholes, catch basins, and other miscellaneous structures.

Relocate mailboxes, which must be disturbed by construction, 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.

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 the oversized manhole castings and assemblies shall become the property of the Contractor. Salvage and deliver the oversized manhole castings and assembly to the Bloomington's Western Maintenance area. 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 Western Maintenance 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 damage caused by the Contractor, the Contractor shall notify the Engineer before proceeding with the reinstallation.

Store and protect all traffic signs requiring removal due to construction operations on site 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, 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.

Dispose of all waste material and debris, and notify the Engineer of the disposal area before the work. No waste material or debris shall be deposited on any public or private property within the City limits of Bloomington without 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.

22. EXCAVATION (2106)

Definition

In general, excavation shall be performed in accordance with Mn/DOT Specification 2106.

Excavation shall consist of removing, to the designated subgrade, 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 item (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.

The contract unit price bid per ton for "Aggregate Base Class 5", "Granular Borrow", and "Common Excavation" includes 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.

Construction Scheduling

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. Prepare a schedule that anticipates installation of base and bituminous immediately following the compaction of subgrade.

Suitable Material and Subcuts

Backfill subcuts 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 Mn/DOT 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 locations. 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).

Ramp into and out of subcut areas that are not less than 1V:12H slopes. Compact backfill by "quality compaction (visual inspection) methods".

Construction Requirements

Remove all sod and vegetation 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. Provide stockpile locations to the Engineer for approval. 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 26 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. Remove materials, which the Engineer considers unsuitable, and replace with material suitable for subgrade and embankments.

Cut slopes and neatly blade and rake. Every effort will be made by the City to obtain the required easements before 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 date(s) may be modified.

Grade private driveways 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 before 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. Construct temporary ditches or swales 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.

Complete all subgrade and embankments 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.

Method of Payment

1. Common Excavation

   The contract unit price per cubic yard for "Common Excavation", includes all excavation, compacting, disposal of excess materials, and maintenance work. The Engineer will measure the excavation 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 (usually sites graded by a Developer), subgrade preparation will be paid instead of Common Excavation. At those locations existing grade will be within six (6) inches of proposed subgrade before this construction. This work consists of grading the roadway, boulevards, sidewalk berms and/or bikeway berms to proposed subgrade. It also includes 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 before construction of base, sidewalk, or bikeway.

   The contract unit price per square yard for "Subgrade preparation" will measure the area between one foot outside the back of curb on one side of the street and one foot outside the back of 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.

23. EMBANKMENT AND OTHER SPECIFIED FILL (2106

Materials

Obtain subgrade and embankment material from excavations on the Project whenever possible.

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.

Provide the Engineer with a written notice of the source of embankment material and a 30-pound representative sample of the material at least five working days before the planned starting time for placement of the material.

Construction Requirements

Construct embankments, subgrades or other specified fills in accordance with provisions of Mn/DOT Specification 2106. Compact embankments, subgrades, or other specified fills by the quality compaction method unless otherwise noted in the Special Provisions.

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.

24. BASE PREPARATION AND TEST ROLLING (2106, 2111)

Construction Requirements

Complete base preparation and test roll before curb and gutter construction, placement of gravel base, sand-gravel subbase, or plant mixed bituminous base on all streets unless otherwise noted on the Plans.

Grade, roll, compact and shape the street. Proof roll the area between, one foot outside of the back of curbs 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 box or sideboards) tandem dump truck or Engineer preapproved equal. Complete proof rolling 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.

Notify the Engineer at least four hours before the proof rolling so that this test may be observed. At least 330 linear feet must be available at the time of test rolling.

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

Correct soft spots or displacement, which appear during proof rolling 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 22) 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.

Method of Payment

Base preparation and proof rolling shall be incidental to the other items in this contract. Any excavation and embankment or specified fill (see Article 22) required to repair the roadbed will be paid for at the Contract unit price for such work, except 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.

25. GEOSYNTHETIC MATERIAL (2106/3733)

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 2108 and 3733. Lap joints 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, place the geotextile 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.)

Secure the geotextile so that it is not displaced during subsequent construction. Sewn seams will be permitted and must meet the requirements of MnDOT Table 3733.2-1. 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 contract square yard price for "Geotextile Fabric, Type V" includes the cost of providing, testing and placement of fabric measured in place as detailed in the plan (no payment will be made for required overlapping).

26. LOAM TOPSOIL BORROW (2106/2574/3877)

Loam topsoil borrow shall be in accordance with the provisions of 2106, 2574, 3877 and the following:

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

Provide a test report from an approved reputable testing company before 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 Phosphorus (P2O5) (lbs/acre), exchangeable Potassium (K20) (lbs/acre) and soluble salts (M hos). Imported topsoil not meeting pH requirements will not be accepted.

Apply fertilizers (incidental) and till into the 4" of topsoil, as required by the test report, in place before sodding. Do not place sod 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 for Loam Topsoil Borrow. Even if salvaged topsoil is used, the Contractor shall be paid the amount placed for Loam Topsoil Borrow, given that it passes the requirements specified.

27. DUST CONTROL (2130)

Immediately alleviate the undesirable condition when dust becomes or appears to be becoming a nuisance or problem to the area or nearby residents. The maintenance responsibility described shall be inherent to the Contractor and shall be applicable at all times, including weekends, throughout the construction period. Provide the names and telephone numbers of employees who can be contacted at all times. 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.

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 prompt basis. The dust control measures may be accomplished by street sweeping, application of calcium chloride or another approved method.

Street Sweeper (with Pickup Broom)

Remove 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 2104.3D.

Under no circumstances will brooms be allowed on site that do not have the ability to contain dust and pick up materials that are swept up. Pre-wetting or the use of a sweeper with a water spray system may be required when the street sweeping creates a nuisance dust condition. Respond to any request by the Engineer for street sweeping within 6 hours.

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. Inform the Engineer, or designated representative, of any roadways within or adjacent to the Project that 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.

The contract unit price for "Street Sweeper (with Pickup Broom)" will only be for those hours as measured to the nearest one-half hour of sweeping, necessary to keep the Project roadways and adjacent roadways clean from construction debris includes 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, before curb and gutter construction on bituminous base, before 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.

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. Apply based on Mn/DOT Specification 2131. Apply the calcium chloride solution at the rate of 0.50 gallon per square yard.

If Calcium Chloride Solution is included as a bid item the contract unit price per gallon of mixed solution for "Calcium Chloride Solution includes the cost of 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.

28. WATER (2130)

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.

Use a tank truck with an approved backflow prevention device (air gap). A representative of the City of Bloomington Utility Division will inspect and approve the tank truck 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 applies to the work shall be metered with a meter obtained from the Utility Division of the City. The contract unit price per 1000 gallons (M.Gal.) for "Water" includes the cost of 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". Record the quantity of water each day and supply this information 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.

Use MnMUTCD Traffic Control Layout 41 when watering for turf establishment on a multi-lane roadway. Obtain the Engineer's approval of any proposed modifications from MnMUTCD Traffic Control Layout 41. The water truck shall move in the direction of traffic unless otherwise approved by the Engineer. Equip the shadow vehicle with a truck mounted attenuator.

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, if it is included as a bid item. If water is not included as a bid item, all water used shall be considered incidental. 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.

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 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.

29. AGGREGATE BASE (2211)

Materials

Provide materials that meet the requirements of Mn/DOT Specification 3138. The class of aggregate will be shown on the Bid Proposal.

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, at least five working days before placement of said material. Change of source shall not be made without approval by the Engineer.

Construction Requirements

Prepare the subgrade in accordance with Article 24 of these specifications.

Construct aggregate base in lifts not to exceed six inches in compacted thickness. Shape and compact each course separately. Avoid segregation of aggregate due to excess movement during shaping operations.

Shape the materials placed on the roadway to the grade and cross-section. Do not place aggregate on the roadway that cannot be compacted within 24 hours.

Compact with an approved vibratory compactor capable of imparting a compactive force of at least 15 tons, and continue until there is no evidence of further compaction. Obtain the Engineer's s approval before adding water, to obtain a maximum compaction.

Overlap each pass of the roller with the preceding pass by at least one/half the width of the roller and end at least three feet in advance or to the rear of the termination of the preceding pass.

Compact the entire surface as specified in Mn/DOT Specification 2211.3D2b "Quality Compaction Method".

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

Method of Payment

The contract unit price for the accepted quantities of "Aggregate Base" of each class specified per cubic yard of compacted base, includes the costs of base preparation and test rolling, obtaining the material, and constructing the base. The Engineer will measure 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 shown on the Proposal. Weight slips will then be required. Weigh aggregate material on an approved scale and record the weights on a weight ticket approved by the Engineer. The contractor shall furnish the scale person. Furnish a copy of the scale weight tickets for the day's run to the Engineer at the end of each working day and show 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. Control weight trucks 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.

30. CRUSHED ROCK FOR DRIVEWAYS (2221)

Materials

Match the crushed rock for driveway surfacing to the material existing in the driveway as nearly as possible and provide a sample of the material proposed for use for approval by the Engineer before any material is hauled.

Method of Payment

The contract unit price for placing the crushed rock for the driveways includes production, testing, placement, compaction and shaping. 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".

31. 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. Keep the BSB on the street from which it was taken and place below the Class 5 aggregate base layer and above any pipe zone areas. Removal of the bituminous pavement shall be paid at the appropriate unit bid price. Excavation down to the bottom of the BSB shall be paid as "Reclaim Bituminous Stabilized Base (CV)" and shall include, 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 or common excavation material 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, which includes but is not limited to the common excavation required to bury the BSB. The cost of burying the BSB is incidental to the square yard unit price.

Refer to the Standard Detail for a depiction of the pay items related to BSB.

The contract unit price for "Reclaim Bituminous Stabilized Base (CV)" includes the costs for all costs of removing, pulverizing, placing per square yard of material regardless of thickness.

32. PLANT-MIXED ASPHALT PAVEMENT (2360)

This work conforms to the requirements of Mn/DOT Specification 2360 except as modified.

Construction Requirements

1. Restriction

Do not place bituminous mixtures when the weather or roadway conditions are unfavorable as determined by the Engineer.

Provide notice of placement of bituminous before 2:00 pm on the business day before 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.

Place bituminous surface 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 Mn/DOT Specifications. The Engineer will not accept Contractor's request from warranty release with regards to Mn/DOT's pre-determined paving dates.

2. Preparation of the Base

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

Apply tack coat 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

Compact all pavements in accordance with Mn/DOT Specification Section 2360.3.D.1 Maximum Density Method in the Special Provisions or for situations as noted in Mn/DOT Specifications Section 2360.3.D.2 Ordinary Compaction Method. After compaction, the surface shall be smooth and true to crown and grade.

5. Miscellaneous Details of Construction

Separate transverse joints in adjacent strips at least five feet. When material is placed in more than one layer, separate longitudinal joints at least one foot. Do not allow traffic over an unmatched longitudinal joint except at locations directed by the Engineer.

Taper the plant-mixed bituminous surface when making a connection to an existing bituminous stabilized surface, 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 material.

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

Do not deposit bituminous material on the road if the rolling cannot be completed before dark.

Weigh bituminous material on an approved scale at the plant and record the weights on an original weight ticket approved by the Engineer. The Contractor shall furnish the scale person. Provide a copy of the scale weight tickets for the day's run to the Engineer at the end of each working day and show the street or streets on which the material was placed, type of material and date. Record a running total for each day's run 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.

Control the weight of the trucks so that no damage will be inflicted upon the base or any haul road.

Method of Payment

1. Plant-Mixed Bituminous Pavement

The contract unit price for plant-mixed bituminous pavement used in each course includes the cost of the material, loading, hauling, placing and otherwise constructing the asphalt surfacing. Each layer of plant mixed bituminous pavement placed will be paid at the contract unit price bid for the specific type of bituminous mix that is shown in the typical section for that layer.

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

The contract unit price for "Bituminous material for tack coat" per gallon, shall include all costs incidental to construction. Bituminous material will be paid for by using the volume at 60 degrees F. Tables found in the Mn/DOT Bituminous Manual section 5-693.240 will be used to calculate the necessary correction factors to convert gallons of bitumen at any temperature to gallons at 60 degrees F.

33. CONCRETE STEPS (2411.607)

This work shall consist of constructing concrete steps in accordance with the applicable specification of Mn/DOT 2411 and as directed by the Engineer, and the following:

Match existing steps in tread width and length with a height between 5 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 the constructability and aesthetics.

Tie the new concrete step work to the existing steps by a method approved by the Engineer.

Use a concrete mix designation of 3Y43 and shall have a light broom finish.

All structural excavation, granular backfill, 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 performance will be measured in the field.

The Contractor shall be responsible for notifying the resident regarding the work to take place at least seven (7) days before any work on the stairs.

The contract unit price for "Concrete Steps" per cubic yard includes the costs of constructing the concrete steps complete in place at the locations as directed by the Engineer.

34. MODULAR BLOCK RETAINING WALL (2411)

This work consists of furnishing and installing precast concrete wall units, geotextile reinforcement, draintile, and related materials, in accordance with the applicable specifications of Mn/DOT 2411. All segmented block walls shall meet the requirements of Mn/DOT Technical Memorandum No. 14-03-MAT-01, dated April 18, 2014, and the following:

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 Engineer preapproved equal

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

Bring all necessary wall block materials needed for the Project 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.

Submit wall system colors for approval by the Engineer. Generally, wall units shall be a tan-terracotta color. The texture of the block shall be beveled and split faced. Supply product information s to the Engineer to approve the color and texture.

Construct the wall system in accordance with the manufacturer's recommendations upon approval of the design method 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 a, Minnesota licensed engineer.

Conform the wall to the following specifications and typical section requirements:

Design and prepare detailed drawings by a Professional Engineer (hired by the Contractor) experienced in retaining wall design who is licensed in the State of Minnesota. Submit the Engineer certified design computations and plans to the wall owner and the City of Bloomington for their permanent record. The design shall be per AASHTO and the Mn/DOT Roadway Design Manual except as noted.

The detailed drawings shall contain all the necessary information for the construction of the wall. Include 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 include information on the individual blocks and the geotextile material.

Identify on all plan sheets the name of the responsible engineering firm and the name of the person certifying the plan. Each sheet shall be certified.

Embed the block a minimum depth of 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.

Install a 4" drainage pipe, Mn/DOT 3278, wrapped in Type 1 geotextile, Mn/DOT 3733, on walls taller than four (4) feet or in areas of high groundwater.

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

Install backfill with at least 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.

Compact in accordance with 2106.G.2, Quality Compaction.

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

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

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

Design the wall to accommodate the additional loading if a fence is required along the top of the wall.

Step the footing when the longitudinal slope of the footing is greater than 10:1.

Locate utilities outside the construction limits of the retaining wall. Install any utilities needing to be located within the wall area 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.

The contract unit price for "Install Modular Block Retaining Wall" includes the cost of: the structural design of the retaining wall, furnishing and installing the blocks and the appurtenant features of the wall (geotextile, draintile, rock filter, sand or concrete 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.

35. SEWER SYSTEM (Mn/DOT 2503/CEAM 2621)

This work shall consist of furnishing and installing pipe sewers and fitting in accordance with the Plans, CEAM specifications and the applicable MnDOT Standard Specifications and the following:

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 shown in the Contract. Unless otherwise shown, 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, 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.

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)

   Cast iron pipe may not be used instead 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:

   All ductile iron pipe 4" – 16" with a bury depth less than 30-feet shall be Class 52 based on DIPRA calculations using a minimum trench type 4. If a different trench type or greater bury depth is used please reference special provisions or drawing sheets for pipe class requirements.

   All ductile iron pipe shall be coated with a layer of arc-sprayed zinc per ISO 8179. The mass of the zinc shall be a minimum of 200g/m^2 with a finishing layer of asphaltic coating.

   Ductile iron pipe shall be lined with cement mortar lining per ANSI/AWWA 21.4/C104 unless called out per special revisions or drawing sheets.

   Manufacture all ductile iron pipe in the USA.

   All metal pipe shall be covered with a V-Bio polyethylene encasement conforming to the latest revisions of AWWA/ANSI C105/21.05 to include anti-microbial biocide and VCI on inside surface of 3-layer co-extruded linear low-density polyethylene fused into a single layer no less than 8-mils in thickness. tube with a minimum thickness of 8 mils.

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

   All pipe joints shall be an approved slip or mechanical joint with rubber gaskets. Gaskets shall be molded styrene butadiene rubber (SBR), or the rubber type called out per special provisions or plan sheets. Each gasket shall be designed specifically for the joint used.

2. Reinforced Concrete Pipe and Fittings (2621.2A3)

   General

   Reinforced concrete pipe may be used for all storm sewer pipe 12" in diameter or larger.

   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.

When stubbing a pipe for a future connection, seal the stub using a RCP pipe plug. Do not use bulkheads in these locations.

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.

Jointing

Reinforced concrete pipe shall have neoprene or Engineer preapproved 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 three feet in length.

3. Corrugated Steel Pipe and Fittings (2621.2A4)

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 asphaltic mastic sealer; "O"-ring gasket secured by coupling bands; or Engineer preapproved equal.

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

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 accordance 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 before construction. A minimum layer of 12 inches of embedment material shall completely surround the PVC pipe. Select material shall be used for backfill to at least 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. Fiberglass Reinforced Pipe

Fiberglass reinforced pipe may be used for sanitary sewer 12" in diameter or larger.

The pipe shall be manufactured with polyester resin systems with a proven history of performance in this application. The historical data shall have been acquired from a composite material of similar construction and composition as the proposed product.

The reinforcing glass fibers used to manufacture the components shall be of highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.

Sand used to manufacture the pipe and fittings shall be minimum ninety eight percent (98%) silica sand with a maximum moisture content of two tenths of a percent (0.2%).

Pipe resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally affect the performance of the products.

Gaskets shall meet ASTM F477 and be supplied by qualified gasket manufacturers and be suitable for the service intended.

Manufacture pipe by the centrifugal casting process to result in a dense, nonporous, corrosion-resistant, consistent composite structure. The interior surface of the pipes exposed to sewer flow shall provide crack resistance and abrasion resistance. The exterior surface of the pipes shall be comprised of a sand and resin layer which provides UV protection to the exterior. Pipes shall be Type 1, Liner 2, Grade 3 per ASTM D3262

Unless otherwise specified, the pipe shall be field connected with fiberglass sleeve couplings that utilize elastomeric sealing gaskets made of EPDM rubber compound to provide watertight joints meeting the requirements of ASTM D4161. Joints at tie-ins, when needed, may utilize fiberglass, gasket-sealed closure couplings.

Fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced overlays. Properly protected standard ductile iron, fusion-bonded epoxy-coated steel and stainless steel fittings are allowed unless otherwise stated in the Special Provisions.

The actual outside diameter (eighteen inch (18") to forty eight inch (48")) of the pipes shall be in accordance with ASTM D3262. Other pipe diameter OD's shall be per manufacturer's literature.

Pipe shall be supplied in nominal lengths of twenty feet (20') except where noted otherwise on the drawings. Actual laying length shall be nominal ±1/4 inches. At least ninety percent (90%) of the total footage of each size and class of pipe, excluding special order lengths, shall be furnished in nominal length sections.

The minimum wall thickness shall be the stated design thickness.

Pipe ends shall be square to the longitudinal pipe axis with a maximum tolerance of one-eighth inch (1/8").

Pipe shall be manufactured and tested in accordance with ASTM D3262.

Coupling joints shall meet the requirements of ASTM D4161.

Minimum pipe stiffness shall be in accordance with manufacturer's recommendation for appropriate installation method.

Pipe shall be HOBAS or Engineer preapproved equal.

6. <u>High Density Polyethylene (HDPE) Pipe and Fittings:</u>

Only use High Density Polyethylene Storm Sewer Pipe 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 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 without debris. Use a joint lubricant supplied by the manufacturer on the basket and bell during assembly. Pipe fittings may be required to fit curvilinear alignments. 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 Water Stop gasket or boot, cast-in-place rubber boot, or Engineer preapproved equal. Where the alignment prevents the use of the above approved watertight methods, Conseal 231 waterstop sealant, or obtain the Engineer's approval for an approved equal.

7. Service Pipe

   The following materials may be used for sewer service pipe:

   - Class 52 Ductile Iron Pipe, with fittings
   - SDR 26 Polyvinyl Chloride – PVX (ASTM D3034), with fittings

8. Tracer Wire for Non-conductive Pipe

   Tracer wire shall conform to the requirements of the most current version of Minnesota Rural Water Association's *Sewer/Water Utility- Trace Wire Specification.* Components of the utility locating system shall be Copperhead SRK-01 or Engineer preapproved equal.

9. Manhole Castings

   The manhole frame shall conform to the requirements of Mn/DOT Standard Frame 700-7 (Neenah 1733-2007) or Engineer preapproved 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 Engineer preapproved 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.

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

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

    Precast manhole joints shall be made water tight with mastic or butyl material or approved "O"-ring gasket at each joint. The mastic or butyl 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 Reinforcement 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.

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 inplace 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. 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 internal chimney seal. Reference Section 13 Internal Manhole Chimney Seal for requirements.

Manholes shall have at least six inches of adjusting rings and a maximum of twelve inches of adjusting rings to finished grade. The barrel sections shall be cast in such a manner that the manhole builds will meet the 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 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.

High Density Polyethylene (HDPE) adjusting rings can be used as an alternate to concrete adjusting rings. However, only formulations and designs for which test data have been submitted to and approved by Mn/DOT and are included on the Mn/DOT Approved Products List will be permitted.

HDPE adjusting rings must be properly sealed as recommended by the manufacturer and approved by the Engineer.

Precast manholes with integral bases shall be set plumb and at grade on at least six (6) inches of sand or foundation material. The details on the Standard Detail Sheet shall apply.

Precast bases shall also be set on at least six (6) 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 at least 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.

The storm sewer covers shall have a center pick-hole conforming to the dimensions of Neenah 1733-0150 or Engineer approved equal. The cover shall not have a lug. The cover shall have "Bloomington Storm Sewer" displayed in one-inch letters.

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.

11. End Sections

    The last three joints of the end section and pipe shall be tied per the detail.

12. Trash Guard

    The trash guard shall have 5/8" vertical galvanized steel rods placed 6" center-to-center. The guard shall be securely attached to the end section. Obtain the Engineer's approval for other methods of constructing the trash guard.

13. Rip Rap

    Individual stones, except those used for chinking, shall be at least 50 pounds each, hand placed to a depth of one (1) foot.

    Filter materials for rip rap shall be in accordance 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 (1) foot in thickness.

14. Internal Manhole Chimney Seal

    Internal Manhole Chimney Seals shall consist of a molded polymer shield I & I Barrier, cut to the height of the manhole chimney section, as manufactured by Strike Products, or an Engineer pre-approved equal conforming to the following requirements.

    The seal shall pass proof-load testing done in accordance with AASHTO Designation M-306 Standard Specification for Drainage Structure Castings. The seal shall be manufactured from medium density polyethylene as defined by ASTM D 1248. The seal shall conform to the requirements of ASTM D 638 test methods, with a minimum 2800 psi tensile strength and elongation at break value of 400%. Sealant is required per manufacturers' instructions. Ramneck and/or grout may be used between rings. Dry rings will not be accepted.

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, compact and reshape the existing backfill material to the required section. A cross-section with survey shots

taken at the property line-centerline-property line average cannot be more than 0.2 feet or the Developer will need to regrade the street width.

Remove any excess material from the compacted utilities trench 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 before construction. Without these terms in writing, the Contractor shall have full responsibility of 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 prior agreement states otherwise.

After backfill has been shaped and compacted, 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, at least six (6) inches of insulation shall be installed.

1. Pipe Laying Operations (2621.3A2)

   Adjustment of the Plan grade or alignment will not be permitted without written consent of the Engineer. The Contractor shall obtain complete accurate measurements to all relocated facilities. These measurements shall be recorded at the time of installation on a document or record plan that shall be kept on site. Upon completion of all subsurface work, the Contractor shall furnish this to the Engineer for as-built plans for the project. The Contractor shall accurately survey and if necessary excavate and expose backfilled facilities to obtain any missing information necessary to complete as-built plans.

   Check the 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

   Check the horizontal and vertical alignment of the existing utilities when making a connection to an existing stub or manhole 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 watertight 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. Seal pipe entrances to manholes 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 A240. The adapter/coupling shall be "Flex-Seal Adjustable Repair Couplings" manufactured by Mission Rubber Company, "Strongback RC Series" manufactured by Fernco or Engineer preapproved 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. Internal Manhole Chimney Seal Installation

Install an Internal Manhole Chimney Seal on all sanitary manholes in accordance with the manufacturer's instructions and the standard construction details.

Cut and remove the pavement two feet (2') beyond the casting to ensure proper compaction of the subgrade and pavement structure. Note that removals, sawing, aggregate base, bituminous patching etc. around the adjusted facilities is incidental to this item.

Submit the manufacturer's literature, shop drawings, installation instructions, and other items in accordance with the provisions of the standard specifications. Submit a notarized certification from the manhole chimney seal manufacturer stating that their product meets the performance and material requirements of this specification.

4. HDPE Pipe Installation/Backfilling

The minimum trench width shall be 1.25*Outside Diameter + 12" or at least 16" plus the Outside Diameter, whichever is greater.

Excavate areas of unstable trench bottom to a depth determined by the Engineer and replace with suitable foundation material to meet the compaction requirements.

Bedding thickness shall be at least 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.

Place and evenly compact the material in the haunch/pipe zone on both sides of the pipe, from the top of 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 at least 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 at least 90% Standard Proctor Density, unless otherwise noted.

Sewer Service Installation (2621.3C)

Generally, use a four (4) or six (6) inch tee in the main line on PVC mains all molded wyes, T-wyes. Tees and service branches must be at least 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 SDR 26 Sewer Fittings or Engineer preapproved equivalent.

Keep house connections as deep as required to serve the property, with a minimum depth of ten feet in the street and at least nine (9) feet at the curb line.

Expose the existing main sufficiently to facilitate the making of a new service tap. Supply all necessary materials, as shown in the details in the plan. Paid for as "Sanitary Sewer Connection" unless otherwise noted in the contract documents.

Mark all services as designated in Standard Utilities Specifications as published by the City Engineers Association of Minnesota. Extend the service markers to the invert at the terminus of the service and write the invert elevation on the service marker.

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 (2621.3E1)

   Perform these tests with suitable equipment specifically designed for air testing sewers.

2. Inspection and Flushing

Before final acceptance of each section of the sewer line, clean the sewer and remove and properly dispose of debris by appropriate method and/or perform video inspection. Clean larger sewers by other appropriate methods. Prevent all dirt and debris from entering the existing sewer system by means of watertight plugs or suitable methods.

Upon completion of the Contract, the Engineer shall carefully inspect all sewers and appurtenances. Remove and replace any unsatisfactory work in a proper manner. Leave the invert of the sewer smooth, clean, and without any obstructions throughout the entire line. This applies to both sanitary and storm sewers.

3. Deflection Test (2621.3F)

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

The Contractor shall supply the mandrel for deflection testing.

Construct the mandrel with an outside dimension tolerance of 0.010" with maximum bar spacing of 40 degrees around the circumference. Construct the mandrel of 1/2" rod or better. Stamp each mandrel 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

Storm Sewer Testing

At the discretion of the Engineer, conduct post installation testing on at least ten percent (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. Pipes 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, perform post installation testing 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.

Pipeline Backfilling Operation

Compact the backfill of all utilities 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 does not 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.

Restoration Of Surface Improvement

Confine the work on the Project to the specified construction limits established by the Engineer. In all instances, restore any disturbed area outside the construction limits at the expense of the Contractor.

Replace that portion of the existing roadway and curb and gutter that is disturbed by this Contract in accordance with these specifications. Place materials on thoroughly compacted subgrade. Cut the existing pavement section back two feet beyond the edge of the trench.

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. Pipe plugs will be paid for at the Contract unit price per linear each.

   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 (2621.4B, 2421.4C)

   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. 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 and Rip Rap

   The contract unit price bid for flared end sections of each size includes 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 price bid per ton of 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 the 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 does not 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 Internal Manhole Chimney Seal

   All costs for furnishing and installing the seal shall be included in the unit price bid for "Internal Manhole Chimney Seal".

36. WATER SYSTEM (Mn/DOT 2504/CEAM 2611)

Materials (2611.2)

1. Ductile Iron Pipe and Fittings (2611.2A1)
   Ductile iron pipe shall conform to the requirements of ANSI/AWWA Specification A-21.51/C151.

   The minimum design thickness of ductile iron pipe shall be Class 52 for 4" – 42" in bury depths less than 16-feet based on DIPRA calculations using a minimum type 4 trench(ANSI/AWWA C150/A21.50, ANSI/AWWA C151/A21.51). If a different trench type or greater bury depth is used please reference special provisions or drawing sheets for pipe class requirements. Ductile iron pipe class and minimum thickness as follows:

	Depth of Cover Over Water Pipe					
Pipe Size	0' to 8.5'		8.5' to 12'		12' to 16'	
	Thickness	Pipe Class	Thickness	Pipe Class	Thickness	Pipe Class
4"	.29"	CL 52	.29"	CL 52	.29"	CL 52
6"	.31"	CL 52	.31"	CL 52	.31"	CL 52
8"	.33"	CL 52	.33"	CL 52	.33"	CL 52
12"	.37"	CL 52	.37"	CL 52	.37"	CL 52
16"	.40"	CL 52	.40"	CL 52	.40"	CL 52
20"	.42"	CL 52	.42"	CL 52	.42"	CL 52
24"	.44"	CL 52	.44"	CL 52	.44"	CL 52

30”	**.47”**	**CL 52**	**.47”**	**CL 52**	**.47”**	**CL 52**
36”	**.53”**	**CL 52**	**.53”**	**CL 52**	**.53”**	**CL 52**
42”	**.59”**	**CL 52**	**0.59**	**CL 52**	**.59”**	**CL 52**

All ductile iron pipe shall be coated with a layer of arc-sprayed zinc per ISO 8179. The mass of the zinc shall be a minimum of 200g/m^2 with a finishing layer of asphaltic coating.

Ductile iron pipe shall be lined with cement mortar lining per ANSI/AWWA 21.4/C104.

Manufacture all ductile iron pipe in the USA.

All metal pipe shall be covered with a V-Bio polyethylene encasement conforming to the latest revisions of AWWA/ANSI C105/21.05 to include anti-microbial biocide and VCI on inside surface of 3-layer co-extruded linear low-density polyethylene fused into a single layer no less than 8-mils in thickness.

All mechanical joint bolts and nuts shall be made domestically of a minimum 304 stainless steel.

Either standard body fittings (AWWA C110/A21.10) or short body fittings (AWWA C153/A21.53) are approved. Manufacture all fittings in the USA.

Watermain fittings will be measured by the pound without joint accessories. The standard weight of watermain fittings, for payment purposes, shall be as published in AWWA C-153 (compact fittings), as follows:

Bends, Caps, Plugs, & Sleeves							
Pipe Size	**Fitting Weights, lbs. (AWWA C153)**						
	Bends – MJ x MJ, (degrees)				**Caps MJ x MJ**	**Plugs MJ x MJ**	**Sleeves[1] MJ x MJ**
	90	**45**	**22.5**	**11.25**			
4”	**25**	**22**	**18**	**16**	**9**	**10**	**17**
6”	**39**	**32**	**31**	**30**	**15**	**16**	**28**
8”	**57**	**46**	**46**	**42**	**22**	**26**	**38**
10”	**89**	**70**	**64**	**58**	**32**	**36**	**49**
12”	**108**	**86**	**80**	**67**	**42**	**46**	**56**
14”	**210**	**160**	**136**	**93**	**66**	**75**	**111**
16”	**264**	**202**	**172**	**148**	**92**	**95**	**123**
18”	**335**	**250**	**255**	**205**	**114**	**121**	**160**
20”	**400**	**305**	**310**	**245**	**125**	**135**	**195**
24”	**565**	**405**	**412**	**315**	**166**	**175**	**255**
30”	**930**	**780**	**665**	**600**	**345**	**355**	**500**
36”	**1,450**	**1,135**	**960**	**820**	**628**	**688**	**725**

Bends, Caps, Plugs, & Sleeves							
Pipe Size	Fitting Weights, lbs. (AWWA C153)						
	Bends – MJ x MJ, (degrees)				Caps MJ x MJ	Plugs MJ x MJ	Sleeves[1] MJ x MJ
	90	45	22.5	11.25			
[1] Weights are based on the use of short sleeves.							

Tees, Crosses & Reducers									
Run	Branch	Fitting Weights, lbs.			Run	Branch	Fitting Weights, lbs.		
		Tee	Cross	Reducers			Tee	Cross	Reducers
Large	Small	MJ x MJ	MJ x MJ	MJ x MJ	Large	Small	MJ x MJ	MJ x MJ	MJ x MJ
4	4	32	40	-	18	10	315	-	195
6	4	46	62	24		14	380	-	190
	6	56	75	-		16	405	-	195
8	4	60	84	32		18	435	-	-
	6	72	98	36	20	6	315	-	-
	8	86	105	-		8	345	-	-
10	4	78	98	46		10	370	-	220
	6	90	121	47		12	395	-	205
	8	105	135	50		14	440	-	200
	10	120	145	-		16	465	-	200
12	4	94	119	58		18	505	-	225
	6	110	138	58		20	535	-	-
	8	125	149	57	24	6	415	-	-
	10	140	187	61		8	445	-	-
	12	160	213	-		10	470	-	-
14	4	172	-	-		12	500	-	305
	6	182	210	100		14	550	-	310
	8	206	231	100		16	580	-	320
	10	228	255	100		18	625	-	305
	12	234	269	100		20	660	-	300
	14	280	299	-		24	720	-	-
16	6	228	250	124	30	8	739	-	-
	8	248	264	124		12	830	-	-
	10	264	286	124		16	959	-	633

Tees, Crosses & Reducers									
Run	Branch	Fitting Weights, lbs.			Run	Branch	Fitting Weights, lbs.		
		Tee	Cross	Reducers			Tee	Cross	Reducers
Large	Small	MJ x MJ	MJ x MJ	MJ x MJ	Large	Small	MJ x MJ	MJ x MJ	MJ x MJ
	12	280	312	112		20	995	-	658
	14	316	-	140		24	1,060	-	478
	16	322	385	-		30	1,323	1,840	-
All weights in accordance to AWWA C153									

The weight for fittings not listed in the tables above shall be in accordance with AWWA C153. The weight for fittings not listed in the tables above **or** in AWWA C153 shall be the actual weight of the fitting(s) furnished and installed based on acceptable documentation provided by the Contractor.

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.

Provide electrical conductivity 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, provide a certification showing the materials provided are manufactured to these specifications.

2. Pre-Stressed Concrete Cylinder Pipe And Fittings

Pre-stressed Concrete Cylinder pipe, fittings and specials shall conform to the requirements of AWWA C-301 and C-304 (Pre-stressed Concrete Pressure Pipe, Steel Cylinder Type) for the size, working pressure, external loading, and laying condition.

Furnish plans and specifications to the pipe manufacturer giving such special details and other information as are necessary for manufacture of the pipe, fittings, and specials in accordance with the specific requirements of the project.

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 pipes 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)

Fire hydrants shall meet or exceed ANSI/AWWA C502, latest revision and shall be Certified by NSF to comply with the criteria of NSF/ANSI 61-G. Rated working pressure shall be 250 psig. The production test pressure shall be 500 psig.

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, furnish and install this for no extra compensation. All extensions shall have the ability to be installed without need to shut off the water and limited to one per hydrant. To ensure proper fit and tolerances all extensions shall be manufactured by the original hydrant manufacturer. When required by the Engineer, 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, plug the drain holes and mark the hydrant with a metal tag to shown the requirement to pump the hydrant after use.

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

Make outlet nipples of bronze, securely fasten into the nozzle section. Provide hose and steamer caps with rubber gaskets, and supply without chains.

Equip hydrants with three hose nozzles / connections as follows:

- One - factory installed 5 inch Storz pumper nozzle / connector, including a standard nozzle cap with a 1.5 inch pentagon nut and NO rocker lug.
- Two – 2.5 inch hose nozzles / connections (with national standard threads) and standard nozzle caps with 1.5 inch pentagon nuts, and NO rocker lugs.

Hydrants shall open in a counter-clockwise direction with a 1.5 inch 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.

Provide “O”-ring seals to prevent water from reaching the operating mechanism. Lubricate operating mechanism 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.

Paint hydrants with (a catalyst two part bright red polyurethane topcoat & epoxy primer) in the factory and repaint in the field if the coating has been damaged per manufacturers recommendations. The hydrant shoe shall also be constructed of ductile iron and shall be fusion bond epoxy coated inside and out prior to assembly for corrosion resistance.

Hydrants shall be Waterous Classic Pacer WB-67 (including Storz pumper nozzle and pentagon nut cap, two standard nozzle caps and a 16” high break-away section), Mueller Super Centurion 250 Model A-423 (including Storz pumper nozzle and pentagon nut cap, two standard nozzle caps and a 16” high break-away section), or Engineer preapproved equal. Hydrants must have a traffic flange design allowing for quick and economical repair of damage resulting from a vehicle’s impact. Hydrants shall be supplied with a single piece barrel/standpipe section and operating rod.

Waterous Pacer Classic Hydrants shall include installation of the manufacturer’s most current anti-chatter brass upper valve washer.

When required in the Plans and Proposal, 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 at least 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 a minimum grade 304 stainless steel.

- Gate Valves and Boxes

  Valve boxes shall be asphaltic coated 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 6860 (utilizing a standard valve box bell-#6 and a cover bearing the word “Water” on top), EJ 3-Piece 8560 Series (#6 Base Set) 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. Center the bell over the gate valve with a bell to gate valve adapter manufactured by Adaptor, Inc., Power Seal or Engineer preapproved equal.

  When required by the Engineer, 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.

- Resilient Seat Valves

  All gate valves up to and including 12" in diameter shall be resilient seat valves. All gate valves shall be rated for 250 psig cold water working pressure, with zero leakage. The rating shall be indelibly marked on the casting. All ferrous components of the valve shall be constructed of ductile iron. All valves shall be cast with the words "DI" or "Ductile Iron". The wrench nut shall be constructed of ductile iron, shall have four flats at stem connection to insure even transfer of torque to the stem.

  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 three (3) O-ring seals. (Fusion bonding epoxy coating per AWWA C550)

  Manufacture the resilient seat valves to meet all applicable requirements of AWWA C515.

  All body to body bolting material shall be a minimum type 304 SS, develop the physical strength characteristics of ASTM A307 and shall have the dimensional requirements of AWWA C-515 and ANSI 18.2.1. All body to bonnet bolting shall be of the same size and length. All bolts shall have square or hexagonal heads. Metric bolts, socket head cap screws, or recessed allen-head type bolts filled with hot-melt type wax will not be allowed.

  The resilient seat valves shall be, American, Clow, or Mueller (or Engineer preapproved equal).

- Butterfly Valves and Boxes (2611.2C3)

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

  Manufacture butterfly valves in accordance with all applicable requirements of AWWA C-504 for 150 psi working pressure minimum, together with such supplementary requirements as may be covered in the Plans, Specification, and Special Provisions or the provisions hereof. The butterfly valves 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. Equip the butterfly valves with a two-inch square operating nut opening counterclockwise. Design the butterfly valves 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.

Valve boxes shall be Tyler Series 6860 (utilizing a standard valve box bell - #6 and a cover bearing the word "Water" on top), EJ 3-Piece 8560 Series (#6 Base Set) or Engineer preapproved equal. Valves and boxes shall be considered integral units. Valve boxes shall have at least 6" adjustment above and below specified depth of pipe. Center the bell over the butterfly valve operator with a bell to butterfly valve adapter manufactured by Adaptor, Inc., Power Seal or Engineer preapproved equal.

5. Water Service Pipe and Fittings (2611.2D)

- 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 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 1.

- 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", 1 1/2", and 2" services, corporation stops shall be Mueller Company B-25000; Ford FB600; A.Y. McDonald 4701B; or Engineer preapproved equal.

- Curb Stops Valve Boxes and Lids

  Curb stops shall be Minneapolis pattern ball style valves, with flared copper ends, and they shall not include drains (or stop and waste valves). Curb stops shall have a 90 degree on/off operating head. Curb stop valves shall be Mueller Company B-25154; Ford B22-333M, B22-444M, B22-666M, B22-777M; A.Y. McDonald 76104; or Engineer preapproved equal. Curb stops shall include reducing nuts or adapters to transition down to a lesser size pipe on one end.

  ¾" and 1" curb stop boxes shall be a foot piece bottom and shall include brass support ring with top section, and a two-inch stack adjustable up or down 6" from 8'-0" of cover.

  1 ½" and 2" Curb stop boxes shall be a foot piece bottom and shall include a Minneapolis Valve Support Bracket – 2" Tap, with top section, and two-inch stack adjustable up or down 6" from 8'-0" of cover.

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

- Tapping Sleeves

  Tapping sleeves and bolts shall be a minimum 304 stainless steel, not including the flanged outlet for connection to the tapping valve which may be a minimum 304 stainless steel or ductile iron with flexi-coat epoxy coating. The tapping sleeves shall be PowerSeal 3480MJ-SS, or Engineer preapproved equal. No test plug will be allowed.

- Water Service Meter Manholes

  Where a water service meter is to be located exterior to a building, the meter shall be set in precast manhole structure and shall be protected from freezing as shown in the Water Service Meter Manhole detail. The manhole shall be open to drain to a crushed rock base and shall have a ring casing and cover suitable for HS-20 traffic loads. The meter and meter setter are to be purchased by the Contractor and furnished by the City. The meter and radio transmitter shall be installed by the City after the Water Service Meter Manhole is constructed and approved, per the City's detail and the meter setter is installed by the Contractor.

6. Polyethylene Encasement (2611.2E)

   All metal pipe shall be covered with a V-Bio polyethylene encasement conforming to the latest revisions of AWWA/ANSI C105/21.05 to include anti-microbial biocide and VCI on inside surface of 3-layer co-extruded linear low-density polyethylene fused into a single layer no less than 8-mils in thickness. tube with a minimum thickness of 8 mils.

   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. Cut an "X" above the weep hole of the hydrant before the construction of the drainage pit and backfill. Contractor must obtain the Engineer's approval for any proposed modification.

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 and appurtenances shall be installed at the locations and depths shown on the plans. Any deviations shall be approved by the Engineer prior to installation and the Contractor shall obtain complete accurate measurements to all relocated facilities. These measurements shall be recorded at the time of installation on a document or record plan that shall be kept on site. Upon completion of all subsurface work, the Contractor shall furnish this to the Engineer for as-built plans for the project. The Contractor shall accurately survey and if necessary, excavate and expose backfilled facilities to obtain any missing information necessary to complete as-built plans.

   A. Horizontal and Vertical Separation from Sewers

      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.

In locations where local conditions prevent the required separation indicated above (due to the presence of rock, buildings, other significant obstructions), the watermain may be laid closer to gravity sewer if one (1) of the following conditions is met:

- The bottom of the watermain is laid at least eighteen inches (18") above the top of the sewer on a separate shelf; or

- The sewer is constructed of materials and with joints that are equivalent to watermain standards of construction and is pressure tested to assure water tightness prior to backfilling.

B. Crossing Sewers

There shall be at least 18" of vertical separation between watermains and any storm or sanitary sewer line crossings, with preference that the watermain cross above the sewer, wherever possible. The crossing shall be arranged that the sewer joints will be equidistant and as far as possible from the watermain joints. Where a watermain crosses under a sewer, adequate structural support (saddles) shall be provided for the sewer to maintain line and grade.

If conditions prevent the 18" of vertical separation the following would apply:

- Construct the sewer of materials equal to watermain standards, or

- Either the watermain or sewer may be encased in a watertight carrier pipe that extends 10 feet on both sides of the crossing, measured perpendicular to the watermain.

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

Proceed with fine grading, to the bottom of the barrel, ahead of the pipe laying; and should any over-excavating 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.

Securely tape and V-Bio poly-wrap all ductile iron pipe used in this Project in accordance with AWWA C-105 and the requirements of this specification. Wrap the hydrant barrels to the ground surface and to the valves operating nut.

2. Restraining of Pipe (2611.3A4)

Restrain all watermain and other pressure pipe in accordance with the current edition of Ductile Iron Pipe Research Association (DIPRA) *Thrust Restraint Design for Ductile Iron Pipe*. Joint restraints shall be equal to EBBA Iron, Inc. Mega-Lug series 1100, ROMAC Industries, Inc. ROMAGRIP, or Engineer preapproved equal. Gasket restraints shall be high visibility restraint gaskets such as Amarillo FastGrip or Barracuda Restraint Gasket or Engineer preapproved equal. The restrained length must meet or exceed the DIPRA design, and all products shall be manufactured in the USA.

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 approved joint or gasket restraints for full restrained length. This may be required so some sections can be shut down and the adjacent watermain can stay active.

All new tees, plugs, reducers, bends and appurtenances for watermain 12" in diameter and greater shall be restrained through the required length with approved joint or gasket restraints. Concrete thrust blocks at tees, bends, and hydrants are required only on watermain less than 12" in diameter.

Concrete thrust blocks (for watermain less than 12" diameter), Joint restraints, gasket restraints, thrust blocks, 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, or DIPRA Thrust Restraint Design calculations for the actual pipe laying conditions. The Engineer may field change the required length of restrained joints depending on actual conditions.

	Recommended Restrained 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**
12"	**115**	**56**	**23**	**11**	**6**
16"	**150**	**73**	**30**	**15**	**7**
20"	**185**	**89**	**37**	**18**	**9**
24"	**220**	**106**	**44**	**21**	**10**

* Based on Poly-wrapped, Sand-Silt Soil, Type 3 Trench, 8' cover, 250psi pressure, SF = 2.0)

		Recommended Restrained 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. Shorter running lengths will require longer restraint lengths in accordance with DIPRA thrust restraint.

3. Water Service Installation (2611.3C)

Locate residential water services 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.

Install copper service line 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. Permitted compression couplings include Ranger NL Service fitting 74758-11 or approved equal.

Install a one-foot length of copper service line on the outlet side of the curb stop as part of the service installation. Pinch or peen the stub 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).

4. Connection To Existing Facilities

Forty-eight hours before connecting to existing watermains, notify the Project Inspector and the Utilities Division. Provide any residents who will be affected by the shutting off of water 48 hour written advance notice as to when and for how long service will be interrupted; the maximum service interruption time shall be eight (8) hours unless otherwise approved by the Engineer.

Before 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, flush the new main to prevent any contamination of the existing facilities. Scrub new fittings or pipes with a chlorine solution of at least 50 ppm before connection to existing facilities. Operate all existing valves under the supervision and approval of the Engineer.

Take every precaution necessary to prevent dirt or debris from entering the main.

Make watermain connections under pressure.

When new copper water services or ductile watermains need to be tapped into an existing, in service watermain, 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 City will 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.

The Contractor will be responsible to give 48 hours notice to the Bloomington Utility Division as to the desired time of the wet tap. The Contractor will also be responsible to excavate and backfill at the location of the tap.

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)

Check the new hydrants installed on the Project with the Inspector in attendance, to be sure weep holes are open or unplugged, depending on the water table elevation, and to determine that moving parts have been properly greased.

Support hydrants and auxiliary valves upon a precast concrete base 18" square and at least 5" thick. Securely brace the hydrant against the far end of the trench by concrete blocking, poured in place. No timber blocking will be allowed. Use concrete thrust blocks on all hydrants, whether or not rodding is involved.

Excavate a drainage pit of at least one cubic yard below and around the hydrant base. Fill the drainage pit with compacted coarse rock or crushed stone (e.g. 1 ½" river rock) to a level of six inches above the drain outlet. (Crushed limestone or BSB shall not be used for the construction of the drainage pit). Place two layers of tar paper, 8 mil poly, or other material approved by the Engineer, over the top of the rock to prevent backfill material from entering the voids in the drainage pit. Plug the outlet drain hole on hydrants located in areas where groundwater is higher than the drain outlet, and equip with a metal tag stating, "Pump After Use".

Maintain the position of the hydrants and do not displace out of plumb during backfilling. Excavate, reset, rebrace and rebackfill any hydrant out of plumb. Expose the breakaway of the hydrant above grade.

Locate the tops of guard posts for close-coupled traffic model hydrants 6" below the operating nut of the hydrant.

Testing

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)

- General

  Disinfect and test all mains at no additional compensation as part of this Project. Use stick-on type chlorine tablets. Granulated chlorine will not be allowed. Follow AWWA C651 requirements, along with the Minnesota Department of Health guidelines, for determining chlorine concentration for disinfection.

- Flushing Main

  Prior to flushing, the Contractor shall perform field dechlorination in accordance with ANSI/AWWA C655-18.

  Flush the entire line after the chlorine contact period specified in AWWA C651, Section 4.5, and continue such flushing until the water is without excess chlorine. Flush the entire line, including hydrant leads, branch lines, and dead-end mains.

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

  Notify the Project Inspector before flushing, to review flushing volumes and to witness flushing procedure.

- 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, before 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 Colilert-18 P/A test as a minimum test for the presence of coliform bacteria and E.coli. Sample results will be available 18 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.

- 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)

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

3. Hydrostatic Testing of Watermains (2611.3G)

Test the watermain after all parts of the new water system have been installed, including services and curb stops, but before the services are connected to water customers. Flush the service 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.

Pipeline Backfilling Operations

Compact backfill of all utilities 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.

Restoration of Surface Improvement

Confine work on the Project 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.

Replace that portion of the existing roadway and curb and gutter that is disturbed by this Contract in accordance with the specifications contained elsewhere in this document. Place the materials on thoroughly compacted subgrade. Cut the existing mat back two (2) feet beyond the edge of the trench.

Replacing Existing Watermain

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

Tap all corporation stops under static water pressure.

Maintain safe conditions 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, submit a plan to be approved by the Engineer.

Temporary Water Service During Construction

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 preventers on the outside spigot. Some backflow preventers can be easily removed, others are much more difficult. In either case, the Contractor is responsible to replace any backflow preventers 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. To reduce the chance of damage, the Contractor shall examine the indoor plumbing of an affected property. Instead of removing backflow preventers, 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 preventers or other plumbing appurtenances.

Any plan for temporary service must include the following requirements:

- Water must be serviced 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 on or adjacent to the existing curb and gutter. Each service shall have its own valve. Place the valves on the temporary service within existing public right-of-way. Install temporary mainline valves at least every 600 feet and the Engineer may change this spacing at his/her 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:
    - Flush air out of the temporary service lines,
    - Shut down the existing curb stop at the street,
    - 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.
    - Turn on the temporary water service line and allow time for the Contractor and the Engineer to observe and operate the line 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.

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.

Methods Of Measurement And Payment (2611.4, 2611.5)

1. Close-Coupled Traffic Model Hydrants

   The price of close coupled traffic model hydrants includes 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 pre-stressed concrete cylinder pipe shall be as designated in the Special Provision of the Project.

3. Foundation Material (Coarse Filter Aggregate)

   "Foundation Material" shall meet Mn/DOT 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. "Course 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 does not 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, includes 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" includes 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.

Miscellaneous Watermain Specifications (CEAM 2611)

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

Protect existing sanitary sewer mainlines and service during this work. Repair any damage done by the Contractor's operations to existing facilities to Bloomington's standards at the Contractor's expense.

37. REVISE IRRIGATION SYSTEM (2504.602)

Before construction work begins, 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, restore and revise the system, 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 ft^2. These irrigation systems can be either residential or commercial type systems. 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.

Provide 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, provide as-built drawings for each system to the Engineer.

The contract unit price bid per each for item "(2504.602) Revise Irrigation System" includes the 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%

38. 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, install insulation between the sewer and water pipe. Unless noted on the plan, the insulation shall consist of slabs of two (2) inch thick, rigid extruded polystyrene insulation per Mn/DOT Specification 3760 laid parallel with and adjacent to the watermain, and extend in both directions at least 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.

Furnish the insulation material in panels two (2) inches thick, with a minimum of 2 panels for a minimum 4" total thickness, and place on a smooth level foundation in a staggered manner that will provide joint overlaps a minimum of six (6) inches on the underlying sheets and the edges shall be trim and square. Provide at least two (2) wood skewers per board driven flush with the surface of the material to hold the insulation material in place during the backfill operations.

The placement of the backfill material over the insulation board and compaction thereof shall be accomplished in a manner that will prevent damage to the insulation material. Construction

equipment of any kind shall not operate directly on the insulation board. Replace sections of insulation board damaged by the Contractor's construction operations at the Contractor's expense.

The Contract unit price bid per square yard of water main insulation includes compensation in full for all costs necessary to furnish and install each two (2) inch thick board of insulation including, but not limited to, materials, excavation, labor, backfill and compaction.

39. ADJUSTMENT OF EXISTING STRUCTURES (2506)

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. High Density Polyethylene (HDPE) adjusting rings can be used as an alternate to concrete adjusting rings. However, only formulations and designs for which test data have been submitted to and approved by Mn/DOT and are included on the Mn/DOT Approved Products List will be permitted.

Seal HDPE adjusting rings properly as recommended by the manufacturer and approved by the Engineer.

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.

Construction Requirements

Adjust existing manholes and catch basins to meet the grades by either removing or adding manhole sections or concrete adjusting rings. Set castings on a full bed of mortar. Any adjustment of casting or adjusting rings on sanitary manholes shall require installation of an internal chimney seal.

Protect all manhole inverts 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 the 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.

Set sewer brick or adjusting rings 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, replace all material removed with base material, place and compact in two-inch lifts up to the bottom of the surfacing. Replace bituminous base with bituminous base. Include backfilling with surfacing material in the price bid for adjustment of existing structures.

When the frame or ring casting cannot be adjusted as shown above, or the casting requires more than 12” (total) of adjusting rings, remove the entire top section of the manhole and reconstruct the manhole to the plan elevation before 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 compact in 2” layers.

After completion of the adjustment, immediately remove any mortar, earth, or other debris in the manhole or catch basin and the leave the sewer invert 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 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.

Adjust valve boxes to grade by turning or by replacing the riser section with a different length riser section. No inserts shall be approved.

Adjust all structures within the roadway to final grade before 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 (2506.602)

   “Reconstruct Manhole” shall include the following:

   - Remove and reuse the existing cover/lid and frame/ring casting unless specified otherwise. However, if there is an oversized (32”-38”) cover/lid, salvage as detailed under “REMOVAL OF MISCELLANEOUS STRUCTURES AND EXCESS MATERIALS” in Section 21.
   - Provide a neat and safe storage area. The Contractor is responsible for any damage or theft to the salvaged cover/lid and frame/ring casting at no expense to the City of Bloomington.
   - Removing, adjusting or adding barrel sections, top slab (27” opening), or top cone (27” opening) to fit the manhole’s new height. The Contractor shall note that adding only a 6” adjusting ring will not be considered a “Reconstruct Manhole” and will be paid as “Adjust Frame and Ring Casting”. Adding a 6” to 8” flat top will also not be paid as a “Reconstruct Manhole” unless it is for an oversized casting.
   - Furnish and install adjusting rings to establish the casting to finished grade.
   - Furnish and install concrete mortar at the invert and doghouse 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. Cut and remove the pavement 2' beyond the casting to ensure proper compaction of the subgrade and pavement structure. Note that the removals, sawing, aggregate base, bituminous patching, etc. around adjusted facilities is incidental to this item.

The contract price bid per each for the appropriate manhole diameter shall include all labor, equipment and materials (including the salvaging and reinstalling the existing cover/lid and frame/ring casting, rings, and mortar) required to rebuild the manhole.

2. Reconstruct Catch basin (2506.602)

"Reconstruct CB" shall include the following:

- Remove 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 6"-12" of adjusting rings.
- Remove and reuse the existing casting assembly unless otherwise specified.
- Furnish and install a 1' to 1.5' precast adjusting section for a 2' X 3' rectangular catch basin.
- Furnish and install adjusting rings and mortar to set the casting at the specified grade.
- Furnish and install concrete mortar at the invert and doghouse if it needs repair.

Install no concrete in front of the catch basin other than mortar for grade rings.

The thickness of pavement patching of the area around the excavation shall be as shown on the specific typical section for each street. Cut and remove the pavement 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.

The contract price bid per each for the appropriate catch basin size shall include all labor, equipment and materials required to rebuild the catch basin.

3. Adjust Frame and Ring Casting (2506.502)

Slip-in metal adjusting rings shall not be allowed without approval of the Engineer. The removal of existing slip-in metal adjusting rings shall be considered incidental to Adjust Frame and Ring Casting

"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 Mn/DOT Specification 2506.

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. Do 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. Cut and remove the pavement 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:

- Remove 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 21.
- Remove all existing adjusting rings down to the precast or concrete block structure of the manhole.
- Furnish and install the Manhole Access Reducer, adjusting rings with mortar and new casting assembly. Adjust the casting 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. Cut and remove the pavement 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.

Method of Payment

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

Item	Unit
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

40. 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".

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

General

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

Construct sidewalk ramps where shown on the Plans or as directed by the Engineer. Remove the curb and gutter when required to construct the sidewalk ramp as detailed. Complete each ramp on the existing curb and gutter as soon as possible after curb removal. The sidewalk ramps may be modified by the Engineer to match existing conditions or to avoid obstructions; however the ramp must meet ADA requirements. No additional compensation will be provided for these modifications.

In areas where the existing material beneath the sidewalk is not considered suitable grading material, provide at least 3" of sand beneath the walk. This sand material is incidental to the unit price of the walk.

Saw existing concrete and bituminous driveways at the point where the new work will abut the existing drive.

Do not leave string lines or forms place through driveways at night, or during weekends and holidays or when workers are not present.

Notice of placement of concrete must occur before 2:00 pm on the day before installation to the Project Inspector. 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.

Material and Construction Requirements

Except when otherwise noted in the Special Provisions, 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

Build the curb and gutter to fit any drainage structures, which may be encountered. Normally final adjustment of structures shall be made at the time forms are set. Construct

the transitions from the regular curb and gutter sections as directed by the Engineer. Finish the exposed surface in the same manner as the regular curb and gutter sections. Leave no excess concrete in front of any structures. Pour curb and gutter with full forms on the front; no overpour will be allowed in front of curb and gutter or catchbasins.

2. Joints

Place contraction joints in the sidewalk at five-foot typical intervals and 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 at least 3/4".

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

Place expansion joints in curb and gutter and in sidewalk at the beginning and end of all radii, and align with like joints in adjoining work. Place expansion joints against all existing fixed objects.

3. Placing Concrete

Follow the requirements of ACI 305R for hot weather placement shall and follow the requirements of ACI 306R for cold weather placement. 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, cover the concrete with insulating blanket or polyethylene and a sufficient depth of straw to prevent freezing. Protect the concrete from any falling precipitation.

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

Place No. 4 reinforcing bars 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.

Apply curing compound 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 stamped textures, 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. Reverse this basic design around planting beds in island areas. Isolate the 4" concrete from the adjacent concrete surfaces with 0.5" expansion material. Space the stamping to create equal joints so that the entire width of the concrete surface is covered with the brick texture. Saw cut contraction joins 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.

Use at least 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. Base the pattern on standard brick sizes (2 1/4" x 3 1/4" x 8") with concave or rodded joints. Make texture samples and submit to the Engineer for approval before any work begins.

Designate an area for a test section of at least 50 square feet to construct and approve by the Engineer. Submit the texture of the design patterns for approval before any test sections are attempted. Give the Engineer 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.

Apply an approved release agent in accordance with the manufacturer's specifications before texturing tools are applied to the concrete surface.

While the concrete is still in its plastic state, apply the tool texture pattern to the surface of the concrete. Tools shall be property 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) place 0.5" flexible expansion material and a 4 inch "reveal" tooled to provide an edge for the stamped pattern. Place this tooled "reveal" around openings for signposts and other small openings without the expansion material.

Cut control joints no later than twelve (12) hours after the concrete has been placed. Remove excess release agent at this time.

5. Color

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 Colony Red - 413, by Solomon Colors or Prizm Walnut P4140 or Chromix Westwood Brown C-27 or Engineer approved equal. The dark gray color shall be L.M. Scofield No. C24 Charcoal or Prizm Gun Metal P9140 Pigments or Bomanite Gunmetal Gray 3B or Engineer preapproved equal. The Engineer shall approve the shade of the color. Show 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.

Deliver concrete to the site in a revolving drum agitator batch truck properly equipped with a device, which will show 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. Add color to the mixture at a rate of seven pounds per bag of cement (approximately 4% mixture). Agitate the batch for an additional 50 revolutions but not more than a total of 150 revolutions on any batch (i.e. no batch reading at the job site may have more than 100 revolutions of agitation before color is added).

Place and screed he concrete to grade, then float using standard practice.

Apply an approved color sealant with at least 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) and Proposed Rights-of-Way Accessibility Guidelines (PROWAG). Conduct this work in accordance with 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, East Jordan Iron Works Truncated Dome Panel or TufTile Detectable Warning Tiles or Engineer preapproved equal in a cast iron natural finish. Bolt the necessary area of the detectable warning plate together or secure per manufacturer's specification to ensure a level seaming between the plates. Place the unit using lifting spring clips and 2x4 lumber or steel bar. Keep concrete 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/detectablewarningsurfaces/detectablewarningsurfaces.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 PROWAG as detailed in the plan. Install all truncated dome systems in strict accordance with the recommendations of the manufacturer.

Grout the installation holes 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 4 Ft 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, backfill the area in front and back of the concrete with suitable material. Limit the amount of concrete in place, but not completely backfilled at any time, to 4000 lineal feet. The backfill material behind the concrete must be approved by the Engineer. Where sod or seed is to be installed, place at least four inches of topsoil. The material on the street side of the curb shall be granular material suitable for base construction. Regrade driveways to a usable condition as soon as the concrete has gained sufficient strength.

8. Completion of Curb and Gutter

Complete all sections of curb and gutter including radii and fill-ins at catch basins within three days after the curb and gutter work has been started on a street. Provide temporary erosion control before the concrete work is backfilled if necessary. This erosion control is considered incidental and no additional compensation will be provided. The method must be approved by the Engineer.

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.

The Contract unit price per square foot for Concrete walk of each thickness includes the cost of labor, materials, excavation not included in roadway excavation quantities, granular base when required, expansion fillers, and application of curing compound.

The contract unit price for each Pedestrian ramps shall includes the cost of the entire area of the ramp (5’4” back from the curb) and 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.

The contract unit price per square foot for colored stamped concrete includes the cost of 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 show color, texture and supervision. Obtain the Engineer's approval for the patterns used to finish concrete medians. No additional compensation will be given regardless of the type of pattern that is chosen.

42. TRAFFIC SIGNS AND DEVICES (2564)

Provide and install Type "C" and Type "D" traffic signs and markers in accordance with the provisions of Mn/DOT 2564 and the following:

Each Type C Sign Panel shall be in accordance with the Standard Sign Drawings of the Mn/DOT Standard Signs Manual.

All bolts shall be 5/16 inch, Grade V Zinc coated. All nuts shall be of the same grade and material as the bolts. No stainless steel bolts or nuts will be permitted.

Sign posts shall be galvanized in accordance with Mn/DOT 3401 and have a mass of 3.0 lbs/ft.

The 14th paragraph of Mn/DOT 2564.2F is modified to read:

> Provide reflective sheeting meeting the requirements of High Performance Diamond Grade, DG3, as shown on the MnDOT approved Product List, for the following applications:
>
> 1. Sign legend material for sign panels for sign panels with brown sheeting
> 2. Delineators and marks, and
> 3. Colors other than yellow on warning signs.

Mn/DOT Specification 2564.3H2 is hereby deleted. Warning stickers will not be required on the signs.

Furnish and install both the galvanized square tube sign post and insert in accordance with the Mn/DOT approved products list when the sign is installed in concrete. Square tubing shall be placed one (1) inch above the concrete surface and leveled as shown in the details.

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 before 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 before written approval.

The contract unit price per square foot of each Type C sign panel includes the cost of labor and materials.

43. PLANT INSTALLATION AND ESTABLISHMENT

Materials

Use Type 6 Mulch in all tree plantings and conform to MnDOT Specification 3882. Furnish representative samples of the mulch for approval by the Engineer before placement of material.

All plant material shall conform to MnDOT Specification 2571.

Construction Requirements

Trees and shrubs may be planted in backyards upon property owners request if, in the opinion of the Engineer, the Contractor has adequate equipment access to the desired location for planting.

Mulch placement associated with tree installation must maintain a depth of 3 inches at all times and upon final acceptance. To protect against insects and other pests, mulch should not be mounded against base of tree or shrub. Replacement mulch shall be required to provide the minimum mulch depth or when the Contractor's operations have contaminated the mulch with soil.

Method of Payment

Type 6 Mulch for all tree placement shall be considered incidental to the placement of the tree. The cost to add or replace mulch, if deemed unacceptable or does not meet the requirements of mulch placement, will also be considered incidental to the placement of the tree.

Fabric placed in planting beds under both Type 6 Mulch and Type 9 Mulch will be considered incidental to the mulch item, unless otherwise included as an item in the Contract.

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.

44. ESTABLISHING VEGETATION AND CONTROLLING EROSION (2575)

Materials

Topsoil shall meet the requirements of MnDOT Specification 3877 for Loam 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 is required from the Contractor before delivery of any topsoil and shall include an analysis of soil nutrient levels as specified in MnDOT 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 (P205)(lbs./acre), exchangeable

Potassium (K20)(lbs./acre) and soluble salts (M hos). Imported topsoil not meeting pH requirements will not be accepted.

Sod shall conform to MnDOT Specification 3878 (Type A-Lawn). Furnish representative samples of the sod for approval by the Engineer before cutting for delivery.

Construction Requirements

Establishing vegetation shall be performed following the methods outlined in the current version of the Mn/DOT Seeding Manual, except where noted below. Soil Preparation:

The Contractor may be requested to submit restoration plans at the start of each project area per the request of the Engineer.

These soil preparation requirements apply to all sod and seeding methods.

Prior to the placement of sod, dry-seed or hydroseed, the site shall be free of excessive weed coverage. If excessive weeds coverage is present, the contractor shall mow vegetation to a height of three inches, wait a week and then treat with an approved herbicide. Once the recommended wait period has elapsed after herbicide application, seed bed preparation should be performed and sod or seed shall be placed within 24 hours.

Soil bed preparation shall consist of the contractor applying fertilizer as recommended in the soil testing report and then tilling existing soil, or newly added topsoil that has become compacted, to a depth of 3 inches. Tilled soil or newly added top soil shall be hand raked, harrowed or cultipacked until the soil surface is smooth, even and without lumps or irregularities.

Turfgrass/Sod:

The work shall include the replacing of all sod that has been disturbed or uprooted by other phases of the Contract.

Prior to placement of sod, cut slopes uniformly, such that the finished sodded slope, including the placement of new topsoil, shall conform to the designated section.

Place all sod and seed on at least four inches of topsoil regardless of the previous condition of the lawn.

Clean topsoil remaining on any impervious surfaces immediately following the sodding operation.

Use full width rolls of sod wherever possible. Place no sod pieces that are less than 1.5’ wide or 2.5’ long. The Engineer, at their discretion, may reject a sodded area for the use of too many small pieces.

Level the new sod 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.

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 the watering of areas to be sodded before sod placement.

MnDOT 2575.3K1 shall be deleted and replaced with the following:

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.

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. Remove the leftover sod and topsoil material 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.

Seeding A and B:

Seeding A and B are used for seeding areas where general mixes (25-xxx) are identified on the plans. Upon completion of seeding, all areas shall be covered, in a separate application, with erosion control products as follows. Items to be included in Seeding A and B are as follows: seed (25-xxx), fertilizer, seeding, blanket/mulching material, and maintenance (no additional compensation will be paid for these individual items unless otherwise specified).

Seeding A: seeding on slopes 3:1 or flatter, provide a Bonded Fiber Matrix hydraulic erosion control product in as per 2575.3E.2.d. For larger sites, straw mulch is acceptable as directed by the Engineer. Straw mulch shall be disc anchored as directed by the Engineer.

Seeding B: seeding on slopes steeper than 3:1, provide Category 15 Erosion Control Blanket as per 2575.3G.2.a.

Additional maintenance, including supplemental watering of seeded areas, is required to provide optimal conditions for germination. If turf-grass seed is not established well (11-15 seedlings per sq. inch) within 1 month after placement the contractor shall follow up with interseeding or other approved method within 2 months after initial placement. Prior to interseeding, the site shall be mowed at a height of 4-6 inches. This mowing and interseeding work shall be considered incidental to seeding unless an item has been included for this work.

Seeding C and D:

Seeding C and D are used for seeding areas where native seed mixes (3x-xxx) are identified on the plans. Items to be included in Seeding C and D are as follows: seed (3x-xxx), fertilizer, seeding, blanket/mulching material, and maintenance (no additional compensation will be paid for these individual items unless otherwise specified).

Prior to seeding with native species, the site should be free from noxious weeds. Soils should not be compacted but the upper most layer of soil should be flattened and firm to prevent native seed from being planted too deep. Place native seed with a seed drill, a drop type seeder or a hydro seeder at the adjusted bulk application rate of each mixture. Use of a cyclone seeder or spinner are allowed only if areas are less than an acre. Place larger seeds and rake or harrow the soil to mix the seed into the upper layer of soil not exceeding one quarter inch in depth. Smaller seeds may be placed on the top of the soil.

A cover crop seed such as oats, winter wheat, annual ryegrass or slender wheatgrass, shall be installed prior to placing the native grasses. Cover crops should be selected based on the season that seeding is to occur. The annual rye grass provides good cover in the early spring and can be seeded when dormant. Oats should be used in the late spring and summer. Winter wheat should be used during fall plantings.

Seeding C and D shall meet the requirements of MnDOT Specification 2575.3B. Apply the seed at the rate of 75 pounds per acre or as noted in the Special Provisions.

Upon approval of seeding by Engineer, all areas shall be covered, in a separate application, with erosion control products as follows.

Seeding C: seeding on slopes 3:1 or flatter, provide a Bonded Fiber Matrix hydraulic erosion control product in as per 2575.3E.2.d. For larger sites, straw mulch is acceptable as directed by the Engineer. Straw mulch shall be disc anchored as directed by the Engineer.

Seeding D: seeding on slopes steeper than 3:1, provide Category 15 Erosion Control Blanket as per 2575.3G.2.a.

Maintenance of Seeding C and D areas is required for two growing seasons. Weed removal and/or mowing shall be done approximately 3 times at 1-month intervals in the first growing season after planting, and 2 times at 1-month intervals in the second growing season. This mowing shall be considered incidental to seeding unless an item has been included for this work.

Method of Payment

Turfgrass/sod:

The contract unit price per square yard as measured in place for sodding includes the cost of sod, 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 percent of the contract bid price will be deducted from any moneys due or which may become due the Contractor each square yard of unacceptable sod.

Seeding:

Seeding will be paid at the measured quantity according to type and shall be payment for all labor, equipment, and materials related to soil bed prep, seeding, applying erosion control products, watering, and maintenance as noted. No additional compensation will be paid for these individual items unless otherwise specified.

Upon satisfactory completion of the soil preparation, fertilizing, seeding, and applying erosion control products associated with Seeding, the Engineer may authorize partial payment of moneys as are due for Seeding (A-D), in an amount up to but not exceeding 50 percent of the contract bid price.

For Seeding A and B, if the acceptable germination rate has been achieved within 2 months after placement, the Engineer may authorize additional partial payment of moneys up to but not exceeding 80 percent of the contract bid price. If interseeding is required, the remaining portion of the contract bid price will be held until remedial efforts have been successful. Upon completion of a one-year warranty period, and successful completion of prescribed warranty work, the Engineer shall authorize release of remaining moneys due.

For Seeding C and D, upon completion of each successive year of maintenance, the Engineer may authorize additional partial payment of moneys up to but not exceeding 25 percent of the contract bid price.

45. PERMANENT PAVEMENT MARKINGS (2582)

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.

Place all epoxy pavement markings after at least 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). Install the delineators 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 of 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.

46. MONUMENTS (3667)

Mutually agreed upon terms for removal and replacement of property and control monuments shall be established before 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.

47. MULTI-COMPONENT LIQUID 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 before the marking application.

48. OTHER ITEMS

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