



City of Plymouth

STANDARD SPECIFICATIONS FOR STREET CONSTRUCTION

CITY OF PLYMOUTH, MINNESOTA

MARCH 2023

ENGINEERING DIVISION

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A handwritten signature in black ink, appearing to read 'Chris LaBounty'.

Chris LaBounty, P.E.
Deputy Public Works Director/City Engineer

These specifications are intended for inclusion into the contract documents.
They only address the technical specifications and construction details of the referenced section.

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SECTION 02400
STANDARD DETAIL SPECIFICATIONS
FOR
STREET CONSTRUCTION
CITY OF PLYMOUTH, MINNESOTA USA

MARCH 2023

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02401 SCOPE OF WORK

The work to be done under this contract shall include the furnishing of all labor, materials, tools and equipment to perform the grading, soil stabilization, placement of aggregate base, bituminous surfacing, concrete curb and gutter, sidewalk, trails and all appurtenant construction as shown on the drawings and as specified herein. Water applied for grading and compaction of base material shall be incidental to the placement. **NO CONCRETE WORK OR BITUMINOUS SURFACING SHALL BE PLACED BEFORE APRIL 15 OR AFTER OCTOBER 31.** Bituminous or concrete installation after October 31 must receive approval from the city engineer and if approved, the street warranty period will be extended one additional year for a total of two years. Any bituminous or concrete installed after October 31 that fails any test or inspection shall be completely removed and replaced as directed by the city engineer.

02402 SPECIFICATIONS WHICH APPLY

02403 STREET CONSTRUCTION MATERIALS

All street specifications contained herein, including attached detail drawings, together with the construction plans for the designated project or projects and including current versions of those portions of the following specification, as indicated by paragraph or designation number, shall apply in the Minnesota Department of Transportation (MnDOT) [Standard Specifications for Construction](#), including special provisions and updated, unless otherwise noted.

In the above referenced MnDOT Specifications and special provisions, the word state shall also mean the City of Plymouth, Hennepin County, Minnesota. Commissioner of Highways is to read City Engineer or Designee, City of Plymouth, 3400 Plymouth Blvd, Plymouth, Minnesota 55447.

02403.1 SELECT GRANULAR BORROW - Materials

Select granular borrow shall meet the requirements of MnDOT [3149.2B2](#). Select granular shall be virgin material, free of bituminous and concrete, and be free draining in nature. The contractor shall provide certification of the materials being used and will be required to perform field sampling for gradation test of any bedding materials used as required by the city engineer. Copies of test results shall be submitted to the city in a timely manner. The source of supply and quality of the material is subject to approval by the city engineer or designee, in accordance with MnDOT Specifications [1601](#) and [1603](#).

02403.2 GEOTEXTILE FABRIC (MnDOT 3733.1 Type V) - Materials

Geotextile shall be a woven, nonwoven, or knit fabric of polymeric filaments or yarns such as polypropylene, polyethylene, polyester, or polyamide formed into a stable network such that the filaments/yarns retain their relative position to each other. Knit fabric will only be allowed for use as perforated pipe wrap. The geotextile shall be inert to commonly encountered chemicals and shall be free of any chemical treatment or coating that might significantly reduce porosity or permeability. Geotextile shall be uniform in texture, thickness, and appearance, and be free of defects, flaws or tears that would significantly alter its strength or filtering properties. All authorized repairs shall be completed to the satisfaction of the city engineer or designee. All rolls of geotextile or geotextile-wrapped perforated pipe shall be delivered to the project with an opaque plastic covering to prevent degradation due to ultraviolet rays of the sun or contamination with mud, dirt, dust, or debris. Rolled geotextile shall be identified by manufacturer, product name, and roll number, both on the outside wrap and inside the core, as well as other requirements of ASTM D4873-02 (Identification, Storage, and Handling). Geotextile shall not be

left exposed to the sun for a period more than 7 days without being covered by the appropriate protective soil or rock layer. The city engineer or designee may require replacement of any geotextile exposed to the sun for periods longer than seven 7 days or if the geotextile is contaminated with foreign matter. When a geotextile fabric is used for stabilization (Type V) or earth reinforcement (Type VI), the contractor shall place the fabric with a 2-foot overlap at the seams.

02403.3 AGGREGATE BASE - Materials

The source of supply and quality of the material is subject to approval by the city engineer or designee in accordance with MnDOT Spec. [1601](#). The contractor shall provide certification of the materials being used and will be required to perform field sampling for gradation test of any bedding materials used as required by the city engineer. Copies of test results shall be submitted to the city in a timely manner. The subgrade stabilization rock for 3-Inch Recycle Minus shall be 70% passing 3 inches, and 30% between 1-1/2 inch and 3 inches. All Class 5 aggregate base shall be 100% crushed virgin quarry or mine rock conforming to MnDOT specification table [3138-1](#) or recycled per specification table [3138-2](#) can be used as aggregate base and meet the gradation requirements of MnDOT specification table [3138-4](#). However, the composite aggregate mixture/blend shall not contain sod, roots, plants, building rubble, building brick, wood, and plaster, reinforcing steel or other similar objectionable or deleterious materials and shall be free of lumps or balls of clay. Material quality from the source to be used must be demonstrated prior to use.

02403.4 CONCRETE - Materials

Concrete mix No. 3F52 MnDOT Specification [2461.2](#) shall be used for hand placed formed curb and gutter, medians, driveways, cross gutters, sidewalks, pedestrian ramps and medians.

Concrete Mix No. 3F32, MnDOT Specification [2461.2](#) shall be used for an extrusion machine placement of concrete. In the production of concrete, an air entraining agent shall be added to the mix according to MnDOT Specification [2461.2](#).

Calcium chloride may be incorporated into the mix, upon written permission of the city engineer or designee, whenever the temperature may be expected to reach 50° Fahrenheit or lower during the 24-hour period following placement of the concrete. If calcium chloride is used, it shall be introduced into the concrete mix as a slurry at the job site, allowing approximately one (1) minute mixing time. The quantity of calcium chloride added shall be determined by the city engineer or designee, but in no case shall it exceed 2 percent of weight of the cement incorporated into the mix.

.4A ADMIXTURES FOR CONCRETE

MnDOT Specification [3113](#).

.4B CALCIUM CHLORIDE

Type 1 or 2, MnDOT Specification [3911](#).

.4C PREFORMED EXPANSION JOINT FILLER

MnDOT Specification [3702](#).

.4D MEMBRANE CURING COMPOUND

Type 2, white pigmented, MnDOT Specification [3754](#).

.4E FORM COATING MATERIAL

MnDOT Specification [3902](#).

.4F EPOXY COATED REINFORCING BARS

MnDOT Specification [3301](#)

02403.5 PLANT MIX BITUMINOUS PAVEMENT - Materials

Bituminous material shall conform to MnDOT Specification [2360](#). Final mix design and ADT estimate shall be approved by the city engineer or designee based upon the following:

A. New Construction

- Medium volume roads (ADT >1000) - Wear course mix design shall be 2360 Type SPWEA340C.
- Low volume roads (ADT <1000) - Wear course mix design shall be 2360 Type SPWEA240C.
- Medium volume roads (ADT > 1000) - Base/Binder course mix design shall be 2360 Type SPNWB330C.
- Low volume roads (ADT <1000) - Base/Binder course mix design shall be 2360 Type SPNWB230C.

B. Overlays

- Medium volume roads (ADT > 1000) - Wear course mix design shall be 2360 Type SPWEA340B.
- Low volume roads (ADT <1000) - Wear course mix design shall be 2360 Type SPWEA240B

C. Driveways and Trails

- 2360 Type SPWEA240B.

02403.6 TACK COAT -Materials

Tack coat shall conform to MnDOT Specification [2357](#)

02403.7 REFLECTORIZED PAVEMENT MARKINGS - Materials

.7A REFLECTORIZED PAINT

Reflectorized Paint, white or yellow per MnDOT Specification [3501](#) and [3591](#).

.7B GLASS BEADS

Glass beads, moisture resistance, drop-on type for use with acrylic latex traffic marking paint to meet MnDOT Specification [3592](#).

.7C PLASTIC PAVEMENT MARKINGS

Preformed plastic pavement markings, white or yellow, 1.5 mm (60 mils) thick, shall be in accordance with the provisions of MnDOT Specification [3354](#).

02403.8 TRAFFIC SIGNS AND DEVICES - Materials

Street and traffic signs shall meet the requirements of MnDOT Specification [3352](#) for reflective sheeting, the Minnesota Manual on Uniform Traffic Control Devices, and Standard Detail Plates [STRT-21](#) through [STRT-25](#).

.8A FLANGED CHANNEL SIGN POSTS

The sign supports will be a U channel post, painted green. They will be punched with a 3/8-inch DIA. – 1 inch on center holes. The posts will be 2 and 3 lbs. per foot and 6, 7, or 8 feet in length. All signs up to 18 inches shall be mounted on two U-Channel posts, each 2 lbs., one 7-foot long and one 6-foot long. The longer post shall be driven in the ground first. All signs up to 30 inches shall use an 8-foot, 3 lb. post and a 7-foot, 2 lb. post, with the 3 lb. post driven into the ground first. All signs over 30 inches shall use two sets of posts (the heavier post placed in the ground first.) All U-Channel posts will be driven 36 inches into the ground.

.8B SIGN POSTS

All sign posts located in concrete or bituminous areas shall use the Minneapolis Style sign post assembly as shown in Standard Detail Plate [STRT-23](#).

.8C BRACKETS

The marker bracket used shall be the Lyle Sign (E-Series) or approved equal. They shall have a galvanized 5/8-inch square center rod welded onto the tubular pole cap and will accommodate an ornamental nut on the top of the rod. Star shaped center clips will be used to accommodate facing the sign at different angles (see Standard Detail Plate [STRT-24](#)). The top nut, plate holder and post cap shall be green. Sign mounting brackets shall be Earl F Anderson's (BR-5 series) aluminum brackets or approved equal.

.8D MARKERS

Street name sign materials (markers) shall be Lyle Sign E-Series or approved equal. The markers are to be a .080-inch minimum thickness flat aluminum plate, single-faced, fully reflectorized with 3M DG3 High Intensity reflective sheeting. The size is to be 9-inch plates with 6-inch, upper case letters or numbers (suffixes such as: TH, ND, etc., will be 3-inch letters in upper case). No more than three blades per pole shall be used.

The markers will have white letters or numbers and border, on green background. All streets that are private will be marked by reversing the colors (green letters on a white background). Series "C" letters shall be used for all markers. If sign exceeds 48 inches in length, "B" series letters may be used.

Note: If the public street markers are damaged during construction, it will be the responsibility of the developer to replace it. The city will assume ownership of the public signs when the project has been accepted by the city and the financial guarantees have lapsed.

.8E TUBULAR POLES

Tubular poles will be galvanized with a minimum wall thickness of .080 inch. The pole shall have a 2-3/8" outside diameter. The tubular pole will be either 10 or 12 feet long. A 12-foot tubular pole will be used for locations where a stop sign is planned or anticipated. The stop sign will be mounted on the same tubular pole as the street marker. The city will determine the locations where stop signs may be installed.

All tubular poles will be placed in an auger drilled 36 inches deep x 10 inches diameter concrete footing. At one interval on the tubular pole, either the pole shall be crimped or doweled to prevent the pole from turning in the concrete footing. The placement of the tubes will vary depending on conflicts with utilities or other obstacles. All poles should be placed in the boulevard area six feet behind the back of the curb. If this cannot be accommodated, placement of the tube should be as close to this requirement as possible.

The city will approve all materials, sign names and locations prior to installation. Submit shop drawings for review and approval. No more than three sign blades can be placed on any single pole assembly.

It will be the responsibility of the installer to have all underground utilities located prior to starting installations.

02403.9 TRUNCATED DOMES FOR PEDESTRIAN RAMPS –Materials

Neenah Foundry Company, East Jordan Iron Works or approved equal from the [MnDOT's approved products page](#), charcoal grey coated cast iron truncated dome panels shall be used for all pedestrian ramps. Use only one supplier of panels within a project. See Standard Detail Plates [STRT-3](#) through [STRT-8](#).

02404 CONSTRUCTION REQUIREMENTS

02404.1 WORKING HOURS – Construction Requirements

The city engineer or designee shall be notified at least 48 hours prior to commencing any work by calling Engineering at (763) 509-5500. Contractors are subject to being shut down and or having work rejected if proper notification is not given to the city.

Work shall not commence before 7 a.m. nor extend beyond sunset Monday through Friday. On Saturdays, work hours are from 8 a.m. to 6 p.m. No work is permitted on Sundays or holidays unless authorized by the city. Existing roadways shall not be restricted between 7 a.m. to 9 a.m. and 3 p.m. to 6 p.m. unless approved by the city engineer.

The definition of "work" also includes the starting of equipment and the delivery of materials to the job site.

02404.2 EXCAVATION – Construction Requirements

Roadway excavation shall be performed in accordance with the provisions of MnDOT Specification [2106](#) except as modified below:

The contractor shall eliminate all topsoil, organic material, and non-granular soils from the subgrade, as directed by the city engineer or designee and defined herein as that material below the bottom of the selected granular base material and excavation and fill sections (refer to typical sections). Suitable topsoil, (not including sod), which is encountered during excavation may be stockpiled and used as backfill material behind the curb, where directed by the city engineer or designee. Stockpile locations are to be provided by the contractor with the approval of the city engineer or designee.

During construction, all excavation shall be maintained in such a condition that they will be well drained at all times. Temporary ditches or gutters shall be constructed when necessary to maintain drainage and avoid damage to the roadway and existing utilities. No excavated material shall be placed or stockpiled in such a manner as to restrict free surface drainage of the subgrade or base courses. The contractor shall remove and replace existing signage, guard posts and mailboxes as required. The contractor shall also install erosion protection devices according to the erosion control plan and or as directed by the city engineer or designee.

02404.3 EMBANKMENT – Construction Requirements

Roadway embankment shall be performed in accordance with the provisions of MnDOT Specification [2106](#) except as modified below:

Material for embankment shall be obtained from common excavation unless otherwise specified in the special conditions or directed by the city engineer or designee.

The material used for embankment material may be from excess common excavation material as directed and approved by the city engineer or designee. If the required amount of material is more than can be obtained from excess common excavation, the contractor shall provide additional material from outside sources subject to the approval of the city engineer or designee. This material shall be in accordance with MnDOT Specification [2106.2B](#) (CV). All roadway embankments shall be thoroughly compacted in accordance with MnDOT Specification [2106.3G.1](#) Specified Density Method unless specifically noted otherwise in the special conditions:

“Where this method is specified, the Engineer will sample and test the soils that are to be used, to determine the maximum density and Optimum Moisture, and will make density and moisture tests on the compacted embankment, using methods described in the MnDOT Grading and Base Manual.

The upper 3 feet of the embankment, together with those portions of the embankment that are below the upper 3 feet but that are adjacent to structures and are subject to the same maximum layer thickness as the upper 3 feet, shall be compacted to a density of not less than 100 percent of maximum density. Those portions of the embankment that are below the upper 3 feet and that are not adjacent to structures shall be compacted to a density of not less than 95 percent of maximum density.

At the time of compaction, the moisture content of the embankment material shall be not less than 65 percent nor more than 115 percent of Optimum Moisture where 95 percent of maximum density is required and shall be not less than 65 percent nor more than 102 percent of Optimum Moisture where 100 percent of maximum density is required.”

After subgrade preparations and prior to placement or construction of roadbed base material in areas where concrete curb and gutter is to be placed, all backfilling behind the curbing shall have been completed. Any damage inflicted on the subgrade or new construction while placing the embankment shall be repaired by the contractor at his or her expense. All embankments shall be completed prior to any excess suitable material being disposed of.

02404.4 SUBGRADE PREPARATION – Construction Requirements

Subgrade preparation shall be performed in accordance with the provisions of MnDOT Specification [2112](#) except as modified below:

Subgrade preparation shall entail the final shaping and compaction of the subgrade to plus or minus 0.05 feet of proposed elevation and cross section.

Any soft spots or displacements which appear during subgrade preparation shall be corrected by scarifying, aerating, or watering and re-compacting as required to obtain stability or by excavating to solid material and backfilling with material suitable for base construction. Unsuitable material, such as vegetation, rubbish, large stones, peat, and wet clay shall be removed and disposed of as directed by the city engineer or designee. After correction, the area shall be test rolled as directed by the city engineer or designee.

Any further roadway work after subgrade preparation may only proceed when all the utility testing has been complete.

02404.5 GEOTEXTILE FABRIC – Construction Requirements

Commence installation of geotextile fabric after material has been approved by the city engineer or a designee and the preparation of the sub-grade has been completed. Install geotextile fabric to the complete limits of the roadway sub-grade including intersections and turning lanes or as directed by the city engineer or designee. Unroll geotextile fabric as smooth as possible on the prepared sub-grade in the direction of the construction traffic. Install geotextile fabric in the longest continuous practical length, free from tension, stress, folds, wrinkles, and creases. Install geotextile fabric in accordance with this specification and procedures recommended by the manufacturer. Overlap joints a minimum of 2 feet. Install pins or place piles of sub-base material as required to hold geotextile fabric in place. Cut or fold geotextile fabric to conform to curves. Place geotextile fabric to ensure it does not extend more than 4 inches over the sub drain trench. Construction vehicles shall not be permitted to drive on the geotextile fabric. Remove or replace geotextile fabric improperly installed or damaged as directed by the city engineer or designee.

02404.6 AGGREGATE BASE - Construction Requirements

Place aggregate in layers to produce a maximum 3 inches of compacted thickness. With vibratory compaction, place the produce to a maximum 6 inches of compacted thickness. Deposit only the amount of aggregate which is intended to be spread and compacted during the same day. Add water as may be required during mixing to produce proper compaction. Replace aggregate for existing gravel driveways with a minimum of 6 inches or match existing thickness, whichever is greater. Mix aggregate uniformly to maintain proper gradation. Spread and compact each layer to the required cross-section and density prior to placing a succeeding layer. Compact each layer until no visible evidence of further consolidation and to a density not less than 100% of standard proctor density using a steel-wheeled or pneumatic tired roller and a water truck. Construct each course to within 0.05/foot of the planned grades and staked elevations at all locations. The

engineer must be present during tolerance to accept the work, but it is the contractor's responsibility to ensure the acceptable tolerance.

02404.7 CONCRETE CURB, AND FLAT WORK – Construction Requirements

02404.7A BASE PREPARATION FOR CONCRETE

The base for curb and gutter, medians, driveways, and sidewalk shall be constructed of materials as shown on the plans and details and shall be well drained and compacted with an approved vibratory compactor to a firm surface with a uniform bearing power. It shall be thoroughly wet down to be in a moist condition when the concrete is placed.

02404.7B CONCRETE CURB

Concrete curbing shall be in conformance with MnDOT Specification [2531](#) using B612, B618 or city standard Surmountable type. See Standard Detail Plate [STRT-1](#).

Two (2) No. 4 epoxy coated reinforcing rods MnDOT Specification [3301](#), shall be placed in the lower portion of the curb 20 feet in length at all sewer and water service trenches, fire hydrant leads and other sewer and watermain trenches. Two (2) 10-foot or longer No. 4 epoxy coated reinforcing rods shall also be placed on each side of all catch basins (see Standard Detail Plates [ST-5](#) and [STRT-1](#)).

All initial curbs shall be placed using Slip Form Machine Placement except at structure fill ins, where the radius is too tight for the machine or as directed by the city engineer or designee.

02404.7C CONCRETE SIDEWALKS AND PEDISTRIAN RAMPS

Concrete sidewalk pedestrian ramps shall be in conformance with MnDOT Specifications [2521](#) and [2531](#) using a [3F52](#) mix, being a minimum of 5-foot-wide and 4-inches-thick standard. Where sidewalk crosses a residential driveway, it shall be 6-inches thick. Where the sidewalk crosses a commercial or private road it shall be 8-inches-thick minimum. See Standard Detail Plate [STRT-10](#).

Sidewalks and pedestrian ramps shall be constructed on a 4-inches-thick aggregate base using either CL 5 aggregate base per the detail plate [STRT-10](#). Concrete pedestrian ramps shall be constructed to conform to MnDOT details [STRT-3](#) through [STRT-8](#).

Complete the [MnDOT ADA compliance Checklist](#) for curb ramps for each pedestrian ramp that is installed. The form is included along with the details at the end of this specification.

02404.7D CONCRETE FINISHING

Concrete shall be struck true to cross section as shown on the plans. No additional water may be added to aid in the finishing process. A light broom finish will be required at right angles to the center line on all concrete work unless directed otherwise. All exposed edges and joints in curb, gutter, and steps shall be rounded with a suitable edging tool. Before final finishing, the contractor shall check the concrete with a 10-foot steel straight edge to ensure there is no variation greater than 3/16" from the straight edge on tangent lines or grades. If deviations greater than 3/16" are found the work will be considered as unacceptable and will be required to be removed and replaced at no expense to the owner.

02404.7E CONCRETE CURING

Curing shall be performed by applying a membrane curing compound (Type 2, white pigmented, MnDOT Specification [3754](#)) to the exposed surface of the concrete within one (1) hour after finishing the concrete surfaces. When the forms are removed in less than 72 hours after placing the concrete, the curing compound shall be applied immediately to the exposed surfaces, or the trenches shall be backfilled immediately with suitable backfill material. The rate of application of curing compound shall be 150 square feet per gallon. The compound shall appear as white as a sheet of paper after application on the concrete surface. See MnDOT [2531.3 G.3](#) Protection Against Cold Weather:

"If the national weather service forecast for the construction area predicts air temperatures of 36 °F [1 °C] or less within the next 24 hours and the contractor wishes to place concrete, submit a cold weather protection plan. Protect the concrete from damage including freezing due to cold weather. Should any damage result, the engineer will suspend operations until the contractor takes corrective action, and may subject the damaged concrete to [1503](#), Conformity with Contract Documents, and [1512](#), Unacceptable and Unauthorized Work."

02404.7F CONCRETE CONTRACTION/EXPANSION JOINTS – Construction Requirements

Preformed expansion joints shall meet MnDOT specification [3702](#), and shall be provided at the following locations:

- At the beginning and end of all curb and gutter radii.
- Where new concrete surrounds, adjoins, or abuts any existing fixed objects such as fire hydrants, building foundations, concrete driveways, sidewalks, and other rigid structures.
- After each load of concrete when placing curb and every 100 feet when placing sidewalk.

Contraction joints will not be sealed but will be required at a spacing of 8 feet on curb and gutter and 6-foot spacing on sidewalk construction. Contraction joints will be cut to a depth one-third (1/3) the thickness of the concrete, surface and back of all curbs. All sidewalk and pedestrian ramp contraction joints shall be saw cut. Contraction joints shall be placed so that no slab is larger than 100 square feet in area. The contractor is responsible for constructing contraction joints that prevent concrete from cracking at other locations.

02404.7G CONCRETE DIMENSIONS AND STRENGTH REQUIREMENTS – Construction Requirements

02404.7G1

Concrete sidewalk will be 5-feet-wide and a minimum of 4-inches-thick with the exception of a 6-inch thickness requirement through residential driveways, and 8-inch thickness requirement through industrial/commercial driveways, unless specified otherwise on the plans or special conditions.

Concrete sidewalk steps shall be equal in width to the existing or new sidewalk. Residential concrete steps shall have an 8-inch rise per step and a 9-inch tread, and commercial concrete steps shall have a 7-inch rise per step and an 11-inch tread.

02404.7G2

Random concrete cylinders will be taken for 7 and 28-day compression strength tests at the rates addressed in the testing portion of this specification. Prior to final acceptance of the work, the city may take cores at random at any suspected weak spots from the concrete to determine thickness and strength.

Where the compressive strength is less than 4500 p.s.i. for 3F32 and 3F52 mixes, after 28 days the city will designate whether or not such defective concrete must be removed and replaced at the contractor's expense. Where the concrete strength is less than 4500 p.s.i., additional cores shall be taken at the contractor's expense to determine the extent of such deficiency.

02404.7H EXISTING CONCRETE REMOVALS

- Replace sections of concrete curb and gutter within 48 hours of removal. Friday removals should be avoided unless they can be replaced that same day.
- Completely remove concrete as marked by the engineer.
- A clean, vertical edge, approved by the engineer, is required for all removals.
- Sawcut curb to at least one-half (1/2) of the curb thickness where one-half (1/2) or more of the existing curb section does not require removal.
- Sawcut concrete at locations directed by the engineer to provide a clean joint or limit removal.
- Protect concrete not designated for removal.
- Protect landscaping adjacent to concrete removed. Replace disturbed landscaping in kind. Landscaping restoration shall be considered incidental to curb placement.
- Protection including temporary relocation of mailboxes and posts to facilitate construction is incidental to curb installation unless otherwise noted. Damaged mailboxes will be replaced by the contractor at the contractor's expense.

02404.8 BITUMINOUS PAVEMENT – Construction Requirements**02404.8A RESTRICTIONS – Construction Requirements**

Bituminous surfaces shall be placed and rolled only during daylight hours and over a dry road surface.

MnDOT [2360.3 D.2.c](#) Mixture Temperature. Refer to Table [2360-26](#) Minimum Temperature Control for the minimum laydown temperatures in all courses of the asphalt mixture as measured behind the paver or spreading machine. Do not pave when the air temperature is less than 32° F [0° C] unless otherwise directed by the engineer in writing.

Table 2360-26*				
Minimum Temperature Control				
Air Temperature, °F	Compacted Mat Thickness, †			
	1 in	1½ in	2 in	≥3 in
32 – 40	—	265	255	250
41 – 50	270	260	250	245
51 – 60	260	255	245	240
61 – 70	250	245	240	235
71 – 80	245	240	235	235
81 – 90	235	230	230	230
≥ 91	230	230	230	225
* Not applicable if using a Warm Mix Asphalt (WMA) additive or process that meets the requirements in 2360.2.C.4. Use at least one pneumatic-tire roller for intermediate rolling unless otherwise directed by the Engineer. The Engineer may specify or modify the minimum laydown temperature in writing. † Based on the lift thicknesses shown on the plans.				

Under no circumstances will bituminous wear be allowed to be placed until all gate valves can be keyed and all valve boxes and manholes castings have been raised. Mixture shall not be placed when, in the opinion of the City engineer or designee, the weather or roadway conditions are considered unfavorable. **Final wear course placement will be allowed in a new housing development only after one freeze – thaw cycle and after 75% of all units have been issued a certificate of occupancy (C.O.).**

Placement of wear course on non-housing projects shall be after one freeze – thaw cycle or by the direction of the city engineer. An inspection of the roadway will be performed by the city engineer or designee prior to wear course placement. From this inspection, any deficiencies or damage to the street, sidewalk and curb will be noted and will need to be corrected prior to the placement of the wear course.

After the first freeze the cycle, and upon approval of the city engineer, the developer may pave the final wear course prematurely provided the street line items in the developments Letter Of Credit remains at 80% of their original amount until they are accepted. The streets acceptance process will remain unchanged and begin once 75% of the development units have a C.O. An inspection of the roadways, sidewalks and trails will be performed at that time and any repairs found, be corrected. If more than 50% of the curb is replaced, per specification section [2404.15J](#), the city engineer may also require that all the wear course be milled off and all the curb and wear course be replaced.

02404.8B BASE PREPARATION – Construction Requirements

Final shaping and compaction of the aggregate base shall be done just prior to construction of the plant mix bituminous surface. The finished surface of the base shall show no variation greater than 1/2 inch from a 10-foot straight edge laid parallel or perpendicular to the center line of the roadway.

02404.8C PLACEMENT OF PLANT MIX BITUMINOUS SURFACE – Construction Requirements

Mixture shall be spread without segregation, at the specified rate to the cross section shown in the plans and per MnDOT Specification [3151](#). See Standard Detail Plate [STRT-14](#).

The thickness of each bituminous course shall be within 0.5 inch of the thickness as shown on the plans. The total thickness of all bituminous courses shall be within 0.5 inch.

Adjust all surface courses to not greater than 0.25 inch above adjacent curb front edges, or 0.5 inch above manhole frames, valve boxes or other fixed structures.

Prior to constructing the bituminous binder and/or wearing courses, the contractor shall sweep the streets. The sweeper shall be a self-propelled pick-up (with water) sweeper. A side-throw sweeper will not be allowed.

All areas to be patched with bituminous wear course shall be saw cut. All areas to be patched in the base course can be either saw cut or jack-hammered out. A minimum of 12 inches shall be maintained around structures and only square or rectangular shaped areas are acceptable. Bituminous patching shall be done in lifts not to exceed 3 inches per lift. A vibratory compactor shall be used.

All manholes, gate valves, catch basins, etc. shall be covered to prevent adherence of the bituminous. Suitable covering includes plywood disks, or other approved methods. Castings and pick holes shall be clean of bituminous after each paving operation.

02404.8D COMPACTION – Construction Requirements

All pavements will be compacted in accordance with MnDOT Specification [2360.3.D.1](#) “Maximum Density Method” unless otherwise specified in the special conditions. After compaction, the thickness of each course shall be within plus or minus 0.25 inch of the thickness shown on the plans for that course.

02404.8E CONSTRUCTION JOINTS – Construction Requirements

The longitudinal joint in the center of the road will be made last and shall overlap any previous laid bituminous course longitudinal joint by at least 6 inches. Transverse joints in adjacent strips shall be separated by a minimum of 5 feet. Connections to an existing asphaltic mat shall be allowed only after the existing mat has had a vertical joint prepared for final connection. This joint shall be constructed by milling the existing surface in accordance with MnDOT Specification [2232](#), mill pavement surface. The milled horizontal distance into the existing bituminous shall be at least 6 inches in width and 2 inches in depth. Any other method in providing the connections shall first be approved by the city engineer or designee. All costs for milling operations shall be considered incidental to the paving costs.

02404.9 TACK COAT –Construction Requirements

Coordinate application to allow traffic movement in at least one direction without pick-up or tracking. Provide warning signs indicating “FRESH OIL” if bituminous is not to be placed immediately after tack coat has been applied. Limit application to only the area on which the subsequent course will be placed on the same day. Areas not paved on the same day will have to be re-tacked with no additional compensation.

The contact surfaces of curbs, concrete pavement or other fixed surfaces, and transverse joints shall be sprayed with a uniform coat of tack coat material. The rate of Tack coat application shall be per MnDOT specification [2357.3 D](#) table [2357-2](#). Apply on a clean surface with all preparation work completed prior to placement. Protect adjacent curb and gutter, sidewalk, and other exposed surfaces from overspray. Do not apply during or immediately prior to precipitation. Do not apply to wet surfaces. Sand applied at pedestrian crossings will be considered incidental. Protect tacked surfaces from dust, debris, and water.

Apply materials with a distributor meeting the requirements of MnDOT [2360.3.B.2.d](#).
Temperature of the material at application shall be in accordance with MnDOT [2357.3.E](#).

02404.10 REFLECTORIZED PAVEMENT MARKINGS – Construction Requirements

02404.10A PREPARATION OF PAVEMENT

At the time of applying the marking material, the application area shall be dry and free of all contamination, including oil, dirt, grease, curing compound and other matter that might adversely affect adhesion or durability of the marking material. Cleaning shall be accomplished with rotary brooms, air blast, hand brooms, scrapers or whatever combination of equipment that is necessary to produce a clean surface without damage. Care shall be taken to remove vegetation and soil from the areas to be edge striped. Should other methods fail, hand scraping or brushing will be required to secure an acceptable surface.

02404.10B APPLICATION EQUIPMENT – PAINT

Application equipment for painted markings shall consist of a machine of the spray type capable of applying the paint under pressure at a controlled temperature through nozzles equipped with remotely controlled cut-off mechanisms and suitable line guides that will produce clean cut lines and prevent excessive paint drift. Except where the use of portable sprayers is specifically approved by the city engineer or designee, the marking stripes shall be applied with truck mounted traveling units properly equipped to apply the paint stripes as required. Where two or more lines are to be applied at closely controlled spacing (such as double solid lines), the machine shall be equipped to apply those stripes simultaneously. For application of skip lines, the spray unit shall include an automatic control device capable of being set to produce the specified stripe to gap ratio.

The paint tanks mounted on the traveling unit shall have provisions for continuous agitation and mixing for the marking material during application. If necessary to maintain uniform flow and application, the paint tank shall be equipped with heating facilities capable of heating and automatically controlling the paint temperature within acceptable limitations as recommended by the paint manufacturer.

02404.10C METHOD OF APPLICATION – PREFORMED PLASTIC PAVEMENT MARKINGS

Preformed plastic markings shall be in accordance with MnDOT Specification [3354](#) and inlaid as recommended by the material manufacturer at the locations indicated on the plans or specifications. The contractor shall use a certified installer of the pavement marking material.

02404.10D PROTECTION OF TRAFFIC AND MARKINGS

Furnish and install all necessary warning and directional signs and devices to maintain traffic wherever pavement markings are applied in the presence of traffic, and to protect uncured markings as needed without damaging markings. When necessary, a pilot car and flaggers shall be used to provide adequate control and direction of traffic. Warning signs and barricades shall be placed only where marking operations are in progress, shall be relocated as often as necessary, and shall not be left in place overnight. Traffic shall be allowed to keep moving at all times and the striping equipment shall be operated in a manner that will not make it necessary for traffic to cross uncured markings. Protective devices such as “cones” shall be of an approved type that will not cause damage to the vehicle when accidentally struck. Protect traffic and markings in accordance with applicable details of the field manual.

02404.10E RESTRICTIONS

Painted pavement markings shall only be applied in seasonable weather when the air temperature is 50° F. or higher and shall not be applied when there is any moisture on the pavement surface or when the wind or other conditions cause a film of dust to be deposited on the pavement surface after cleaning and before the marking material can be applied.

The filling of paint tanks, pouring of paint or cleaning of equipment shall not be performed on unprotected pavement surfaces unless adequate provisions are made to prevent spillage of paint.

Application of pavement markings during hours of darkness will only be allowed after approval of the city engineer or designee. On pavements open to traffic, the work may be suspended by direction of the city engineer or designee during peak traffic hours or at any other time traffic is being unduly hampered or delayed by the work in progress.

02404.11 TRAFFIC SIGNS AND DEVICES – Construction Requirements

Traffic signs including street name, warning and regulatory signs shall conform to the [MN MUTCD](#) manual. See detail plates [STRT-21](#) through [STRT-27](#) for further information. New traffic and street signs shall be installed in new developments once the roadways are in service. If a delay is anticipated in installation of the permanent signs, temporary sign shall be installed in the interim at the contractor's expense.

02404.12 TRAFFIC CONTROL AND DETOURS –Construction Requirements

All traffic control shall be in conformance with the Minnesota Manual on Uniform Traffic Control Devices ([MN MUTCD](#)), [Temporary Traffic Control Zone Layouts Field Manual](#), current edition, and or as directed by the city engineer or designee. Traffic control plans shall be submitted to the city engineer or a designee for approval prior to implementation. Closures and detours need 10 working days minimum prior notice before they can be implemented. Contact the city engineering department at (763) 509-5500 for assistance in implementation of an approved plan.

02404.13 TRAILS AND PARKS –Construction Requirements

Soil sterilant shall be used where necessary under the trails as determined by the Parks and Recreation Department. All trees, stumps, brush, etc., shall be cleared out within 4 feet of both edges of the trail, except for hardwood trees or others that the plan shows to remain. Trails are to be installed when the adjacent street is constructed. Two rolls of sod will then be placed along both sides of the trail. See Standard Detail Plate [STRT-15](#).

02404.14 RESTORATION –Construction Requirements

All seeding and sodding shall be performed in conformance with MnDOT Specification [2575](#) Establishing Turf and Controlling Erosion. All disturbed areas must be covered by a minimum of 4 inches of topsoil, free of unsuitable materials, prior to turf establishment. Slopes steeper than 4:1 shall be stabilized with wood fiber blanket in accordance with MnDOT Specification [2575.3K2](#).

02404.15 CRITERIA FOR DAMAGED CONCRETE CURB, AND FLAT WORK REPLACEMENT FOR NEW STREET WARRANTY WORK –Construction Requirements

The following criteria shall be used to determine concrete curbing and flat work that must be removed and replaced prior to wear course paving. Its primary use is for the markup of damaged curb or sidewalks that are in a new residential development. It can be referenced for use on any

project at the engineer's discretion. City staff will mark all the concrete sections that need to be removed and replaced. All concrete areas must be clean prior to inspection and marking.

Glossary

- **Control Joints:** Expansion and contraction joints installed by the contractor during curb and sidewalk construction.
- **Gouges:** Portions of concrete that are missing due to damage to the curb section during or subsequent to curb construction. Gouges shall be measured from the front edge, back edge or top of curb to the maximum projection of the gouge both into and along the curb section.
- **Flat Work:** Includes sidewalks, aprons, driveways, cross gutters and medians.

CURB AND FLAT WORK DAMAGE CRITERIA

.15A All curb and flat work panels that have visible cracks at locations other than control joints shall be replaced. No saw and seal.

.15B All curb and flat work panels that have settled shall be replaced. No mud jacking will be allowed.

.15C A minimum of two consecutive non-damaged curb or flat work panels is required between panels identified for replacement, i.e., a non-damaged panel between two damaged panels shall also be identified as damaged curb and shall be replaced.

.15D All curb and flat work replacement shall be full panels unless otherwise directed by the city engineer.

.15E Horizontal or vertical alignment offsets of curb and flat work panels at control joints greater than 3/8" will require curb replacement to correct the offset.

.15F Curb and flat work panels with street side/front edge damage shall be removed and replaced if the damage meets the following criteria:

- Curb and flat work with horizontal gouges greater than 1 inch from the street edge regardless of vertical gouge depth.
- Curb and flat work with horizontal gouges between 0.5 inch and 1 inch from the street edge with a cumulative length along the curb panel greater than 6 inches regardless of vertical gouge depth.

.15G Curb panels with house side/back edge damage, adjacent driveways, or other hard surfaces, shall be removed and replaced if the damage meets the following criteria:

- Curb with horizontal gouges greater than 1 inch from the curb edge regardless of vertical gouge depth.

- Curb with horizontal gouges between inch and 1 inch from the curb edge with a cumulative length along the curb panel greater than 6 inches regardless of vertical gouge depth.

.15H Curb panels with house side/back edge damage, adjacent sod/landscaped areas, shall be removed and replaced if the damage meets the following criteria:

- Curb with horizontal gouges 2 inches or greater from the curb edge regardless of vertical gouge depth.
- Curb with horizontal gouges between 1 and 2 inches from the curb edge with a cumulative length greater than 1 foot, regardless of vertical gouge depth.

.15I Curb and flat work panels with top surface damage shall be removed and replaced if the damage meets the following criteria:

- Curb and flat work with vertical gouges or scrapes 1 inch or greater, regardless of horizontal length.
- Curb and flat work with vertical gouges or scrapes between 0.5 inch and 1 inch with a cumulative horizontal length greater than 1 foot.

.15J Partial curb panel replacement shall not be allowed if the percentage of curb panels to be replaced exceeds 50% of the total curb length of each block. When the amount of curb damage exceeds 50% of the total block curb length, 100% of that's block's curb must be removed and replaced per city standards. The city reserves the right to determine the street segment or length to which the 50% rule will be applied.

02405 TESTING

The city shall be copied on all test reports. Samples shall be taken in rates called out in this section or as directed by the city engineer or a designee or addressed in the special provision for this project. All testing will be considered incidental unless otherwise noted.

02405.1 SOILS TESTING

Soil tests required to determine 20-year pavement design. Unsuitable soils shall be excavated, and recommendations made for the necessary corrective work. See Standard Detail Plate [STRT-14](#).

02405.2 COMPACTION TESTING

Compaction tests on sub-grade and base courses shall be in accordance with MnDOT Specification [2106.3G.1](#).

02405.3 TEST ROLLING

Test rolling shall be performed in accordance with the provisions of MnDOT Specification [2111](#) except as modified below.

Perform test rolling after subgrade or aggregate base is established to the proposed width and is within specified tolerance of the staked grades at all locations. Test rolling will be required on all

new street sub grades prior to placement of the roadway structural section. On roadway reconstruction projects the engineer will decide whether to test roll the subgrade or aggregate base. Test rolling may also be required on bituminous or concrete trails and sidewalks. This will be determined in the field by the city engineer or designee prior to placing the trail or sidewalk section. The city engineer or designee, project engineer or designee, and a soils engineer shall be present to witness the test. The contractor shall provide a loaded tandem axle truck with a minimum gross weight of 25 tons. The contractor shall provide a weight ticket for the test roll vehicle to the city engineer or their designee prior to the test roll.

The test rolling shall be at the direction of the city engineer or their designee. A soils engineer will be present during test rolling and provide a written certification to the city that the test passed or what corrections or recommendations are necessary if there is a failure.

The city may also require test rolling of the aggregate base once the base section has been constructed. The city engineer or designee may require a subgrade stabilization, geotextile fabric, or subgrade excavation where poor subsoils exist. The contractor's soils engineer shall evaluate these conditions, and a recommendation made to the engineer. The expense of test rolling shall be incidental to construction of the roads or walks unless otherwise modified in the contract documents.

Protect all culverts and other structures during test rolling. Provide additional cover as required over in place structures as protection during test rolling. Replace structures damaged during test rolling.

After completing the test rolling, heavy traffic shall be prevented from using the subgrade until it is covered with the required sand and aggregates. Truck traffic shall not use the subgrade when delivering the sand and aggregate to construct the road section. All loads shall be dumped, pushed, and spread over the newly prepared and tested subgrade.

02405.4 AGGREGATE AND BITUMINOUS TESTING

Roadway aggregate gradation testing shall be as specified in MnDOT Specification [2211](#). One test for gradation for each 500 tons of material delivered. All bituminous testing shall be in accordance with MnDOT Specification [2360](#). The test procedure shall be the Quality Assurance (QA) method for streets, and the Quality Control (QC) method for patching, driveways, parking lots, and trails. The contractor shall provide an independent, MnDOT trained and certified, testing company to provide QA testing for the Engineer. All testing shall be paid for by the contractor.

02405.5 CONCRETE AIR TESTING

Concrete Air - in accordance with MnDOT Specification [2461](#). Test the first load of the day and one (1) test per every 100 cubic yards placed thereafter.

02405.6 CONCRETE SLUMP TESTING

Concrete Slump - in accordance with MnDOT Specification [2461](#). Test the first load of the day and one (1) test every 100 cubic yards placed thereafter.

02405.7 CONCRETE STRENGTH TESTING

Concrete Strength - MnDOT Design [3F52](#). Take one set of cylinders per day minimum regardless of quantity. Cylinders sets shall be taken per every 100 cubic yards placed.

02405.8 CONCRETE MIX DESIGN TESTING

Concrete mix design shall be prepared by testing laboratory and submitted to the city engineer or designee for approval.

02405.9 BITUMINOUS AND CONCRETE CORES

Bituminous and concrete cores may be taken as determined by the city engineer or designee. The cores shall be taken at any locations within the roadway or trail as directed by the city engineer or designee. The contractor shall pay the cost of all core tests and any corrections required by the city.

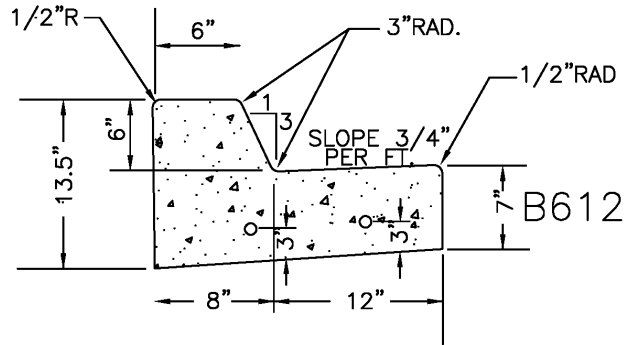
02406 MEASUREMENT AND PAYMENT

All items will be measured separately according to design designation as indicated in the pay item name and as may be detailed and defined in the plans, specifications, or special provisions. Complete-in-place items shall include all component materials/parts thereof as described or required to complete the unit, but excluding any excesses covered by separate pay items.

02407 STREET DETAIL PLATES

STRT-1 through STRT-31

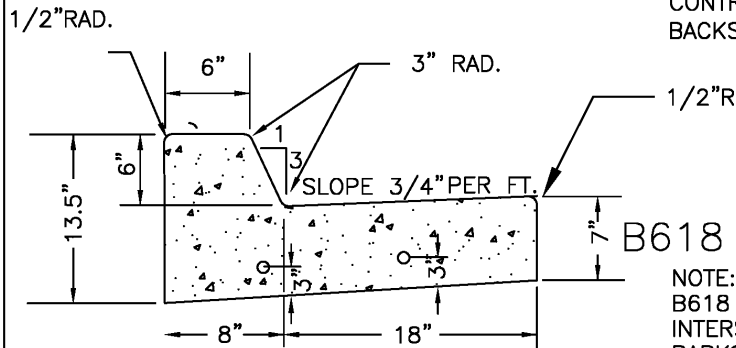
NOTE: B612 CURB MAY BE USED FOR PRIVATE DRIVES AND PARKING LOTS, BUT NOT PUBLIC STREETS



INSTALL AT ALL TRENCHES CROSSINGS OF THE CURB, 2 #4 EPOXY COATED REINFORCING RODS 20' IN LENGTH AND SHALL BE PLACED IN THE LOWER PORTION OF THE CURB

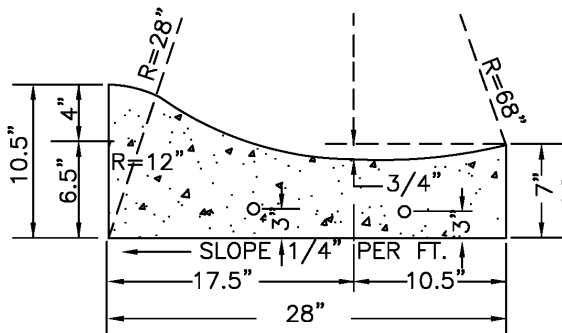
2 # 4 EPOXY COATED REINFORCING RODS EXTENDING FROM BOTH SIDES OF CATCH BASINS NO LESS THEN 10' IN LENGTH

CONTROL JOINTS SHALL CONFORM WITH MNDOT SPEC. 2531.3C. (8' SPACING) CONTROL JOINTS SHALL EXTEND TO THE BACKS OF THE CURBS AND BE 2" DEEP.



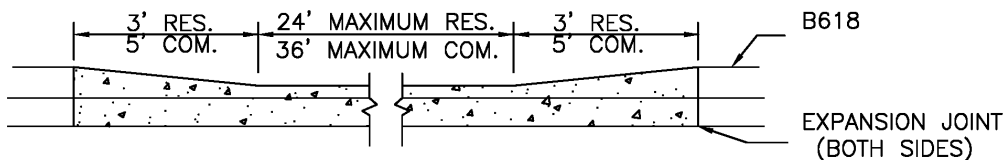
NOTE: B618 CURB TO BE INSTALLED AT ALL INTERSECTION RADIUS, ALONG OUTLOTS, PARKS, PLAY LOTS, MAJOR ARTERIES, CATCH BASINS, AND SUSTAINED STRETCHES WITH NO DRIVEWAYS.

GENERALLY SURMOUNTABLE CURB TO BE INSTALLED WHERE RESIDENTIAL DRIVEWAYS ARE PLANNED.



SURMOUNTABLE

CURING COMPOUND SHALL BE APPLIED IMMEDIATELY AFTER FINISHING AND TO ALL EXPOSED SURFACES INCLUDING THE FRONT AND BACK OF THE CURBS. COVERAGE SHALL BE UNIFORM AND SHALL MATCH THE APPEARANCE OF A WHITE SHEET OF PAPER.



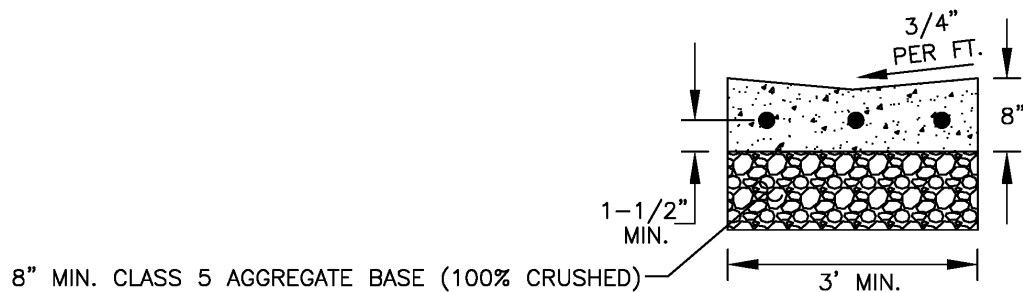
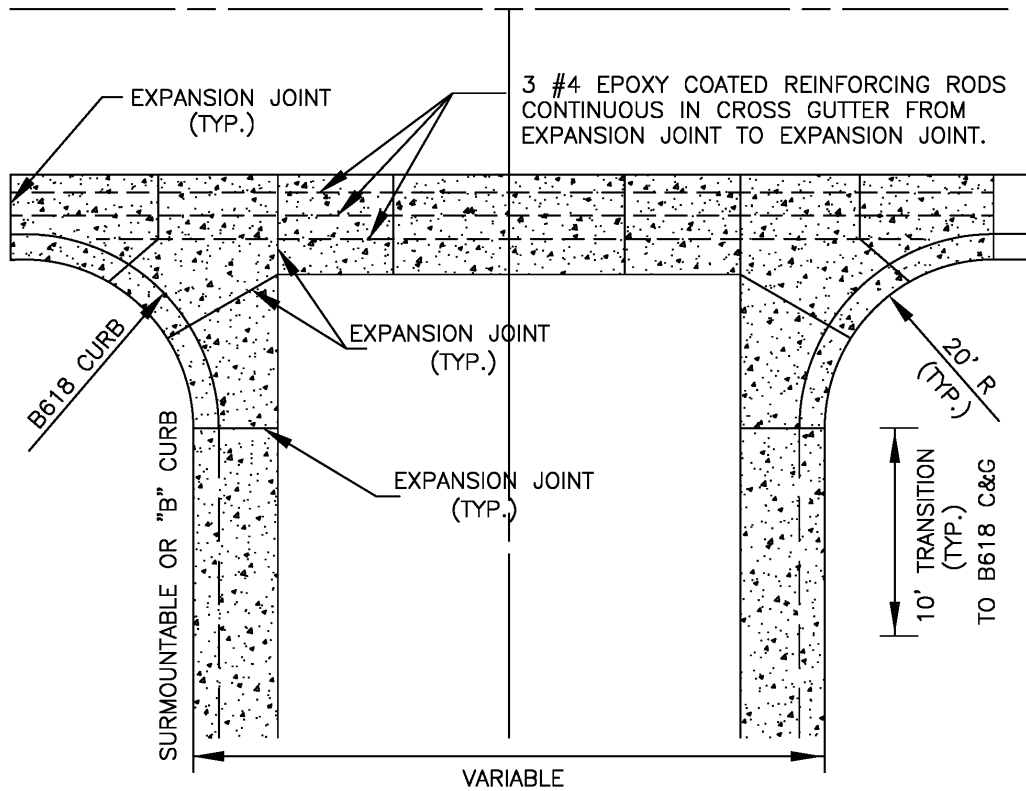
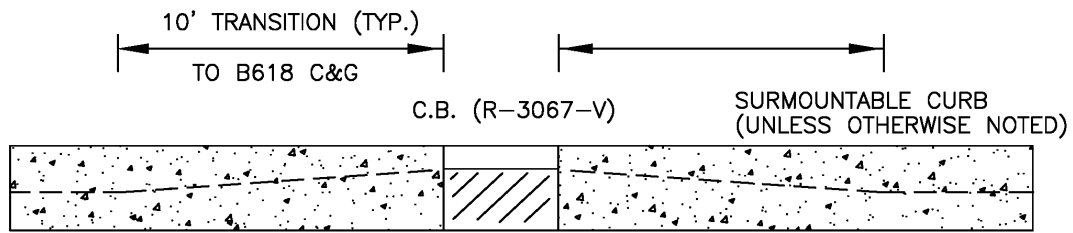
CURB CUT DETAIL



STANDARD DETAILS
STANDARD CURB DETAILS
CITY OF PLYMOUTH

PUBLISHED
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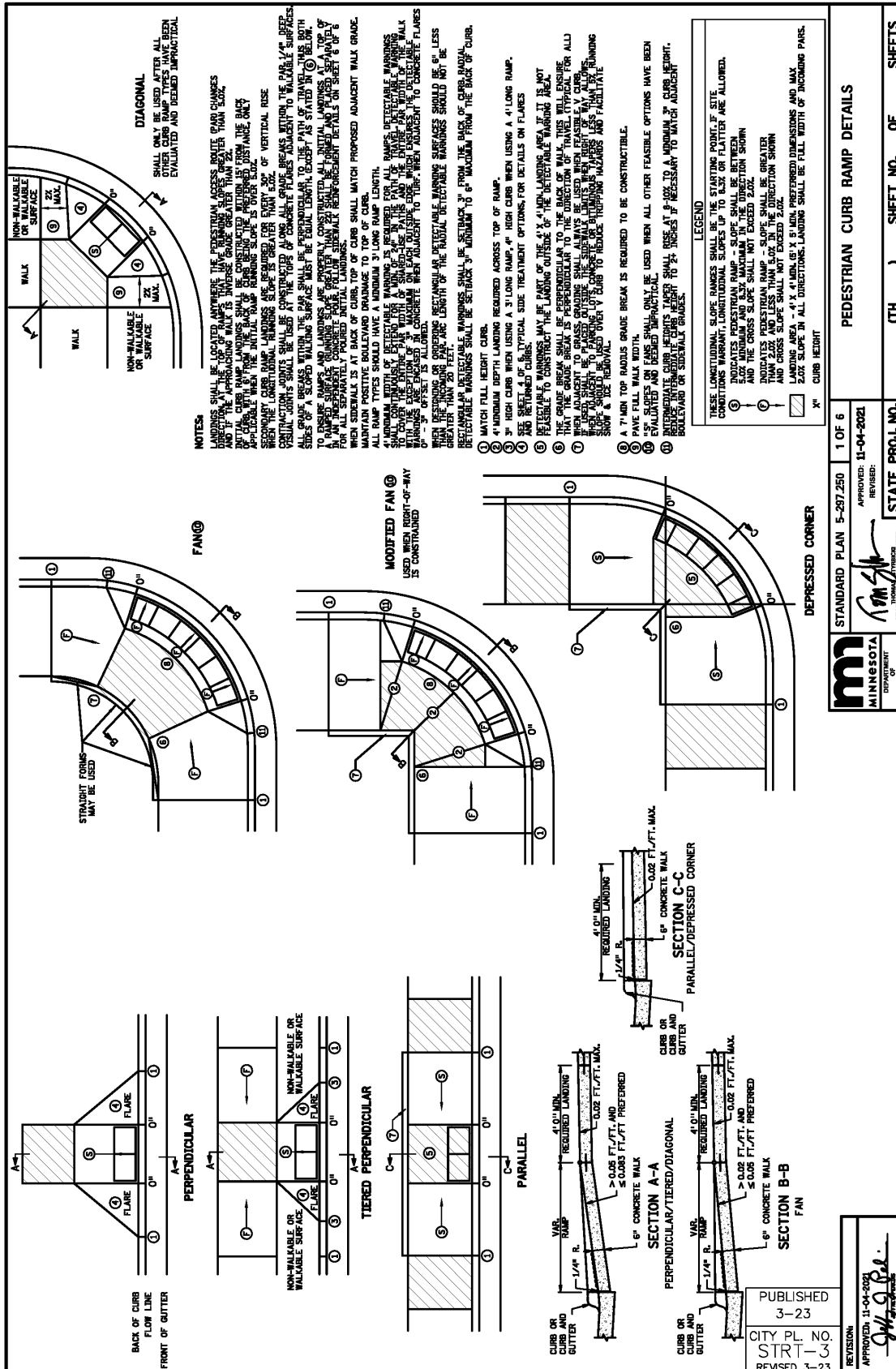
CITY PL. NO.
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REVISED 1-22

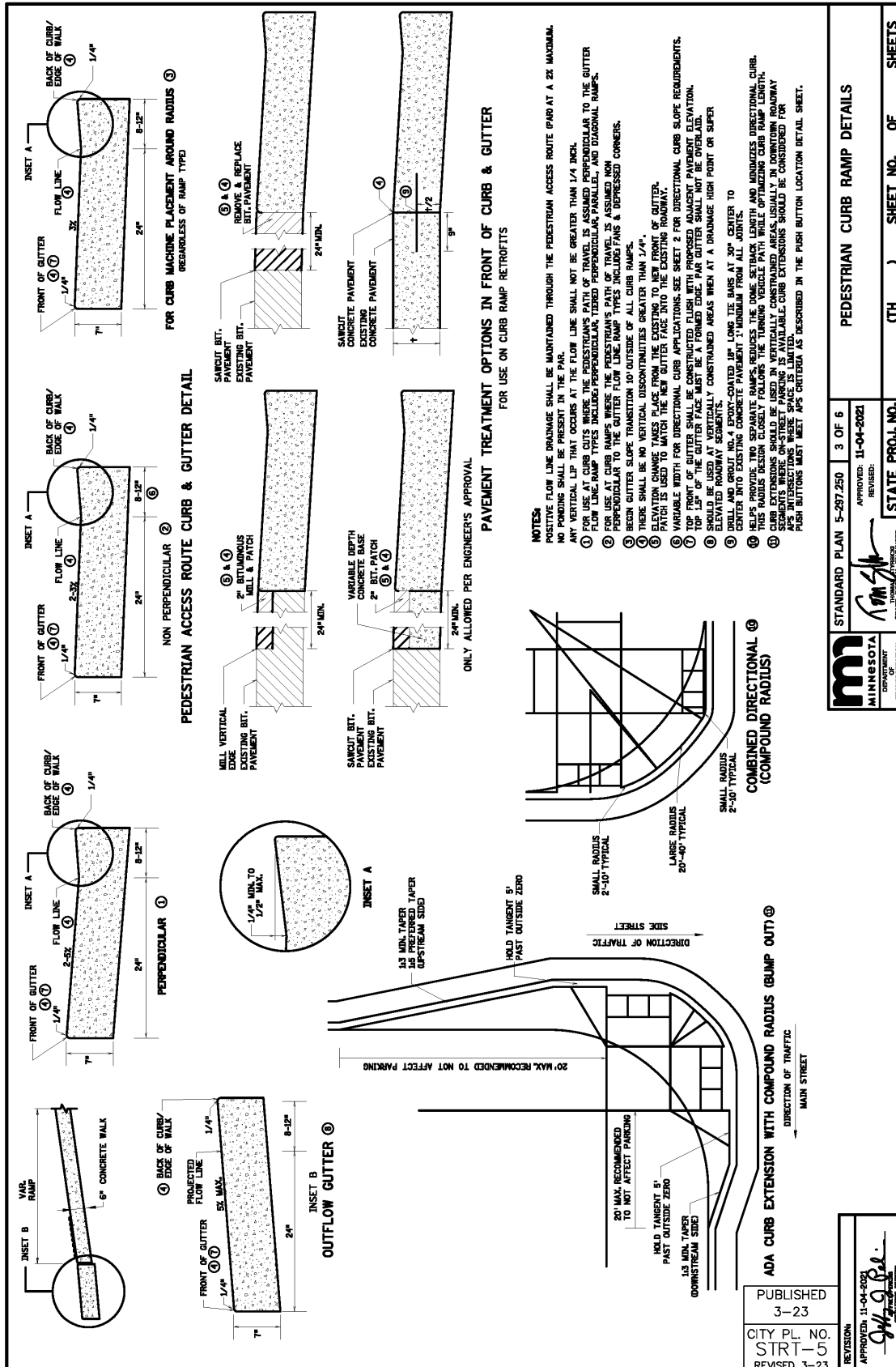


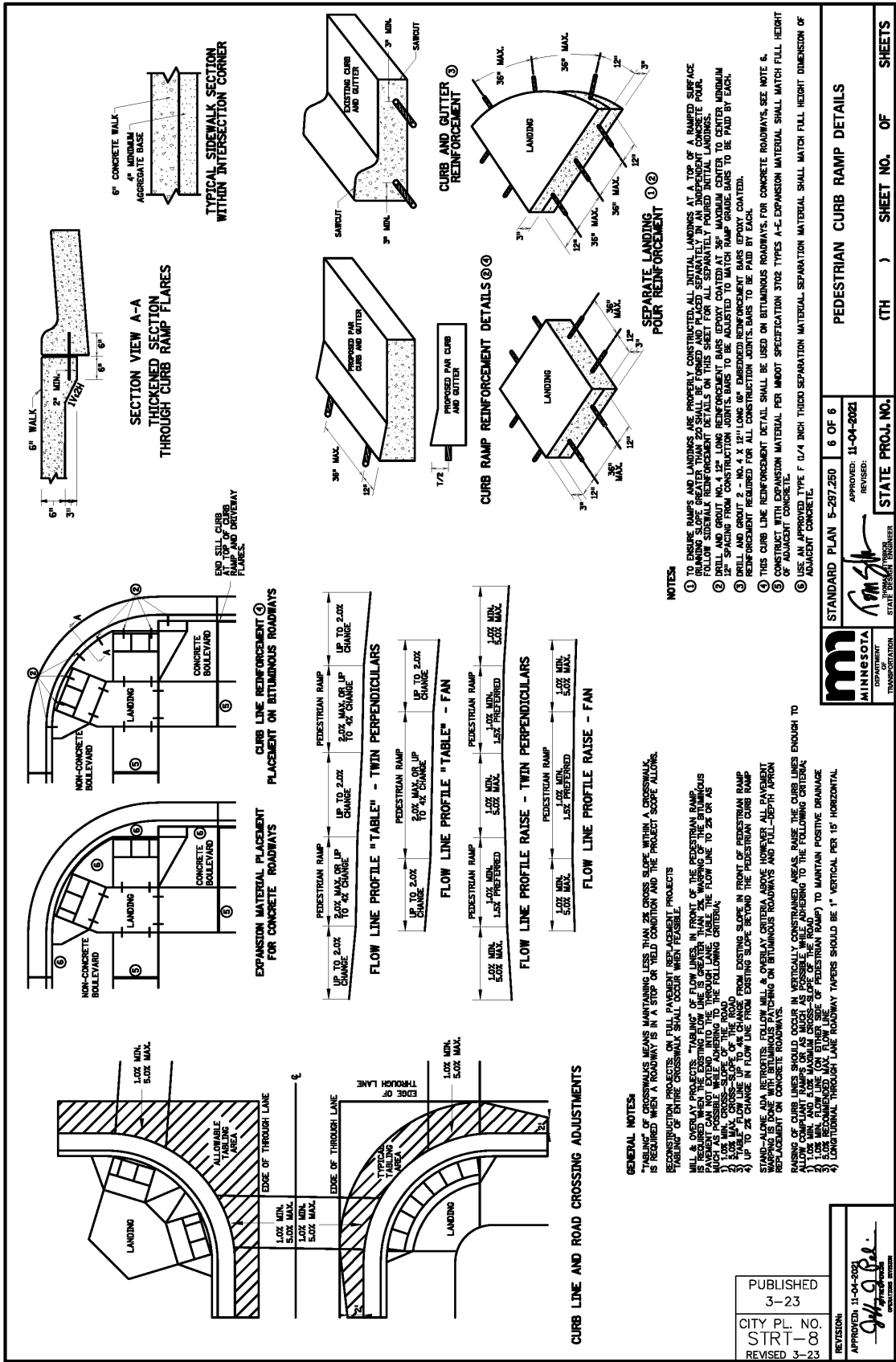
STANDARD DETAILS
CONCRETE CROSS GUTTER
CITY OF PLYMOUTH

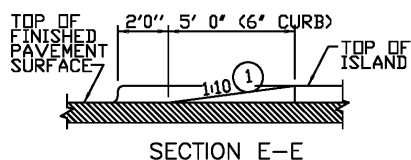
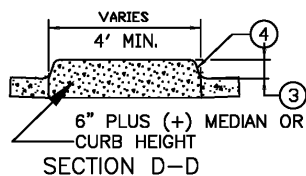
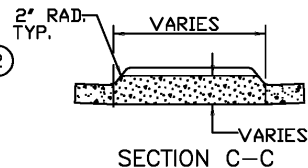
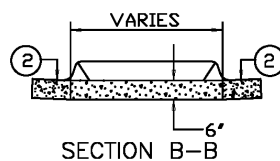
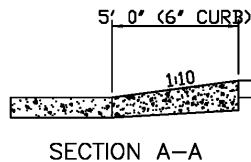
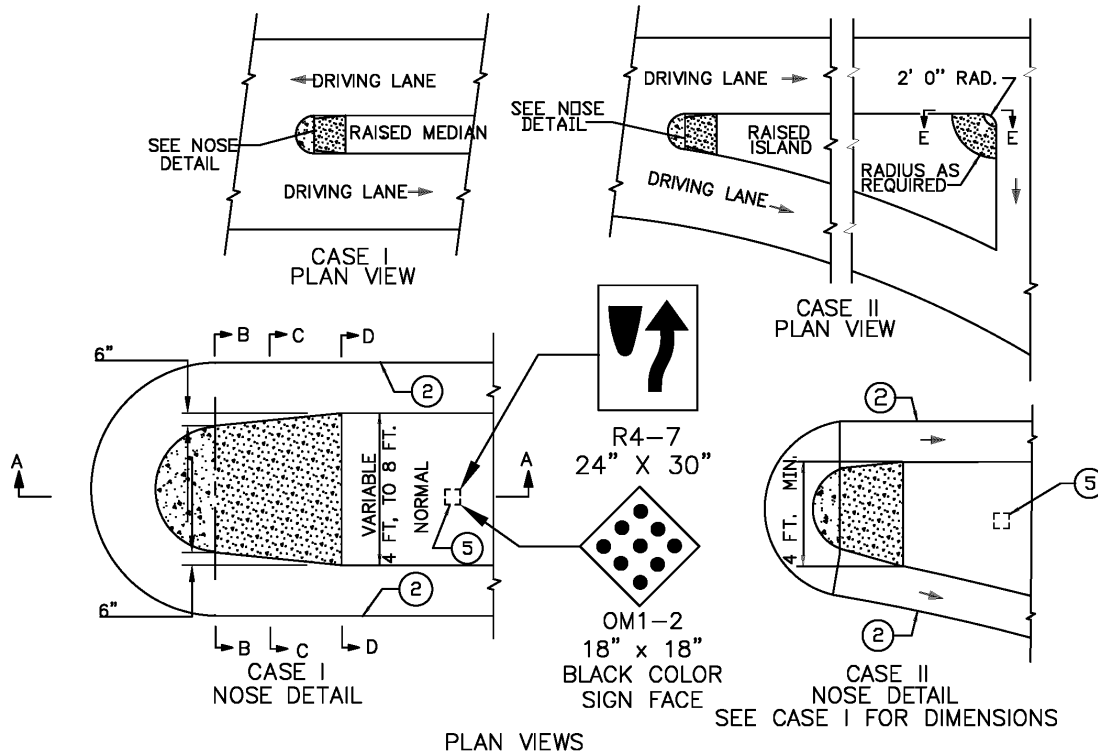
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CITY PL. NO.
STRT-2
REVISED 1-22









NOTES:

- ① TYPICAL SLOPE ALONG GUTTER LINE EACH DIRECTION.
- ② GUTTER, IF REQUIRED.
- ③ VARIABLE MEDIAN OR CURB HEIGHT.
- ④ SHAPE SAME AS MEDIAN OR CURB.
- ⑤ PROVIDE SIGN POST EMBEDMENT ASSEMBLY PER DETAIL STRT-23 IF THIS AREA HAS ANY TYPE OF PAVING.
- ⑥ INSTALL R4-7, 24" X 30" (KEEP RIGHT) AND OM1-2, 18" X 18" (OBJECT MARKER) SIGNS ON A SINGLE POST IN EACH ISLAND NOSE.
- ⑦ ALL ISLAND CONCRETE FLAT WORK SHALL BE PLACED ON A MIN. OF 4" OF CL 5 AGGREGATE BASE.
- ⑧ MEDIANS WIDE ENOUGH TO HAVE PLANTING BEDS MUST INCLUDE 4" THICK, 2' WIDE CONCRETE MAINTENANCE STRIP FOLLOWING TOP BACK OF CURB ON BOTH SIDES FROM NOSE TO NOSE



STANDARD DETAILS

CONCRETE ISLAND APPROACH NOSE DETAIL

CITY OF PLYMOUTH

PUBLISHED
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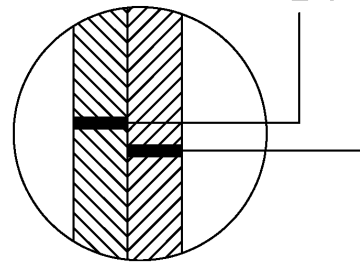
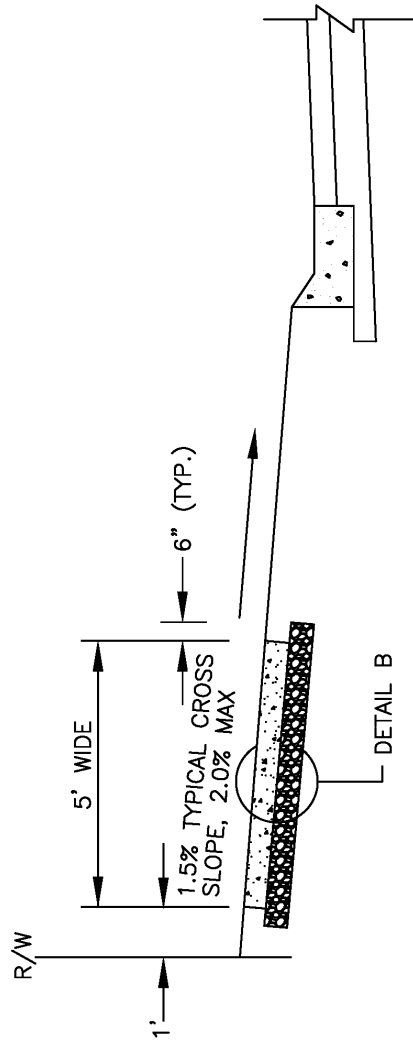
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STRT-9
REVISED 1-20



STANDARD DETAILS
CONCRETE WALK SECTION
CITY OF PLYMOUTH

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CITY PL. NO.
STRT-10
REVISED 1-21

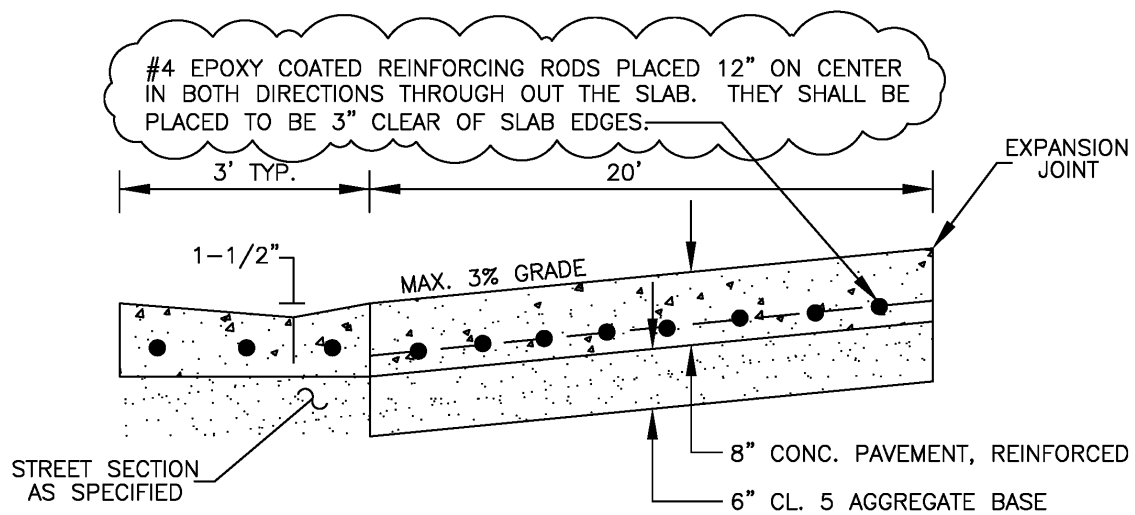


MN/DOT SPEC. 2461.2 4", 6" OR
8" THICK CONC. WALK (MIX 3F52)
4" AGG. BASE CL 5 (100% CRUSHED)

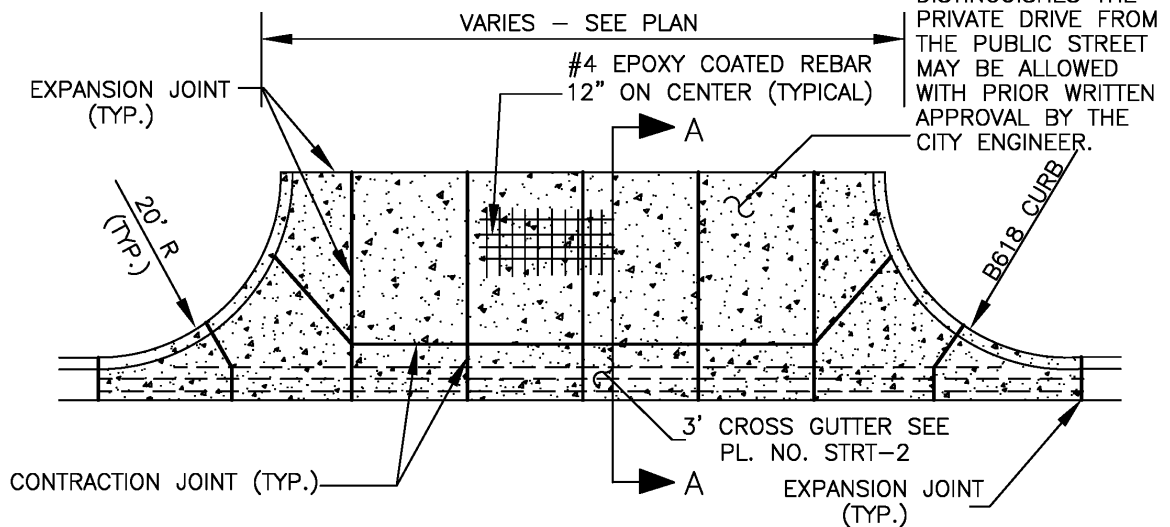
DETAIL B

NOTES:

1. MIN 6" THICK CONCRETE SIDEWALK AT ALL RESIDENTIAL DRIVEWAYS AND 8" THICK AT ALL COMMERCIAL DRIVEWAYS.
2. PLACE PEDESTRIAN CURB RAMPS AT ALL INTERSECTIONS.
3. PROVIDE EXPANSION JOINT MATERIAL AT 100' MAX SPACING AND 6' SPACING FOR CONTRACTION JOINTS (SAWCUT).
4. PROVIDE EXPANSION JOINT MATERIAL ALONG BOTH EDGES OF WALK, WHERE WALK IS CONTAINED BETWEEN FIXED OBJECTS.
5. JOINT SPACING SHALL BE EVERY 6'.
6. PLYMOUTH CITY CODE 524.05 SUBD. 1 (J) REQUIRES THAT "SIDEWALKS AND TRAILS SHALL BE INSTALLED AT THE TIME A STREET IS CONSTRUCTED".
7. THE PROFILE GRADE OF THE SIDEWALK SHALL NOT EXCEED THE GRADE OF THE ADJACENT ROADWAY UNLESS AUTHORIZED BY THE CITY ENGINEER.
8. THERE SHALL BE A 2' CLEAR ZONE AT A MAXIMUM 2% CROSS SLOPE ON EITHER SIDE OF THE WALK.



SECTION A-A



PLAN

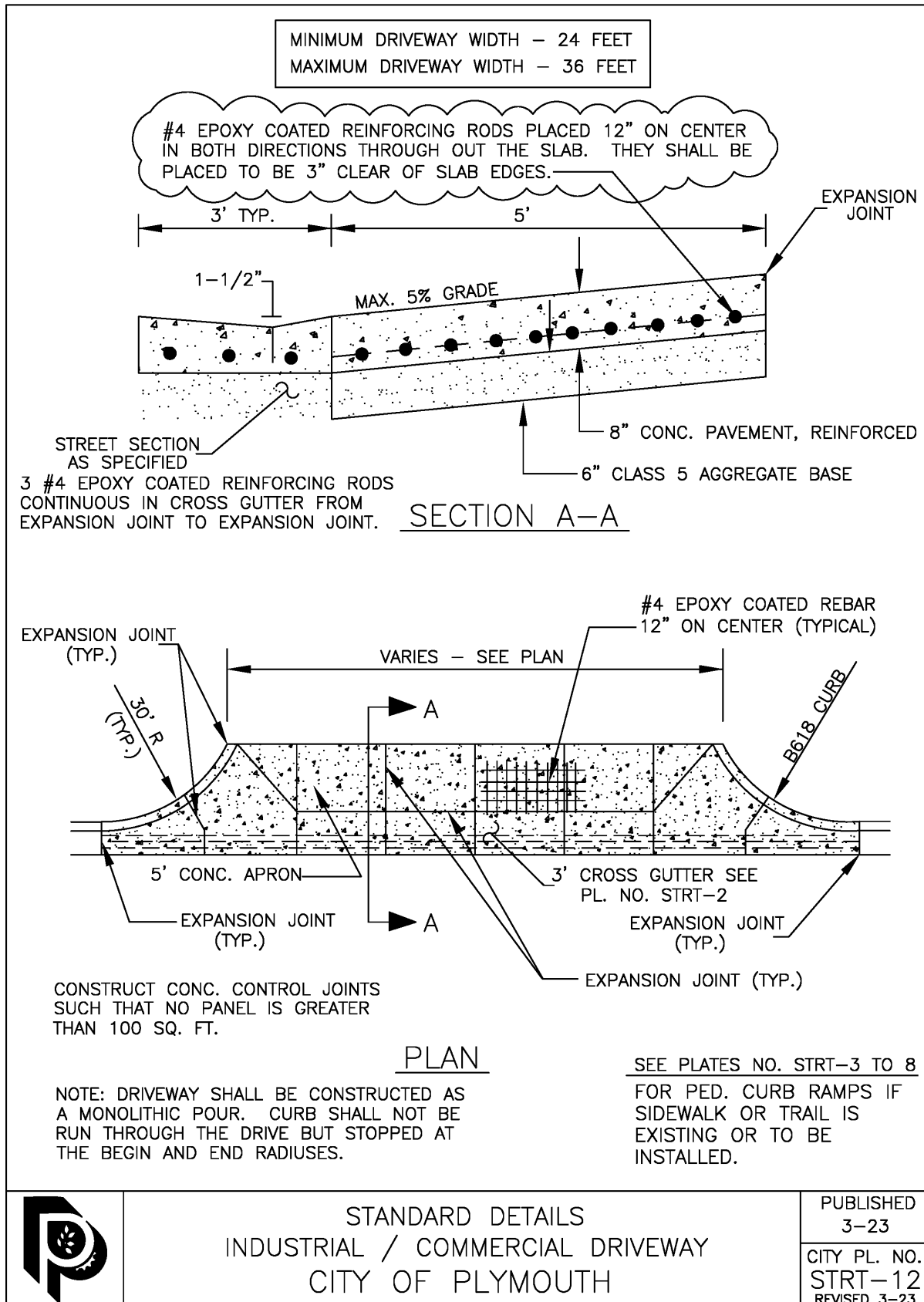
SEE PLATES NO. STRT-3 TO 8 FOR PED. CURB RAMPS IF SIDEWALK OR TRAIL IS EXISTING OR TO BE INSTALLED.



STANDARD DETAILS
PRIVATE DRIVE
CITY OF PLYMOUTH

PUBLISHED
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CITY PL. NO.
STRT-11
REVISED 3-23

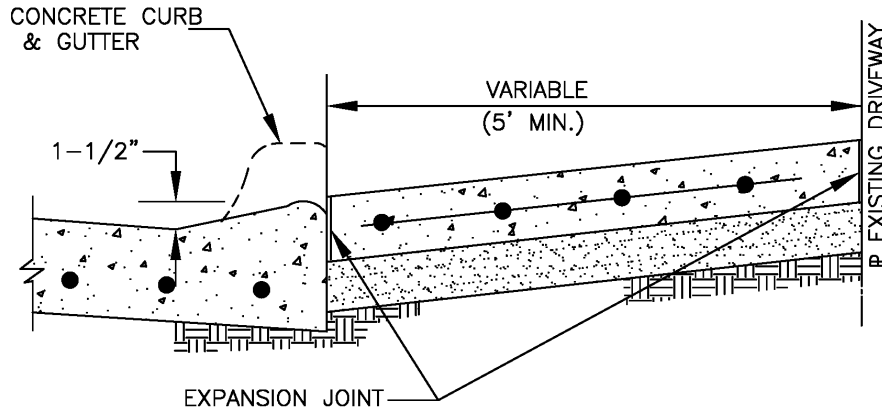


STANDARD DETAILS
INDUSTRIAL / COMMERCIAL DRIVEWAY
CITY OF PLYMOUTH

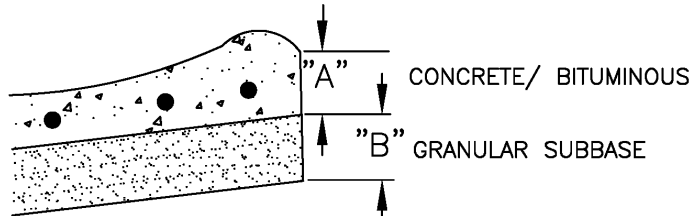
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CITY PL. NO.
STRT-12
REVISED 3-23

CONCRETE SLAB 6" MIN. THICKNESS, REINFORCED WITH #4 EPOXY COATED REINFORCING RODS PLACED 18" ON CENTER IN BOTH DIRECTIONS THROUGH OUT THE SLAB. THEY SHALL BE PLACED TO BE 3" CLEAR OF SLAB EDGES. SLAB SHALL BE PLACED ON 6" OF COMPACTED CL 5 AGGREGATE BASE.

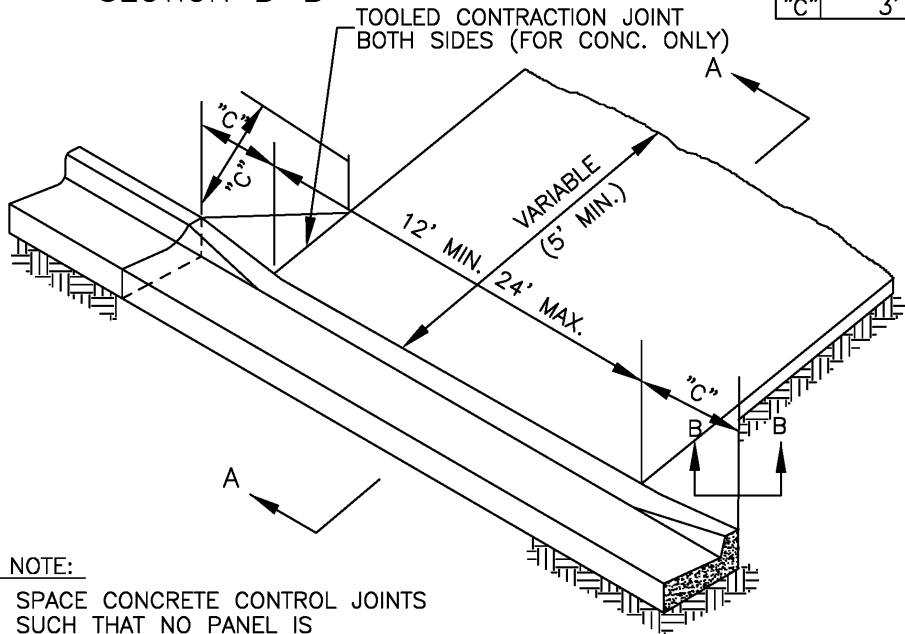


SECTION A-A



SECTION B-B

	CONCRETE	BITUMINOUS
"A"	6"	3"
"B"	6"	6"
"C"	3'	3'



NOTE:
SPACE CONCRETE CONTROL JOINTS SUCH THAT NO PANEL IS GREATER THAN 100 SQUARE FEET.



STANDARD DETAILS
RESIDENTIAL DRIVEWAY DETAIL
CITY OF PLYMOUTH

PUBLISHED
3-23

CITY PL. NO.
STRT-13
REVISED 1-20

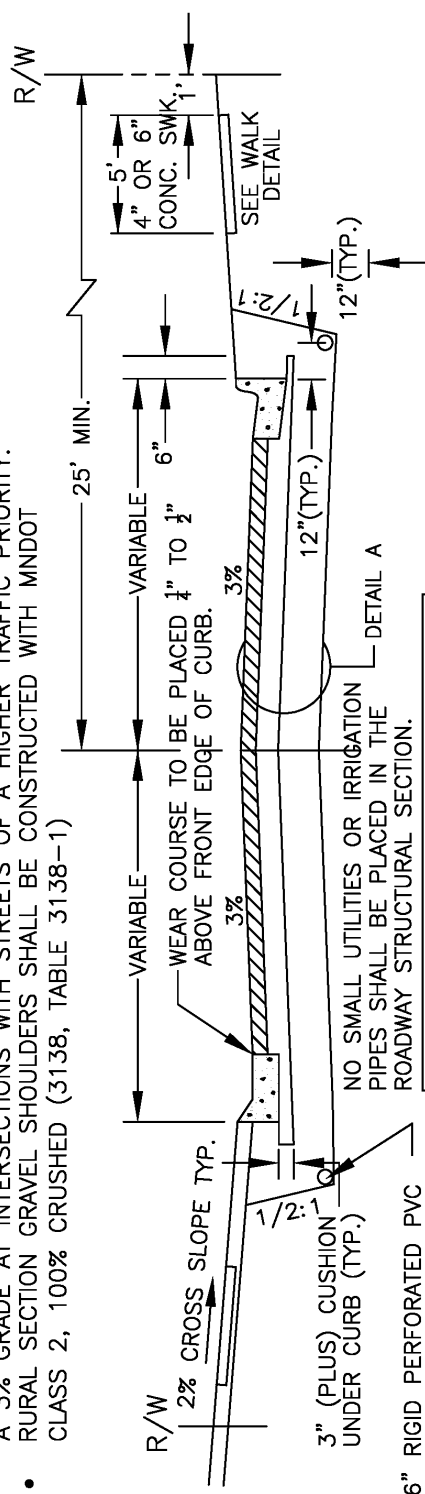


STANDARD DETAILS
RESIDENTIAL STREET SECTION
CITY OF PLYMOUTH

PUBLISHED
3-23

CITY PL. NO.
STRT-14
REVISED 3-15

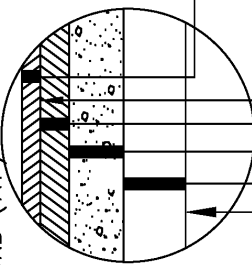
- STREET SECTIONS SHALL BE DESIGNED BY A QUALIFIED ENGINEER BASED ON RESIDENTIAL C.D.S.-90' MIN. DIAMETER ACTUAL SITE SOIL CONDITIONS. THE STREET SECTION SHOWN IS THE MINIMUM TO BACK OF CURB SECTION ALLOWED.
- GRADES ON MINOR STREETS SHOULD PROVIDE AN AREA OF NOT MORE THAN 102' MIN. DIAMETER COMMERCIAL C.D.S.-102' MIN. DIAMETER TO BACK OF CURB
- A 3% GRADE AT INTERSECTIONS WITH STREETS OF A HIGHER TRAFFIC PRIORITY.
- RURAL SECTION GRAVEL SHOULDERS SHALL BE CONSTRUCTED WITH MNDOT CLASS 2, 100% CRUSHED (3138, TABLE 3138-1)



9 TON STREETS BASED ON PROJECTED TRAFFIC ARE EQUIVALENT TO OR GREATER THAN THE STANDARDS HEREIN SPECIFIED.

CONCRETE SIDEWALKS SHALL BE A MINIMUM OF 6 INCHES (6") THICK AT ALL DRIVEWAYS.

MINIMUM SECTION
DETAIL A



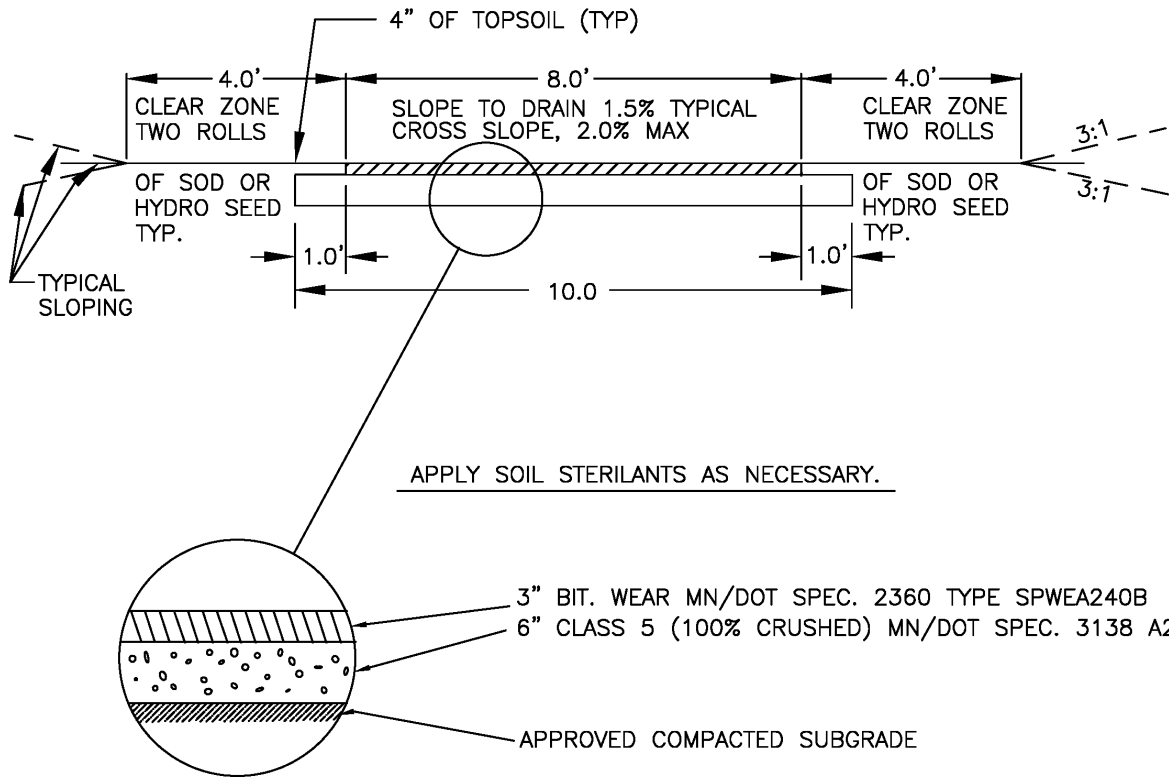
GRANULAR EQUIVALENT (MN/DOE SPECIFIED)

MATERIAL	SPECIFICATIONS	G.E. FACTORS
BITUMINOUS WEAR COURSE	2360	2.25
BITUMINOUS BINDER & BASE	2360	2.25
AGGREGATE BASE	CL.5 (3138)	1.00
AGGREGATE SUBBASE	CL.3, CL.4 (3138)	0.75
SELECT GRANULAR MATERIAL	3149	0.50

DESIGN CRITERIA

PRESENT ADT=1000 VPD (MIN.)
ANNUAL GROWTH FACTOR=3.0%
20 YEAR DESIGN PERIOD
DESIGN SPEED IS 30 MPH, UNLESS OTHERWISE NOTED BY CITY
MIN. $\sum N18_{20} = 150,000$

PUBLIC OR PRIVATE TRAILS



NOTES:

1. PLACE CONCRETE PEDESTRIAN CURB RAMPS AT ALL INTERSECTIONS SEE DETAILS STRT-3 THROUGH STRT-8.
2. PLYMOUTH CITY CODE 524.05 SUBD. 1 (J) REQUIRES THAT "SIDEWALKS AND TRAILS SHALL BE INSTALLED AT THE TIME A STREET IS CONSTRUCTED".
3. THE PROFILE GRADE OF THE TRAIL SHALL NOT EXCEED THE GRADE OF THE ADJACENT ROADWAY UNLESS AUTHORIZED BY THE CITY ENGINEER.



STANDARD DETAILS TYPICAL TRAIL CROSS SECTION CITY OF PLYMOUTH

PUBLISHED
3-23

CITY PL. NO.
STRT-15
REVISED 1-17

INSTALL 2 BARRICADES AT THE END OF THE CUL-DE-SAC PER DETAIL STRT-25

FUTURE SEWER AND WATER LINES ARE TO BE EXTENDED BEYOND THE END OF THE STREET.

A HYDRANT & GATE VALVE SHALL BE PLACED AT THE END OF THE WATERMAIN.

10' TEMPORARY ROADWAY EASEMENT

4" HIGH TEMPORARY BITUMINOUS CURB.

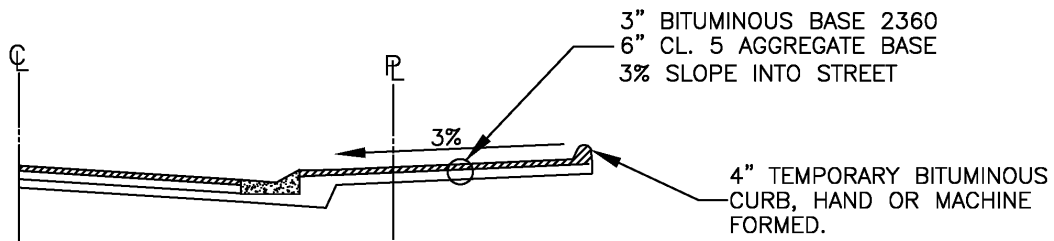
NOTE:
NO BUILDING PERMIT SHALL BE ISSUED FOR ANY PROPERTIES CONTAINING SUCH TEMPORARY EASEMENT UNTIL AFTER THE TEMPORARY CUL-DE-SAC IS CONSTRUCTED.

CURB & GUTTER

35' MIN. RAD.
45' MIN. RAD.

EXTEND SEWER/ WATER SERVICES 10' BEYOND THE TEMP. BIT. CUL-DE-SAC.

10' RAD.



STANDARD DETAILS
TEMPORARY BITUMINOUS CUL-DE-SAC
CITY OF PLYMOUTH

PUBLISHED
3-23

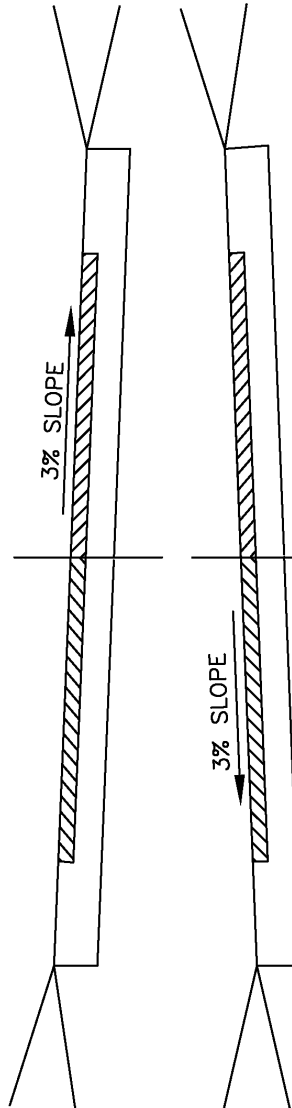
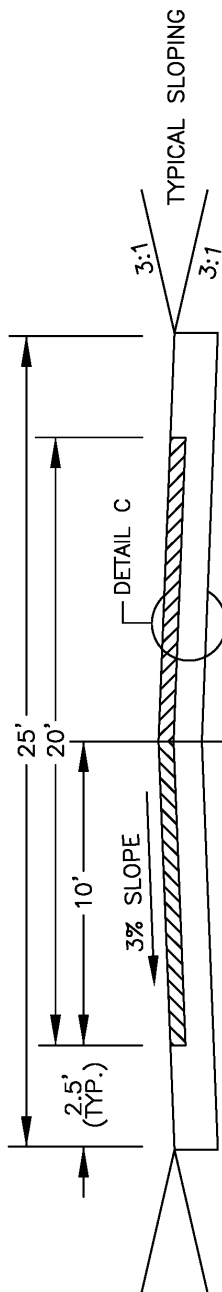
CITY PL. NO.
STRT-16
REVISED 1-21



STANDARD DETAILS
FIRE APPARATUS ACCESS ROAD (FIRE LANES)
CITY OF PLYMOUTH

PUBLISHED
3-23

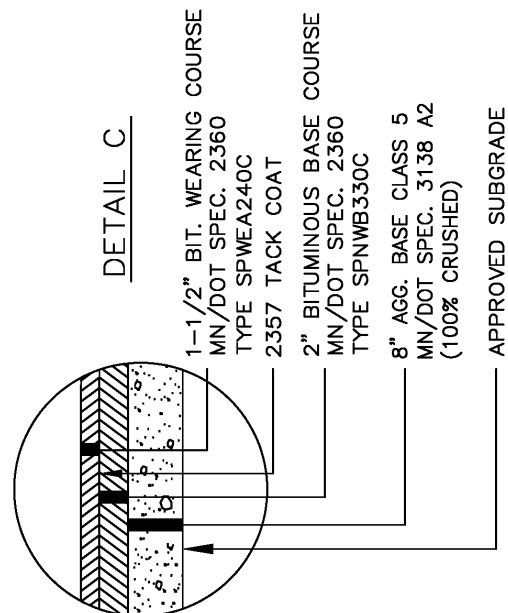
CITY PL. NO.
STRT-17
REVISED 1-20



NOTE: DEMONSTRATE
TURN RADIUS FROM
ALL DIRECTIONS
BASED UPON PFD
FIRE APPARATUS
DESIGN SPECS. IS
MET.
SUBMIT TO FIRE
INSPECTOR FOR
APPROVAL.

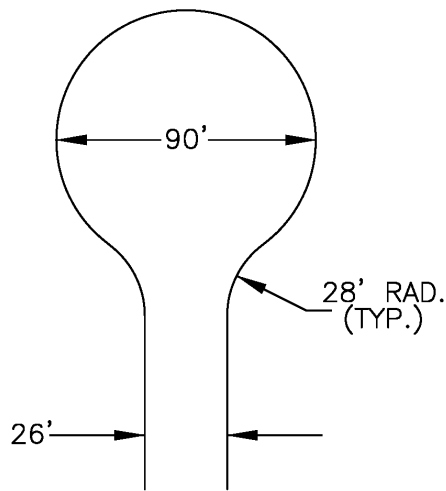
NOTE: 7 TON CAPACITY
CONCRETE SIDEWALKS THAT ARE PART OF
FIRE LANE SHALL BE A MINIMUM OF
6" THICK WITH 6" OF CL. 5 AGG. BASE.
MAXIMUM 3% VERTICAL GRADE @
STREET/DRIVE ENTRANCE AND 5% ON SITE.
MINIMUM 13'-6" VERTICAL CLEARANCE
FIRE LANES ACCESSED FROM THE STREET SHALL HAVE AN
ADA RAMP OR DRIVEWAY CUT AS REQUIRED BY FIRE OFFICIAL

DETAIL C

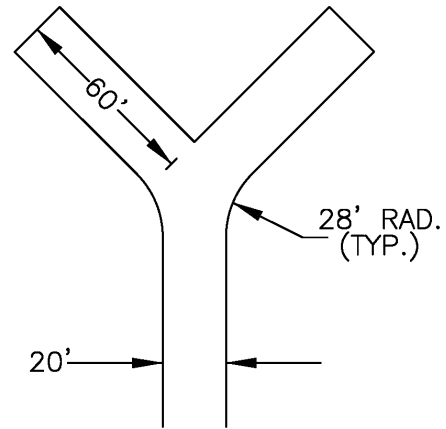


GRANULAR EQUIVALENT (MN/DOT SPECIFIED)

MATERIAL	SPECIFICATIONS	G.E. FACTORS
BITUMINOUS WEAR COURSE	2360	2.25
BITUMINOUS BINDER & BASE	2360	2.25
AGGREGATE BASE	CL.5 (3138)	1.00
AGGREGATE SUBBASE	CL.3, CL.4 (3138)	0.75
SELECT GRANULAR MATERIAL	3149	0.50

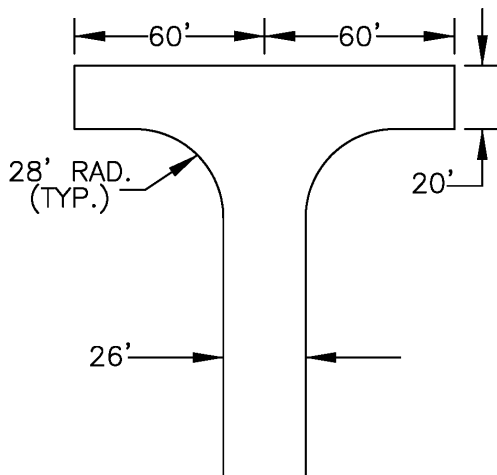


90' DIAMETER CUL-DE-SAC
PERMANENT

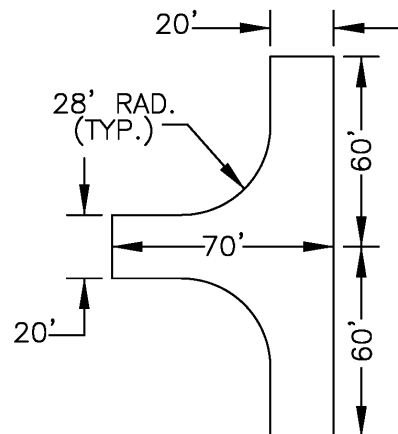


60' "Y"
TEMPORARY

SEE STD. DETAIL PLATE STRT-17 FOR
SECTION VIEW OF THESE FIRE LANE
LAYOUTS



120' HAMMERHEAD
TEMPORARY



ACCEPTABLE ALTERNATIVE
TO 120' HAMMERHEAD
TEMPORARY



STANDARD DETAILS
TURNAROUND REQUIREMENTS FOR DEAD-END FIRE
APPARATUS ACCESS ROADS (FIRE LANES)
CITY OF PLYMOUTH

PUBLISHED
3-23

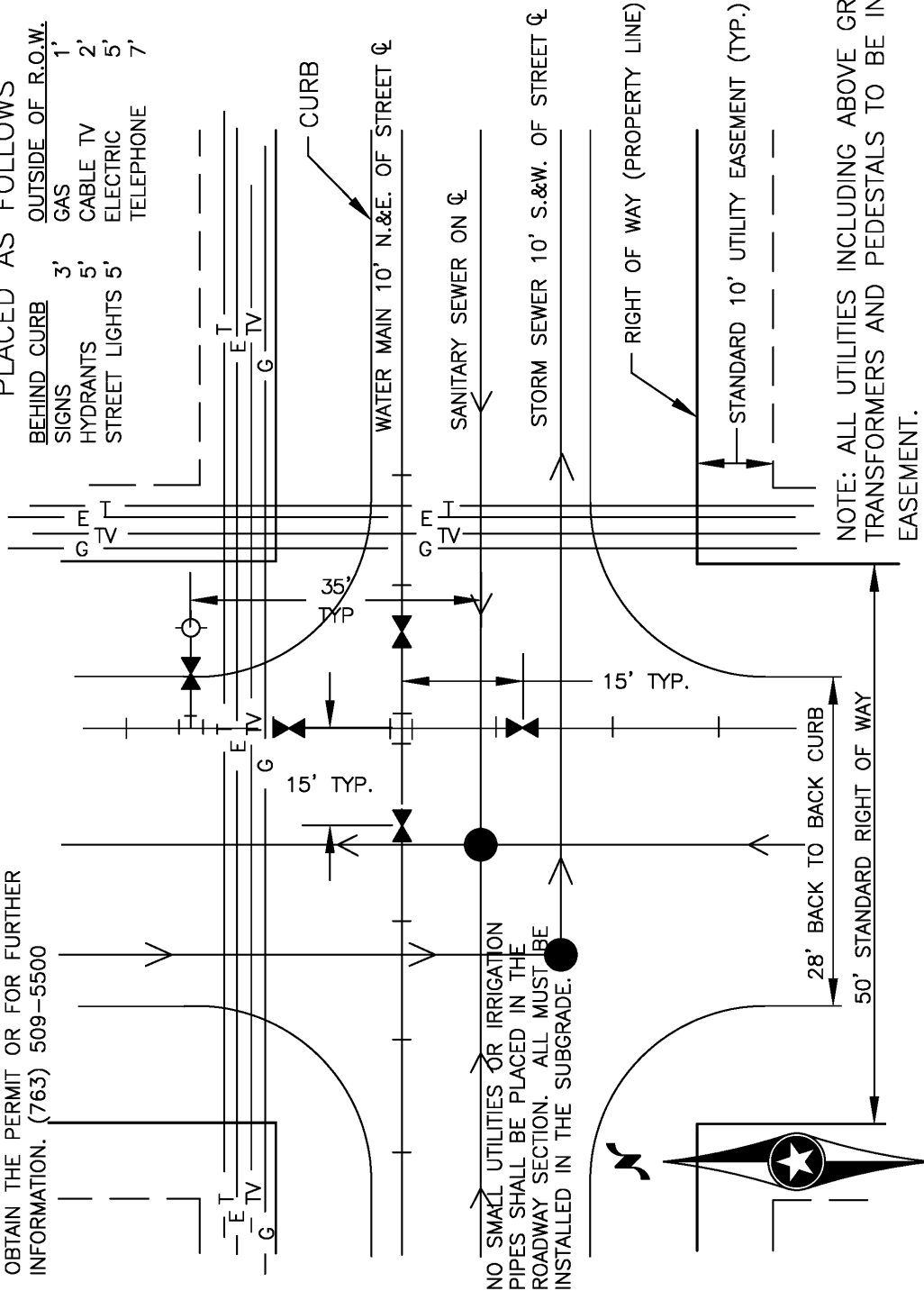
CITY PL. NO.
STRT-18
REVISED 1-21

NOTE: A PERMIT IS REQUIRED TO WORK IN THE PUBLIC RIGHT-OF-WAY. THIS INCLUDES INSTALLATION OF SMALL UTILITIES. CONTACT THE CITY OF PLYMOUTH ENGINEERING DIVISION TO OBTAIN THE PERMIT OR FOR FURTHER INFORMATION. (763) 509-5500

NOTE: SEE CITY PLATE NO. STRT-20 FOR ALTERNATE UTILITY PLACEMENT.

UTILITIES SHALL BE PLACED AS FOLLOWS

BEHIND CURB	OUTSIDE OF R.O.W.
SIGNS	GAS
HYDRANTS	CABLE TV
STREET LIGHTS	ELECTRIC
	TELEPHONE
3'	1'
5'	2'
5'	5'
	7'



NOTE: ALL UTILITIES INCLUDING ABOVE GROUND TRANSFORMERS AND PEDESTALS TO BE IN EASEMENT.

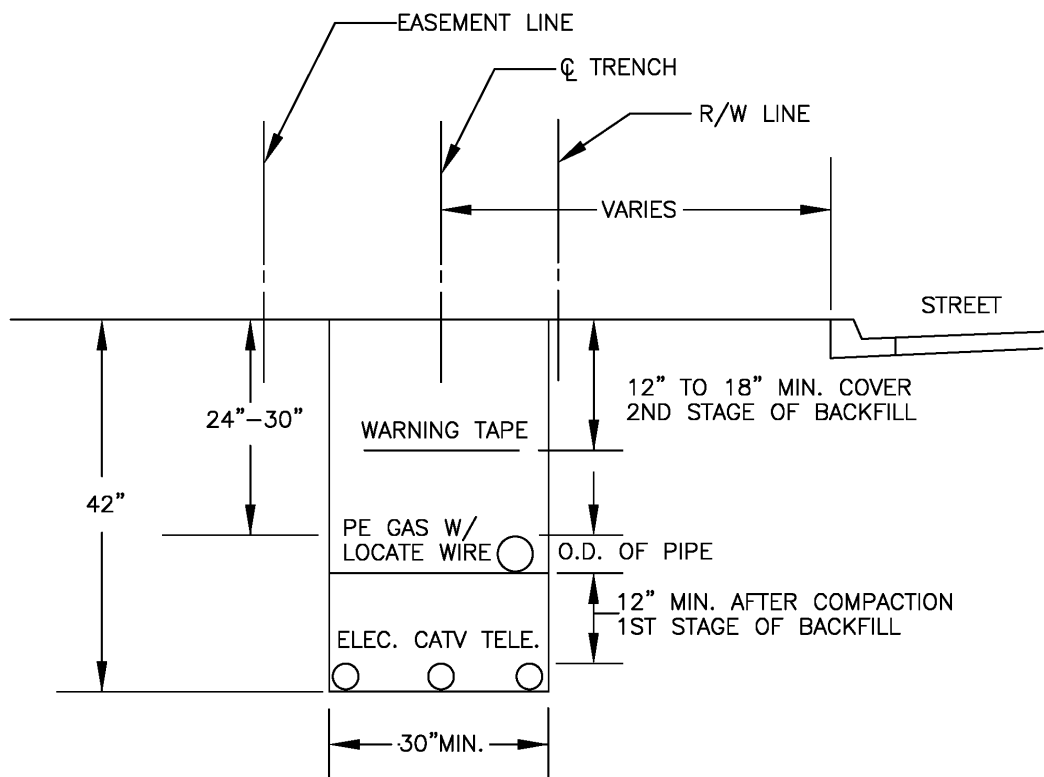


STANDARD DETAILS LOCATION OF PUBLIC UTILITIES CITY OF PLYMOUTH

PUBLISHED
3-23

CITY PL. NO.
STRT-19
REVISED 3-16

NOTE: A PERMIT IS REQUIRED TO WORK IN THE PUBLIC RIGHT-OF-WAY. THIS INCLUDES INSTALLATION OF SMALL UTILITIES. CONTACT THE CITY OF PLYMOUTH ENGINEERING DIVISION TO OBTAIN THE PERMIT OR FOR FURTHER INFORMATION. (763) 509-5500



NOTE:
ALL SMALL UTILITIES INCLUDING ABOVE GROUND TRANSFORMERS AND PEDESTALS TO BE LOCATED IN THE DRAINAGE AND UTILITY EASEMENTS PARALLEL TO THE RIGHT-OF-WAY. TRANSFORMERS AND PEDESTALS SHALL NOT BE PLACED OVER PUBLIC UTILITIES THAT ARE IN THE D&U EASEMENTS EITHER ALONG THE STREETS OR THROUGH THE LOTS.



STANDARD DETAILS
SINGLE TRENCH INSTALLATION
LOCATION OF PUBLIC UTILITIES
CITY OF PLYMOUTH

PUBLISHED
3-23

CITY PL. NO.
STRT-20
REVISED 3-12

THE INTENT OF THESE SPECIFICATIONS IS TO HAVE A UNIFORM TRAFFIC CONTROL SIGNS THROUGHOUT THE CITY. THIS IS IMPORTANT FOR AESTHETIC PURPOSES AND WILL EASE REPAIRS, KEEPING THE NUMBER AND TYPES OF PARTS NEEDED IN INVENTORY TO A MINIMUM.

THE SPECIFICATIONS INCLUDE, BUT ARE NOT LIMITED TO: REGULATORY, PARKING, SCHOOL, WARNING, PARK AND INFORMATION SIGNS.

ALL SIGNAGE SHALL BE SHOWN ON THE STREET PLANS OR A SEPARATE PLAN SHEET FOR THE PROJECT.

THE CITY PUBLIC WORKS DEPARTMENT SHALL APPROVE ALL SIGNS AND MATERIALS PRIOR TO INSTALLATION. (SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL)

SIGNS:

COMMON SIGN SIZES:

STOP – R1-1, 30" X 30"

"NO PARKING ANY TIME" (SYMBOL W/"ANY TIME" UNDERNEATH)– R7-2A, 12" X 18"

SPEED LIMIT – R2-1, 24" X 30"

STOP AHEAD – W3-1, 36" X 36"

SIGNAL AHEAD – W3-3, 36" X 36"

KEEP RIGHT – R4-7, 24" X 30"

OBJECT MARKER – OM1-2, 18" X 18" (BLACK BACKGROUND W/ YELLOW REFLECTORS)

NO OUTLET – W14-2, 30" X 30"

ALL SIGNS SHALL BE LYLE SIGNS OR APPROVED EQUAL.

ALL SIGNS WILL HAVE "3M" HIGH INTENSITY REFLECTIVE SHEETING OR APPROVED EQUAL.

ALL SIGNS SHALL BE ON ALUMINUM PLATE.

ALL SIGNS UP TO 18" SHALL BE .080 MIN. THICKNESS.

ALL SIGNS OVER 30" SHALL BE 0.100 MIN. THICKNESS.

ALL SIGNS TO BE SIZED ACCORDING TO MN MUTCD MANUAL.

AND PUNCHED WITH $\frac{3}{8}$ " HOLES MEETING MN/DOT SPECS.

STREET SIGNS SHALL NOT INCLUDE "N" FOR NORTH

POSTS:

THE SIGN SUPPORTS WILL BE EITHER A "U" CHANNEL POST, PAINTED GREEN OR A 3" DIAMETER, 12' LONG TUBE POST. THE POSTS SHALL BE 2 & 3 LBS. PER FT. AND 6,7 AND 8' IN LENGTH. ALL SIGNS UP TO 18" SHALL BE MOUNTED ON 2 U-CHANNEL POSTS, EACH 2 LBS., ONE 7' LONG AND ONE 6' LONG. THE LONGER POST TO BE DRIVEN IN THE GROUND FIRST.

ALL SIGNS 18" TO 30" SHALL USE A 8' – 3 LB. POST AND A 7' – 2 LB. POST, WITH THE 3LB. POST DRIVEN INTO THE GROUND FIRST.

ALL SIGNS OVER 30" SHALL USE 2 SETS OF POSTS. (THE HEAVIER POST PLACED IN THE GROUND FIRST)

ALL U-CHANNEL POSTS WILL BE POUNDED 3' INTO THE GROUND.

PLACEMENT AND MOUNTING HEIGHTS:

SEE PLATES STRT-21 THROUGH STRT-25

ALL TUBE POST SHALL BE PLACED IN A 10" DIAMETER BY 3' DEEP CONCRETE FOOTING FLARED AT THE BOTTOM.

IT WILL BE THE RESPONSIBILITY OF THE INSTALLER TO HAVE ALL UNDERGROUND UTILITIES LOCATED.



STANDARD DETAILS
TRAFFIC SIGN SPECIFICATIONS
CITY OF PLYMOUTH

PUBLISHED
3-23

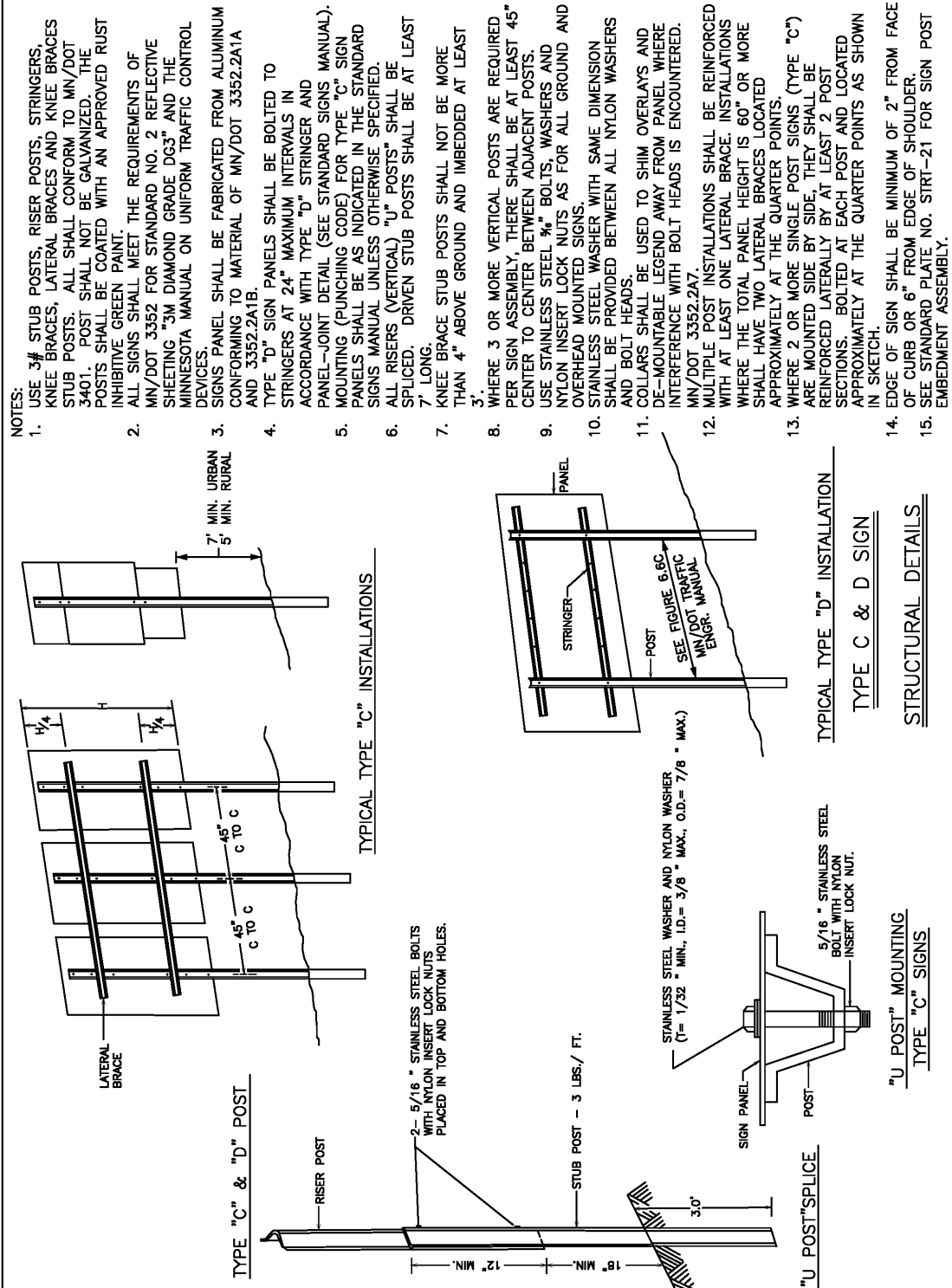
CITY PL. NO.
STRT-21
REVISED 1-20

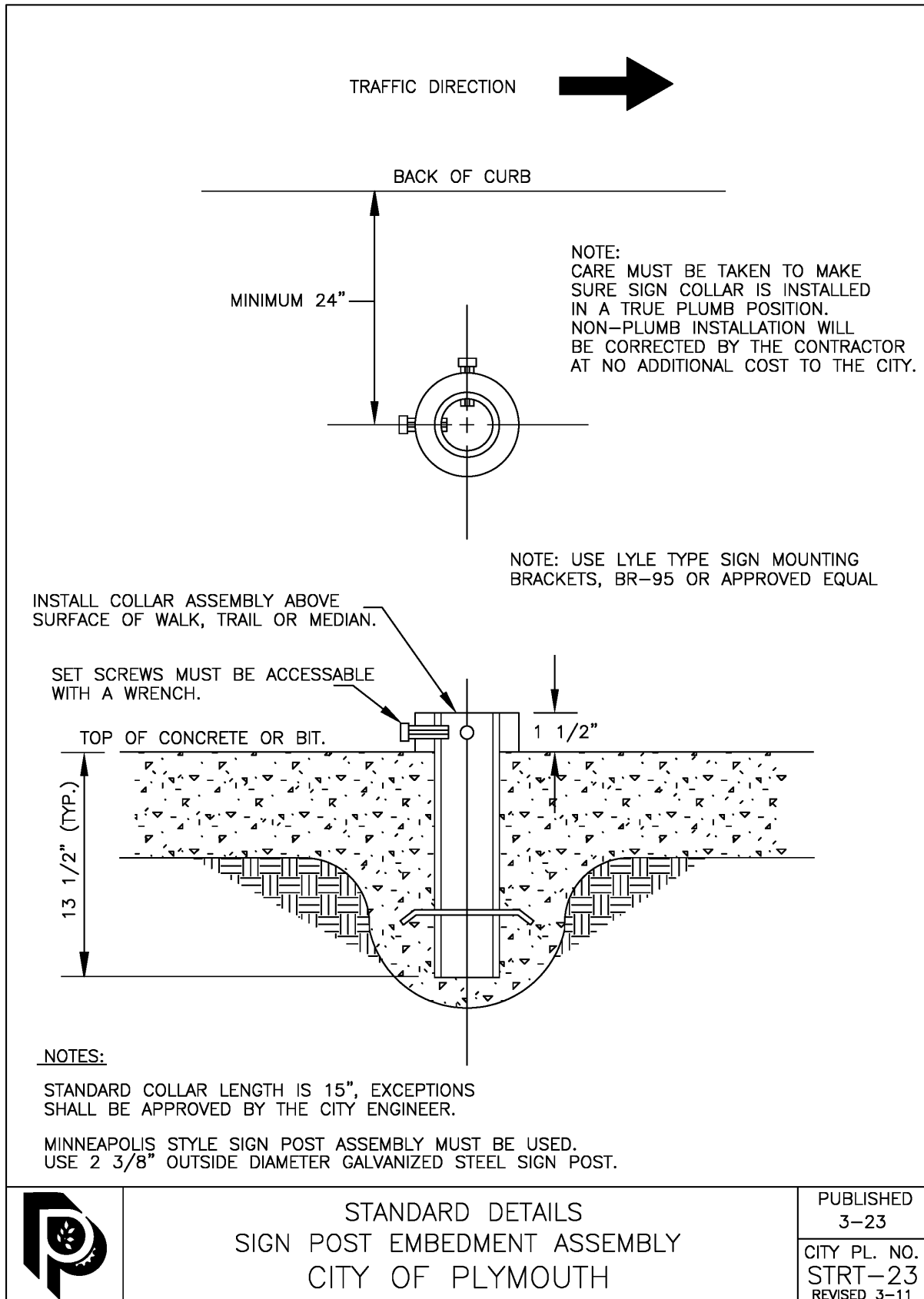


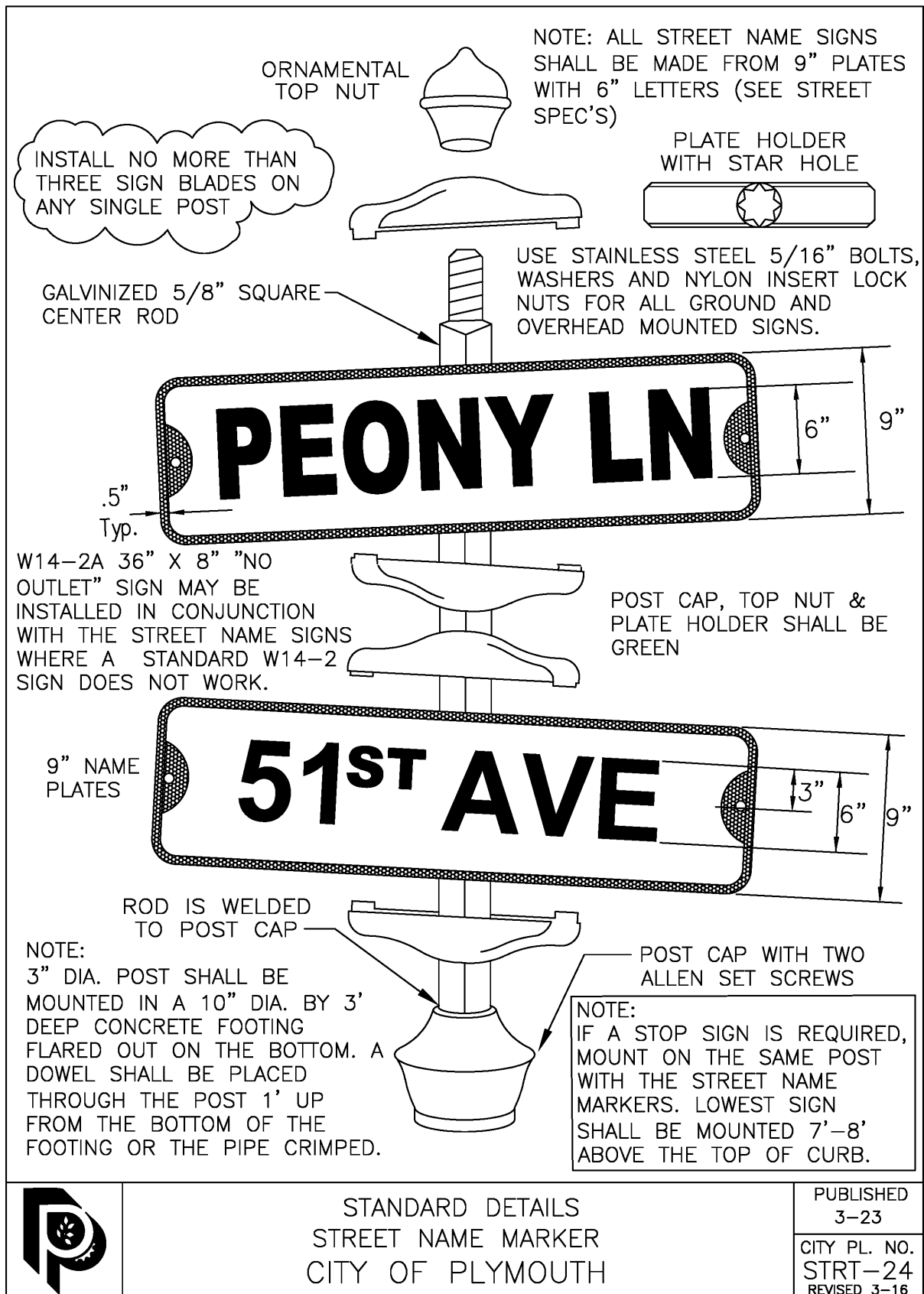
STANDARD DETAILS
TRAFFIC SIGNS
CITY OF PLYMOUTH

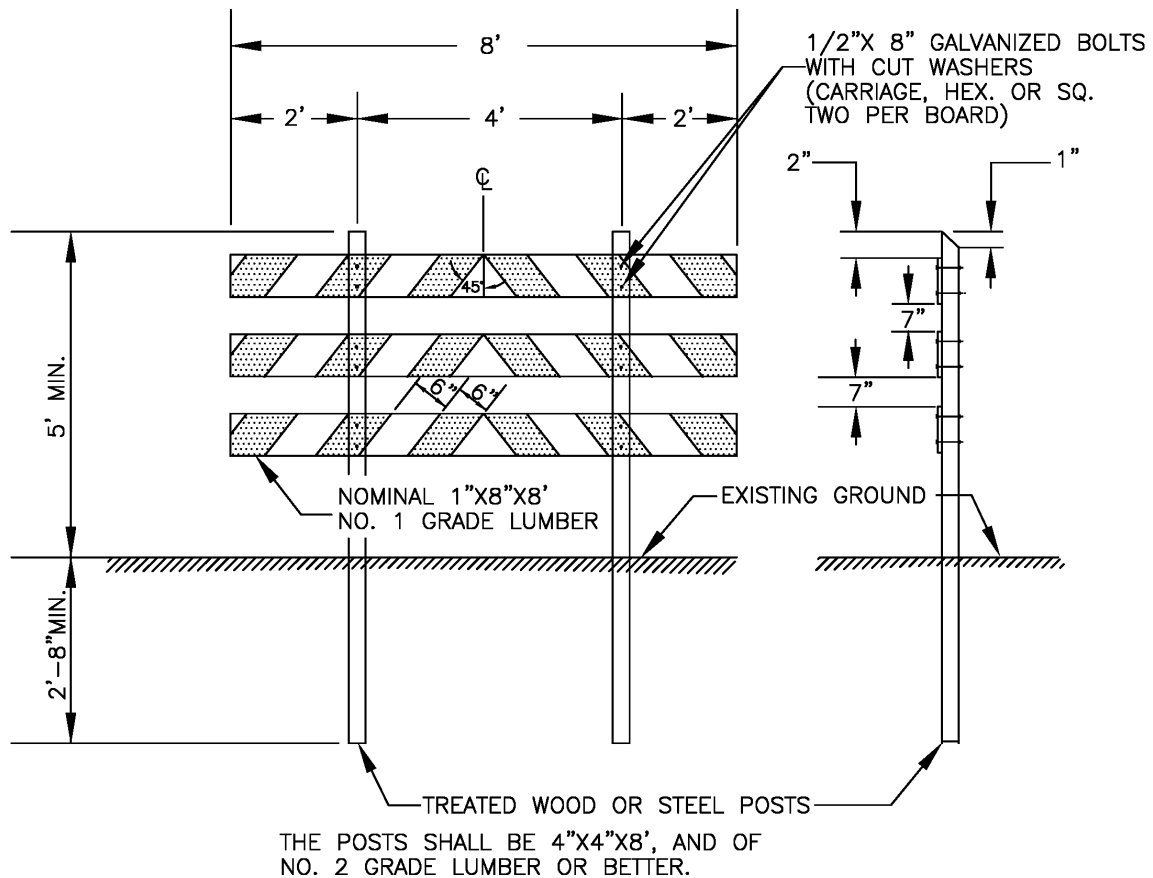
PUBLISHED
3-23

CITY PL. NO.
STRT-22
REVISED 3-11









NOTE:

PLACE BARRICADES AT THE END OF TEMPORARY NO THROUGH STREETS AND UNUSED COMMERCIAL DRIVEWAYS, 10' BACK FROM THE END OF THE SURFACE. INSTALL TWO TYPE III BARRICADES SIDE BY SIDE TO CLOSE OF THE FULL WIDTH OF THE STREET OR DRIVE OPENING.

THE BARRICADE BOARD FACE SURFACES SHALL BE FULLY REFLECTORIZED IN ALTERNATE SILVER-WHITE AND RED STRIPING, USING A REFLECTIVE SHEETING CONFORMING TO THE REQUIREMENTS OF MNDOT SPEC. 3352A2a, STANDARD NO. 1.

PRIOR TO INSTALLING THE REFLECTIVE SHEETING, THE BARRICADE BOARDS SHALL BE GIVEN A COMPLETE COATING OF WHITE WOOD PRIMER PAINT FOLLOWED BY SECOND COAT OF WHITE EXTERIOR PAINT APPLIED ONLY TO THE SURFACES NOT COVERED WITH REFLECTIVE SHEETING.

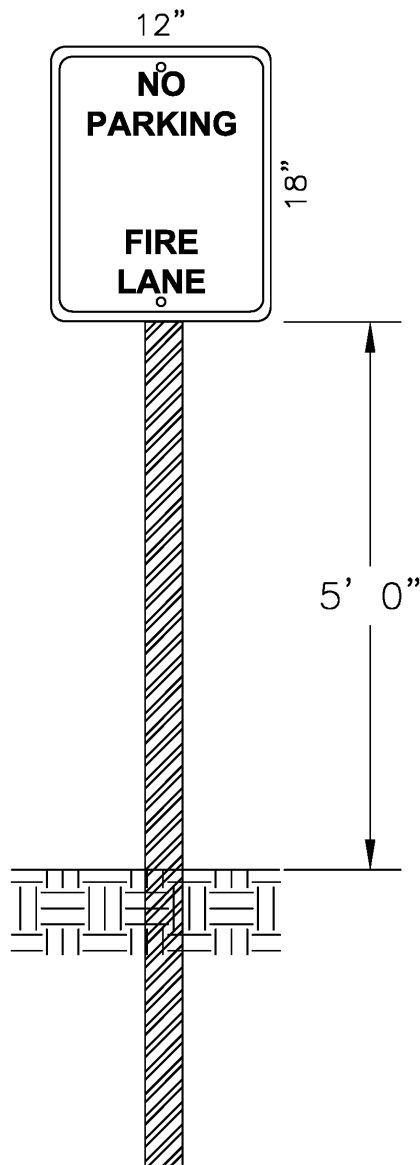
THE BARRICADES BOARDS SHALL BE COMPLETELY PAINTED AND REFLECTORIZED SHEETING APPLIED BEFORE BEING INSTALLED ON THE POSTS.



STANDARD DETAILS
PERMANENT BARRICADE
CITY OF PLYMOUTH

PUBLISHED
3-23

CITY PL. NO.
STRT-25
REVISED 3-11



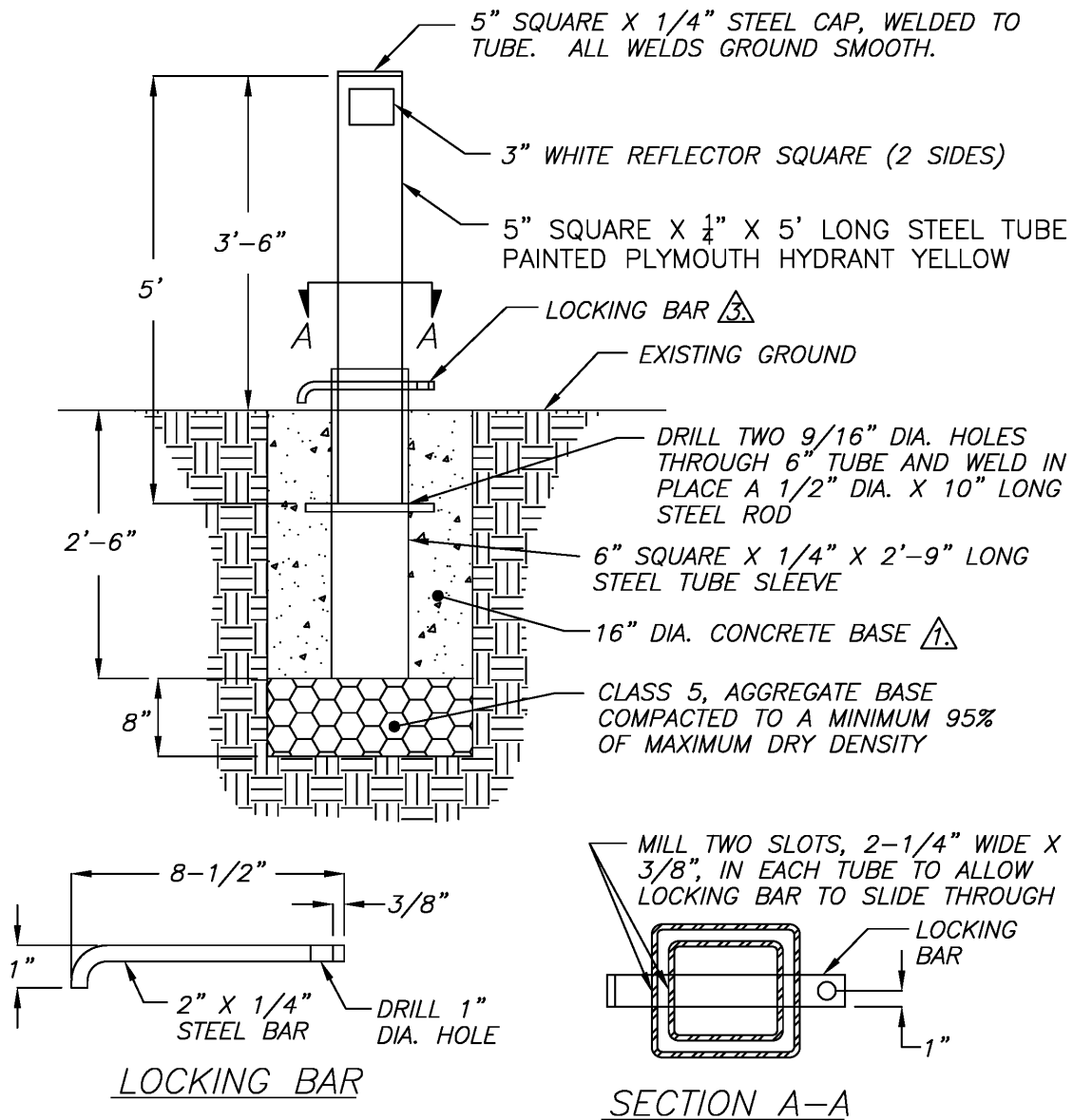
1. USE LYLE SIGN, "NO PARKING FIRE LANE, LR7-22 OR APPROVED EQUAL. SIGN MUST BE A MINIMUM OF 12" X 18", ALUMINUM PLATE, .080 MIN. THICKNESS, HIGH INTENSITY SHEETING, INSTALLED AT A HEIGHT 5' ABOVE GROUND, WITH RED LETTERING ON WHITE BACKGROUND (STANDARD).
2. THE SIGN SUPPORTS WILL BE A U POST, PAINTED GREEN. THE MATERIALS AND INSTALLATION REQUIREMENTS ARE PER DETAIL STRT-21 UNDER THE "POSTS" SECTION.
3. THE SUPPORTING POSTS SHALL BE SET BACK A MINIMUM OF 12" BUT NOT MORE THAN 36" FROM THE CURB ON BOTH SIDES OF THE FIRE LANE/PRIVATE DRIVE.
4. ALL SIGNS SHALL FACE THE DIRECTION OF TRAVEL AND BE INSTALLED ACCORDING TO THE LOCATIONS IDENTIFIED BY THE CITY ON THE APPROVED SITE PLAN, AND ONSTIE FOR THE DEVELOPMENT.
5. A FIRE LANE SHALL BE REQUIRED IN FRONT OF FIRE DEPARTMENT CONNECTIONS EXTENDING 5 FEET ON EACH SIDE AND ALONG ALL AREAS DESIGNATED BY THE FIRE OFFICIAL.
6. ANY DEVIATION FROM THE ABOVE REQUIREMENTS SHALL BE SUBMITTED IN WRITING, WITH A REVISED SITE PLAN, FOR PRIOR APPROVAL BY THE FIRE OFFICIAL.



STANDARD DETAILS
 REQUIREMENT FOR FIRE LANE SIGNAGE ON PRIVATE DRIVES,
 EMERGENCY ACCESS DRIVES, AND FIRE LANES
 CITY OF PLYMOUTH

PUBLISHED
3-23

CITY PL. NO.
STRT-27
REVISED 1-20



NOTES:

- ¹ PORTLAND CEMENT CONCRETE SHALL HAVE THE FOLLOWING CHARACTERISTICS: 3000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS, MINIMUM 6 SACKS OF CEMENT PER CUBIC YARD WITH A SLUMP AT 1 TO 4 INCHES.
2. ALL WELDS AND BENDS SHALL BE SMOOTH, EVEN AND PAINTED.
- ³ DEPENDING ON THE APPLICATION, THE CITY PLYMOUTH SHALL PROVIDE THE PADLOCK AND MAINTAIN THE KEYS.
4. INSTALL ONE BOLLARD FOR EVERY 5' OF PAVEMENT WIDTH AT ALL TRAIL OR FIRE LANE ACCESSES



STANDARD DETAILS
REMOVABLE BOLLARD
CITY OF PLYMOUTH

PUBLISHED
3-23

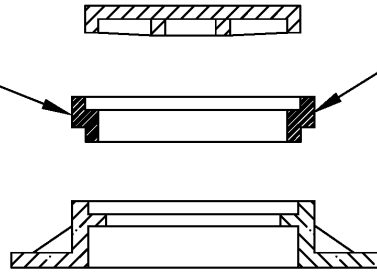
CITY PL. NO.
STRT-28
REVISED 1-20

NEENAH R-1772-B
MANHOLE FRAME (24")

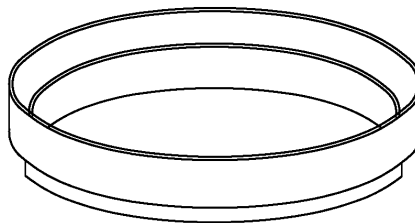
ESS BROTHERS 307,
NEENAH NO. R-1979
D-1=2" RISE
D-2=2-1/2" RISE
D-3=3" RISE
OR APPROVED EQUAL

NEENAH R-1642-B
MANHOLE FRAME (27")

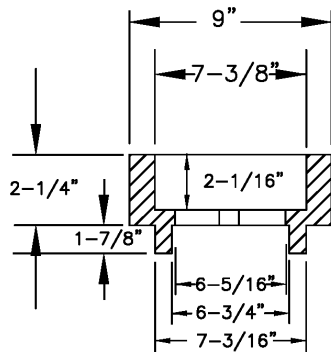
ESS BROTHERS 309,
NEENAH, NO. R-1979
M-1=2" RISE
M-2=2-1/2" RISE
M-3=3" RISE
OR APPROVED EQUAL



NO 2-PIECE RINGS
WILL BE ALLOWED



TYPE A



VALVE BOX RISER TO FIT THE
TYLER NO. 6850, 6855, 6860
OR 6865 TOP SECTION AND THE
TYLER 6850-6855 OR 6860-
6865 DROP COVER, OR APPROVED EQUAL.



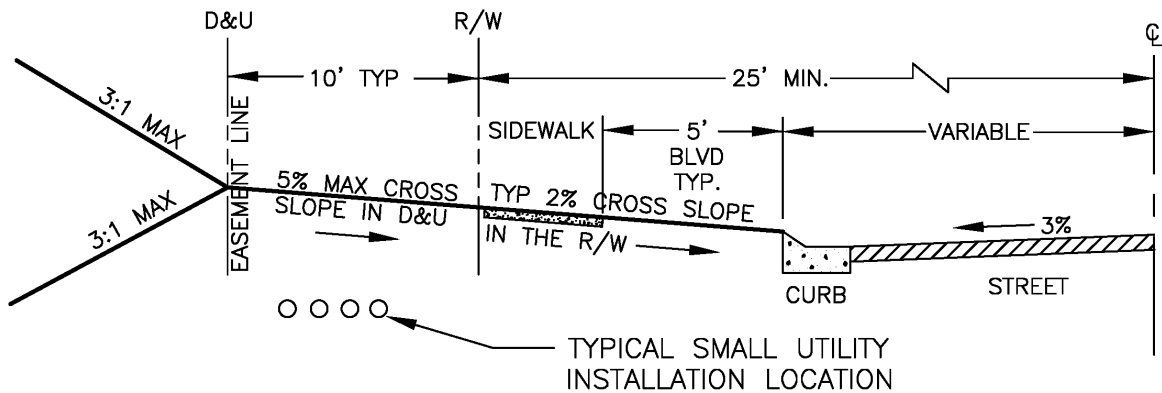
STANDARD DETAILS
RISERS FOR EXTENSION OF
GATE VALVES & MANHOLES
CITY OF PLYMOUTH

PUBLISHED
3-23

CITY PL. NO.
STRT-29
REVISED 3-11

NOTE:

1. RIGHT-OF-WAY BOULEVARDS BEHIND STREET CURBS SHALL BE GRADED WITH A 2% CROSS SLOPE TOWARDS THE STREET. THE D&U EASEMENT AREA MAY BE GRADED WITH A 5% MAXIMUM CROSS SLOPE TOWARDS THE STREET.
2. ALL GRADING SHALL BE SUBSTANTIALLY COMPLETE PRIOR TO THE START OF UTILITY INSTALLATION.
3. NO OFF ROAD GRADING EQUIPMENT SHALL BE DRIVEN OVER ANY NEW OR EXISTING UNDERGROUND UTILITIES.



RETAINING WALL NOTES:

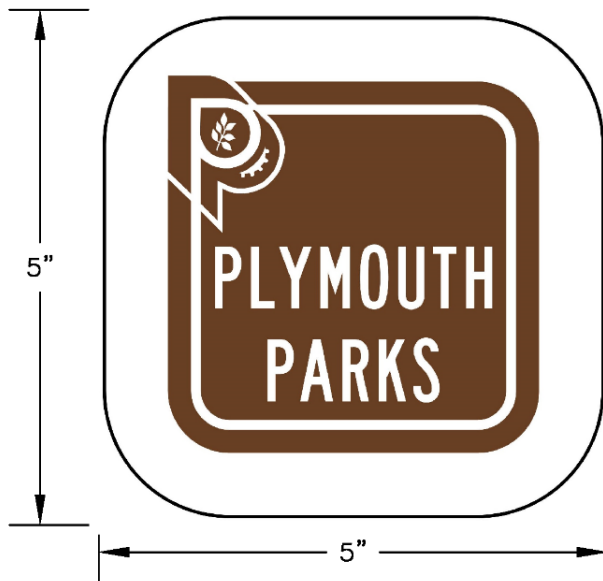
1. RETAINING WALL INSTALLATION REQUIRES A PERMIT.
2. RETAINING WALLS AND THEIR SUPPORTING SYSTEMS CANNOT BE PLACED WITHIN THE STREET RIGHT-OF-WAY OR THE DRAINAGE AND UTILITY EASEMENTS.



STANDARD DETAILS
TYPICAL RIGHT-OF-WAY CROSS SECTION
CITY OF PLYMOUTH

PUBLISHED
3-23

CITY PL. NO.
STRT-30
REVISED 1-17



SPECIFICATIONS:

MONUMENT

CONSISTS OF A POST AND A PROPERTY ID SIGN

PROPERTY ID SIGNS

SUPPLIED BY THE CITY OF PLYMOUTH, PARKS & FORESTRY DIVISION

MOUNTED FLUSH WITH THE ANGLE CUT OF THE POSTS

FASTENED WITH NON-REMOVABLE SCREWS OR RIVETS

POST MATERIALS

5" X 6"

TREATED WOOD OR OTHER CITY APPROVED MATERIAL

POST INSTALLATION

INSTALL POST PLUMB TO A HEIGHT OF FOUR FEET ABOVE GRADE

SET AT LEAST 42 INCHES IN THE GROUND

INSTALLED AT LOT CORNERS WHERE IT ABUTS A PARK/OPEN SPACE PROPERTY, WITH A MAXIMUM SPACING OF 200 FEET BETWEEN SIGNS, WITH SIGNS FACING PARK PROPERTY

PLACE ADDITIONAL POSTS AS NECESSARY TO FOLLOW PARK PROPERTY LINE



STANDARD DETAILS
PARK MONUMENT
CITY OF PLYMOUTH

PUBLISHED
3-23

CITY PL. NO.
STRT-31
REVISED 1-19



MnDOT ADA Compliance Checklist (Curb Ramp)

Development: City Proj. #
 Intersection: Quadrant:
 Ramp Type: Const. Year:

- (1) Minimum 4' wide pedestrian access route (PAR) maintained? ☐ Yes ☐ No
 (2) Landing meets min. 4'x4' and perpendicular grade break(s)? ☐ Yes ☐ No
 (3) Are landing(s) located at the top of each ramp and at change(s) in direction and at inverse grades? ☐ Yes ☐ No

- (4) Landing **slopes (%)**: (TH) (TH) (SS) (SS)
 (5) Ramp's **running slope (%)**: TH Initial TH Secondary SS Initial SS Secondary
 (6) Ramp's **cross slope (%)**: TH Initial TH Secondary SS Initial SS Secondary

- (7) Gutter **flow line slope (%)**: TH SS
 (8) Gutter **inslope (%)**: TH SS
 (9) Roadway **cross slope (%)**: TH SS

TH = Trunk Highway
SS = Side Street

- (10) Do truncated domes cover the entire curb opening and are they properly oriented? ☐ Yes ☐ No
 (11) Are gutter line and ramps draining properly? ☐ Yes ☐ No
 (12) Are there any vertical discontinuities greater than 1/4"? ☐ Yes ☐ No
 (13) Do ramps comply with Spec 2521.3? ☐ Yes ☐ No
 (14) Are ramps **fully compliant**? ☐ Yes ☐ No

If **NO**, check the reason(s) below. Explain why the ramp didn't meet compliance and how the ramp has been improved from the pre-construction condition (see ADA Compliance Checklist Guidance for more info and attach pages if needed).

☐ Topography ☐ Structure(s) ☐ Utilities ☐ Contractor ☐ MnDOT

- (15) Was the curb ramp able to be built according to the plan details? ☐ Yes ☐ No

If **NO**, please explain:

Printed Name: Date (mm/dd/yyyy):

☐ I certify that the information entered on this form is accurate to the best of my knowledge and that I fully understand the checklist standards and am qualified to carry out the inspection.