VILLAGE OF HARTLAND
STANDARD SPECIFICATIONS
AND DETAIL DRAWINGS
(Hartland Standards)

Current Edition: MARCH 1, 2017

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STANDARD SPECIFICATIONS

DETAIL DRAWINGS

SECTION 32 90 00 HARTLAND

PLANTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Topsoil.

B. Sodding.

C. Fertilizing.

D. Maintenance.

E. Hydroseeding.

1.02 RELATED SECTIONS

A. 01 33 00 - Submittal Procedures.

B. 01 57 13 - Temporary Erosion and Sediment Control. Includes temporary seeding (cover crop) for erosion control.

1.03 REFERENCES

A. ASNS: American Standard for Nursery Stock, ANSI; Z60.1 by the American Association of Nurserymen.

B. Technical Standard: Wisconsin Department of Natural Resources (DNR) Storm Water Construction Technical Standards: http://dnr.wi.gov/topic/stormwater/standards/const_standards.html.

C. DNR Specification: Wisconsin Department of Natural Resources Specifications S100-Compost: http://dnr.wi.gov/topic/stormwater/documents/specifications S100Compost.pdf.

1.04 DEFINITIONS

A. Weeds: Bent grass, bermuda grass, bindweed, bird's-foot trefoil, blackberry, brome grass, canada thistle, chickweed, crabgrass, cress, crown vetch, dandelion, foxtail, garlic mustard, horsetail, jimsonweed, johnson grass, lambs quarter, leafy spurge, morning glory, mustard, narrow-leaved cattail, nimble will, nutgrass, nut sedge, perennial sorrel, poison ivy, poison oak, purple loosestrife, quack grass, ragwort, reed canary grass, rush grass, spotted knapweed, sweet clover, tansy, teasel, wild parsnip.

B. Plants: Living trees, shrubs, and herbaceous plants specified in this Section.

C. Project completed and ready for final payment: General Conditions 15.06.A.1.

D. Defective: See General Conditions 1.02. Includes plants that are dead, show disease, weakness, or probability of death.

E. Full growing season: Period from April 15 to November 15.

1.05 SUBMITTALS

A. Action:
1. Follow 01 33 00 for:
a. Seed data including source, species, mix composition, documentation of PLS (pure live seed) testing, percentage by weight, and percentages of purity, germination and weed.
b. Starter mix backfill material and fertilizers. Show certified analysis and component product data.
c. Product data for PAL-listed soil stabilizer product.
d. Anti-desiccant product data.
e. Herbicide product data.

B. Informational:
1. Follow 01 33 00 for:
a. Name and address of nursery supplying plantings or plugs.
b. Description of at least 5 successfully completed projects by proposed installer of similar size and scope as Work in this Project.
c. Statement of qualifications for proposed installer's on-site supervisor including similar project summaries with contact names and project descriptions.
d. Seed bag certification tags stating seed species, mix composition, documentation of PLS (pure live seed) testing, percentage by weight, and percentages of purity, germination and weed seed for each seed species.
e. Plantings and native plant plugs tags or shipping documents identifying source, species, size, and quantities of stock.
2. Follow 01 33 00 for:
a. Maintenance instructions listing procedures and timing to be followed by Contractor and Owner for:
1) Native seed and plug Work, submit 3-year plan.

1.06 QUALITY ASSURANCE

A. Native seed and native plan plugs:
1. Mix: True to species. Cultivars and hybrids will not be permitted.
2. Genotype grown or collected from within a 100-mile radius of Site. If stock is not available from within a 100-mile radius, obtain from source(s) within same EPA Level III Ecoregion as Site.
3. Installer:
a. Specialized in installing native seed and native plant plug work with minimum 5 years experience
b. On-site supervisor: Minimum 5 years experience with native seed and native plant plug work projects.

B. Commercial herbicide applicator certified and licensed by State of Wisconsin for pesticide application.

1.07 DELIVERY STORAGE AND HANDLING

A. Ship, store, and handle seed to ensure protection from moisture, heat, rodents, and other conditions that jeopardize viability and cause germination before installation. Discard damaged seeds.

B. Deliver and store plant plugs to protect from drying winds and direct sunlight. Store plugs in shaded locations and maintain moist packing soil until planting.

C. Dig and handle plant stock to prevent injuries to trunk, branches, and roots. Prevent tops from drying during transport. Handle plants by earth balls or containers.

1.08 APPLICATION

A. Sod shall be used for restoring smaller disturbed areas such as: curb, gutter/sidewalk removal/replacement areas; water and sewer service of replacements, fire hydrant replacement, and other small disturbed areas.

B. Turf grass seeding shall be used for larger disturbed areas such as: New subdivisions, larger roadway and utility reconstruction.

1.09 SCHEDULING

A. Perform permanent turf grass seeding between March 15 and October 1. Outside these dates temporarily stabilize Site following 01 57 13. Dormant seed between November 15 and December 15.

B. Perform no-mow lawn seeding between March 30 and June 1, or between August 21 and September 21. Outside these dates temporarily stabilize Site following 01 57 13. Dormant seed between November 15 and December 15.

C. Perform native plant seeding in spring before June 15 or after September 15 and before ground is snow-covered. Between June 15 and September 15 temporarily stabilize Site following 01 57 13.

D. Plant native plant plugs between March 30 and August 31.

E. Apply herbicide between April 1 and October 1.

1.10 WARRANTIES

A. Correction Period: One year that begins on date Project is completed and ready for final payment. Period shall be extended for defective Work that is corrected, or removed and replaced. Follow General Conditions 15.08.

B. Defects and damage due to animal depredation and weather extremes are excluded from warranty.

1.11 MAINTENANCE

A. Perform all maintenance for landscaping until Project is completed and ready for final payment. For native plant seeding and plug work, perform initial part of approved 3-year Maintenance Instructions.

B. After Project is completed and ready for final payment, Owner will perform maintenance procedures presented in approved Maintenance Instructions submitted by Contractor.

PART 2 - PRODUCTS

2.01 WATER

A. Free from impurities harmful to plants.

2.02 TOPSOIL

A. Site-salvaged humus-bearing soil screened before final placement.

B. Imported: Humus-bearing loam-type soil with a pH level between 6.0 and 7.0, screened before final placement.

C. Screened: Mechanically screened free of roots, sticks, branches and stones greater than 1/2 inch diameter.

2.03 SEEDING MATERIALS

A. Permanent turf grass seed: Deluxe 50 seed mix by Reinders, Inc., Waukesha, WI, Phone: 262-524-0200, or approved equal.

B. No-mow lawn seed: "No Mow" lawn mix from Prairie Nursery, P.O. Box 306, Westfield, WI 53964, Phone: 1-800-476-9453, or approved equal.

C. Temporary cover crop seed: Follow 01 57 13.

D. Native plant seed:
1. ● TBD ●. Seed Mix from Prairie Nursery, P.O. Box 306, Westfield, WI 53964, Phone: 1-800-476-9453.
2. ● TBD ●. Seed Mix from JFNew, 1402 Pankratz St., Suite 302, Madison, WI 53704, Phone: 608-240-1453.
3. ● TBD ●. Seed Mix from Agrecol, 2918 Agriculture Drive, Madison, WI 53718, Phone: 608-266-2544.

E. Nurse crop seed: Annual oats or annual ryegrass.

F. Turf grass seed fertilizer:
1. Granular or liquid marked with content analysis.
2. 1-2-1 nitrogen-phosphorous-potassium ratio.
3. At least 50 percent of nitrogen content in organic, slow-release form.

G. No-mow lawn seed and native plant seed fertilizer: None.

H. Soil stabilizer: Land application. Follow Technical Standard 1050. Use PAL-listed product(s).

I. Hydromulch: Hydraulically applied wood fiber or wood fiber blend mulch.

J. Erosion control mats. Follow 01 57 13.
1. Biodegradable stakes.
2. Biodegradable netting.

2.04 SODDING MATERIALS

A. Sod:
1. Dense, well-rooted permanent and desirable grasses, weed free with lush appearance cut in uniform commercial strips. Thickness should be full and uniform, approximately 3/4 inch or more.
2. If sod is in dry condition before cutting, ensure that sufficient water is applied to sod 12 hours before cutting to provide a sod strip well moistened throughout cutting depth.

B. Sod fertilizer:
   1. Granular or liquid, marked with content analysis.
   2. 3-1-2 nitrogen-phosphorous-potassium ratio.
   3. At least 50 percent of nitrogen content in organic, slow-release form.

2.05 NATIVE PLANT PLUG MATERIALS

A. Plant plugs: See Drawings for planting schedule and locations.
   1. Size: Minimum 2-1/4 inches in diameter and 4-3/4 inches deep.
   2. Root systems shall be well developed throughout the soil volume, but not overly root bound.
   3. Plant tops should be adequately developed, viable, healthy, and sufficiently hardened for outdoor planting.

B. Starter mix backfill material: Compost, peat moss and topsoil at a ratio of two parts topsoil to one part compost/peat moss blend by volume.
   1. Compost: Follow DNR Specification S100.
   2. Peat moss: Brown to black color with at least 75-percent partially decomposed stems and leaves.

C. Fertilizer: None.

D. Mulch: Shredded hardwood bark from disease-free trees.

E. Stakes: Biodegradable stakes.

PART 3 - EXECUTION

3.01 TOPSOIL

A. Preparation:
   1. Eliminate uneven areas and low spots. Remove debris, roots, branches, stones in excess of 1/2 inch in size.
   2. Scarify subgrade to 4 inches depth by ripping, tilling, disking, or other method where topsoil is scheduled and where equipment used for hauling and spreading topsoil has compacted subsoil.
   3. Minimize compaction during grading operations by utilizing equipment having low unit pressure ground contact and by limiting repeat passes over the same areas in areas to receive topsoil.

B. Placement depths:
   1. Turf grass seed and sod subgrade: 4 inches.
   2. No-mow lawn seed: 4 inches.
   3. Native seed and native plant plugs: 6 inches.

C. Installation:
   1. Use topsoil in relatively dry state. Place during dry weather.
   2. Fine grade topsoil eliminating rough or low areas. Break down clods and lumps with appropriate equipment that creates uniformly textured soil. Maintain levels, profiles, and contours of subgrade.
   3. Remove stone, roots, and branches exceeding 3/4-inch sieve, and foreign material, and clods that cannot be broken down while spreading.
   4. Manually spread topsoil uniformly around trees, plants and building to prevent damage.
   5. Lightly compact placed topsoil, so as to negate any detrimental differential settling.

6. Remove surplus subsoil and topsoil from Site. Leave stockpile areas ready to receive landscaping.

D. For no-mow and native seeding, and native plug planting.
1. Apply soil stabilizer over newly spread topsoil.
2. Allow weed seeds to germinate and grow to one-foot height after topsoil placement.
3. Mow weeds to 4 inches high or less 10 days before applying herbicide.
4. Coat all green growth on germinated weeds with herbicide to kill.
5. Repeat herbicide application after 14 days if vegetation persists, and a minimum of 7 days before seeding or planting.

E. Finish grade tolerance: Plus-or-minus 1/2 inch.

3.02 TURF GRASS SEEDING

A. Preparation:
1. Before seeding, disk, harrow, drag, and rake to form a level and loose seed bed. Lightly roll topsoil before final raking to eliminate soft spots and mounds.
2. Notify Engineer to allow inspection after fine grading and before seeding.

B. Permanent installation:
1. Hydroseed over prepared bed using a sprayed water. Keep contents stirred to allow for uniform distribution. Seeds remaining in water for longer than one hour will be rejected. Add hydromulch and a tackifier to hydroseed tank and apply with seed and fertilizer following manufacturer's instructions to produce mulch coverage rate of uniform maximum 1/4-inch depth.
2. Sowing rate:
   a. Turf grass: 4.5 pounds per 1000 square feet. Double rate for dormant seeding.
   b. Temporary cover crop: Follow 01 57 13.
3. Uniformly apply fertilizer and lightly disc or harrow into soil in conjunction with final topsoil preparation, before seeding.
4. Fertilizer rate: 7 pounds per 1000 square feet.
5. Protect seeded areas to prevent damage to completed installation.
6. Place erosion control mats on slopes greater than 3H:1V and other areas shown on Drawings. Follow 01 57 13.

C. Maintenance:
1. Water seeded areas as follows:
   a. First day (after seeding and fertilizing): 1-1/2 inches water.
   b. Days 2-14 (or until complete germination, whichever comes last): 1/2 inches water every other day.
   c. As needed after complete germination to maintain a uniform stand of healthy grass.
   d. Natural rain events may substitute for watering, but perform additional watering on rain-event days to achieve stipulated water amounts.
   e. In the event that Contractor does not achieve stipulated water amounts, the Owner reserves the right to perform watering and back charge the Contractor.
2. Lawn areas shall receive at least two 2-inch mowings before acceptance. Do not allow grass height to exceed 4 inches.
3. Reseed areas that show inadequate catch and bare spots exceeding 2 square feet. Bare spots shall not exceed 3 percent of total seeded areas.
4. Correct damage from erosion, gullies, washouts, traffic, or other causes by filling with topsoil, tamping, refertilizing, and reseeding.
5. Protect grass areas during maintenance period.

3.03 NATIVE PLANT SEEDING AND NO-MOW LAWN SEEDING.

A. Preparation:
1. Do not seed until topsoil has been chemically treated to eliminate weeds. Follow Article 3.01.
2. Before seeding, till under any existing temporary cover crop to a minimum depth of 6 inches.
3. Disk, harrow, drag, and rake to form a level and loose seed bed. Lightly roll before final raking of topsoil to eliminate soft spots and mounds.
4. Notify Engineer to allow inspection after fine grading and before seeding.

B. Permanent installation:
1. Hydroseed over prepared bed using a sprayed water. Keep contents stirred to allow for uniform distribution. Seeds remaining in water for longer than one hour will be rejected.
2. Seed sowing rates:
   a. Native plant seed: Follow manufacturer's recommendations.
   b. No-mow lawn seed: Follow manufacturer's recommendations. Double rate for dormant seeding.
   c. Nurse crop:
      1) Annual oats: 1.5 pounds per 1000 square feet if seeded after September 15.
      2) Annual ryegrass: 0.2 pounds per 1000 square feet if seeded before June 15. 0.6 pounds per 1000 square feet if seeded after September 15.
   d. Temporary cover crop: Follow 01 57 13.
   e. Calibrate equipment used to deliver seed to specified seedling rates.
3. Fertilizer: None.
4. Place mulch within 2 days after seeding. Apply hydromulch and a tackifier over seeded areas using sprayed water at a rate to produce a mulch coverage of uniform depth following manufacturer's instructions. Maximum mulch depth shall be 1/4 inch.
5. Protect seeded areas to prevent damage to completed installation.
6. Place erosion control mats on slopes greater than 3H:1V and where shown on Drawings. Follow 01 57 13.

C. Maintenance:
1. For now-mow lawn seed, and native plant seed placed before June 15, water as follows: natural rain events may substitute for watering, but perform additional watering on rain event days to achieve stipulated water amounts:
   a. First day (after seeding and mulching): 1-1/2 inches water.
   b. Days 2 - 45 (1/2-inch water every other day.
   c. Natural rain events may substitute for watering, but perform additional watering on rain-event days to achieve stipulated water amounts.
   d. In the event that Contractor does not achieve stipulated water amounts, the Owner reserves the right to perform watering and back charge the Contractor.
2. Do not water native plant seed placed after September 15.
3. Achieve 90-percent vegetation with native species or nurse crop species, as verified by Engineer. At no time during maintenance period shall more than 10 percent of seeded area be dominated by weed species.
4. Reseed areas that show inadequate germination and have spots exceeding 25 square feet. Bare spots shall not exceed 3 percent of total seeded areas.
5. Correct damage resulting from erosion, gullies, washouts, traffic, or other causes by filling with topsoil, tamping, refertilizing, and reseeding.

6. Chemically treat areas dominated by weed specifies at least two times before reseeding. Follow Article 3.01.
7. Protect seeded areas during maintenance period.

3.04 SODDING

A. Preparation:
1. Ensure area is free from stones, roots, and undesirable materials. Loosen soil to at least one inch deep.
2. Apply fertilizer uniformly over soil before sodding then work fertilizer into soil while preparing.

B. Installation:
1. Moisten earth bed to loosened depth if not already sufficiently moist. Place sod within 24 hours of being cut in strips of commercial size where possible (no pieces smaller than 18 by 24 inches). Stagger joints and place tightly against previously laid strip. Roll sod or lightly tamp with wooden or metal tampers.
2. Stake every 18 to 36 inches along length of strips on slopes steeper than 4H:1V and in drainage components. Stakes should hold sod firmly in place. Lay sod perpendicular to direction of slope so end joints alternate.
3. Clear excess soil from sod surface.
4. Repair and resod damage resulting from erosion, gullies, washouts, dying because of lack of watering, or other causes.
5. Protect sodded areas during maintenance period. Maintain sodded areas by watering for at least 30 days to prevent drying and shrinking. Resod and maintain areas that dry out or fail to establish.

C. Maintenance:
1. Water sodded areas as follows:
   a. First day (after sodding): 1-1/2 inches water.
   b. Days 2-14 (or until complete germination, whichever comes last): 1/2 inch water every day.
   c. As needed after complete germination to maintain a uniform stand of healthy grass.
   d. Natural rain events may substitute for watering, but perform additional water on rain-event days to achieve stipulated water amounts.
   e. In the event that Contractor does not achieve stipulated water amounts, the Owner reserves the right to perform watering and back charge the Contractor.

3.05 NATIVE PLANT PLUG INSTALLATION

A. Preparation:
1. Before planting, till under any existing temporary cover crop to at least 6 inches deep.
2. Disk, harrow, drag, and rake to form a level and loose seed bed. Lightly roll topsoil before final raking to eliminate soft spots and mounds.
3. Notify Engineer to allow inspection after fine grading and before planting.

B. Installation:
1. Install plugs in auger-drilled holes that are within plus 0.75 and minus 0.25 inches of plug diameter and depth.
2. Space plant plugs one-foot apart.
3. In wetland or shoreline areas with potential for high wave action, secure plugs in place with 8-inch U-shaped wire erosion control blanket staples.

C. Maintenance:

1. Care for plants after planting. This includes watering, weeding, and other Work necessary to keep plants neat and healthy.
2. Perform watering at 10 to 14-day intervals between May 15 and October 15. Intervals may lengthen or shorten depending upon weather conditions.
3. In the event that Contractor does not achieve stipulated water amounts, the Owner reserves the right to perform watering and back charge the Contractor.
4. At the end of the first full growing season after planting, at least 75 percent of individual plugs installed shall be present as live individuals and 75 percent of species installed shall be present and alive.
5. Survival percentages shall be established by sampling of one square meter quadrants located at regular intervals along with transects. The quantity of quadrants shall be as needed to represent 0.2 percent of the total planting area in each planting zone, and there shall be at least one randomly located transect in each planting zone.

END OF SECTION

SECTION 33 05 00 HARTLAND

COMMON WORK RESULTS FOR UTILITIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Bedding, cover and backfill.

B. Location aids.

C. Insulation.

D. Connections between dissimilar pipes.

E. Excavation in pavement.

F. Excess excavated material.

G. Trench surface restoration.

H. Pipelines located greater than 4 feet from buildings or reservoir structures. Follow 22 05 05 and 40 23 19 for pipelines 4 feet and less distant.

1.02 RELATED SECTIONS

A. 01 33 00 - Submittal Procedures.

B. 01 43 26 - Inspection and Testing Agency Qualifications.

C. 01 57 13 - Temporary Erosion and Sediment Control.

D. 32 90 00 - Planting.

E. 33 05 23.13 - Utility Horizontal Directional Drilling.

F. 33 05 23.16 - Utility Pipe Jacking.

G. 33 11 00 - Water Utility Distribution Piping.

H. 33 30 00 - Sanitary Sewerage.

I. 33 40 00 - Storm Drainage.

J. 34 71 00 - Roadway Construction.

K. 40 23 19 - Basic Process Piping Materials and Methods.

1.03 REFERENCES

A. Standard Specification for Sewer and Water Construction in Wisconsin, Current Edition (SWS).

B. Wisconsin Standard Specifications.

1.03 SUBMITTALS

A. Action:
1. Follow 01 33 00 for:
a. Product data.
b. Mechanical trench compaction reports. Follow 01 43 26.

B. Informational:
1. Follow 01 33 00 for documentation showing permits have been obtained from Owner and from Regulatory Agencies for excess material disposal sites.

PART 2 - PRODUCTS

2.01 UTILITY PIPE AND APPURTENANCE MATERIALS

A. Utility Horizontal Directional Drilling: Follow 33 05 23.13.

B. Utility Pipe Jacking: Follow 33 05 23.16.

C. Water Utility Distribution Piping: Follow 33 11 00.

D. Sanitary Sewerage: Follow 33 30 00.

E. Storm Drainage: Follow 33 40 00.

2.02 BEDDING AND COVER MATERIALS

A. Crushed stone chips: Follow SWS 8.43.2.

B. Around and over Underground Facilities: Follow respective owner's requirements.

C. Polyethylene pipe embedment: 3/8 inch crushed stone chips. Follow SWS 8.43.2.

D. Cover: Same material as bedding.

2.03 BACKFILL

A. Granular: Follow SWS 8.43.4. Limestone screenings not allowed.

B. Spoil: Follow SWS 8.43.5. Maximum particle size 3-inches.

C. Aggregate slurry: Follow SWS 8.43.8.

D. Crushed road gravel: Follow State Specifications 305.2.2.1 3/4-inch crushed road gravel SWS 8.43.7.

E. Graded aggregate: Follow SWS 8.43.7 Use 3/4 inch.

2.04 LOCATION AIDS

A. Tracer wire:
1. Follow SWS 2.11.0.
2. For open-cut: Direct-burial-rated insulated #10 AWG solid copper conductor.

3. For trenchless installation:
    a. Duratrace DD, Copperhead, Pro-Trace.
    b. Extra high-strength directional tracer wire.
        1. Provide wire with break load greater than expected drilling loads.
        2. Minimum #12 AWG copper clad solid steel core.
        3. Minimum 867 lbs. average tensile break load.
        4. 45 mil. high density polyethylene jacket.
        5. 30 volt rating.
4. Splices: Copperhead Industries DryConn® 3-Way Direct Bury Lug Connector 3WB-01 or approved equal.
5. Color:
    a. Water: Blue.
    b. Sanitary: Green.

B. Location boxes for tracer wire access.
1. Buried:
    a. SnakePit Test Station, by Copperhead Industries, or approved equal.

C. Grounding anode rod to have a minimum of 1 pound of magnesium and #10 AWG wire.

D. Marker flag:
1. “HYDRAFINDER”.
2. 5 feet long.
3. Fiberglass, red and white.
4. Spring load action.

2.05 SURFACE RESTORATION

A. Pavement: Follow 34 71 00.
1. Asphalt pavement: Follow SWS 2.7.3 Type D, except 3 inch thickness one course
2. Concrete pavement: Follow SWS 2.7.3 Type B. Do not add calcium chloride.

B. Lawn: Follow SWS 2.7.4 Type C. Follow 32 90 00.

C. Curb and gutter: Follow SWS 2.7.3. Do not add calcium chloride. Follow 34 71 00.

D. Concrete sidewalk: Follow SWS 2.7.3. Follow 34 71 00.

E. Temporary seeding: Follow 01 57 13.

2.06 INSULATION

A. Follow SWS 8.50.2.

PART 3 - EXECUTION

3.01 CONNECTING DISSIMILAR PIPE MATERIALS

A. Follow pipe manufacturers' recommendations and design details.

3.02 EXCAVATION IN PAVEMENT

A. Pavement sawing: Follow State Specifications 690.3 cut depth: Full pavement thickness.

B. Sealed surface pavement: Cut evenly along excavation edges before removal to avoid excess removal or ragged, uneven edges.

C. Utility trench cut locations: Follow SWS File No. 1 Drawing.

D. Bridging: Furnish and install trench bridging over open trenches crossing roadways when requested by Engineer. Use steel plates, composite timber construction, or prefabricated structural steel members. Do not fabricate structural steel bridging on job Site. Design to support HS-20 wheel loading. Secure installed bridging against shifting and utilize asphalt ramping. Do not leave bridging in roadway during winter months without Engineer's approval.

3.03 UTILITY PIPE AND APPURTENANCE INSTALLATION

A. Utility Horizontal Directional Drilling: Follow 33 05 23.13.

B. Utility Pipe Jacking: Follow 33 05 23.16.

C. Water Utility Distribution Piping: Follow 33 11 00.

D. Sanitary Sewerage: Follow 33 30 00.

E. Storm Drainage: Follow 33 40 00.

3.04 LOCATION AIDS

A. Detector wire:
1. SWS 2.11.0.
2. Place maximum 3 inches directly above pipe.
3. Test detector wire continuity prior to acceptance of pipe installation.

B. Install detector wire at:
1. Water mains.
   a. Every hydrant. Extend detector wire through a test station box that is to be located adjacent to the hydrant.
   b. Every curb stop. Extend detector wire up curb stop box and connect to curb stop lid.
2. Sewers, laterals.
   a. Every manhole.
   b. Sanitary wires can be placed into the manhole below the frame.
   c. Every lateral. Extend detector wire to top of hardwood marker at end of lateral.

C. Grounding anode rod:
1. Install at every hydrant using wire connector extended from main.
2. Install at every curb stop box using wire connector extended from main.

D. Demonstrate continuity of detector wires to Engineer. Connect ohm meter in a series loop with detector wire and above-ground wire. Circuit resistance shall not exceed 5 ohms.

E. Test locating. Contact Owner at (262) 367-2714 to locate all utilities.
1. After completion of continuity test.
2. Before acceptance for use.

3.05 EXCAVATED MATERIAL

A. Surplus excavated material shall be disposed at Contractor's cost. Follow submittal requirements for each disposal site utilized. After delivery to the designated location, such material shall be graded level by Contractor.

3.06 INSULATION

A. Follow SWS 4.17.2 and SWS Drawing File No. 48 when requested by Engineer or when depth of cover is less than 7 feet over sanitary sewer, water main and force main or where storm sewers cross over water main or laterals.

3.07 BEDDING AND COVER

A. Follow SWS 3.2.6(b) Class B, except use 6 inches of bedding material.

3.08 TRENCH BACKFILLING AND CONSOLIDATION

A. Material:
   1. For new developments.
      a. Granular. Utilize spoil if it meets the gradation of granular. Maximum particle size allowed is 3-inches. Screen existing material, otherwise provide hauled in granular.
   2. For Village projects in areas from 5 feet behind existing or future back-of-curb or edge-of-pavement to and including paved areas and driveways:
      a. Granular. Use where temporary asphalt patches are being used. Utilize spoil if it meets the gradation of granular. Maximum particle size allowed is 3-inches. Screen existing material, otherwise provide hauled in granular.
      b. Aggregate slurry. Use where permanent asphalt patches are being used or as directed by Engineer.
   3. Other areas: Spoil.
   4. Around and over Underground Facilities: Follow respective owner's requirements.

B. Consolidation: Either of the following methods may be used for new developments or Village projects.
   1. Flooding. Following SWS 2.6.14(a). Insertions shall be made in a grid pattern with 3-foot maximum spacing both longitudinally and laterally.
   2. Mechanical compaction. Follow SWS 2.6.14(b) except Contractor shall furnish and pay for compaction testing services from a geotechnical testing firm approved by the Village.
      a. In addition, all utility structures within the Village right-of-way or under other paved areas shall be further consolidated by flooding. Follow SWS 2.6.12(a). Insertions shall be made in a grid pattern with 3-foot maximum spacing both longitudinally and laterally to a minimum radius of 6 feet from the structure.
   3. Repair any trench that settles within one year after final completion.

3.09 SURFACE RESTORATION

A. Pavement: Follow 34 71 00.

B. Lawn: Follow 32 90 00.

C. Curb and gutter: Follow 34 71 00.

D. Concrete sidewalk: Follow 34 71 00.

E. Temporary seeding: Follow 01 57 13.

3.10 CLEARING AND GRUBBING

A. Follow SWS 2.1.2. Cleanly prune damaged trees.

3.11 CLEANUP

A. Clean dirt and construction material from haul roads:
   1. At end of each working day.
   2. As needed during the day to avoid creating hazards or complaints.
   3. As requested by Owner.

END OF SECTION

SECTION 33 11 00 HARTLAND

WATER UTILITY DISTRIBUTION PIPING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Water mains, control and distribution appurtenances.

1.02 RELATED SECTIONS

A. 01 33 00 - Submittal Procedures.

B. 33 05 00 - Common Work Results for Utilities.

1.03 REFERENCES

A. Wisconsin Administrative Code Chapters:
1. NR 105 - Surface Water Quality Criteria and Secondary Values for Toxic Substances.
2. NR 106 - Procedures for Calculating Water Quality Based Effluent Limitations for Point Source Discharges to Surface Waters.

B. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

C. American Water Works Association (AWWA):
1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
2. AWWA C110 - Ductile-Iron and Gray-Iron Fittings.
3. AWWA C150 - Thickness Design of Ductile-Iron Pipe.
4. AWWA C151 - Ductile-Iron Pipe Centrifugally Cast.
5. AWWA C502 - Dry Barrel Fire Hydrants.
6. AWWA C504 - Rubber Seated Butterfly Valves.
7. AWWA C509 - Resilient Seated Gate Valves for Water Supply Service.
8. AWWA C550 - Protective Interior Coatings for Valves and Hydrants.
9. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings 4 In. Through 12 In. for Water Distribution.
10. AWWA C905 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings 14 In. Through 48 In.

D. American Society for Testing and Materials (ASTM):
1. ASTM D1248 - Polyethylene Plastics Molding and Extrusion Materials.
2. ASTM D3350 - Polyethylene Plastics Pipe and Fittings Materials.
3. ASTM D3261 - Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
4. ASTM D2657 - Practice for Heat Joining of Polyolefin Pipe and Fittings.

E. Standard Specification for Sewer and Water Construction in Wisconsin.

1.04 SUBMITTALS

A. Action:
1. Follow 01 33 00 for:
a. Product data.

PART 2 - PRODUCTS

2.01 LEAD REDUCTION

A. Products and parts thereof with wetted surfaces in contact with drinking water shall meet or exceed the requirements of Public Law 111-380-Reduction of Lead in Drinking Water Act, which is an amendment to the Safe Drinking Water Act.

2.02 WATER MAIN PIPE AND APPURTENANCES

A. Pipe, 3-inch and larger. Provide one type from following:
   1. Ductile iron:
      a. For 3-inch diameter: Follow AWWA C151, thickness Class 53 with cement lining.
      b. For 4-inch diameter and larger: Follow AWWA C151 Class 52 with cement lining.
      c. Tyton gasketed joint pipe.
      d. Cable bond connectors.
      e. Follow SWS 8.18.0.
   2. PVC:
      a. For 3 through 12-inch diameter: AWWA C-900, Class 150, and have a minimum pressure class of 235 PSI and a thickness of DR 18.
      b. For 14 through 36-inch diameter. AWWA C-905, CI OD pressure pipe rated 235 PSI with DR 18 or less.
      c. Integral elastomeric bell and spigot joints.
      d. SWS 8.20.0.
   3. HDPE: For transmission mains only. Follow SWS 8.51.3. Review and approval through the Village's Public Works Director.

B. Resilient seated gate valves:
   1. Follow AWWA C515 including:
      a. Nonrising stem.
      b. Mechanical joint.
      c. Actuator: wrench nut.
      d. Opens counterclockwise.
      e. Stem seals: O-ring.
      f. Epoxy interior and exterior coating following ANSI/AWWA C550.
      g. Follow SWS 8.27.0.
      h. All bolts shall be 300 Series (18-8) stainless steel. No bolt shall be smaller than 5/8 inch in diameter.
      i. AFC 2500 Series or Clow C2640.

C. Valve enclosures:
   1. Boxes:
      a. Cast iron assembly, size DD, cover marked "WATER".
      b. Manufacturers: Tyler 6860 or East Jordan.
      c. Follow SWS 8.29.0.
      d. Valve box adapters: Adaptor, Inc.
      e. Polyethylene film wrap around all valve boxes.

D. Hydrant assembly.
   1. Follow AWWA C502 and SWS 8.26.0:
      a. Bury depth: 7'-6" minimum.
      b. Opens counterclockwise.
      c. Break-flange.

d. 5-1/4 inch minimum main valve opening, National Standard 2-1/2 inch hose nozzle and a 5-inch Storz nozzle-factory installed. Nozzles shall be mechanically attached.
e. Factory painted red, with all caps painted white.
f. Mechanical joint connection.
g. Hydrants shall be factory installed with 304 stainless steel bolts between barrel and shoe.
h. Upper stand pipe dimension of 16 inches.

2. American Flow Control Inc. (formerly Waterous) WB-67 Pacer.
3. Hydrant lead:
   a. Ductile iron Class 52.
   b. PVC AWWA C150 SDR 18 or less.
4. Marker Flag:
   a. "HYDRAFINDER".
   b. 5 feet long.
   c. Fiberglass, red and white.
   d. Springload action.

E. Fittings: Follow SWS 8.22.0.:
1. Joints:
   a. Buried: Mechanical.
   b. In structures: Flanged.
2. Pressure rating:
   a. Full body: 250 psi.
   b. Compact: 350 psi.
3. Material:
   a. Ductile iron:
      1) Class 52 wall thickness.
      2) Bituminous exterior coating following ANSI/AWWA C153/A21.10.
      3) Cement lined and bituminous coated interior following ANSI/AWWA C104/A21.4.
      4) Cor-Blue tee bolts.

F. Service lines, valves and fittings.
1. Lines.
   a. 2 inch and smaller shall follow SWS 8.24.0 and:
      1) Type K copper tubing. Compression fittings shall be used.
      2) Polyethylene (HDPE) SDR 9 CTS. Stainless steel stiffeners shall be used.
   b. 3 inch and larger: Follow 33 11 00 2.02.A.
2. Corporation valves for copper or HDPE:
   a. Must withstand 150 PSI pressure test.
   b. Compression fittings: Mueller B-25008 (1, 1 1/2, or 2 inch), Ford FB1000-5Q Full Port (1 1/4 inch only).
   c. Use compression fittings with stainless steel stiffeners for HDPE.
3. Curb valves for copper or HDPE:
   a. Must withstand 150 PSI pressure test.
   b. Compression fittings: Mueller B-25155 (1 or 1 1/2 inch) Minneapolis pattern, or approved equal with lid pentagonal brass plug. A.Y. McDonald not allowed.
4. Curb boxes:
   a. Screw-on style.
   b. Mueller H-10300 with tracer wire lid or A.Y. McDonald 5610TW.
   c. Lid pentagonal brass plug.
5. Valve stem extension to within 18 inches of surface on 1 and 1-1/4-inch curb stops.
   a. Valve stem extensions are not allowed on 1-1/2 and 2-inch curb stops.

6. No splices will be allowed between the main and the curb stop.

G. PVC main tapping sleeve for service lines 2-inch and smaller.
1. Taps shall use a wraparound stainless saddle with full circle gasket.
2. Romac 306 with a corp tap, or Smith-Blair 372 with a corp tap.

H. Restrained joints for ductile iron pipe:
1. EBAA Iron Megalug.
2. In addition to Megalugs, hardwood or solid concrete block buttresses may be used.

I. Restrained joints for PVC pipe:
1. EBBA Iron Series 2000 PVC Megalug.
2. In addition to Megalugs, hardwood or solid concrete block buttresses may be used.

2.03 INCIDENTAL CONSTRUCTION

A. Follow 33 05 00 for:
1. Bedding.
2. Cover.
3. Backfill.
4. Location aids.
5. Trenchless utilities.
6. Insulation.
7. Surface restoration.

PART 3 - EXECUTION

3.01 WATER MAIN INSTALLATION

A. Follow SWS Part IV.

B. For ductile iron, provide electric continuity using strapping or metallic retainer glands.

C. PVC pipe.
1. Remove beveled pipe end at connections to mechanical joint or flanged fittings.

D. Set valve boxes to 1/2 inch below finish grade after curb and gutter placement and before asphalt placement.

E. All mains shall have minimum 7-foot cover.

F. Hydrants:
1. Locate hydrant valves behind curb as shown on Detail Drawing WM-01. All joints along hydrant lead shall be restrained:
    a. Restrained joints for ductile iron pipe:
        1) EBAA Iron Megalugs.
    b. Restrained joints for PVC pipe:
        1) EBAA Iron Series 2000 PVC Megalug.
        2) Provide minimum 7-foot cover over lead.
        3) Position centerline of lowest hydrant outlet nozzle 20 inches (plus-or-minus above finish grade).
2. Provide proper bury depth hydrant based upon plan elevations.

G. Buttresses: No poured buttresses will be allowed. Hardwood or solid concrete block buttresses may supplement mechanical restraints.

H. Pressure test pipelines following SWS 4.15.0. Combination leak/pressure test at 150 PSI for two hours is allowed.

I. Disinfect pipelines following SWS 4.3.12 and 4.16.0 utilizing granular chlorine not tablets. After successful pressure test, Village shall take two successive safe water samples prior to approval of installed pipe first after flushing chlorine and second in 24 hours.

J. All chlorinated, chemically treated or contaminated flushing water shall be discharged to the Village sanitary sewer via flexible hose provided by Contractor. Contractor shall notify Owner prior to discharging to sanitary sewer and shall monitor/quantify and report the total flows to the Owner. Meter available from DPW operations supervisor by calling (414) 630-8167. All other flushing water may be discharged to grassed areas, provided that there is no chance for negative impact to private property. Water wasted from pipeline that may reach bodies of surface water may not contain any substances in concentrations that adversely affect the water as determined by the Wisconsin Administrative Code NR 105 and 106. For chlorine, no total residual chlorine may be measured in water being discharged to a surface water. Advise the Village of proposed discharge schedule to arrange DNR-required measurements. Contractor shall review flushing plan with Village and receive approval prior to chlorinating and flushing any water main.

K. Services:
1. Services shall be installed after pressure and safe water sample tests have passed.
2. All services shall be minimum 7-foot cover.
3. Wet tap service connections at normal operating system pressure.
4. Lateral locations on Drawings are tentative. Actual locations shall be marked in the field. Contact Engineer if stake not found.
5. For 2 inch and smaller follow SWS Part V and:
   a. Provide curb valve and box at 1 foot inside right-of-way line or as directed by Engineer.
   b. Provide 2 by 6-inch hardwood marker at curb box location from invert of service to 2 feet above finished grade.
   c. Provide tailpiece. Follow SWS Drawing File No. 51 drawing.

L. Connections to existing mains and services:
1. Contractor shall coordinate his work schedule with the Owner when connecting intersecting streets to the new water main in order to minimize inconvenience and disruption caused by the temporary discontinuance of water service. The Contractor shall notify the Village at least 72 hours prior to shutting off any water service. Water service to residences shall not be shut down for a period longer than eight (8) hours, nor after 4:00 p.m. or on weekends, without approval of the Owner. Residential water service may only be shut down between the hours of 7:30 a.m. to 4:00 p.m., except that residential water services may be shut down outside of these hours with the Owner's permission. Water service to businesses or other entities shall not be shut down for a period longer than two (2) hours unless satisfactory arrangements are made with the business or other entities affected. The Contractor shall take whatever measures are necessary to return service at the end of each working day, including the use of temporary valves or plugs.

3.02 INCIDENTAL CONSTRUCTION

A. Follow 33 05 00 for:
1. Connecting dissimilar pipe materials.
2. Excavation in pavement.

3. Bedding.
4. Cover.
5. Backfill.
6. Location aids.
7. Insulation.
8. Excess excavated material.
9. Surface restoration.

END OF SECTION

SECTION 33 30 00 HARTLAND

SANITARY SEWERAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Sanitary sewer mains and maintenance and collection appurtenances. For force main or sanitary pressure sewer specifications contact Village Engineer.

1.02 RELATED SECTIONS

A. 01 33 00 - Submittal Procedures.

B. 33 05 00 - Common Work Results for Utilities.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
2. ASTM C361 - Standard Specification for Reinforced Concrete Low-Head Pressure Pipe.
3. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
4. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
5. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR Series).
6. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.
7. ASTM D2513 - Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings.
8. ASTM D2657 - Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings.
9. ASTM D3034 - Standard Specification for Type PSM Poly(VinylChloride) (PVC) Sewer Pipe and Fittings.
10. ASTM D3251 - Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
11. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
12. ASTM F679 - Standard Specification for Poly(Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings.

B. American Association of State Highway and Transportation Officials (AASHTO):
1. AASHTO M198 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
2. AASHTO T99 - Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop.

C. United States Department of the Interior-Bureau of Reclamation. Standard Specifications for Reinforced Concrete Pressure Pipe.

D. American Water Works Association (AWWA):
1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
2. AWWA C110 - Ductile-Iron and Gray-Iron Fittings.
3. AWWA C151 - Ductile-Iron Pipe Centrifugally Cast.
4. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings 4 In. Through 12 In. for Water Distribution.
5. AWWA C905 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings 14 In. Through 48 In.

1.04 SUBMITTALS

A. Action:
1. Follow 01 33 00 for:
a Sanitary sewer main video inspection records.

PART 2 - PRODUCTS

2.01 GRAVITY SANITARY SEWER

A. Pipe. If not shown on Drawings, use one type from following:
1. Polyvinyl chloride and fittings solid wall:
a. 4 through 15 inch: Type PSM, Follow ASTM D3034, SDR 35.
b. 18 through 21 inch: Type PSM, Follow ASTM F679, 12454C.
c. Follow SWS 8.3.0. and 8.10.0.

B. Pressure-rated pipe. If not shown on Drawings use one type from following:
1. Polyvinyl chloride pipe:
a. 4 through 12 inch: Follow AWWA C900 SDR18 or less.
b. 14 through 20 inch: Follow AWWA C905 SDR 18 or less.
2. Fittings for PVC and ductile iron pipe shall follow SWS 8.22.0 and:
a. Joints:
1) Buried: Mechanical.
2) In structures: Flanged.
b. Pressure rating:
1) Full body: 250 PSI.
2) Compact: 350 PSI.
c. Material:
1) Ductile iron class 52 wall thickness.
2) Bituminous exterior coating following ANSI/AWWA C110/A21.10.
3) Cor-Blue tee bolts.
4. Interior coating for ductile iron pipe and fittings:
a. Cement-lined and bituminous-coated following ANSI/AWWA C104/A21.4

C. Bulkhead and Plug: Follow SWS 3.2.25.

D. Structures:
1. Manholes:
a. Follow SWS 3.5.0. and SWS 8.39.0. No steps allowed in top five feet of structure, measured down from rim elevation.
b. Follow ASTM C478.
c. If not shown on Drawings: 48-inch inside diameter (minimum).
2. Frame: Follow SWS Drawing File No. 14A approximate weight 385 pounds.
a. Neenah R-1661-B (non-modernized).
3. Cover: Self sealing, concealed pick hole, no vents. Follow SWS Drawing File No. 14B, approximate weight 108 pounds.
4. Pipe to manhole connection: Follow SWS 3.5.7.

5. Frame and chimney sealants: Follow SWS 8.42.0. between grade rings and casting. Butyl rubber rope joint sealant (mastic) and back plaster grout on the exterior of the structure. No back plaster inside structure. No chimney seals.
6. Grout: IPATOP Penngrout, non-shrink cementitious grout by IPA Systems.
7. Flat decks - HS20 loading.
8. Grade adjusters for castings:
   a. Follow SWS 8.39.11 precast concrete grade rings.
   b. Do not use bricks, stones, wood, nor pieces thereof.
9. External joint wrap if ground water is above bottom of manhole:
   a. Caddilloc, Inc.
   b. Esky – Wrap.
   c. Mac Wrap.
10. Anchored manhole frame and cover: Follow SWS Drawing File No. 32 for frame subject to inundation.

E. Risers:
1. Follow SWS 3.2.26. and File No. 10E.
2. For flexible riser to flexible main greater than 6 feet in height, or main greater than 16 feet deep, see Drawings as the types of materials will be project specific.

F. Laterals:
1. Follow SWS 5.3.10 and SWS 5.3.11 and same material as main.
2. 6 inch.
3. Connection to main: Wyes or use tees if using risers.
4. Adapt pressure rated pipe to SDR35 with hubless adaptors.

2.02 INCIDENTAL CONSTRUCTION

A. Follow 33 05 00 for:
1. Connecting dissimilar pipe materials.
2. Excavation in pavement.
3. Bedding.
4. Cover.
5. Backfill.
6. Location aids.
7. Trenchless utilities.
8. Surface restoration.

PART 3 - EXECUTION

3.01 GRAVITY SANITARY SEWER INSTALLATION

A. Before starting, bulkhead and/or plug the connection to existing sewer. Leave in place until new sewer has been cleaned and accepted.

B. Follow SWS Part III.

C. Set manhole frames to 1/4 to 1/2-inch below finish grade after placement of curb and gutter and before asphalt placement. Provide asphalt ramping if only binder is being paved. Set grade rings and casting flanges onto a butyl rubber rope joint sealant (mastic).
1. Contractor shall install concrete collar at their cost around manhole if 1/4 to 1/2-inch tolerance cannot be achieved.

D. Chimney:
   1. Height: 4 to 24 inches.
   2. No steps allowed.
   3. Use single monolithic precast concrete ring and two 2-inch precast concrete adjusting rings for manhole chimney.

E. Laterals. Follow SWS Part V and:
   1. 1/4 inch per foot minimum slope.
   2. Provide 2 by 6 inch hardwood marker at end of lateral from invert of lateral to 2 feet above finish grade.
   3. Lateral locations on Drawings are tentative. Actual locations shall be marked by Engineer.

F. Before testing, repair or replace piping, valves, fittings, structures or other parts of system which have visible defects or leakage even if leakage or pressure loss may be below allowable limits.

G. Air test: Follow SWS 3.7.3.

H. Go-No-Go Test: Follow SWS 3.2.6(i)4.

I. Manhole vacuum test:
   a. Follow SWS 3.7.6.
   b. Test after backfilling.

J. Use external joint wrap on manhole joints below the ground water level.

K. Televise mains and record video. Use self-propelled crawler camera. Do not use jetter-propelled camera. Follow SWS 7.1.2. Perform after:
   1. Manhole benches installed.

L. Convey copy of video record to Owner. Furnish DVD.

END OF SECTION

SECTION 33 40 00 HARTLAND

STORM DRAINAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Storm sewer and storm water facility mains, maintenance and collection appurtenances.

B. Underdrains.

1.02 RELATED SECTIONS

A. 01 33 00 - Submittal Procedures.

B. 33 05 00 - Common Work Results for Utilities.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM C76 - Standard Specification for Reinforced concrete Culvert Storm Drain, and Sewer Pipe.
2. ASTM C361 - Standard Specifications for Reinforced Concrete Low-Head Pressure Pipe.
3. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
4. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
5. ASTM C497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.
6. ASTM C506 - Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain and Sewer Pipe.
7. ASTM C507 - Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe.
8. ASTM C698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil using Standard Effort.
9. ASTM A760 - Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains.
10. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.

B. American Association of State Highway and Transportation Officials (AASHTO):
1. AASHTO M252 - Standard Specification for Corrugated Polyethylene Drainage Pipe.
2. AASHTO M294 - Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500- mm (12- to 60-in.) Diameter.
3. AASHTO Section 30 - Standard Specification for Highway Bridges, Division II, Section 30, Thermoplastic Pipe.
4. AASHTO M36 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains.

C. United States Department of the Interior - Bureau of Reclamation. Standard Specifications for Reinforced Concrete Pressure Pipe.

D. American Water Works Association (AWWA):

1. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated fittings 4 In. Through 12 In. for Water Distribution.
2. AWWA C905 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated fittings 14 In. Through 48 In.

E. Standard Specifications for Sewer and Water Construction in Wisconsin.

F. Wisconsin Standard Specifications.

1.04 SUBMITTALS

A. Action:
1. Follow 00 33 01 for:
a. Product data.

PART 2 - PRODUCTS

2.01 STORM SEWER

A. Main lines:
1. Concrete pipe.
a. Joints: Rubber-gasket following ASTM C443.
b. Reinforced concrete pipe (RCP): Follow ASTM C76 and SWS 8.6.0.
c. Reinforced concrete horizontal elliptical pipe: Follow ASTM C507 and SWS 8.6.0.
d. Reinforced concrete arch pipe: Follow ASTM C506 and SWS 8.6.0.

B. Structures:
1. Manholes: Follow SWS 3.5.0 and SWS 8.39.0. No steps allowed in top five feet of structure, measured down from rim elevation.
2. Catch basin frame and cover: Neenah R-3067-L for curb section and Neenah R-3290-C for driveway section.
3. Catch basin: Follow SWS 3.6.0 for precast.
4. Manhole frame and cover: Neenah R-1661 open grate, approximate weight 500 pounds.
5. Concrete block: Follow State Specifications 519.2.2 (salt resistant pink block).
6. Inlet and catch basin grout: IPATOP Penngrout, non-shrink cementitious grout by IPA Systems. Backplaster allowed on exterior of structure only.
7. Butyl rubber (mastic) shall be used between sections, adjusting rings, and frame. Backplaster grout on exterior of structure only.
8. Grade adjusters for castings:
a. Follow SWS 8.39.11 precast concrete grade rings.
b. Do not use bricks, stones, wood, nor pieces thereof.
9. Flat decks: HS20 design loading.

C. Apron endwalls: Follow State Specifications 520 through 525 for apron endwalls and same material as pipe.

D. Pipe grates: Follow SWS 8.16.0. 15-inch endwalls and larger. Wausau Concrete Plate A20 or approved equal.

2.02 INCIDENTAL CONSTRUCTION

A. Follow 33 05 00 for:
1. Bedding.
2. Cover.
3. Backfill.

4. Insulation.
5. Surface restoration.

PART 3 - EXECUTION

3.01 STORM SEWER INSTALLATION

A. Follow SWS Part III.

B. Set manhole frames to 1/4 to 1/2-inch below finish grade after placement of curb and gutter and before asphalt placement. Provide asphalt ramping if only binder is being paved. Set casting flanges onto a continuous layer of mastic rope.
   1. Contractor shall install concrete collar at their cost around manhole if 1/4 to 1/2-inch tolerance cannot be achieved.

C. Set inlet frames to finish grade, unless interim inlets are called for on the Drawings. Set casting flanges onto a continuous layer of mastic rope.

D. Storm manhole repairs:
   1. Replace storm manhole. Contractor shall remove the existing storm manhole in its entirety. Saw cut and remove asphalt pavement to perform the repairs. The Contractor shall install a new precast manhole and slurry backfill. Mastic shall be used between sections, adjusting rings and frame. Also repair asphalt and other impacted facilities to restore the site per its original condition.
   2. Repair storm manhole: Contractor shall remove any loose brick, block, mortar in existing manhole to the depth shown on the drawings. Saw cut and remove asphalt pavement to perform repairs. Repair the manhole by replacing precast manhole material, tuck pointing and backplastering outside of structure, mastic between sections, adjusting rings, and frame, and slurry backfill. Repair asphalt pavement and other impacted facilities to restore the site to its original condition.
   3. Remove and replace manhole cone: Contractor shall remove and replace existing storm manhole cone. Item only includes manhole cone. Saw cutting, excavation, removal and replacement of adjustment rings, tuckpointing, backplastering outside of structure, and restoration are included in other payable items.
   4. Manhole frame and grate: Contractor shall reinstall the existing frame and lid. Re-installation of the existing frame and lid will be incidental to the cost of repair.
   5. Concrete finishing. The Contractor shall tuckpoint and backplaster all storm sewer pipe connections at manhole affected by contract Work.
   6. Asphalt patch restoration, traffic control, and erosion control: These items are separate bid items from repair and replacement Work.

E. Storm inlet repairs:
   1. Replace storm inlet: Contractor shall remove the existing storm sewer inlet in its entirety. Replacement storm inlets shall have 2-foot sumps. Contractor shall saw cut and remove asphalt, curb and gutter, and sidewalk (as necessary) per the project plans. Install inlet, utilize mastic between sections, adjusting rings and frame, set frame, backplaster outside of structure and slurry backfill. Repair asphalt, curb and gutter, and sidewalk and restore the site as necessary.
   2. Repair storm inlet: Contractor shall remove any loose brick, block, and mortar in the existing storm sewer inlet to the depth shown on the drawings (12-inch or less). Repair the inlet by replacing precast inlet materials, tuck pointing, and backplastering outside of structure, mastic between sections, adjusting rings and frame, and slurry backfill.
   3. Reset inlet frame and grate: Contractor shall saw cut and remove curb and gutter and asphalt, reset frame on existing rings using mastic, tuckpoint and backplaster outside of structure, slurry backfill, pour concrete curb and gutter, pave asphalt patch, and restore Site to original condition.

4. Inlet frame and grate: Contractor shall reinstall the existing frame and grate unless a field investigation by the Engineer or Owner determines that a new frame and grate is required. Re-installation of the existing frame and grate will be incidental to the cost of repair or replace inlet. The installation of a new frame and grate will be paid for at the new inlet frame and grate unit price.
5. Concrete finishing: The Contractor will tuckpoint and backplaster all storm sewer pipe connections at inlet affected by the contract Work.
6. Asphalt patch, restoration, concrete curb and gutter, traffic and erosion control: These items are separate bid items from repair and replacement Work.

3.02 INCIDENTAL CONSTRUCTION

A. Follow 33 05 00 for:
1. Connecting dissimilar pipe materials.
2. Excavation in pavement.
3. Bedding.
4. Cover.
5. Backfill.
6. Insulation.
7. Surface restoration.

END OF SECTION

SECTION 34 71 00 HARTLAND

ROADWAY CONSTRUCTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Earthwork.

B. Base course.

C. Pavement and surface course.

D. Incidental construction:
1. Curb and gutter.
2. Sidewalks.
3. Curb ramps.
4. Drive approaches, and driveways.
5. Pavement sawing.
6. Pavement markings.
7. Traffic control.
8. Restoration.

1.02 RELATED SECTIONS

A. 01 22 00 - Unit Prices.

B. 01 33 00 - Submittal Procedures.

C. 01 43 26 - Inspection and Testing Agency Qualifications.

D. 32 90 00 - Planting.

1.03 SUBMITTALS

A. Action:
1. Follow 01 33 00 for:
a. Product data.
b. Sieve analyses from State-certified laboratory.
c. Mix design. Submit at least 7 days before paving:
1) Asphaltic concrete pavement. Follow State Specification 460.2.7.
2) Portland cement concrete curb and gutter, driveway, sidewalk.
3) High-early-strength concrete. Follow State Specification 415.2.1.
d. Wisconsin DOT-verified hot mix asphalt (HMA) pavement mix design for each pavement classification specified. Submit at least 7 days before paving.

B. Informational:
1. Base compaction test reports: Follow 01 43 26.
2. Subbase compaction test reports. Follow 01 43 26.
3. Paving mix delivery tickets.
a. Asphaltic materials:
1) Furnish ticket before placing material.

2) Display on ticket:
a) Project.
b) Date.
c) Time.
d) Ticket number.
e) Type of mix.
f) Gross weight.
g) Tare weight.
h) Net weight.
i) Job total.

b. Concrete:
1) Furnish tickets after delivery.
2) Display on ticket:
a) Project.
b) Date.
c) Time.
d) Ticket number.
e) Class of concrete.
f) Grade of concrete.
g) Cement Weight.
h) Fly Ash type and weight.
i) Fine aggregate weight.
j) Coarse aggregate weight.
k) Gallons of water.
l) Time water was added.
m) Additives.

4. Base course delivery tickets that display:
a. Project.
b. Date.
c. Ticket number.
d. Type of material.
e. Gross weight.
f. Tare weight.
g. Net weight.
h. Job total.
5. Written concrete cylinder compression test results. Submit to Engineer.
6. Provide Quality Management Program following State Specifications 460.2.8.1. General and 460.2.8.2. Contractor Testing control plan including:
a. Do not use 460.2.8.3. Department Testing.

1.04 REFERENCES

A. ASTM D698 - Standard Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.

B. American Association of State Highway and Transportation Officials (AASHTO):
1. AASHTO T22 - Standard Method for Compressive Strength of Cylindrical Concrete Specimens.
2. AASHTO T23 - Standard Method of Test for Making and Curing Concrete Test Specimens in the Field.
3. AASHTO T52 - Standard method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method.

C. Wisconsin Standard Specifications.

D. Wisconsin Manual Uniform Traffic Control Devices.

E. Wisconsin Department of Transportation Products Approved List (PAL).

1.05 REGULATORY REQUIREMENTS

A. Pay for local, county or state permits for Work on right-of-ways. Damage to pavements and to all property, public and private, due to this Work shall be repaired to same condition before construction by Contractor.

1.06 UNIT PRICES

A. Follow 01 22 00.

1.07 QUALITY MANAGEMENT PROGRAM

A. As a condition of acceptance, arrange, conduct, and pay for tests necessary to demonstrate satisfactory compliance with Contract Documents. Make adjustments at the plant necessary to meet requirements of Specifications including the instructions.

B. Lab testing:
1. Test material from the plant at least once a day.
2. Meet the following parameters:
   a. Air voids (VA): Follow State Specifications 460.2.8.3.1.6 and follow State Specification-Additional Special Provision 460.2.1 issued under ASP-6.
   b. Voids in the mineral aggregate (VMA): Follow State Specifications Table 460-1.
   c. Gradations: Job mix formula (JMF): Follow Paragraph 1 of State Specification-Additional Special Provision 460.2.8.2.1.5 issued under ASP-6.

C. Density testing:
1. Take a minimum one test per location and one test per 250 tons.
   a. Use nuclear method.
   b. Targets specified hereinafter.
2. Locations will be at Engineer's request.

D. Results and reports:
1. Make field adjustments to keep material within specified tolerances. If test results fall out of tolerance, increase testing frequency until material is within specification.
2. Submit test reports within 48 hours to Engineer.

PART 2 - PRODUCTS

2.01 EMBANKMENTS OR SUBGRADE FILL

A. Follow State Specifications 207. Do not use logs, stumps, brush, perishable material, frozen materials or humus-bearing materials. No stones larger than 3-inches or lumps allowed within entire subgrade of roadway, approaches, curb and gutter, sidewalk or pathways.

2.02 EXCAVATION OF SUBGRADE CUT.

A. Follow State Specifications 205. No organic material or stones larger than 3-inches allowed within upper 12-inches of subgrade of roadway, approaches, curb and gutter, or sidewalk or pathways. Scarifying is required.

2.03 EXCAVATION BELOW SUBGRADE (EBS) BACKFILL

A. Breaker run: State Specification 311, maximum particle size 3 inches.

B. Geotextile subgrade stabilization material: Follow State Specification 645, Type SAS.

2.04 BASE COURSE

A. Follow State Specifications 305. Use crushed limestone traffic bond. See Hartland Details Drawings for thickness and gradation.

2.05 ASPHALTIC CONCRETE PAVEMENT (HMA)

A. Binder course (Lower and Intermediate Layers): Follow State Specification 460.2 and:
1. Type: See Hartland Detail Drawings.
2. Binder gradation: See Hartland Detail Drawings.
3. Maximum recycled content: Follow State Specifications 460.2.5.

B. Surface course (Upper Layer): Follow State Specification 460.2 and:
1. Type: See Hartland Detail Drawings.
2. Surface gradation: See Hartland Detail Drawings.
3. Maximum recycled material content: Follow State Specifications 460.2.5.

C. Tack coat: Follow State Specification 455.2.5 Asphaltic material CSS-1h.

2.06 INCIDENTAL CONSTRUCTION

A. Concrete curb and gutter:
1. Follow State Specifications 601. Maximum particle size 3-inches, within subgrade. Follow 2.04 of this Section for base course.
2. Do not add calcium chloride.

B. Concrete sidewalks and ramps:
1. Follow State Specifications 602.2. Maximum particle size 3-inches, within subgrade. Follow 2.04 of this Section for base course.
2. Do not add calcium chloride.

C. Curb ramps.
1. Detectable warning field color: yellow.
2. Follow State Specifications 602.2. Furnish metal detectable warning field from the DOT approved products list for the color defined above.
3. Maximum particle size 3-inches, within subgrade. Follow 2.04 of this Section for base course.

D. Drive approaches, and driveways.
1. Concrete:
   a. Follow State Specifications 501.
   b. Do not add calcium chloride.
2. Asphaltic concrete (HMA): Follow specifications for surface course under ASPHALTIC (HMA) CONCRETE PAVEMENT in this Section.
3. Maximum particle size 3-inches, within subgrade. Follow 2.04 of this Section for base course.

E. Pavement marking: Follow State Specifications 646:
1. Epoxy.
2. Glass beads: Follow State Specifications 646.2.3.

F. Drainage facilities:
   1. Culvert pipe.
      a. Corrugated steel: Follow State Specifications 521.
      b. RCP in Village right-of-way.
   2. Bedding: 3/8-inch clear stone chips.
   3. Backfill: Granular.
   4. Apron endwalls: Same as pipe material.

G. Traffic Control: Follow State Specifications 643.
   1. Contractor shall prepare and submit traffic control plan for approval.
   2. Traffic control plan shall conform to Wisconsin MUTCD.

H. Restoration. Follow 32 90 00.

2.07 SOURCE QUALITY CONTROL

A. Asphaltic paving materials scale: Follow State Specification 450.3.1.1.1.

B. Concrete paving materials scale: Follow State Specification 501.3.4.5.2.

C. Base course materials scale: Follow State Specifications 109.1.4.

PART 3 - EXECUTION

3.01 EARTHWORK

A. Removing miscellaneous structures. Follow State Specifications 204.3 for:
   1. Curb and gutter.
   2. Asphaltic concrete pavement.
   3. Sidewalk.
   4. Driveways.

B. Roadway and drainage excavation. Follow State Specifications 205.3 for:
   1. Common excavation. No organic material or stones larger than 3-inches allowed within upper 12-inches of subgrade in a cut section. No organic material or stones larger than 3-inches allowed within entire subgrade layer in a fill section.
   2. Rock excavation.
   3. Excavation below subgrade.
   4. Overhaul: No allowance for overhaul.

C. Preparation of roadway foundation: Follow State Specifications 211.3.

D. Subgrade proof roll: Allow Engineer to inspect prepared subgrade and to witness proof roll test by a fully loaded quad axle dump truck. Reconstruct where deflection is greater than 1/2 inch. Additional proof roll tests will be performed until entire subgrade passes.

3.02 BASE COURSE

A. Crushed aggregate base course: Follow State Specifications 301 and 305.
   1. Compaction: Standard compaction.
      a. 95 percent of maximum density determined by Modified Proctor.
      b. Allow Engineer to inspect prepared base course and to witness proof roll test by a fully loaded quad axle dump truck. Reconstruct where deflection is greater than 1/2 inch. Additional proof roll tests will be performed until entire base course passes.
   2. Allowable deviation from design grade: 1/2 inch

3.03 PAVEMENT PULVERIZING, SHAPING AND GRADING

A. Follow State Specification 325 and:
1. Remove and stockpile excess pulverized materials to Owner approved location.
2. At completion of each working day, ramp ends of pulverized material flush to adjacent pavement for all traffic lanes.
3. Excavate and remove topsoil and unstable subgrade materials and replace with on-site sound material.
4. Grade, shape, and compact pulverized materials.
5. Redistribute materials as needed within project to fill areas with insufficient materials, low areas, and settled utility trenches.
6. Move excess material to other areas within the project.
7. Use new crushed stone base material only when existing materials are depleted and Engineer approves.
8. Allow Engineer to inspect new base course before paving.
9. Allowable deviation from design grade: 1/2 inch.
10. Utility structures: Set to finish course elevation.
11. Compaction: Standard compaction.
    a. Allow Engineer to inspect prepared base course and to witness proof roll test by a fully loaded quad axle dump truck. Reconstruct where deflection is greater than 1/2 inch. Additional proof roll tests will be performed until entire base course passes.

B. Abutting existing pavement:
1. Provide full depth saw cut at match lines.
2. Provide butt joint at locations specified in field. Anticipate full width.
3. Pulverize existing pavement within construction limits.
4. Stockpile pulverized materials at location secured by Contractor.
5. Over-excavate, remove and dispose of earth material over butt joint length.
6. Taper thickness of removed materials from 4 inches at match line to 0 inches at opposite end of butt joint.
7. Respread pulverized materials over excavated area.
8. Remove sufficient material to maintain minimum pavement and base thickness as specified herein at saw cut.

3.04 PAVEMENT AND SURFACE COURSES

A. Tack coat: Follow State Specification 455.3.2.
1. Apply between each layer of asphaltic concrete.
2. Allow to cure before paving.

B. Asphaltic concrete pavement: Follow State Specifications 450, 460 and 465.
1. Do not use 460.2.8.3 Department Testing.
2. Maximum variations:
    a. 1/8 inch across a 5 foot straight edge.
    b. Thickness: Within 1/4 inch of design.
    c. Finish elevation: Within 1/4 inch of design.
3. Temperatures:
    a. Asphaltic concrete at placement: Between 236 and 330 degrees Fahrenheit.
    b. Air temperature: Follow State Specifications 450.3.2.1.2.3.
    c. Subgrade: Above 32 degrees Fahrenheit.
        1) Contractor may submit cold weather paving plan for review if air temperature falls below specified limits. Engineer reserves the right to reject plan without cause. If implemented, plan shall be at no additional cost to Owner.

4. Layer thickness: Shown on Drawings.
5. Compaction: Follow State Specifications 460.3.3 Maximum Density Method and follow Paragraph 1 of State Specification-Additional Special Provision 460.3.2.1 issued undner ASP-6.
6. Saw cut, excavate and remove unstable binder course, base course and subgrade materials. Replace removed materials. Clean binder pavement by sweeping or flushing before applying surface pavement.
7. Allow Owner or Owner Representative to inspect binder course before applying surface course.
8. Joints: All longitudinal joints shall be hot seams.

3.05 INCIDENTAL CONSTRUCTION

A. Concrete curb and gutter: Follow State Specification 601.3.
   1. Joints.
      a. Construct expansion joints at:
         1) 5 feet from inlets or catch basins.
         2) End of curves.
         3) 100 feet maximum intervals.
         4) At one end of all curb and gutter removed and replaced.
         5) Single layer 1/2-inch thick expansive material.
      b. Construct contraction joints at 10 feet spacing.
         1) Minimum spacing: 6 feet.
         2) Maximum spacing: 12 feet.
         3) Match abutting concrete joints.
         4) Depth: Minimum 2 inches.
   2. Curing:
      a. Apply impervious coating within one hour of placement.
      b. Coat all sides of curb including exposed surface after forms removed.
      c. Apply two coats in perpendicular directions.

B. Sidewalks: Follow State Specifications 602.3.
   1. Joints.
      a. Provide expansion joints abutting existing construction and structures with 1/2 inch expansion joint filler.
         1) 100 feet maximum interval.
         2) At one end of all sidewalk removed and replaced.
      b. Provide contraction joints at spacing equal to width of walk and:
         1) Minimum 5 feet.
         2) Maximum 12 feet.
         3) Depth: Minimum 1 inch.
         4) Width: Approximately 1/8 inch.
   2. Curb ramps: Follow State Specifications 602.3.
   3. Curing:
      a. Follow State Specifications 415.3.12.
      b. Apply impervious coating within one hour of placement.
      c. Coat all sides of sidewalk including exposed surface after forms removed.
      d. Apply two coats in perpendicular directions.

C. Concrete drive approaches: Follow State Specifications 465.
   1. Joints.
      a. Expansion Joints abutting curb or walk: Use 1/2-inch expansion joint filler.
      b. Contraction Joints: Locate at midpoint of drive, perpendicular to curb.
         1) Minimum spacing 6 feet.
         2) Maximum spacing 12 feet.

2. Curing.
    a. Follow State Specifications 415.3.12.
    b. Apply impervious coating within one hour of placement.
    c. Coat all sides of concrete drive approach including exposed surface after forms removed.
    d. Apply two coats in perpendicular directions.

D. Pavement sawing. Follow State Specifications 690.3. Cut depth: Full pavement thickness.

E. Pavement marking: Follow State Specifications 646.3.
1. Apply same day on pavements open to traffic: State Specifications 646.3.1.
2. Pavement surface temperature:
    a. Epoxy: Above 50 degrees Fahrenheit.
3. Provide clean pavement to ensure proper bonding.
4. Provide temporary centerline marking at 50 foot interval between paving operations and application of final pavement marking.
5. Temporary pavement marking: Follow State Specification 649.3 and Drawings.

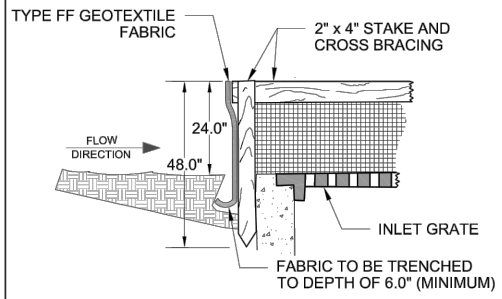
F. Drainage facilities: Follow 33 40 00.
1. Pipe culverts:
    a. Follow State Specification 520.3, except do no use Paragraph 1 in Section 520.3.1.
    b. Bedding: Provide 6 inches of 3/4 inch crushed stone chips below pipe.
2. Private entrance and temporary culverts. Provide 6 inches of 3/8 inch crushed stone chips below pipe.
3. Backfill with:
    a. Excavated material-when granular gradation is met. Maximum particle size 3-inches.
    b. Granular backfill.
4. Consolidate backfill by: Flooding.
5. Salvaged pipe: Follow State Specifications 524.
6. Apron endwalls:
    a. Material: Same as pipe.

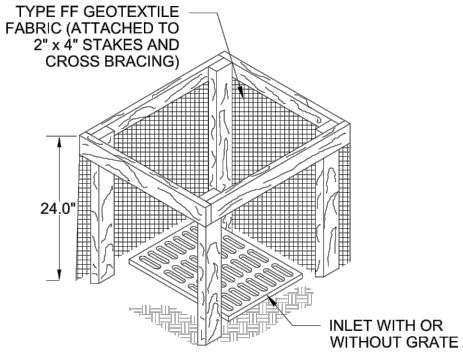
G. Traffic control: Follow State Specification 643.3.
1. Warning lights: Type A.

END OF SECTION

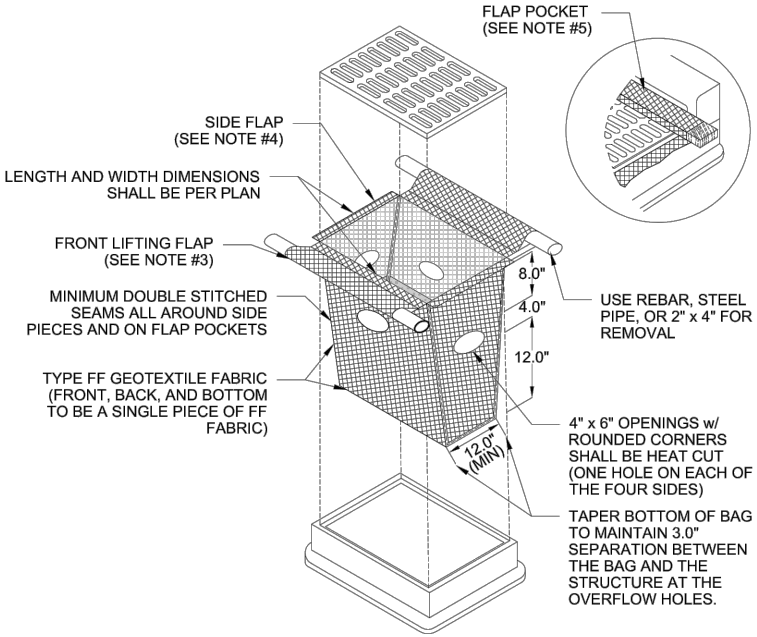
EXHIBIT EC-01

FIGURE 1. INLET PROTECTION TYPES A AND D





INLET PROTECTION TYPE A



INLET PROTECTION TYPE D

CAN BE INSTALLED IN INLETS WITH OR WITHOUT CURB BOXES

NOTES:

1. TAPER BOTTOM OF BAG TO MAINTAIN THREE INCHES OF CLEARANCE BETWEEN THE BAG AND THE STRUCTURE, MEASURED FROM THE BOTTOM OF THE OVERFLOW OPENINGS TO THE STRUCTURE WALL.
2. GEOTEXTILE FABRIC TYPE FF FOR FLAPS, TOP AND BOTTOM OF OUTSIDE OF FILTER BAG. FRONT, BACK, AND BOTTOM OF FILTER BAG BEING ONE PIECE.
3. FRONT LIFTING FLAP IS TO BE USED WHEN REMOVING AND MAINTAINING FILTER BAG.
4. SIDE FLAPS SHALL BE A MAXIMUM OF TWO INCHES LONG. FOLD THE FABRIC OVER AND REINFORCE WITH MULTIPLE STITCHES.
5. FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2" x 4". THE REBAR, STEEL PIPE, OR WOOD SHALL BE INSTALLED IN THE REAR FLAP AND SHALL NOT BLOCK THE TOP HALF OF THE CURB FACE OPENING.

MAINTENANCE NOTES:

1. WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED IN THE FABRIC DOES NOT FALL INTO THE STRUCTURE. MATERIAL THAT HAS FALLEN INTO THE INLET SHALL BE IMMEDIATELY REMOVED.

WISCONSIN DEPT. OF NATURAL RESOURCES

1060	TECHNICAL STANDARD No.
08/2014	REVISION DATE
NOT TO SCALE	

VILLAGE OF HARTLAND NOTE: TYPE D INLET PROTECTION SHALL BE USED IN ALL AREAS. WOOD/REBAR TO BE REMOVED DURING WINTER.

Mar 03, 2017 7:31am
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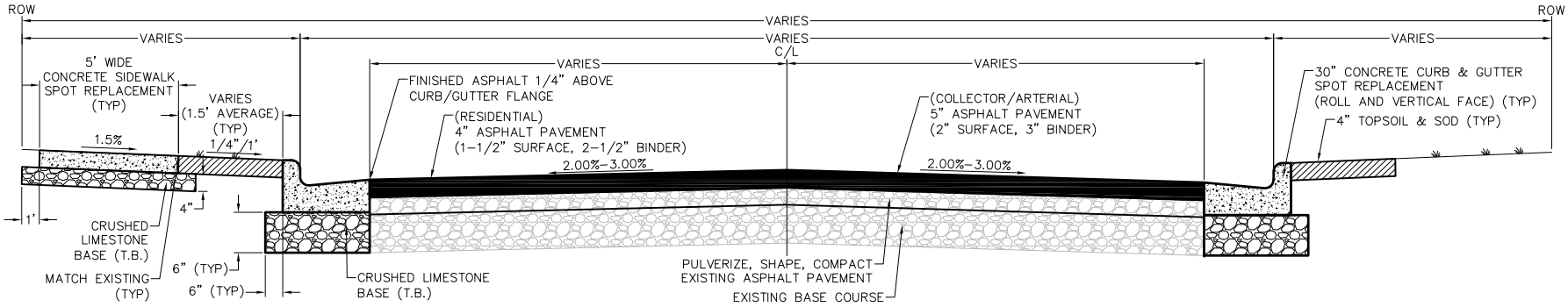
RM811PB

EXHIBIT PV-01 - EXISTING REHABILITATION



ASPHALT MIX SPECIFICATION			
COURSE	RESIDENTIAL	COLLECTORS	ARTERIAL/INDUSTRIAL
BINDER	3LT 58-28S	3LT 58-28S	3MT 58-28S
SURFACE	5LT 58-28S	5LT 58-28S	5MT 58-28H

NOTES:

1. ADJUST MH FRAMES, AND VALVE BOXES TO 1/4-INCH TO 1/2-INCH LOWER THAN FINISH GRADE.
2. 4" THICK CONCRETE SIDEWALK, EXCEPT 6" THICK THROUGH DRIVEWAY APPROACH.
3. COMPACT BASE TO 95%.

TYPICAL EXISTING URBAN SECTION-REHABILITATION

NO SCALE

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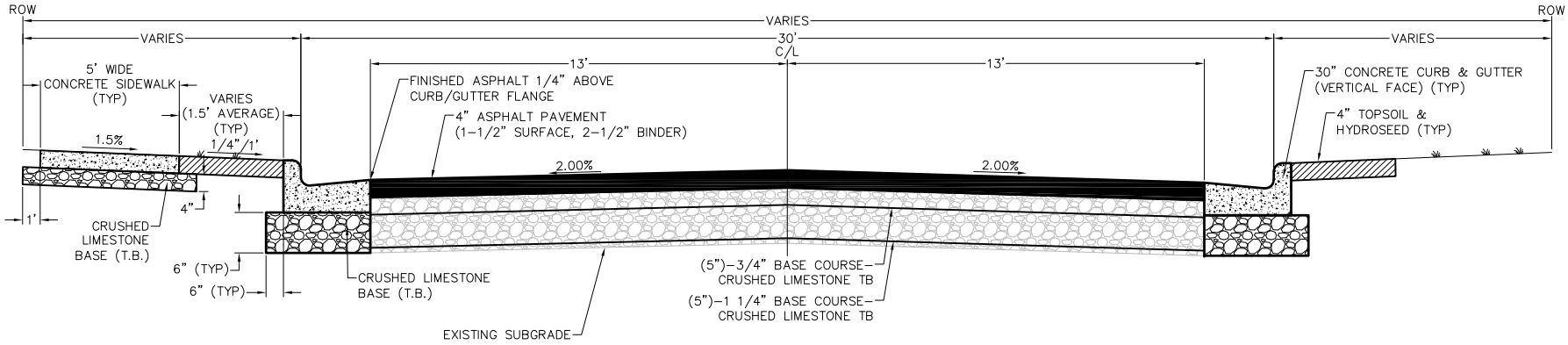
RM811PB

EXHIBIT PV-01A - NEW RESIDENTIAL



ASPHALT MIX SPECIFICATION			
COURSE	RESIDENTIAL	COLLECTORS	ARTERIAL/INDUSTRIAL
BINDER	3LT 58-28S	3LT 58-28S	3MT 58-28S
SURFACE	5LT 58-28S	5LT 58-28S	5MT 58-28H

NOTES:

1. ADJUST MH FRAMES, AND VALVE BOXES TO 1/4-INCH TO 1/2-INCH LOWER THAN FINISH GRADE.
2. 4" THICK CONCRETE SIDEWALK, EXCEPT 6" THICK THROUGH DRIVEWAY APPROACH..
3. COMPACT BASE TO 95%.

TYPICAL NEW URBAN SECTION-RESIDENTIAL NO SCALE

PV-01A 2

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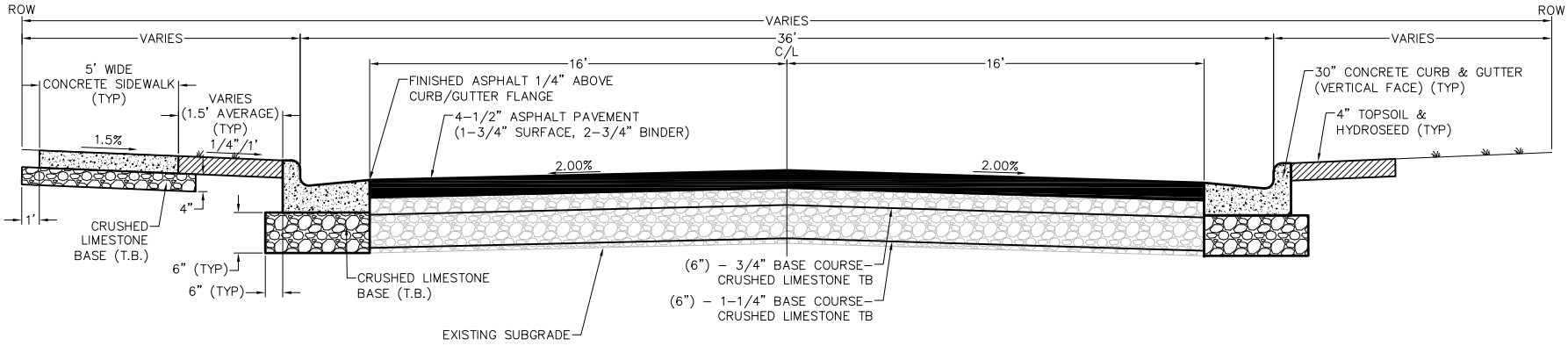
RM811PB

EXHIBIT PV-01B - NEW COLLECTOR



ASPHALT MIX SPECIFICATION			
COURSE	RESIDENTIAL	COLLECTORS	ARTERIAL/INDUSTRIAL
BINDER	3LT 58-28S	3LT 58-28S	3MT 58-28S
SURFACE	5LT 58-28S	5LT 58-28S	5MT 58-28H

NOTES:

1. ADJUST MH FRAMES, AND VALVE BOXES TO 1/4-INCH TO 1/2-INCH LOWER THAN FINISH GRADE.
2. 4" THICK CONCRETE SIDEWALK, EXCEPT 6" THICK THROUGH DRIVEWAY APPROACH.
3. COMPACT BASE TO 95%.

TYPICAL NEW URBAN SECTION-COLLECTOR NO SCALE

PV-01B 2

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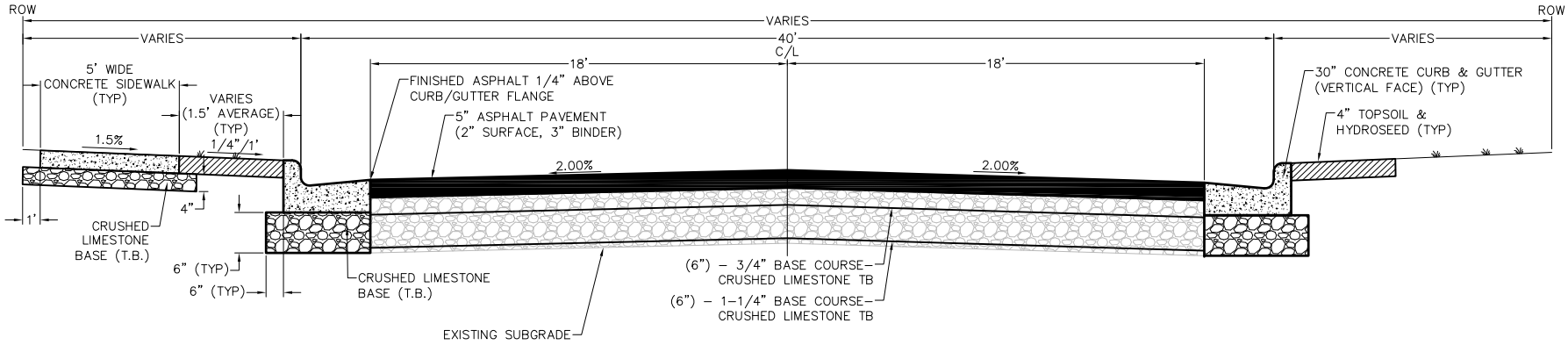
RM811PB

EXHIBIT PV-01C - NEW ARTERIAL



ASPHALT MIX SPECIFICATION			
COURSE	RESIDENTIAL	COLLECTORS	ARTERIAL/INDUSTRIAL
BINDER	3LT 58-28S	3LT 58-28S	3MT 58-28S
SURFACE	5LT 58-28S	5LT 58-28S	5MT 58-28H

NOTES:

1. ADJUST MH FRAMES, AND VALVE BOXES TO 1/4-INCH TO 1/2-INCH LOWER THAN FINISH GRADE.
2. 4" THICK CONCRETE SIDEWALK, EXCEPT 6" THICK THROUGH DRIVEWAY APPROACH.
3. COMPACT BASE TO 95%.

TYPICAL NEW URBAN SECTION-ARTERIAL

NO SCALE

PV-01C 2

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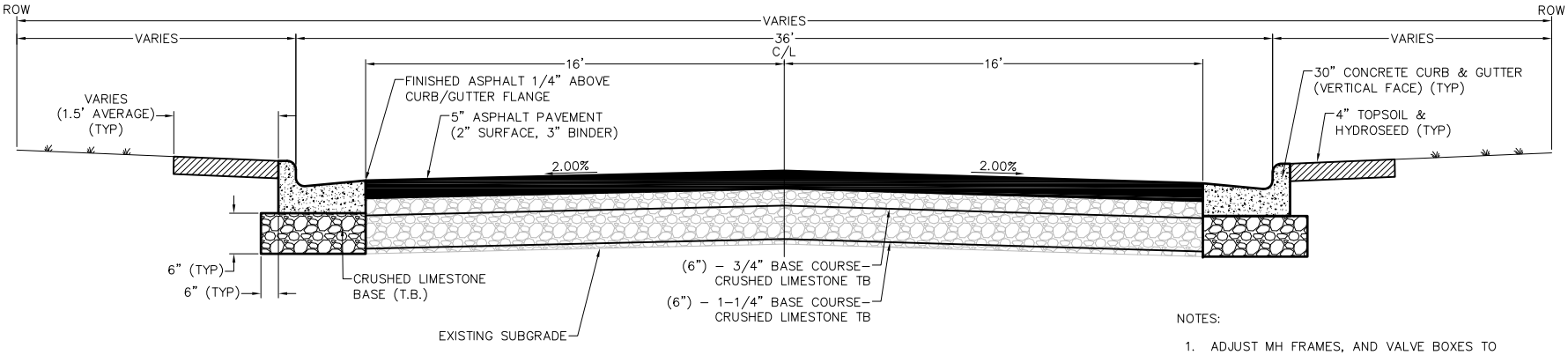
EXHIBIT PV-01D - NEW INDUSTRIAL



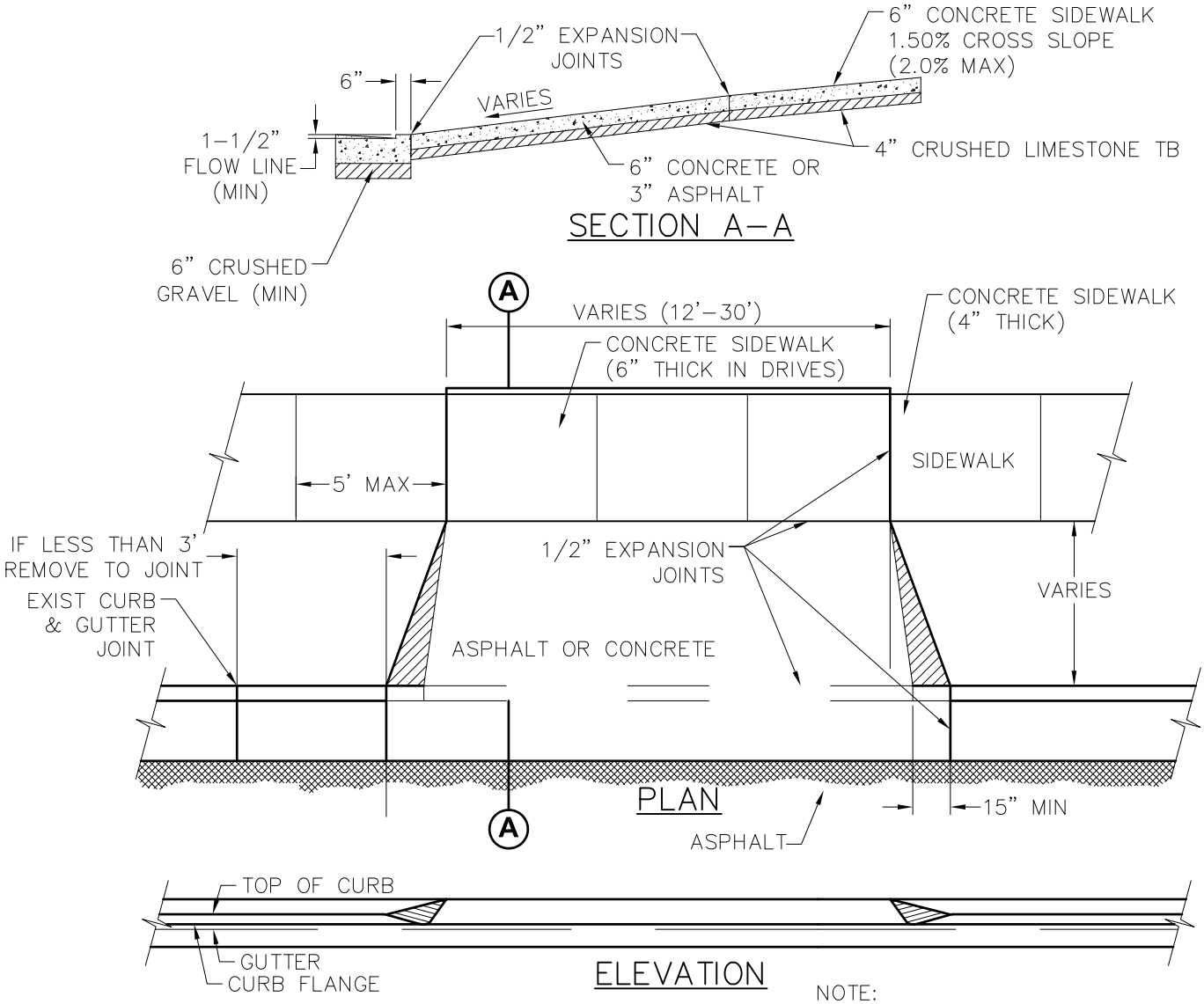
ASPHALT MIX SPECIFICATION			
COURSE	RESIDENTIAL	COLLECTORS	ARTERIAL/INDUSTRIAL
BINDER	3LT 58-28S	3LT 58-28S	3MT 58-28S
SURFACE	5LT 58-28S	5LT 58-28S	5MT 58-28H

NOTES:

1. ADJUST MH FRAMES, AND VALVE BOXES TO 1/4-INCH TO 1/2-INCH LOWER THAN FINISH GRADE.
2. COMPACT BASE TO 95%.

TYPICAL NEW URBAN SECTION-INDUSTRIAL NO SCALE

PV-01D 2



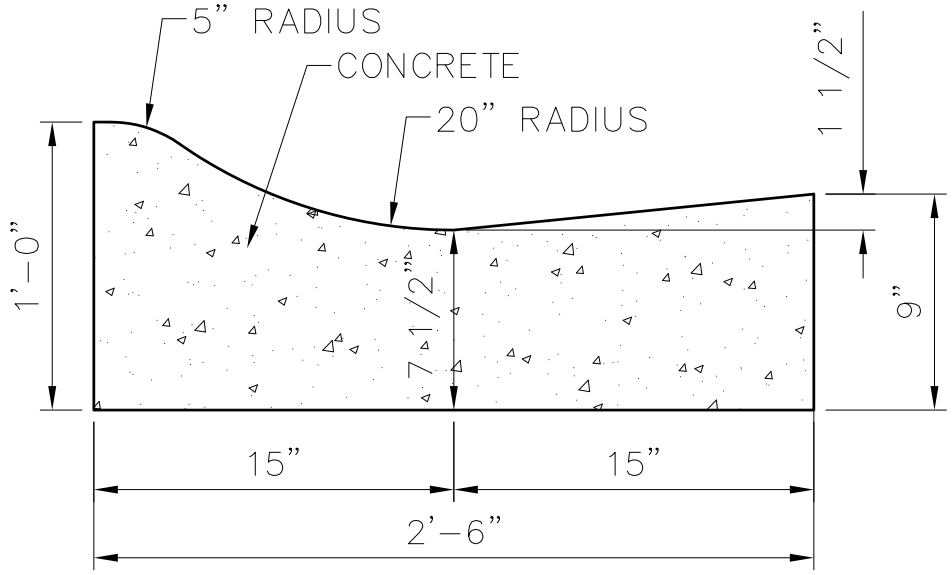
NOTE:
1. IN AREAS WHERE CURB IS MOUNTABLE, DRIVEWAYS TO MATCH TOP OF CURB.
2. DRIVEWAY OPENING AT CURB MINIMUM 15' AND MAXIMUM 33'.

ASPHALT OR CONCRETE DRIVEWAY

NO SCALE

driveapr 48

EXHIBIT PV-02



NOTE:
ROLL FACE CURB & GUTTER NOT ALLOWED IN NEW DEVELOPMENT.

30" ROLL FACE CURB & GUTTER-REHABILITATION

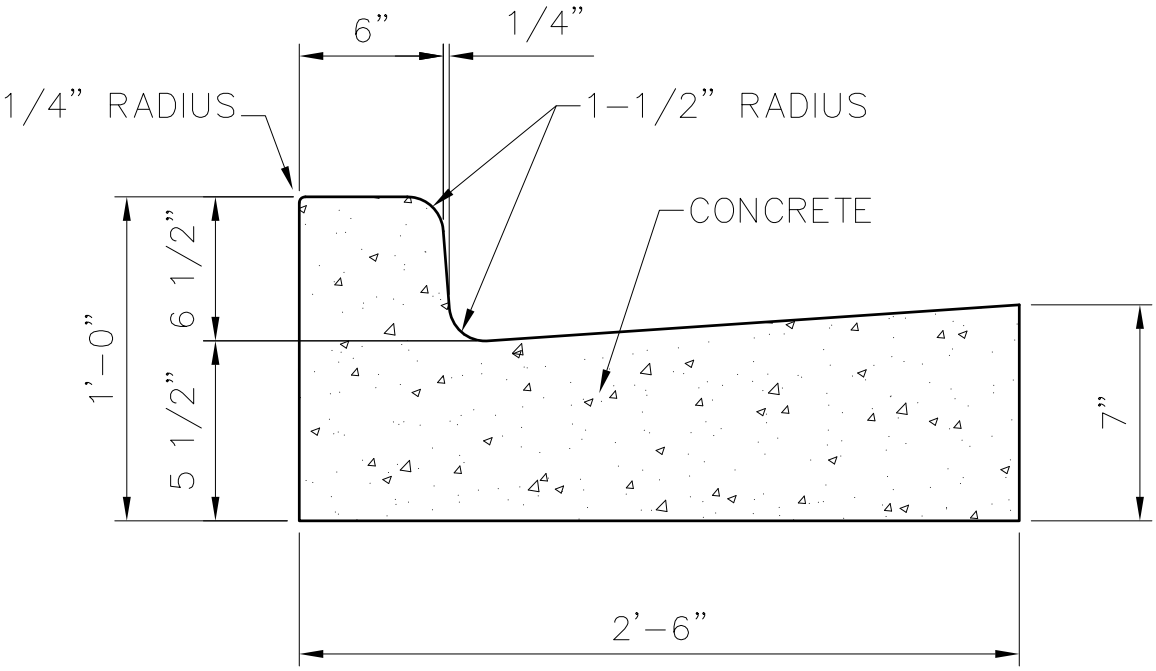
NO SCALE

02770C&G1 1

NOTE:

1. ONLY TO BE USED IN REPLACEMENT OF EXISTING ROLL FACE CURB & GUTTER.

EXHIBIT PV-03



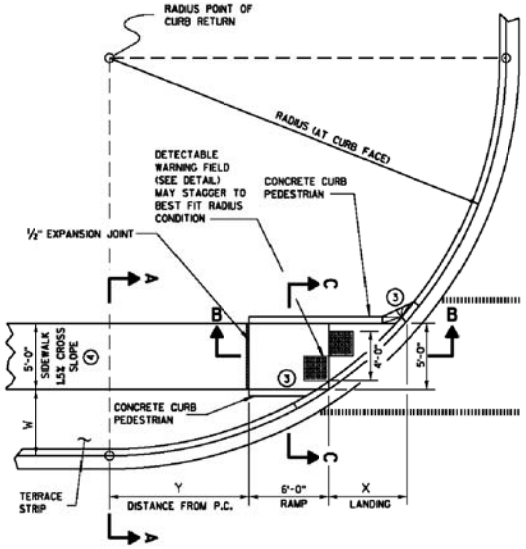
30" VERTICAL FACE CURB & GUTTER

NO SCALE

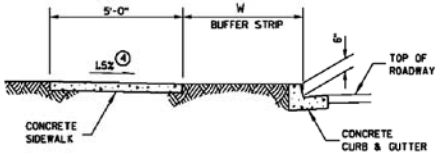
02770C&G2 1

EXHIBIT PV-04

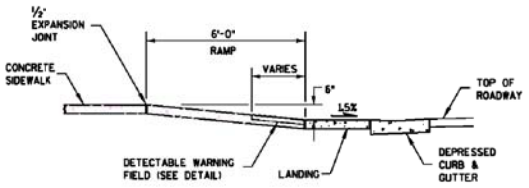
EXHIBIT PV-05



CURB RAMP TYPE 4B
PLAN VIEW



SECTION A-A FOR TYPE 4B



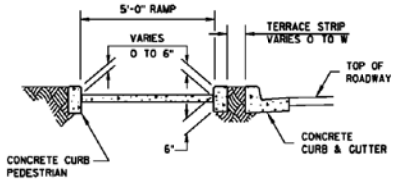
SECTION B-B FOR TYPE 4B

LEGEND

- ½" EXPANSION JOINT-SIDEWALK
- CONTRACTION JOINT FIELD LOCATED
- PAVEMENT MARKING CROSSWALK (WHITE)

RADIUS (AT CURB FACE)	W = 3'-0"		W = 4'-0"		W = 5'-0"		W = 6'-0"		W = 7'-0"	
	X	Y	X	Y	X	Y	X	Y	X	Y
20 FEET	5'-5½"	4'-6½"	4'-8½"	6'-0"	4'-1"	7'-2¾"	3'-7"	8'-3½"	3'-1½"	9'-2½"
30 FEET	7'-3¾"	7'-1"	6'-5½"	8'-11½"	5'-9¼"	10'-7"	5'-2½"	12'-0"	4'-8¾"	13'-3¼"
40 FEET	8'-9½"	9'-2½"	7'-10"	12'-5¼"	7'-1"	13'-4½"	6'-5¾"	15'-3¾"	5'-11½"	16'-7¼"
50 FEET	10'-3¼"	11'-3¼"	9'-1¼"	13'-7¼"	8'-2½"	15'-9½"	7'-6½"	17'-9"	6'-11¾"	19'-6¼"
60 FEET	11'-2½"	12'-8¾"	10'-3¼"	15'-6½"	9'-2¼"	17'-11¾"	8'-5¾"	20'-1¾"	7'-10½"	22'-1½"

INTERMEDIATE RADII CAN BE INTERPOLATED



SECTION C-C FOR TYPE 4B

GENERAL NOTES

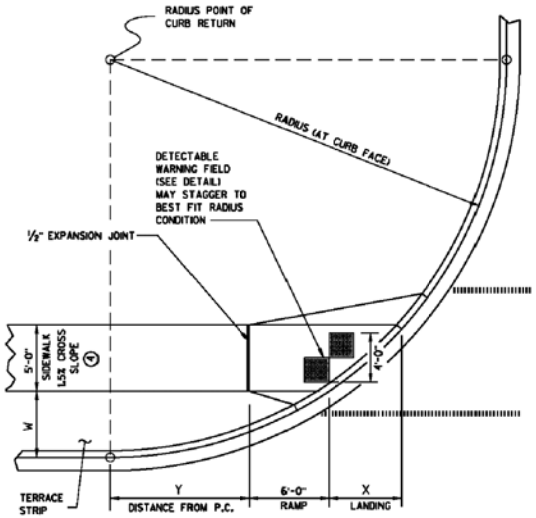
AVOID PLACING DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.

RAMP SLOPES SHALL NOT BE STEEPER THAN 12:1.

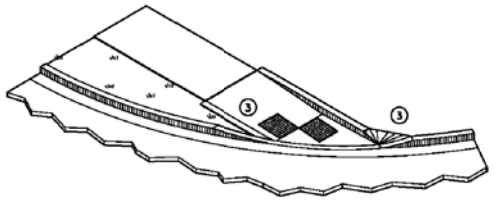
DETECTABLE WARNING FIELDS THAT ARE INSTALLED AS A GROUP OR SIDE BY SIDE, SHALL BE FROM THE SAME MANUFACTURER.

③ INSTALL TRANSITION NOSE. (INCIDENTAL TO OTHER PAY ITEMS.) DO NOT MARK TRANSITION NOSE.

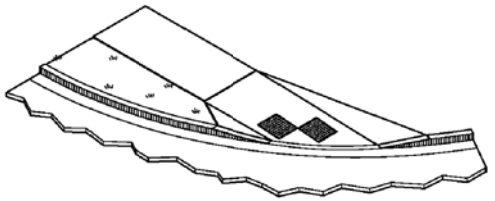
④ ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.



CURB RAMP TYPE 4B1
PLAN VIEW



ISOMETRIC VIEW FOR TYPE 4B



ISOMETRIC VIEW FOR TYPE 4B1

CURB RAMPS TYPE 4B AND 4B1

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

S.D.D. 8 D 5-15d

NOTE: TRUNCATED DOME PANELS SHALL BE YELLOW METAL

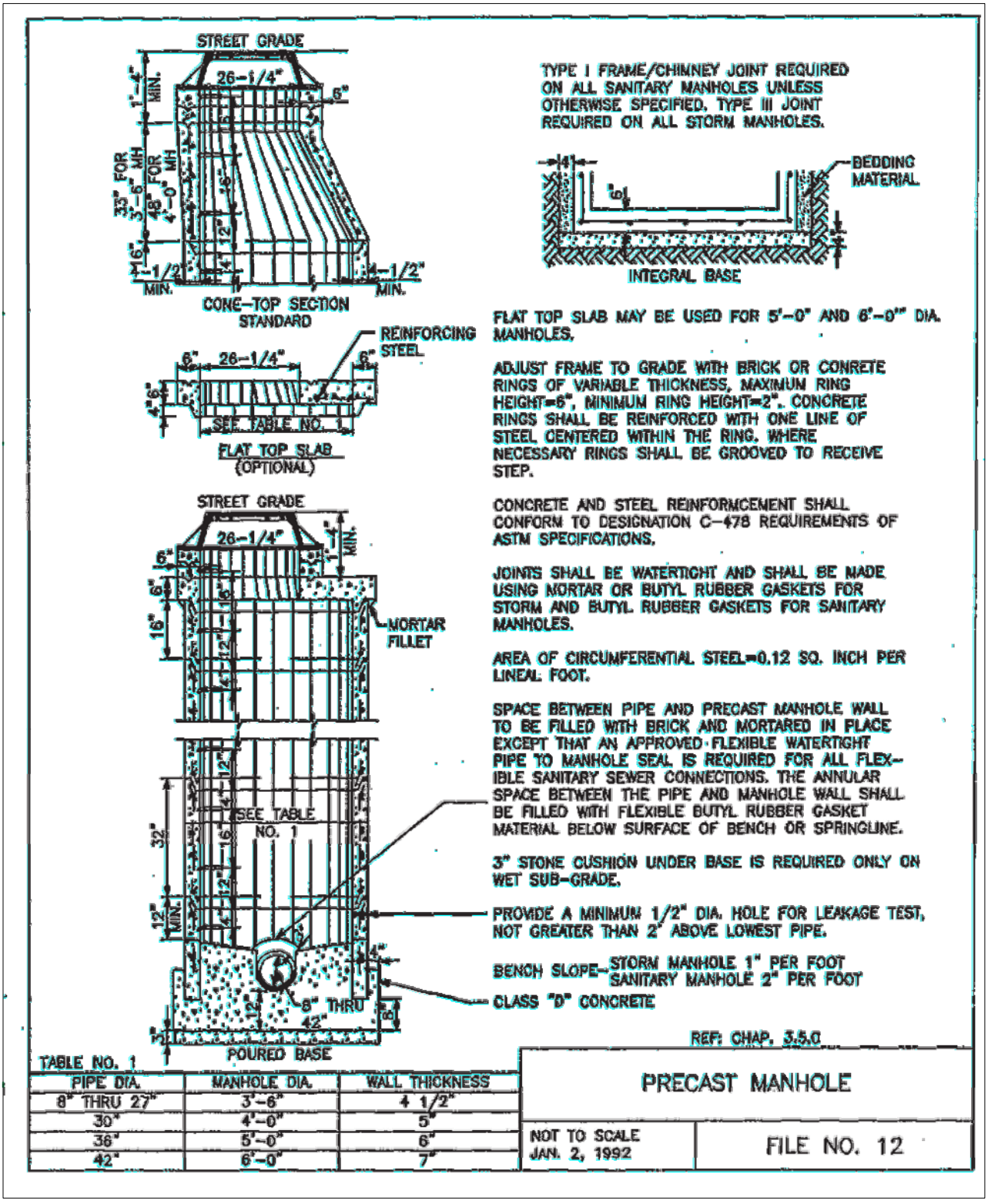


TABLE NO. 1

PIPE DIA.	MANHOLE DIA.	WALL THICKNESS
8" THRU 27"	3'-6"	4 1/2"
30"	4'-0"	5"
36"	5'-0"	6"
42"	6'-0"	7"

PRECAST MANHOLE

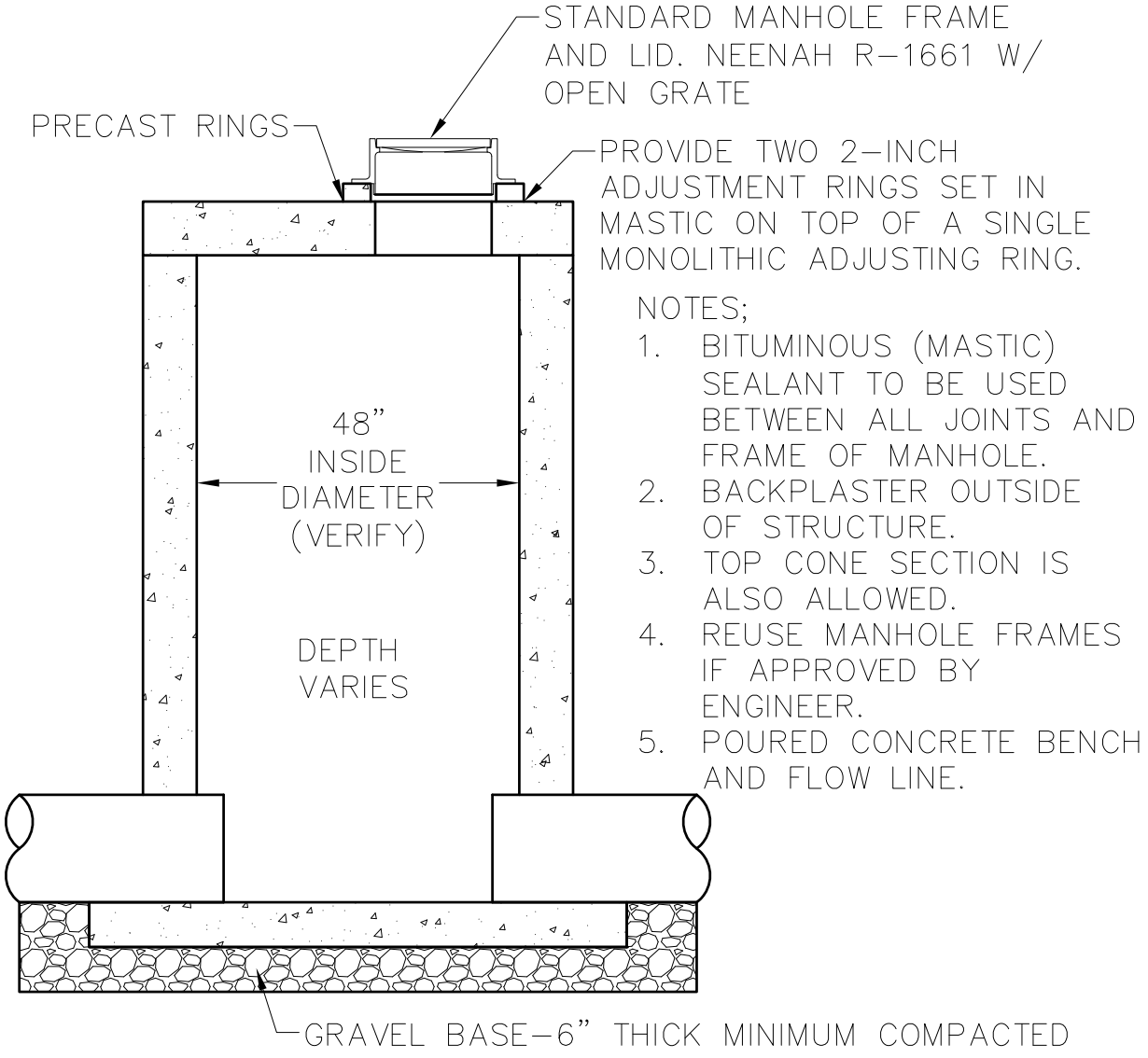
NOT TO SCALE
JAN. 2, 1992

FILE NO. 12

NOTE:

1. USE SINGLE LAYER MONOLITHIC RING AND TWO 2-INCH ADJUSTING RINGS IN CHIMNEY.
2. NO STEPS ALLOWED IN TOP FIVE FEET OF MANHOLE, MEASURED FROM RIM ELEVATION DOWN.
3. SET ADJUSTING RINGS AND FRAME IN MASTIC.
4. BACKPLASTER OUTSIDE OF STRUCTURE, NO BACKPLASTER ALLOWED INSIDE MANHOLE.

EXHIBIT SAN-01



NOTES;

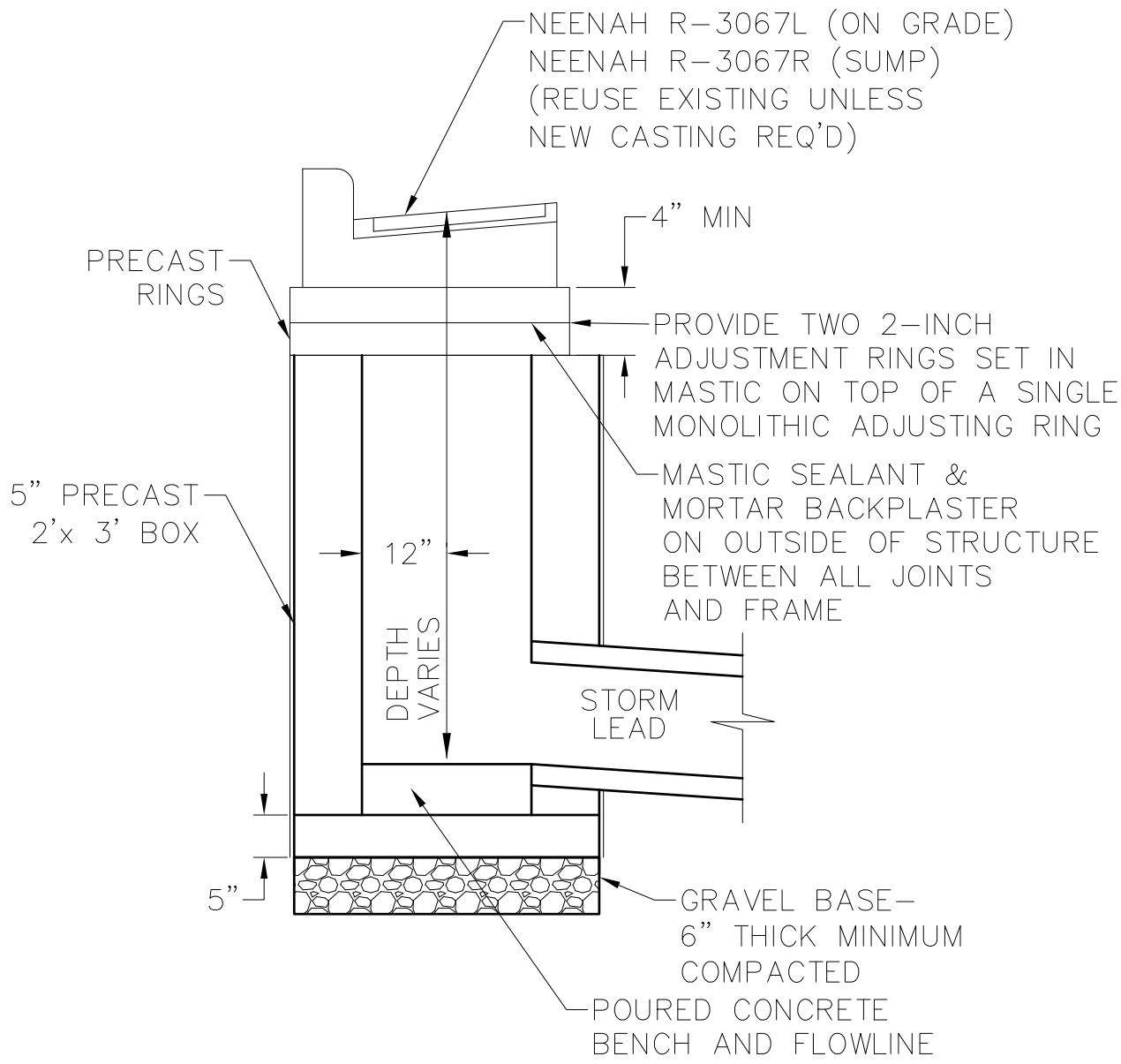
1. BITUMINOUS (MASTIC) SEALANT TO BE USED BETWEEN ALL JOINTS AND FRAME OF MANHOLE.
2. BACKPLASTER OUTSIDE OF STRUCTURE.
3. TOP CONE SECTION IS ALSO ALLOWED.
4. REUSE MANHOLE FRAMES IF APPROVED BY ENGINEER.
5. POURED CONCRETE BENCH AND FLOW LINE.

STORM MANHOLE DETAIL

NO SCALE

STO-01 20

EXHIBIT STO-01



1. INLET TO BE PROTECTED WITH GEOTEXTILE FABRIC BETWEEN THE GRATE AND FRAME. PROTECTION TO REMAIN IN PLACE UNTIL SITE VEGETATION IS ESTABLISHED.

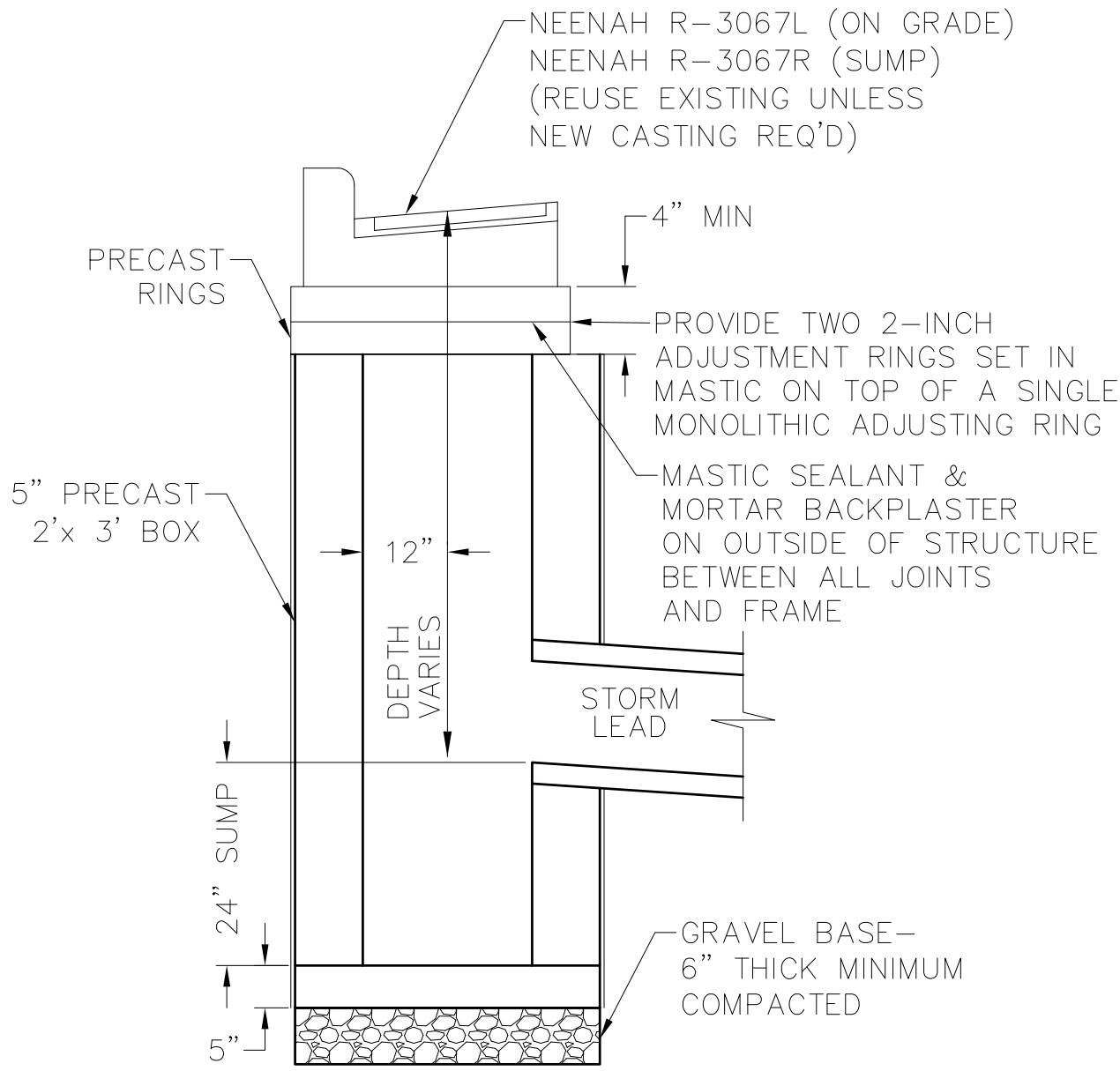
2. IN AREAS WITH ROLL FACE CURB, REPLACEMENT CURB SHALL TRANSITION TO VERTICAL FACE CURB & GUTTER AT INLET FRAME.

STORM INLET DETAIL

NO SCALE

STO-02 20

EXHIBIT STO-02



1. INLET TO BE PROTECTED WITH GEOTEXTILE FABRIC BETWEEN THE GRATE AND FRAME. PROTECTION TO REMAIN IN PLACE UNTIL SITE VEGETATION IS ESTABLISHED.

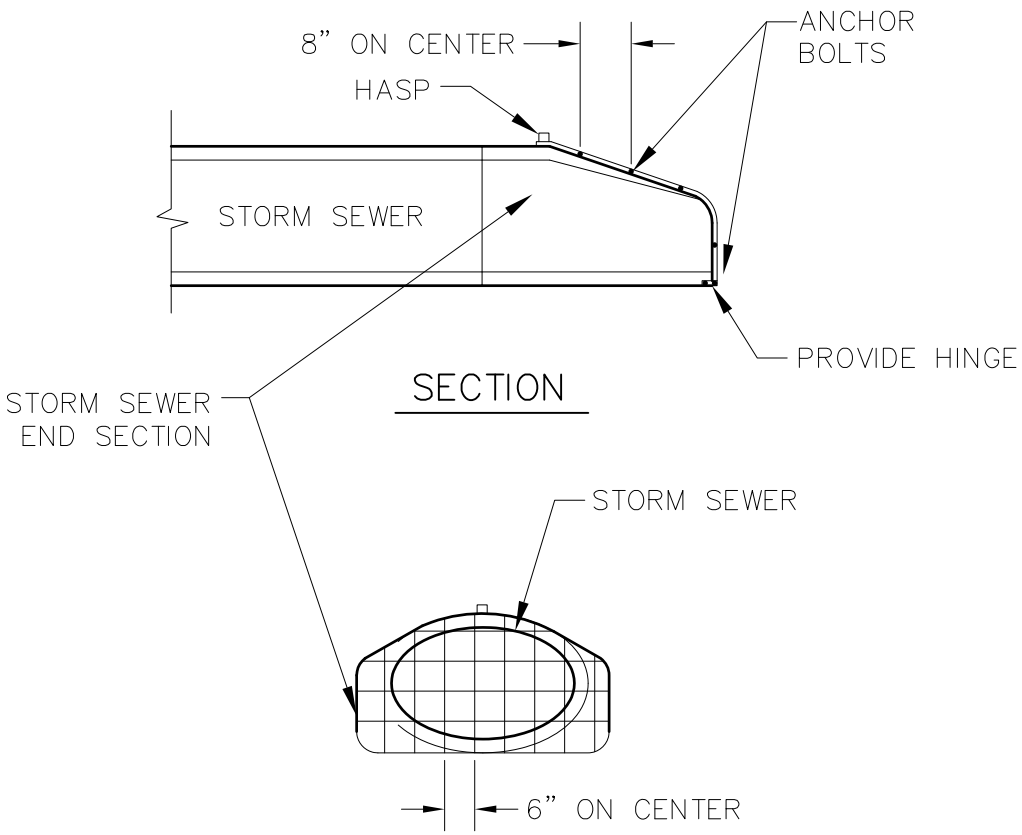
2. IN AREAS WITH ROLL FACE CURB, REPLACEMENT CURB SHALL TRANSITION TO VERTICAL FACE CURB & GUTTER AT INLET FRAME.

CATCH BASIN DETAIL

NO SCALE

STO-03 20

EXHIBIT STO-03



SECTION

END VIEW

NOTES:

1) TRASH RACK BARS TO BE GALVANIZED.

2) CONNECTOR PLATE WITH BOLT ATTACHED AT THREE POINTS TO ENDWALL.

3) PLANT FIT TRASH RACK CONFIGURATION TO FIT RELATIVE END SECTION.

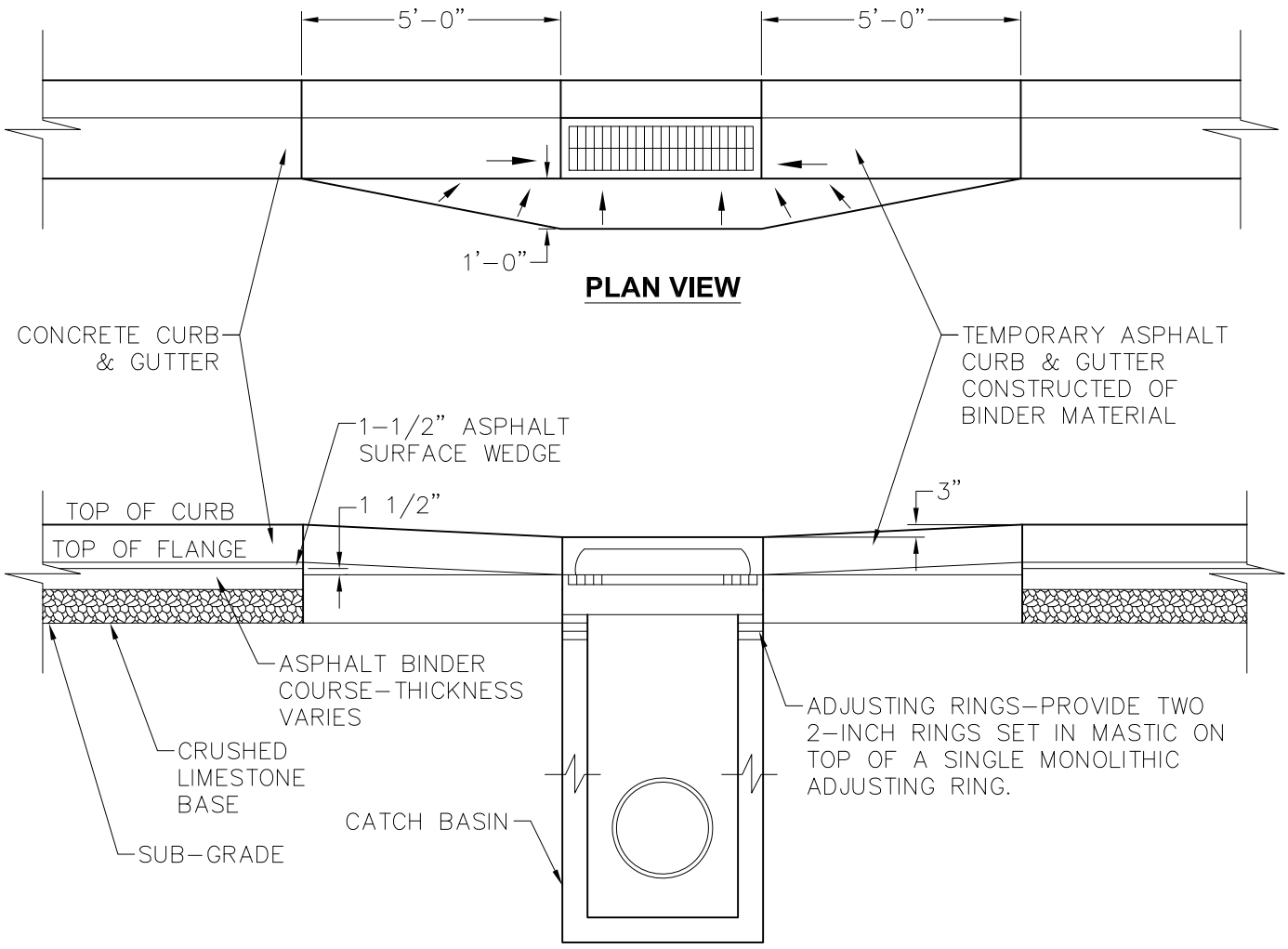
TRASH RACK

NO SCALE

STO-GRATE-04 96

EXHIBIT STO-04

RM811PB



PLAN VIEW

CROSS SECTION

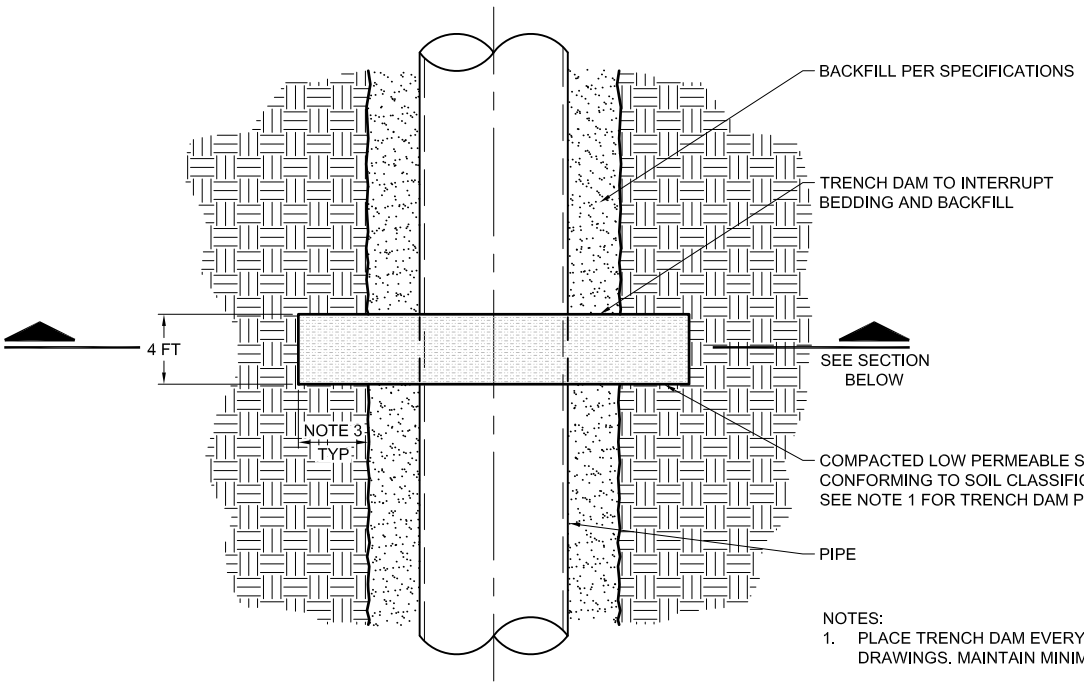
NOTE:
TEMPORARY BITUMINOUS CONCRETE CURB AND GUTTER TO REMAIN IN PLACE UNTIL FINISHED ASPHALT SURFACE COURSE IS SCHEDULED. PRIOR TO REPLACEMENT OF ASPHALT SURFACE COURSE, CONTRACTOR TO REMOVE TEMPORARY ASPHALT BINDER, CURB AND GUTTER, ADJUST FRAME TO PROPER GRADE AND POUR CONCRETE CURB AND GUTTER

INTERIM CATCH BASIN

NO SCALE

STO-CB-07 32

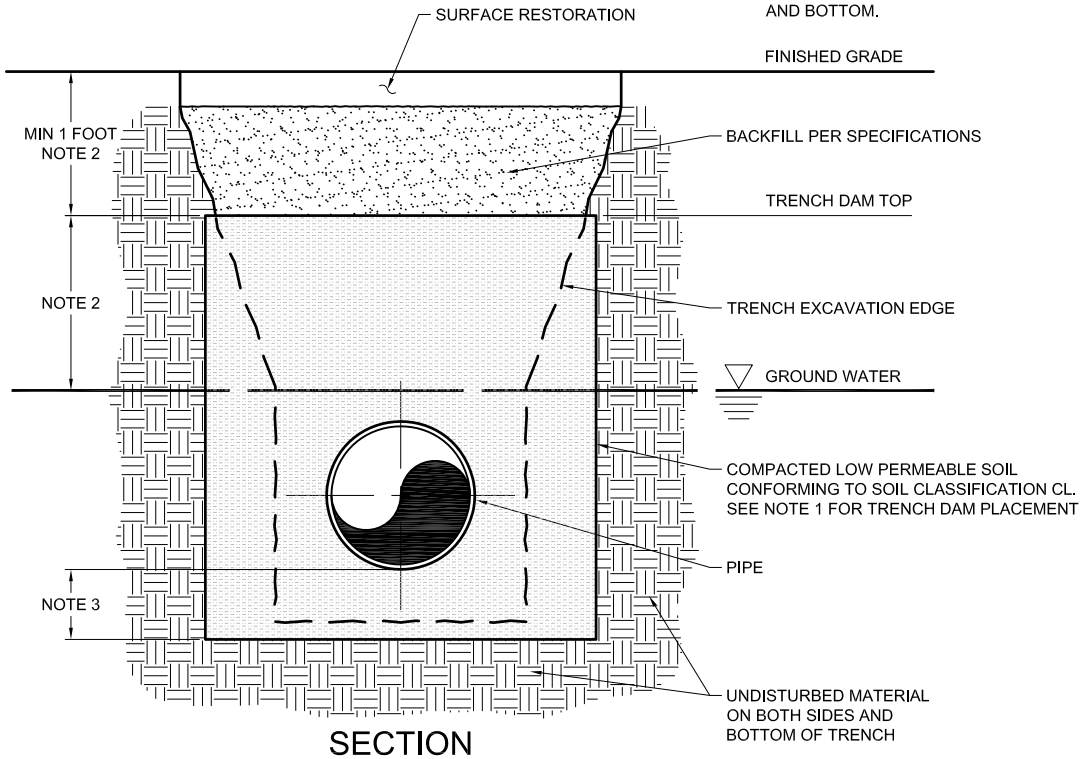
EXHIBIT STO-05



PLAN

NOTES:

1. PLACE TRENCH DAM EVERY 500 FT AND WHERE SHOWN ON DRAWINGS. MAINTAIN MINIMUM 5 FT FROM MANHOLES.
2. EXTEND TRENCH DAM TOP A MINIMUM OF 5 FT ABOVE GROUND WATER LEVEL, OR MAINTAIN A MINIMUM DEPTH OF ONE FOOT BELOW FINISHED GRADE (WHICHEVER ELEVATION IS LOWER). GROUND WATER DETERMINED BY NEAREST BORING OR BY ENGINEER.
3. NOTCH TRENCH DAM A MINIMUM OF 2 FT BEYOND UNDISTURBED MATERIAL ON TRENCH EXCAVATION SIDES AND BOTTOM.

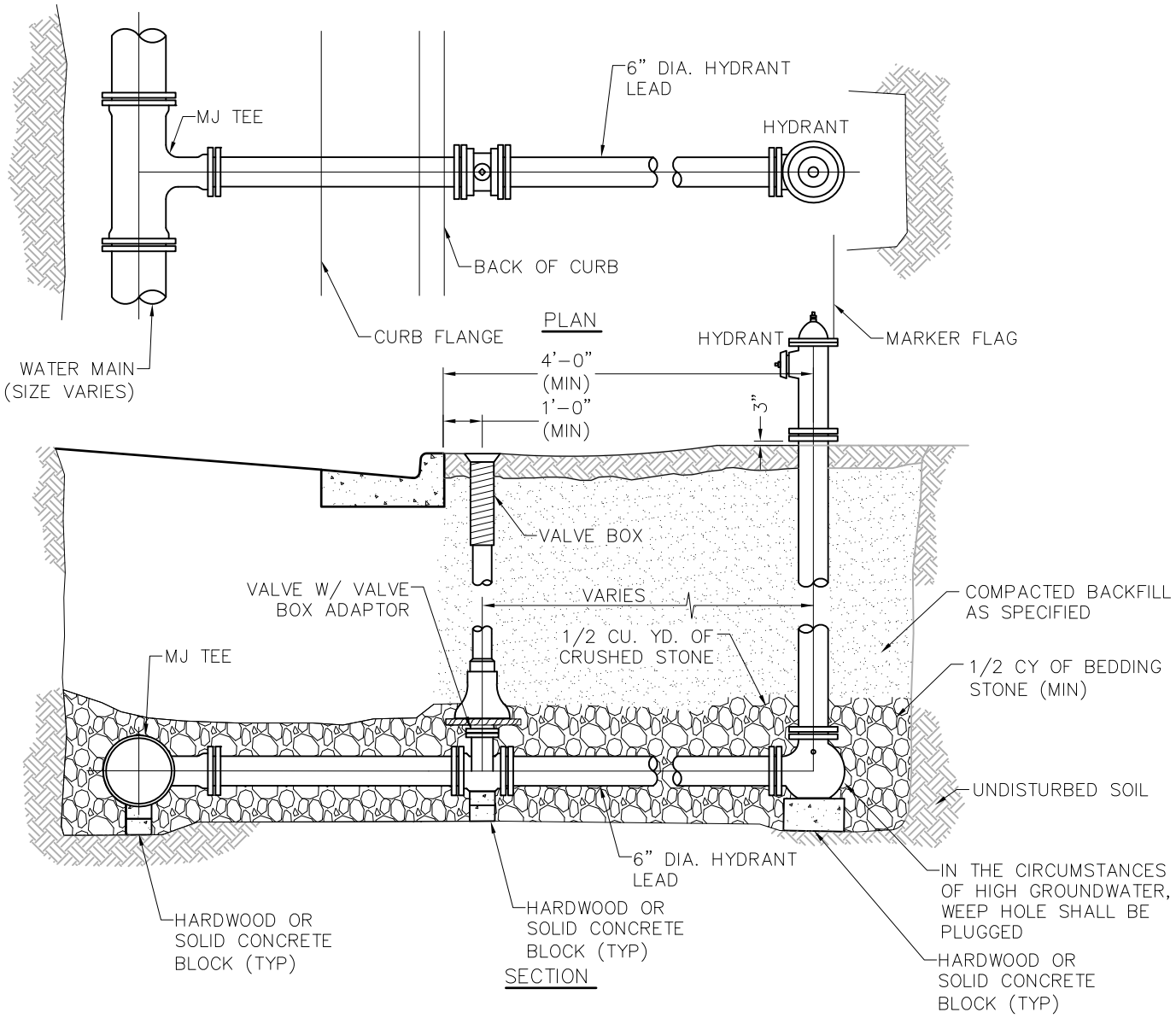


SECTION

TRENCH DAM

NO SCALE (32) CDT-TRENCH DAM

EXHIBIT-UT-01



NOTE:

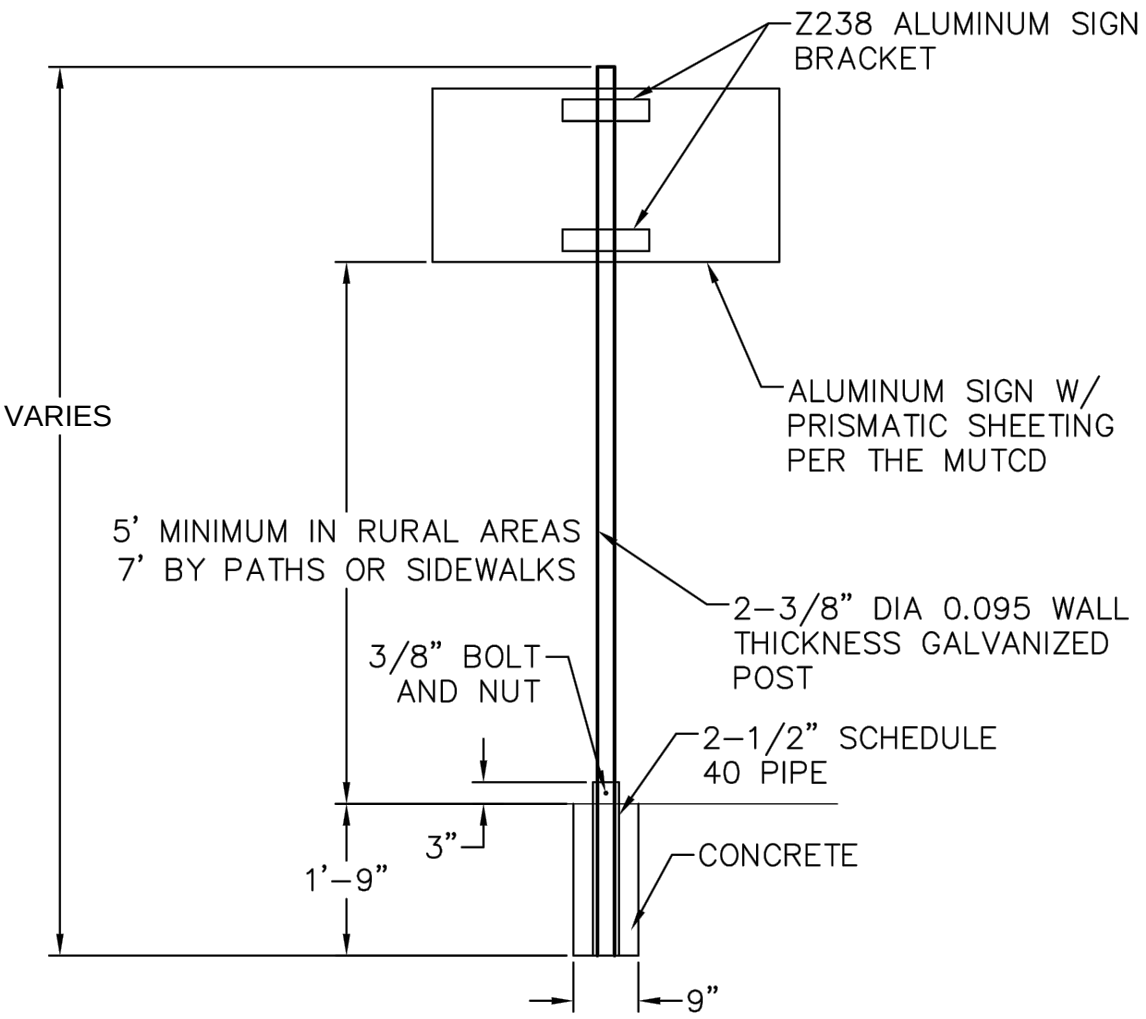
1. REFER TO FILE NO. 38 OF THE "STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN" FOR FURTHER INFORMATION.
2. ALL JOINTS ON HYDRANT LEADS SHALL HAVE MEGALUG RESTRAINTS.
3. BURY DEPTH OF HYDRANT AND LEAD SHALL BE 7.5 FEET FOR NEW CONSTRUCTION AND SHALL BE FIELD VERIFIED BY CONTRACTOR FOR REPLACEMENT.

HYDRANT SETTING DETAIL

NO SCALE

WM-HYD-01 24

EXHIBIT WM-01



ALL SIGN INSTALLATIONS TO MEET MUTCD STANDARDS.
SIGNS TO BE HELD TO THE BRACKETS WITH STAINLESS STEEL NYLOK LOCK NUTS.
ALL PEDESTRIAN AND SCHOOL CROSSING SIGNS HAVE TO BE FYGHIP.
STREET NAME PLATES SHALL BE 9" BLADE WITH 6" UPPER/LOWER CASE LETTERING, WHITE ON GREEN LETTERING. (FOR PRIVATE ROADS LETTERING IS WHITE ON BLUE)

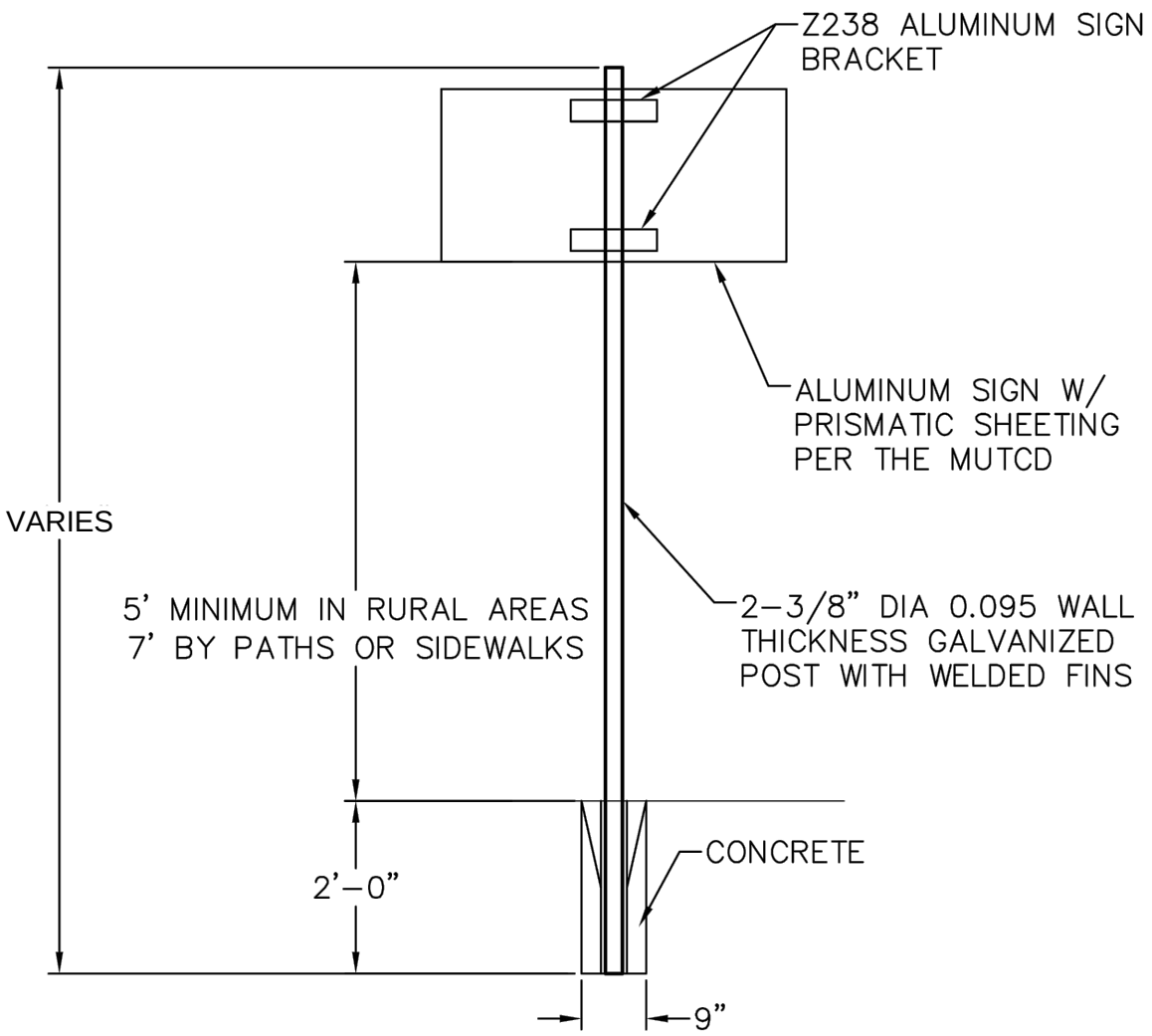
SIGN POST DETAIL IN PAVEMENT

NO SCALE

Sign post detail in pavement 2

EXHIBIT GN-01

RM811PB



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STREET NAME PLATES SHALL BE 9" BLADE WITH 6" UPPER/LOWER CASE LETTERING, WHITE ON GREEN LETTERING. (FOR PRIVATE ROADS LETTERING IS WHITE ON BLUE)

SIGN POST DETAIL IN UNPAVED AREAS

NO SCALE

Sign post detail in rural 2

EXHIBIT GN-02