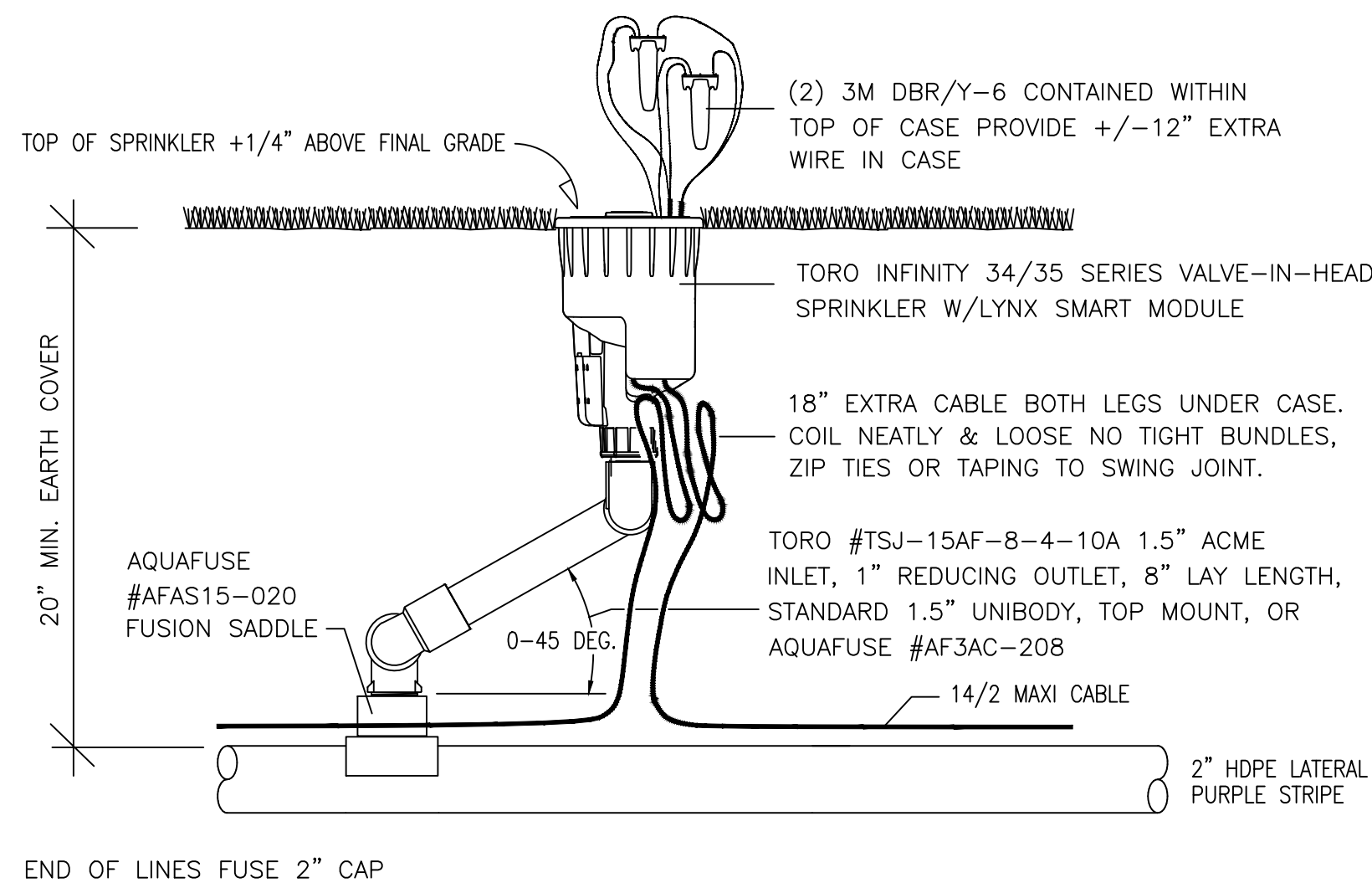
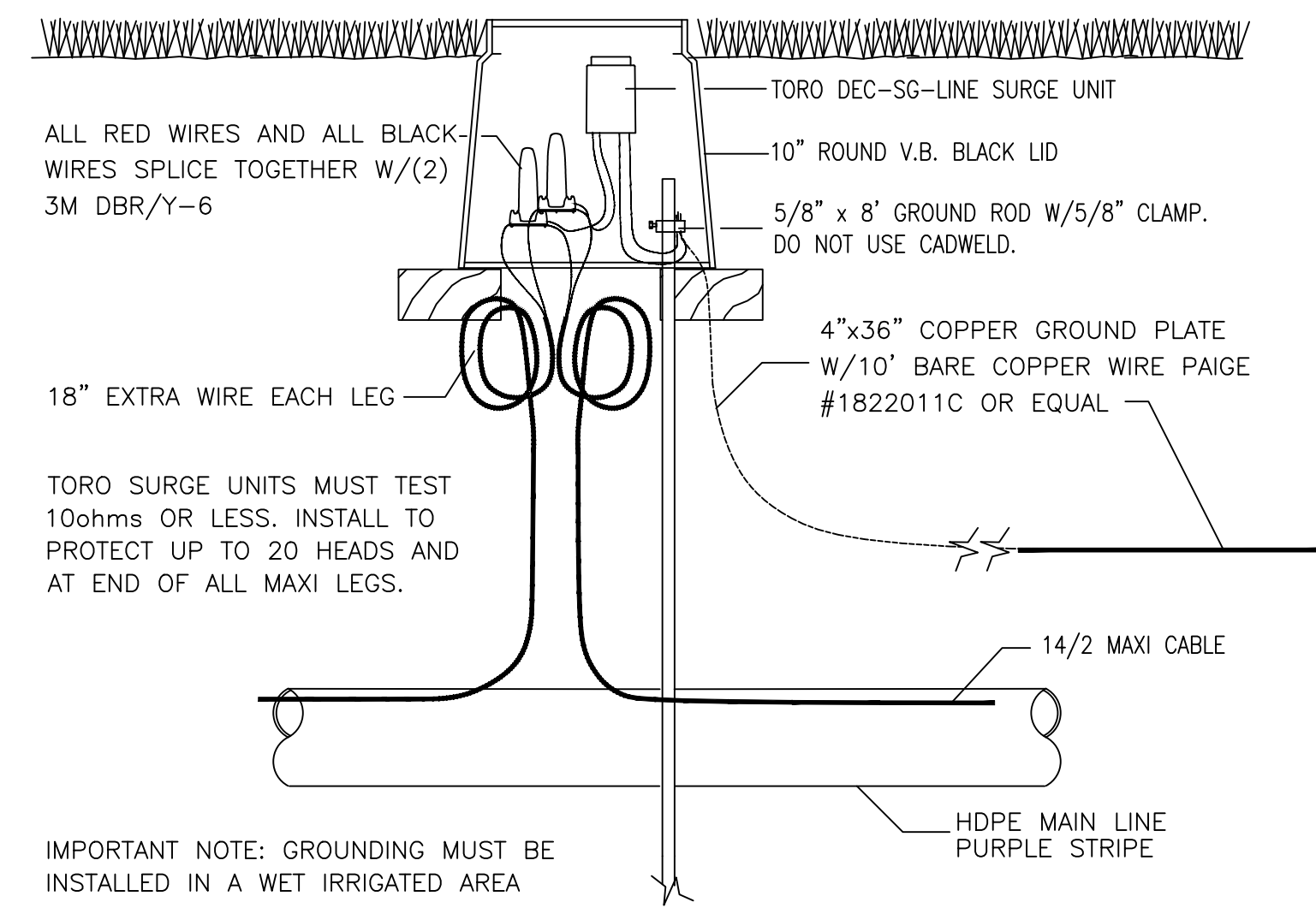


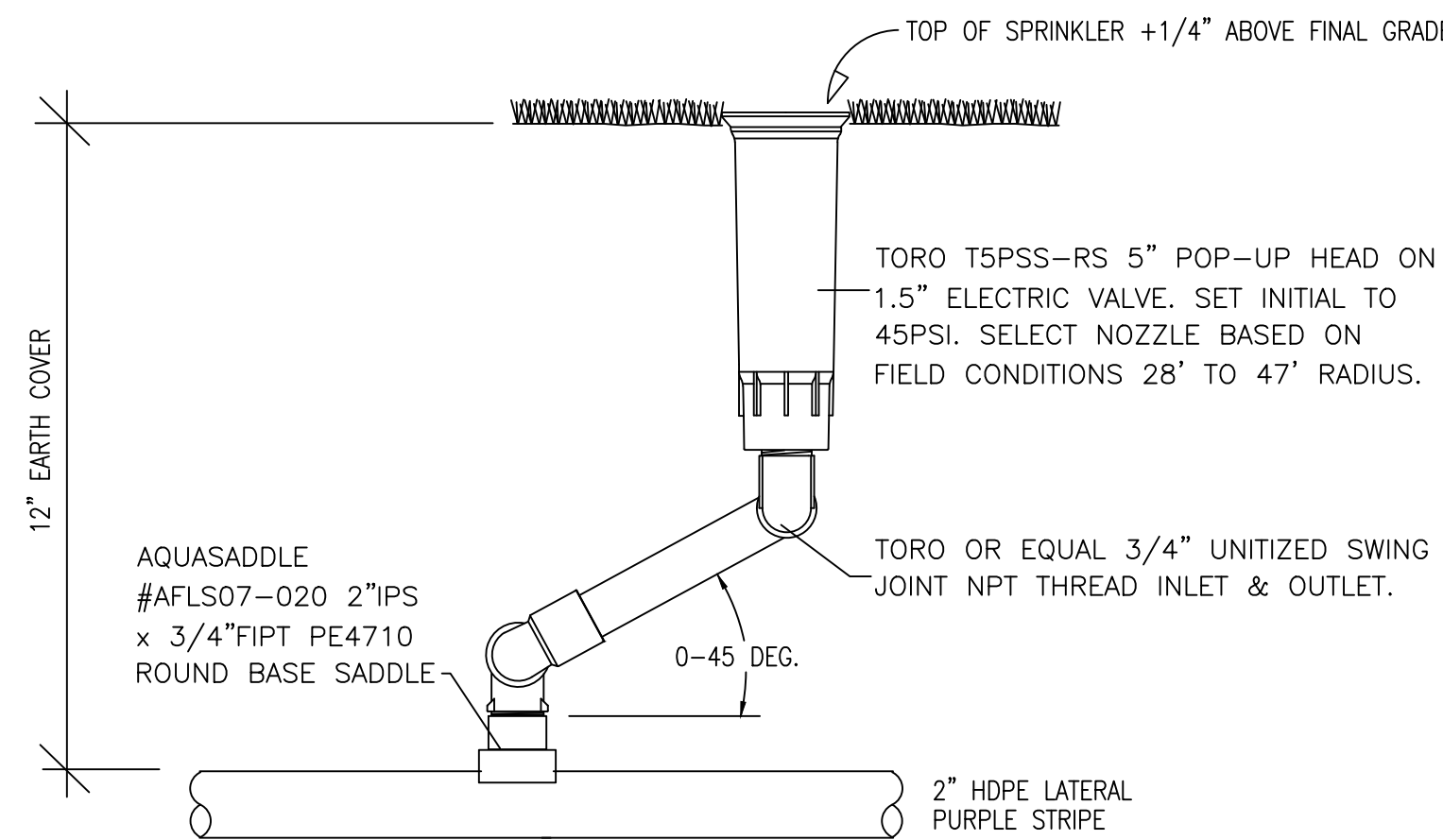
1 TORO FLX34/35 SERIES LSM MODULE SPRINKLER & SWING JOINT
IR7



2 OPTIONAL BID ITEM: TORO INFINITY 34/35 SPRINKLER & SWING JOINT
IR7

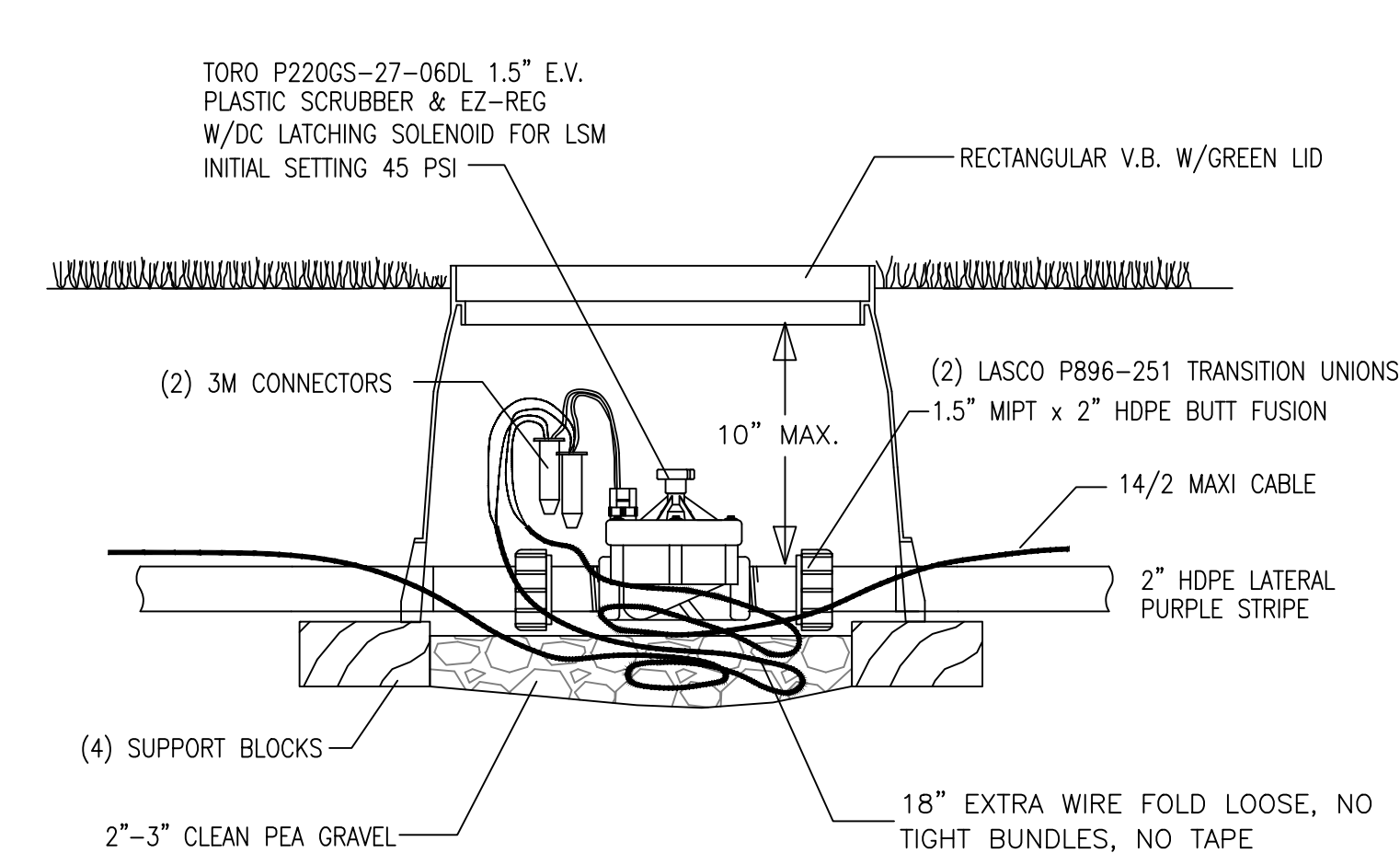


3 TORO SURGE UNIT INSTALLATION AT MAINLINES
IR7

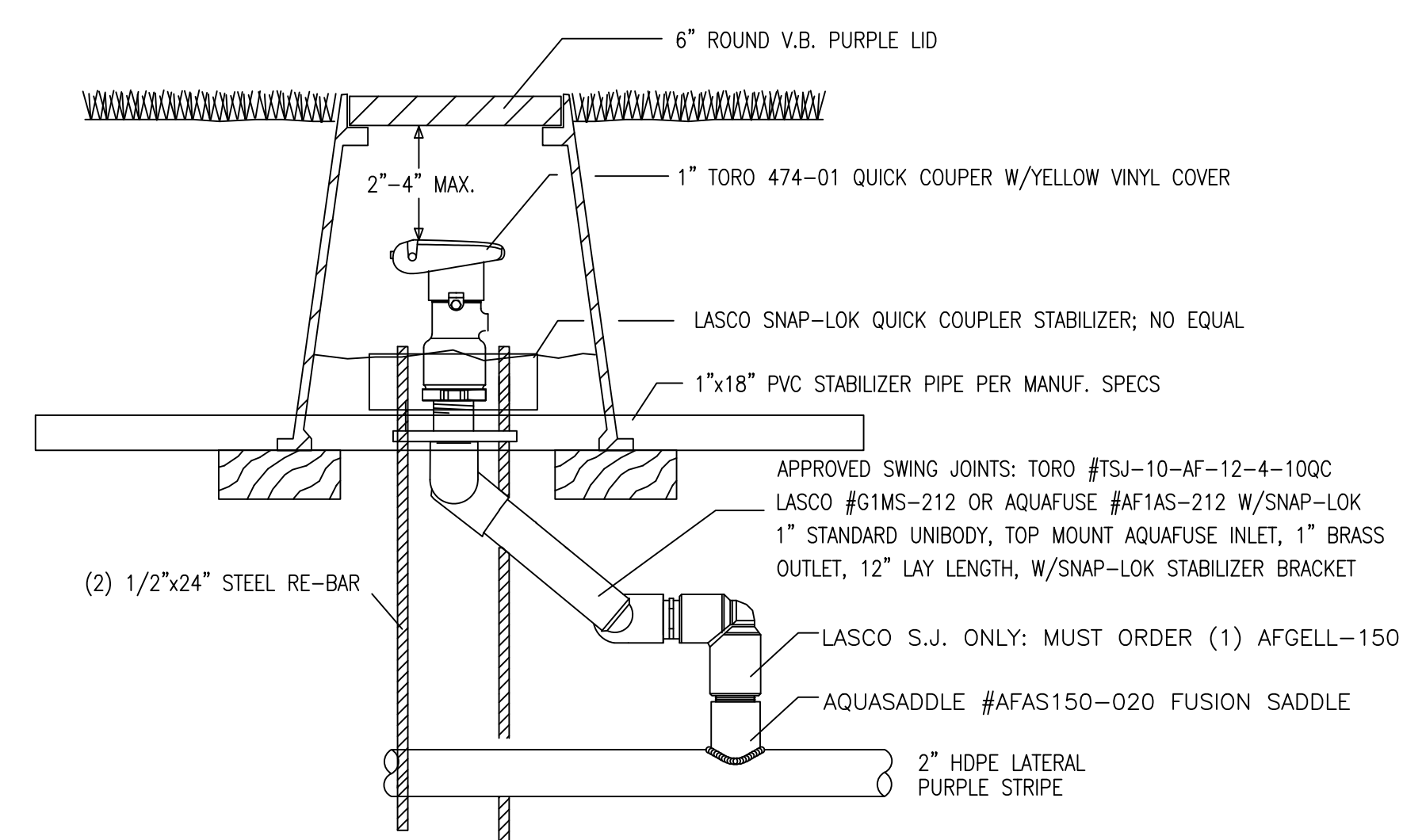


NOTE: SPRINKLERS ARE SHIPPED WITH MULTIPLE NOZZLES. CONTRACTOR SHALL INSTALL NOZZLES MEETING SITE CONDITIONS AND AS DIRECTED BY ARCHITECT AND/OR PHGC.

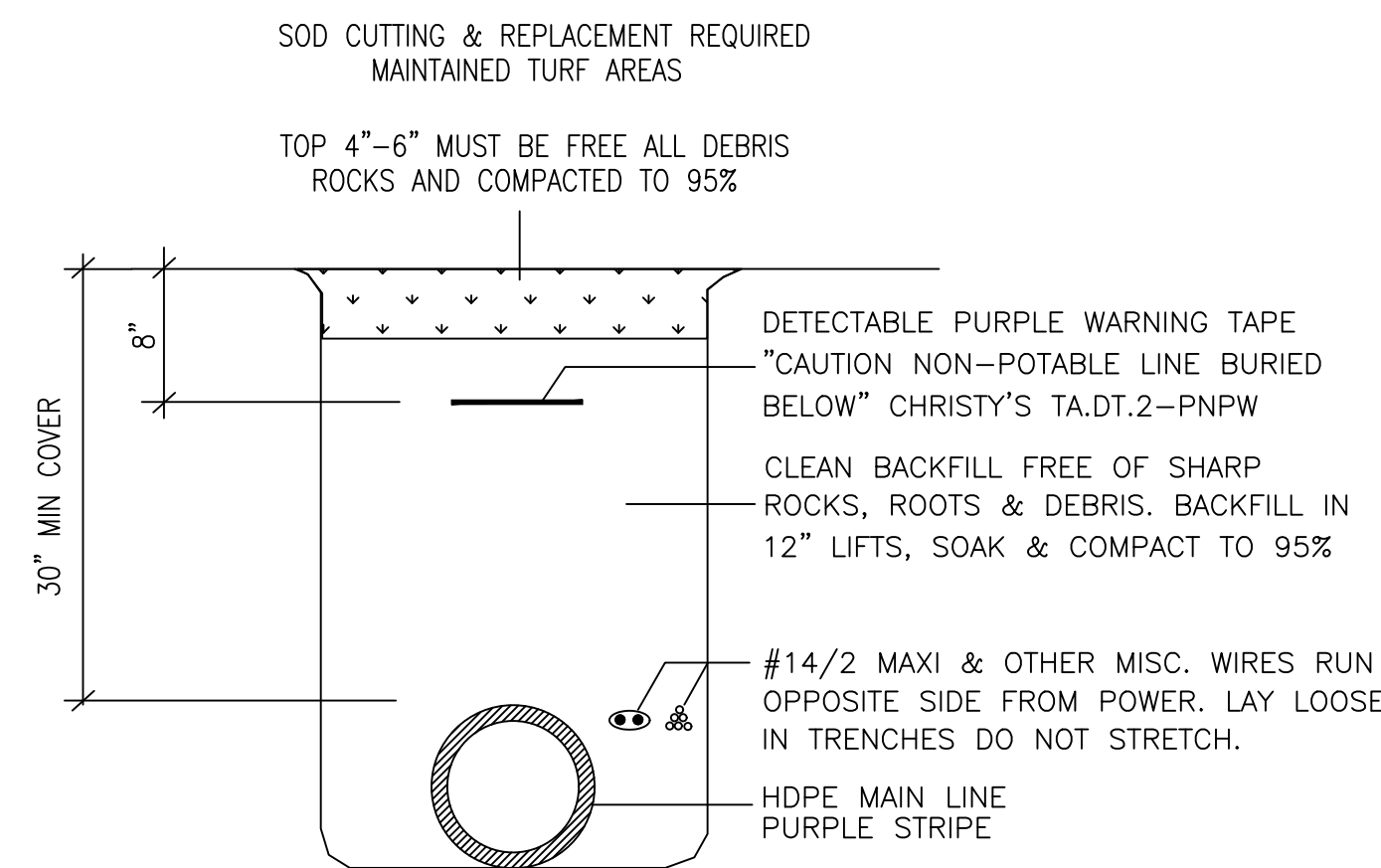
4 TORO T5 POP-UP SPRINKLER & SWING JOINT
IR7



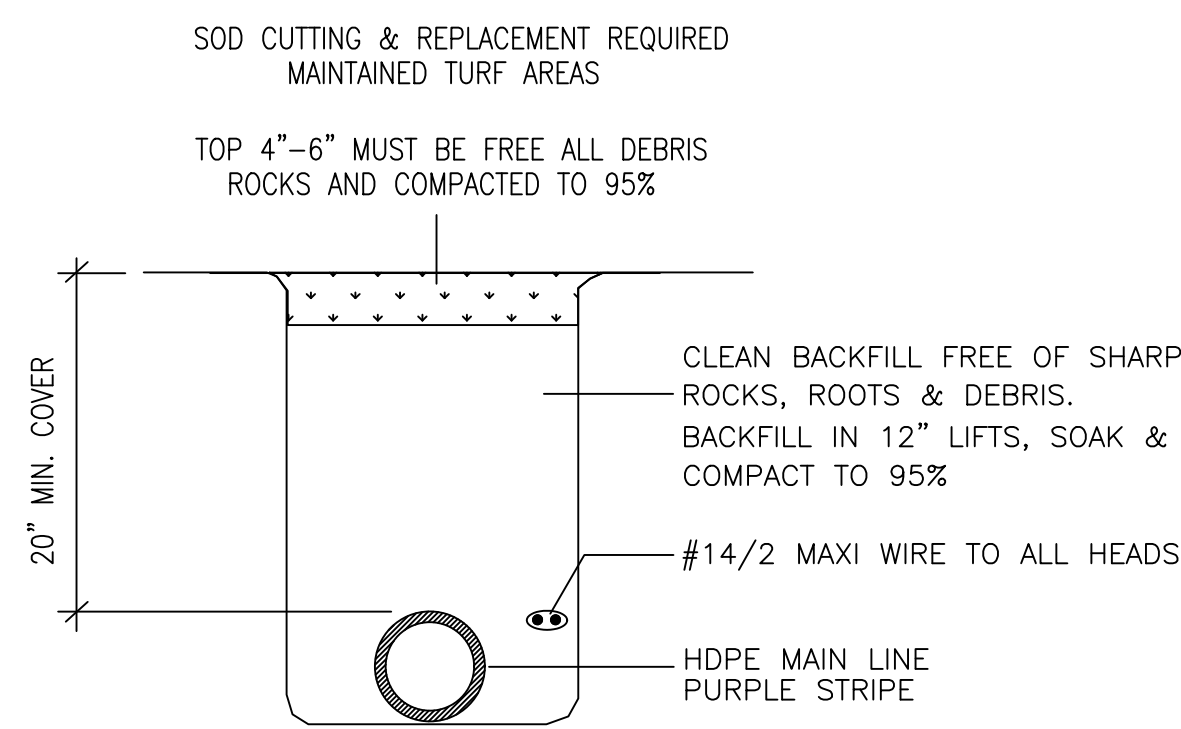
5 TORO P220GS PRESSURE REGULATED ELECTRIC VALVE
IR7



1 1" QUICK COUPLER WITH 'SNAP-LOK' STABILIZER
IR7



7 TORO SYSTEM - MAIN LINE TRENCH DETAIL
IR7



8 TORO SYSTEM - LATERAL TRENCH DETAIL
IR7

9 RESERVED FUTURE USE
IR7



Gary Kaye Design & Project Management
Ph. (623) 341-2302
garykaydesign@gmail.com

TORO TWO-WIRE SYSTEM INSTALLATION DETAILS PINE TRACE GOLF CLUB IRRIGATION DESIGN

Delivery Address: 3600 Pine Trace Blvd, Rochester Hills, MI 48309 Ph. (248) 852-7100

JOB No. 2024-01
DRAWN BY: GSK
APPROVED:
DATE: 02/19/2025

| REVISIONS | | |
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| 11/7/2024 | GAS LINE AVOIDANCE CHANGES | GSK |
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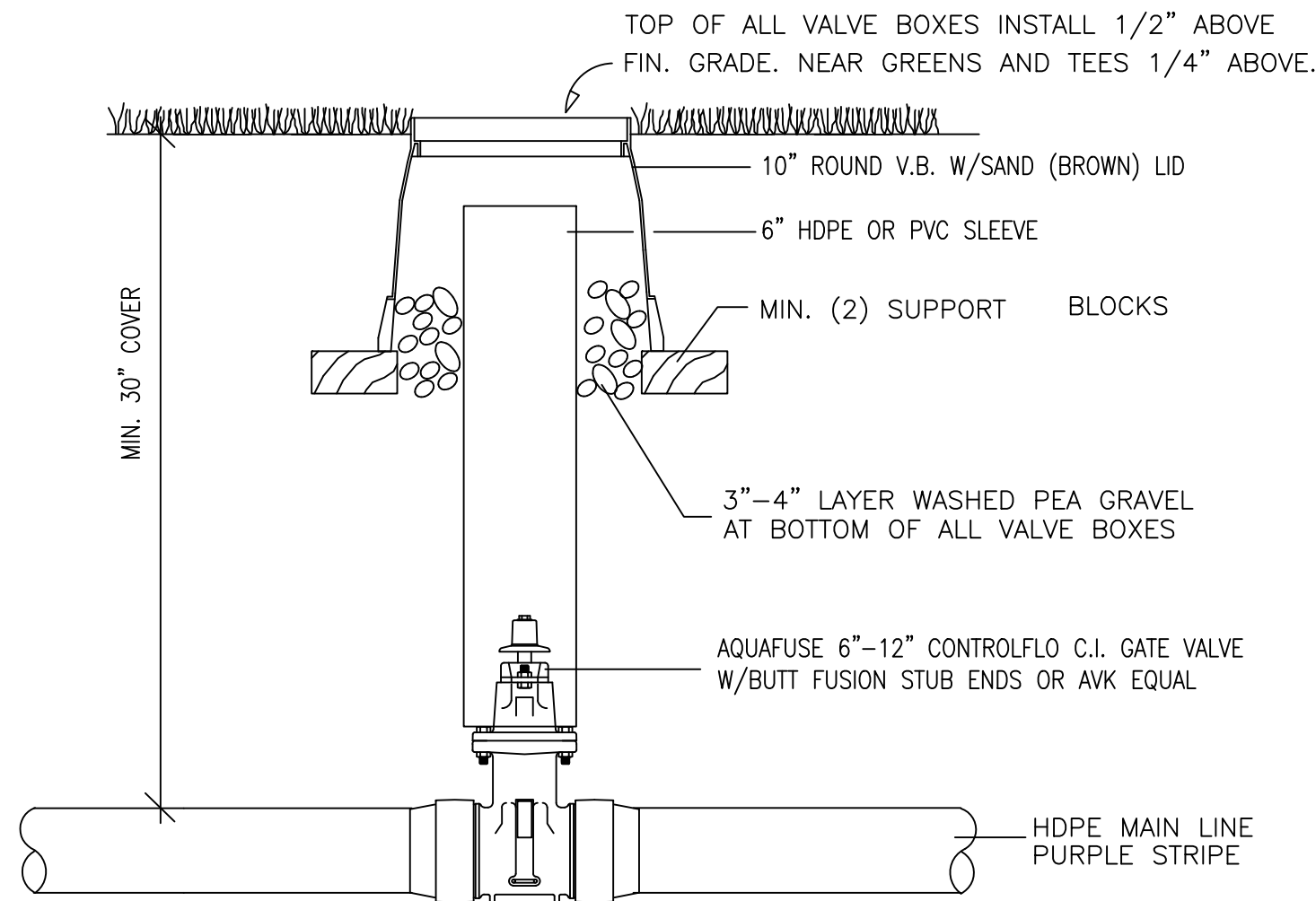
SHEET

IR-7

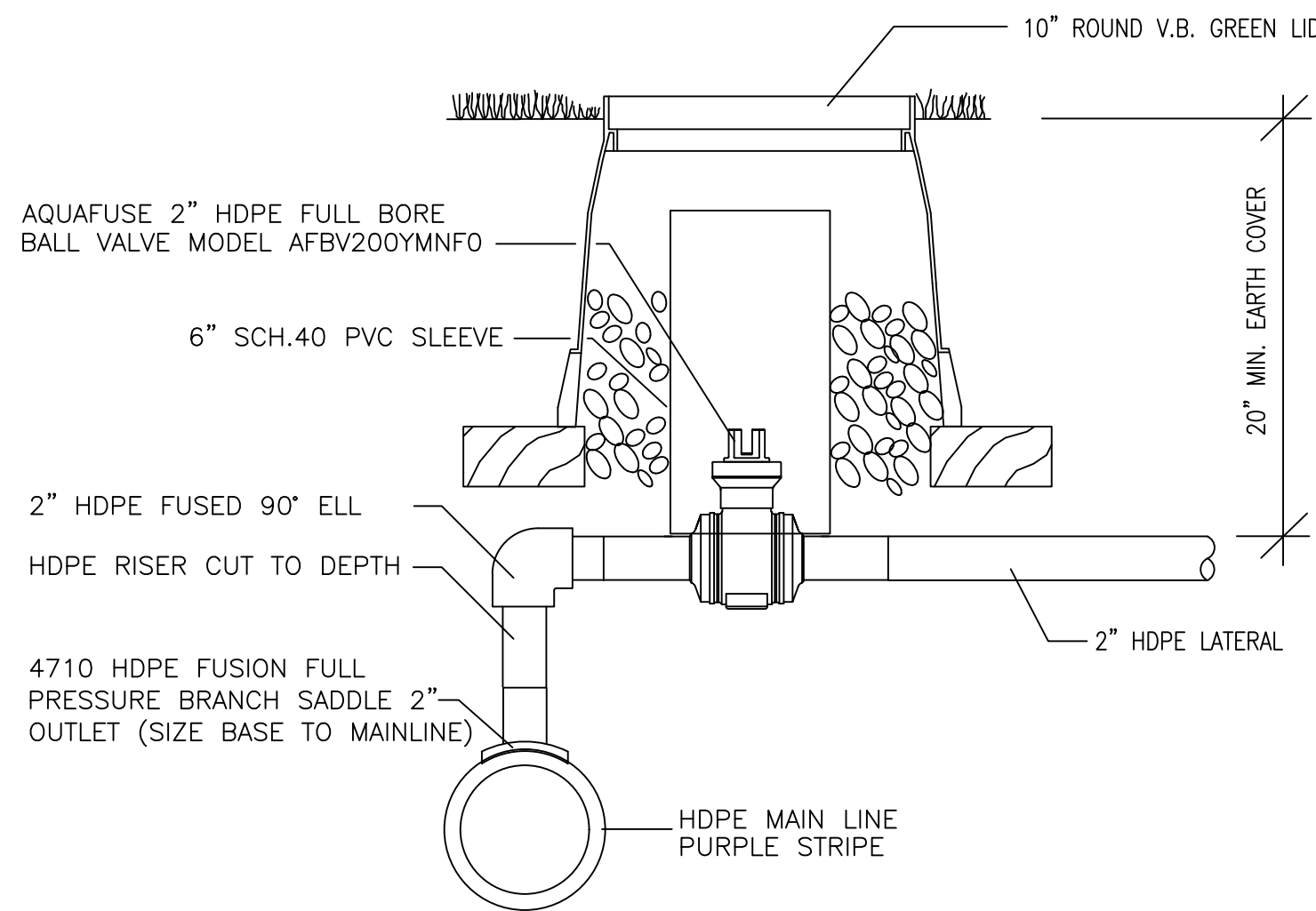


J2025-0107
PSP2025-0006
Revision #2

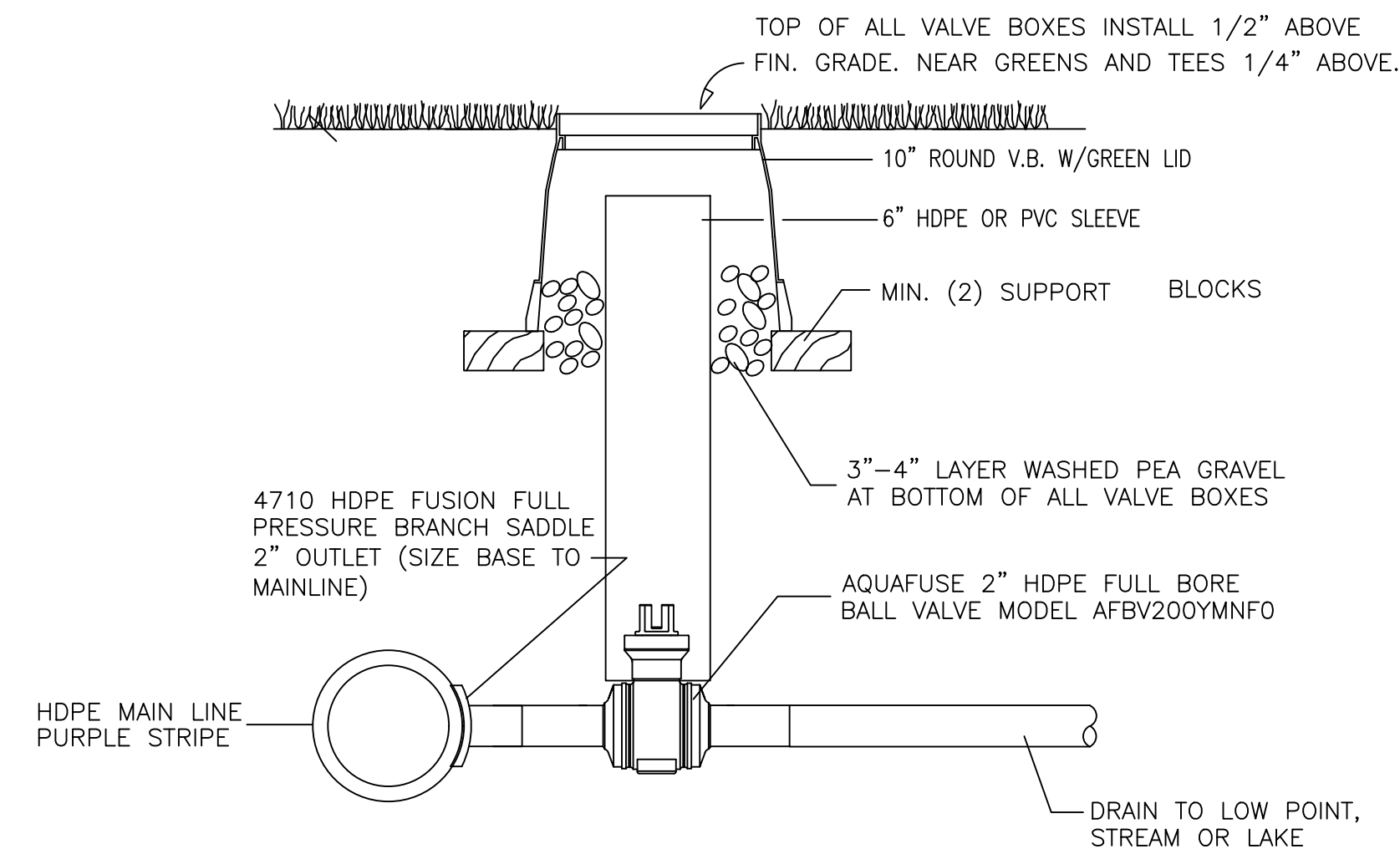
Received
6/13/2025
City of Rochester Hills
Planning & Economic
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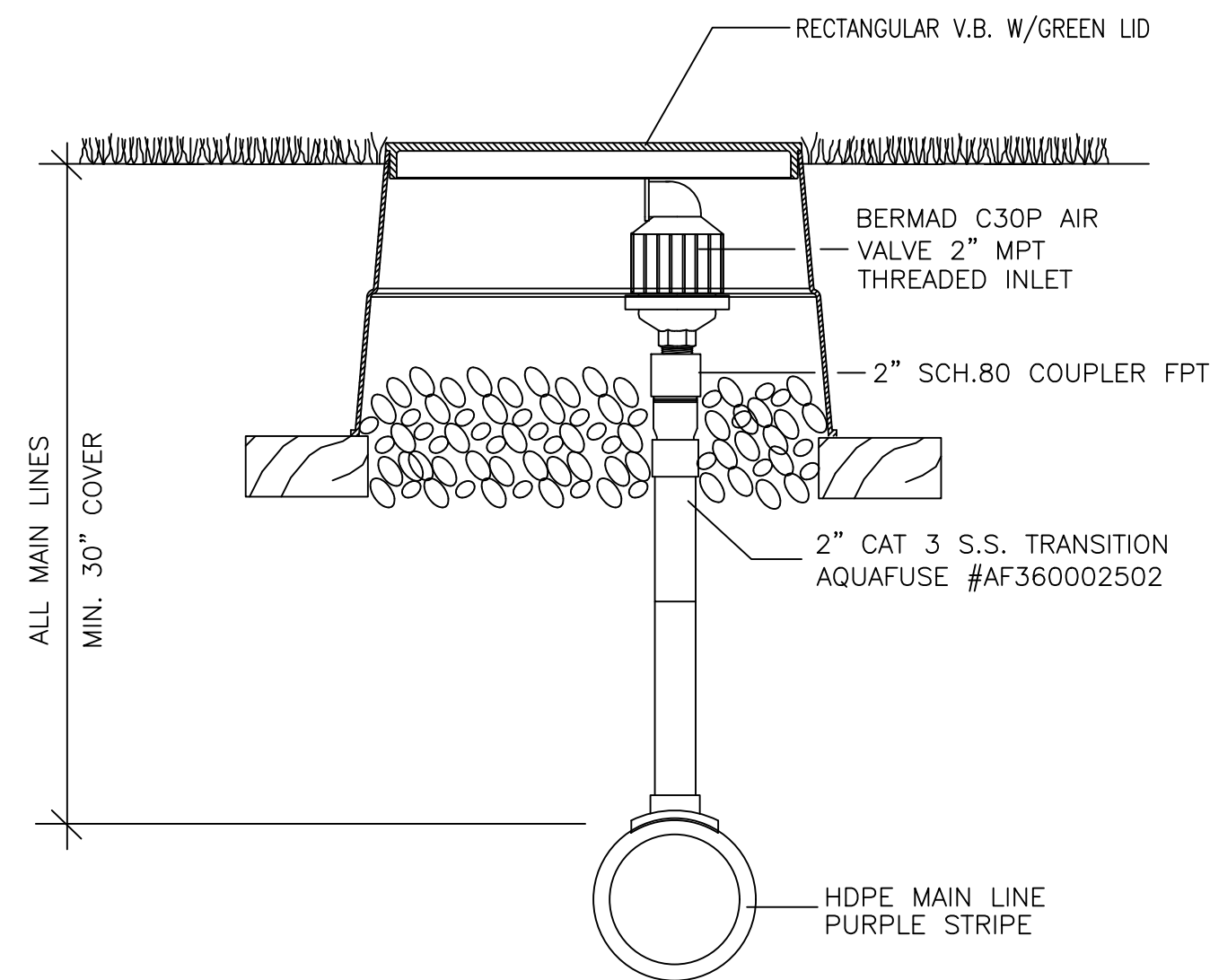
1 HDPE MAIN LINE GATE VALVES AND VALVE BOX DETAILS
IR8



2 HDPE MAINLINE TO LATERAL LINE CONNECTION W/BALL VALVE
IR8

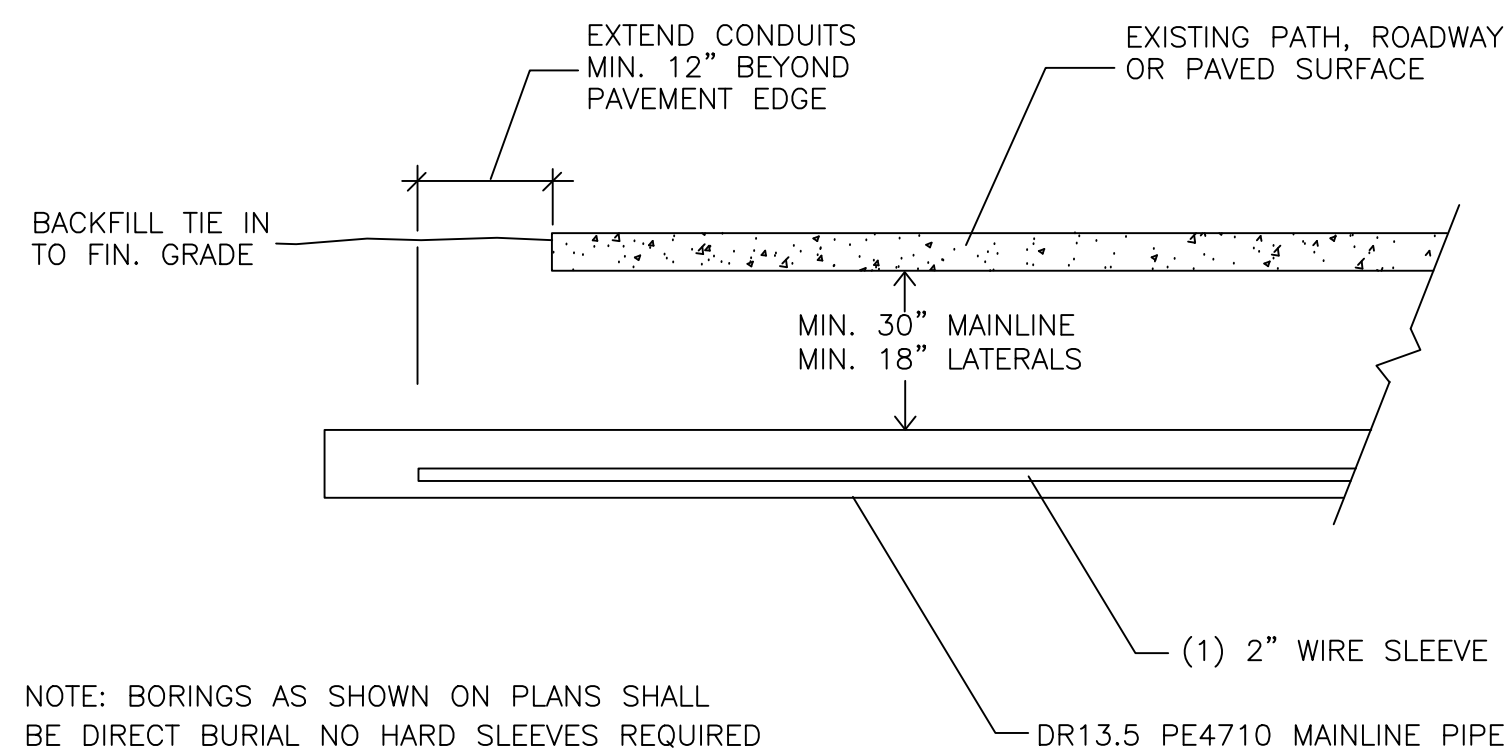


3 2" HDPE DRAIN VALVE ASSEMBLY
IR8

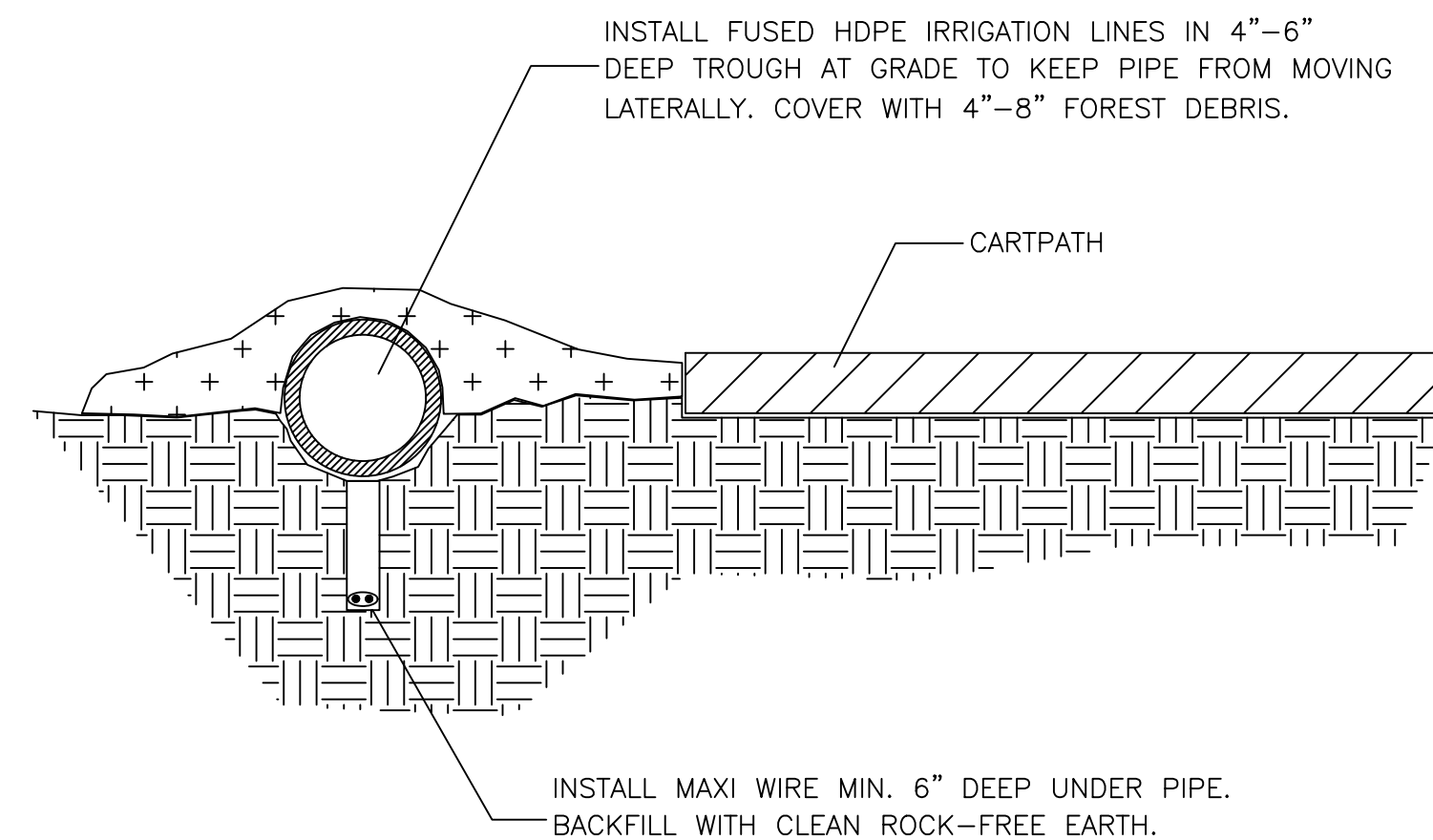


4 COMBINATION AIR RELIEF / VACUUM VALVE ASSEMBLY
IR8

SIDE VIEW



5 HDPE PIPELINES UNDER PAVEMENT & STREAMS
IR8



6 ABOVE GROUND PIPELINE INSTALLATIONS
IR8

7 RESERVED FUTURE USE
IR8

8 RESERVED FUTURE USE
IR8

9 RESERVED FUTURE USE
IR8

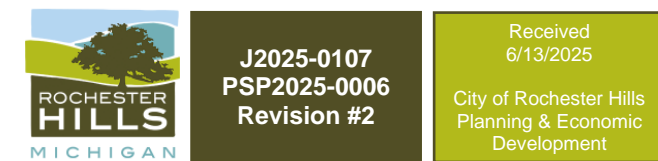


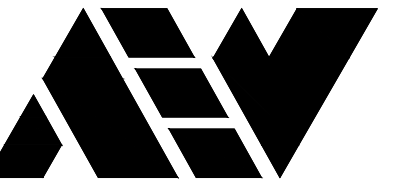
IRRIGATION SYSTEM INSTALLATION DETAILS
PINE TRACE GOLF CLUB IRRIGATION DESIGN
Delivery Address: 3600 Pine Trace Blvd, Rochester Hills, MI 48309 Ph. (248) 852-7100

JOB No. 2024-01
DRAWN BY: GSK
APPROVED:
DATE: 02/19/2025

| REVISIONS | | |
|-----------|----------------------------|-----|
| 11/7/2024 | GAS LINE AVOIDANCE CHANGES | GSK |
| | | |
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| | | |

SHEET
IR-8





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CIVIL ENGINEERS SURVEYORS ARCHITECTS

51301 Schoenherr Road Phone 586 726 1234
Shelby Township Fax 586 726 8780
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ENGINEERING STRONG COMMUNITIES

06/13/2025 Site Plan Submittal 3
05/09/2025 Site Plan Submittal 2
03/18/2025 Site Plan Submittal 1

DATE SUBMITTALS/REVISIONS

PROJECT NAME:

PINE TRACE GOLF
COURSE

SHEET TITLE:

FLOOR PLAN -
BANQUET

CLIENT:

PINE TRACE GOLF COURSE

PRELIMINARY CONSTRUCTION RECORD
DRAWN BY: CBR CHECKED BY: SAK DATE: JUNE 2025
SCALE: AS NOTED

811 Know what's below. Call
72 hours before you dig.

UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE
LOCATIONS AND TYPES OF EXISTING FACILITIES ONLY, AS
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PROJECT NO.

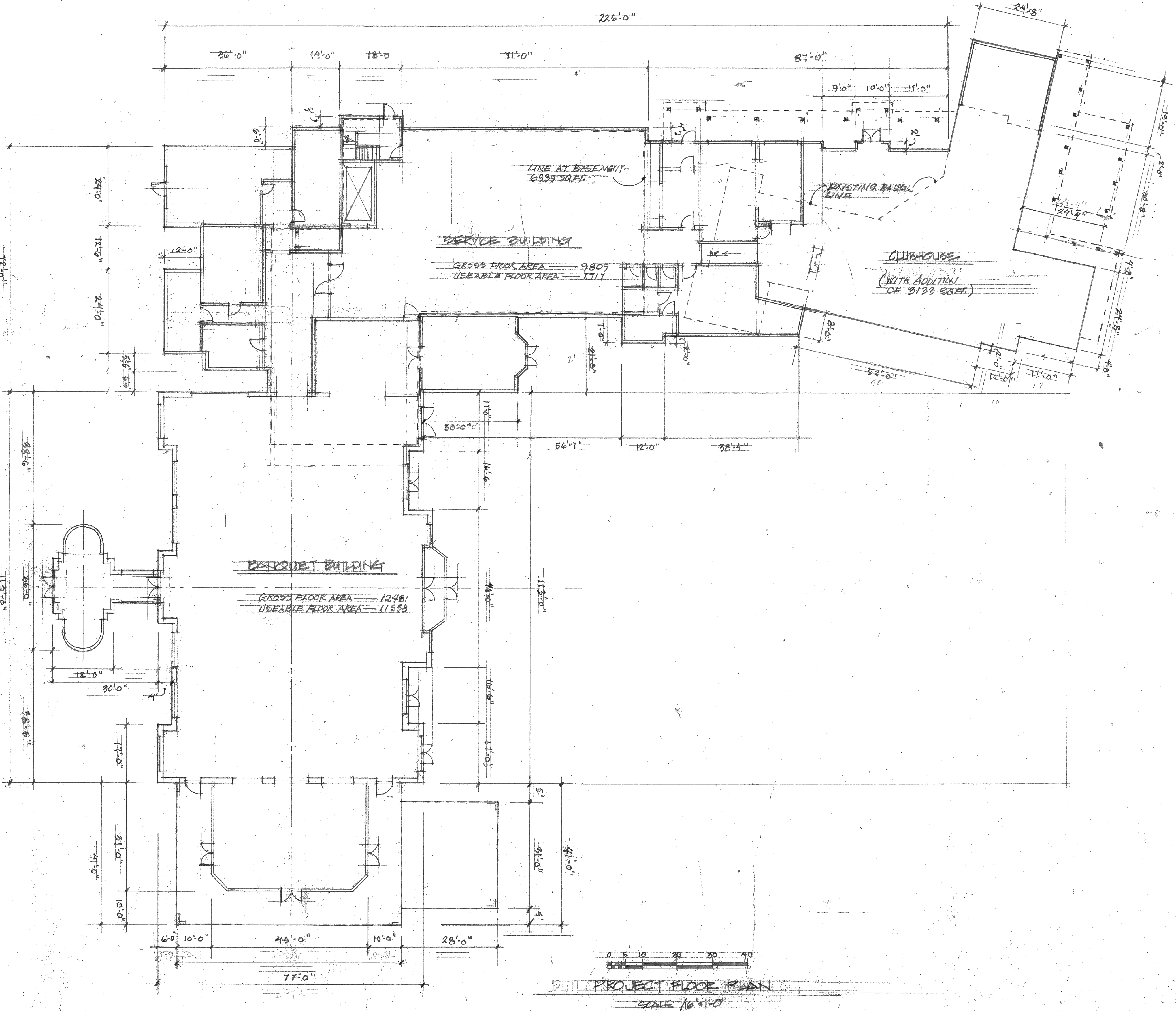
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SHEET NO.

A101

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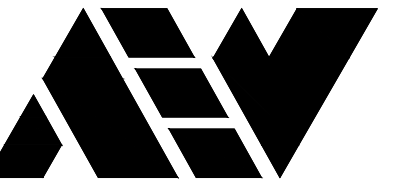
THE ORANGERIE

THIS DEVELOPMENT PROJECT
AT PINE TRACE CONSISTS OF
NEW CONSTRUCTION PROVIDING A
MEETING AND BANQUET VENUE
INCLUDING A REMODEL AND
ADDITION TO THE EXISTING
CLUBHOUSE.
WITHIN THE MICHIGAN BUILDING
CODE IT IS A 5th CONSTRUCTION
TYPE AND A GROUP A2 ASSEMBLY
FACILITY.



J2025-0107
PSP2025-0006
Revision #2

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6/13/2025
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ENGINEERING STRONG COMMUNITIES

| | |
|--|---|
| 06/13/2025 05/09/2025 03/18/2025 | Site Plan Submittal 3 Site Plan Submittal 2 Site Plan Submittal |
| DATE | SUBMITTALS/REVISIONS |

PROJECT NAME:

PINE TRACE GOLF
COURSE

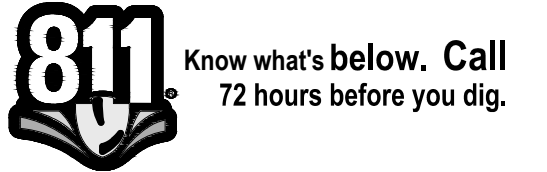
SHEET TITLE:

ELEVATIONS -
BANQUET

CLIENT:

PINE TRACE GOLF COURSE

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| DRAWN BY: CBR | CHECKED BY: SAK | DATE: JUNE 2025 |
| SCALE: | AS NOTED | |



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PROJECT NO.

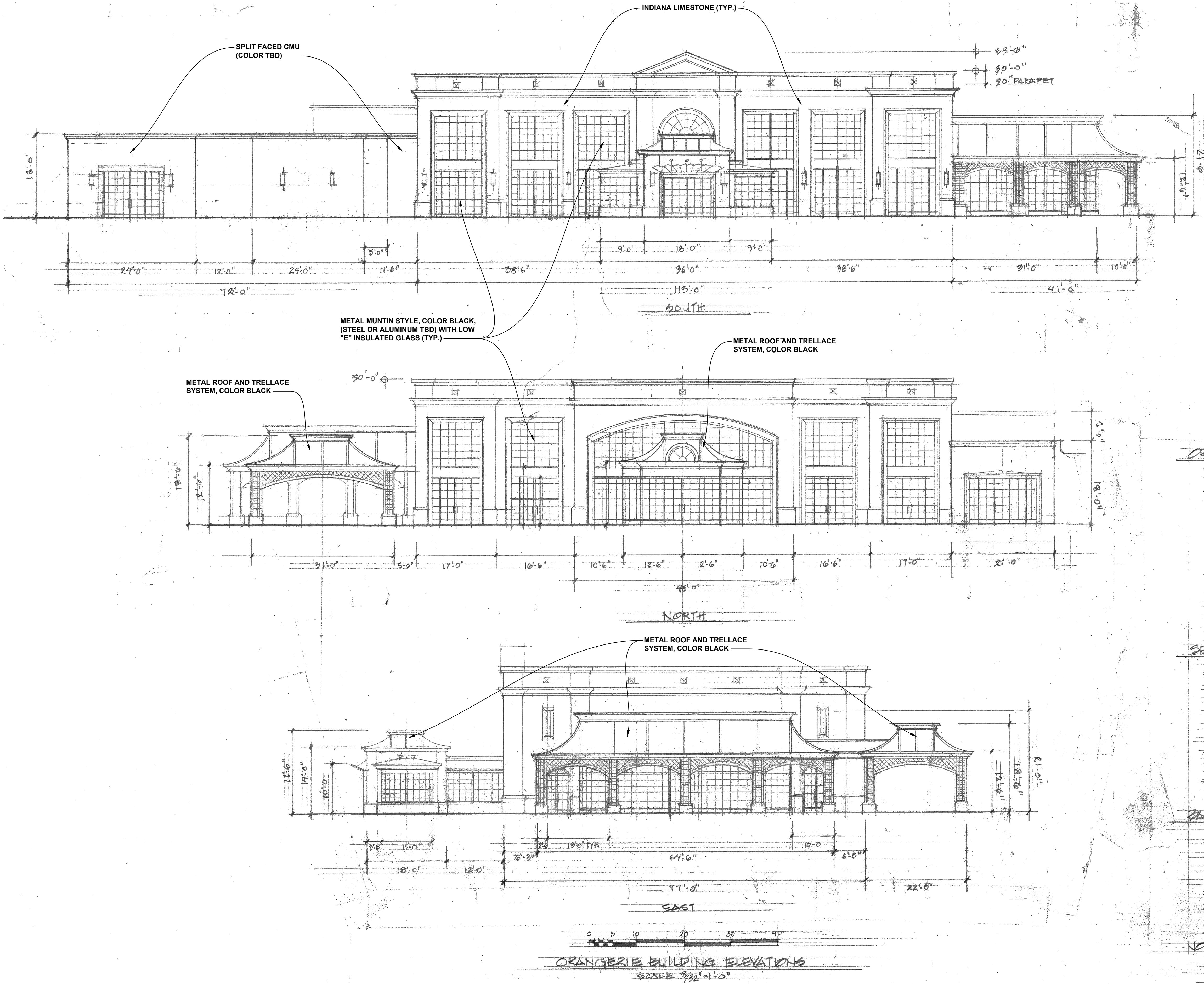
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SHEET NO.

A201

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ORANGERIE BUILDING

FACADE:

- INDIANA LIMESTONE OVER STRUCTURAL STEEL FRAME

WINDOWS & DOORS:

- METAL MUNTIN STYLE (STEEL OR ALUMINUM TBD) W/ LOW "E" INSULATED GLASS

ROOF:

- FULLY ADHERED ROOFING MEMBRANE OVER 4" RIGID INSULATION ON METAL DECK W/ INSULATION AND VAPOR BARRIER ON INSIDE OF PARAPET WALL

SERVICE BUILDING

FACADE:

- COLORFUL SPLIT FACED CMU W/ PRECAST STONE CORNICE W/ OPEN CELLS FILLED W/ BATTEN INSULATION AND VAPOR BARRIER ON INSIDE OF PARAPET WALL

WALL

WINDOWS & DOORS:

- SAME AS ORANGERIE BLDG.

ROOF:

- SAME AS ORANGERIE BLDG.

BANQUET PAVILION

WINDOWS & DOORS:

- SAME AS ORANGERIE BLDG.

ROOF:

- METAL MANSARD OVER STRUCTURAL STEEL FRAME

COLUMNS:

- METAL LATTICE OVER STEEL FRAME

NOTE: SCREEN FOR MECH. EQUIPMENT - 36" H. PERFORATED PANEL W/ 1/8" GORTON ITEM W/ POWDER COAT FINISH



J2025-0107
PSP2025-0006
Revision #2



MAY 11 2025
DPR 2/25/2025
JAN 10 2025



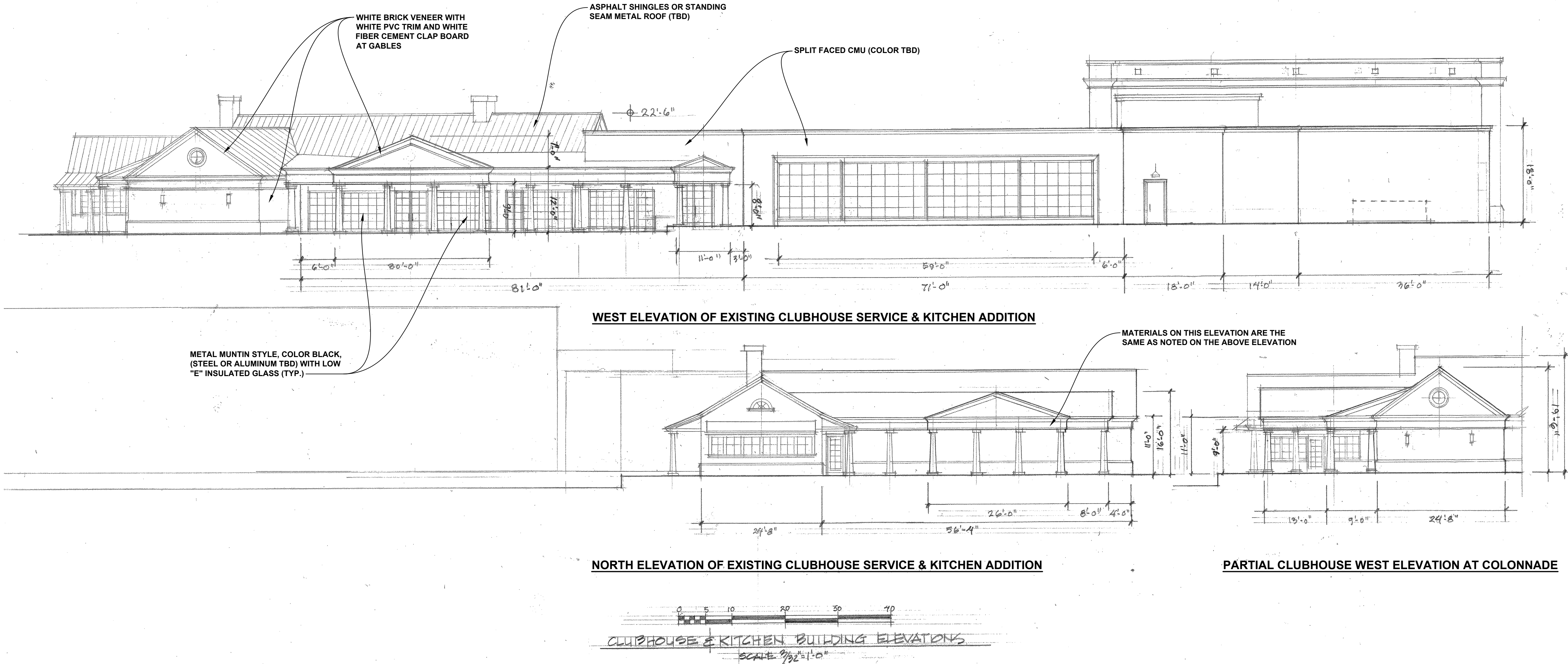
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51301 Schoenherr Road Phone 586 726 1234
Shelby Township Fax 586 726 8780
Michigan 48315

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ENGINEERING STRONG COMMUNITIES



PINE TRACE GOLF
COURSE

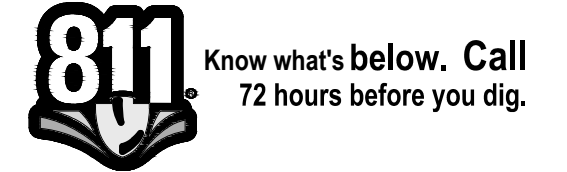
SHEET TITLE:

ELEVATIONS -
BANQUET

CLIENT:

PINE TRACE GOLF COURSE

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| DRAWN BY: CBR | CHECKED BY: SAK | DATE: JUNE 2025 |
| SCALE: AS NOTED | | |



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PROJECT NO.

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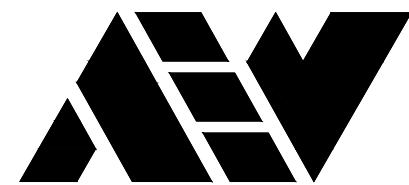
A202

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51301 Schoenherr Road Phone 586 726 1234
Shelby Township Site Plan Submittal 2
Michigan 48315 Site Plan Submittal
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| | |
|--|---|
| 06/13/2025 05/09/2025 03/18/2025 | Site Plan Submittal 3 Site Plan Submittal 2 Site Plan Submittal |
| DATE | SUBMITTALS/REVISIONS |

PROJECT NAME:

PINE TRACE GOLF COURSE

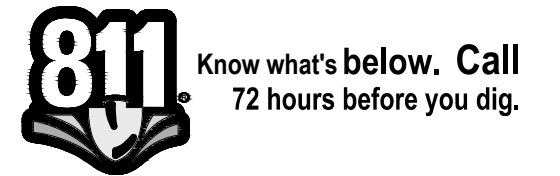
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FLOOR PLAN & ELEVATIONS - DRIVING RANGE

CLIENT:

PINE TRACE GOLF COURSE

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| DRAWN BY: CBR | CHECKED BY: SAK | DATE: JUNE 2025 |
| SCALE: | AS NOTED | |



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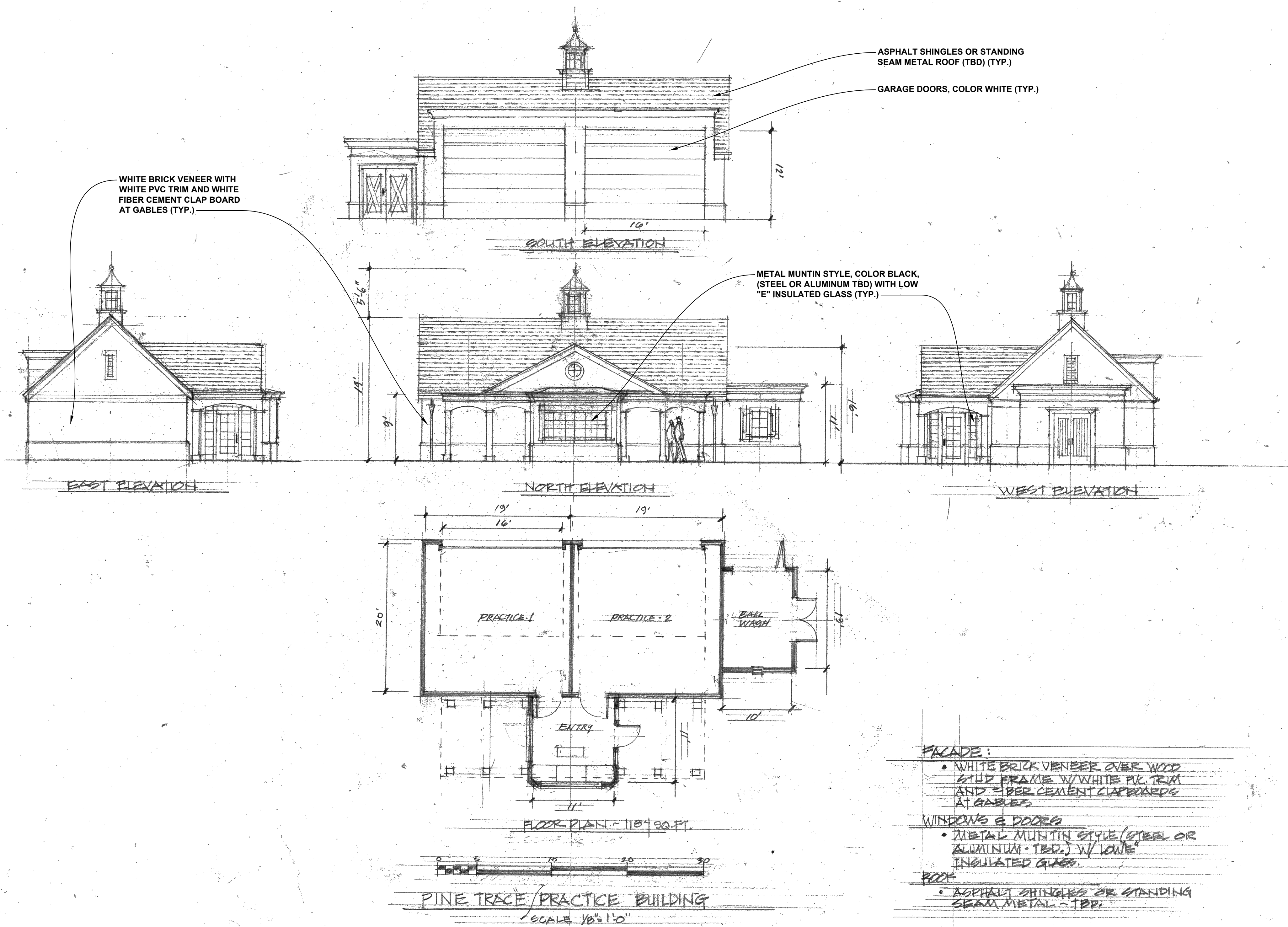
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A203

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Apr. 29/2025



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Michigan 48315 Fax 586 726 8780

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NOTE:
ALL SIGNS MUST MEET THE
REQUIREMENTS OF THE CITY OF
ROCHESTER HILLS AND BE APPROVED
UNDER SEPARATE PERMITS ISSUED
BY THE BUILDING DEPARTMENT.



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Revision #2

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6/19/2025
City of Rochester Hills
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PINE TRACE GOLF COURSE

ELEVATIONS - ENTRANCE SIGN

CLIENT:
PINE TRACE GOLF COURSE

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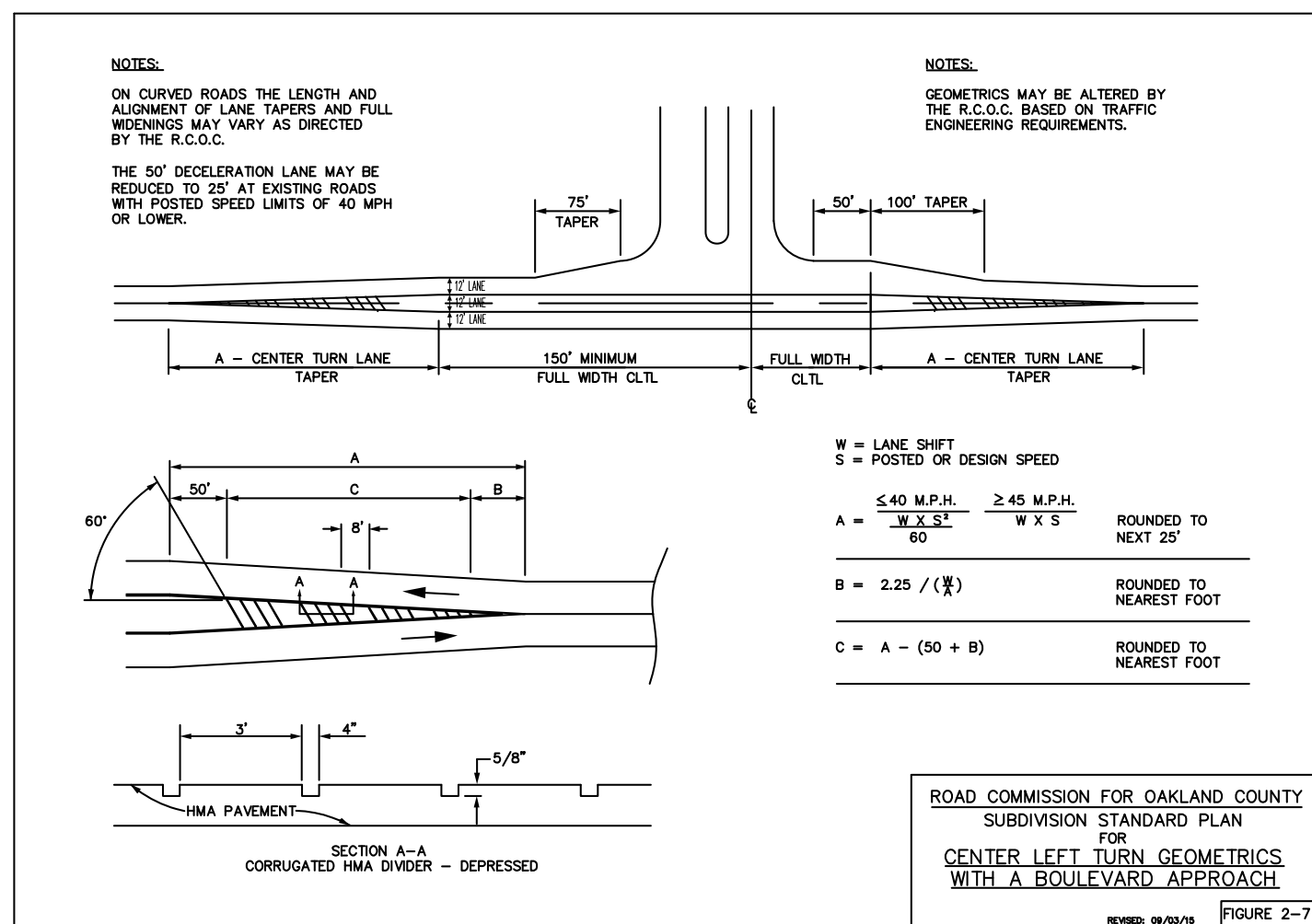
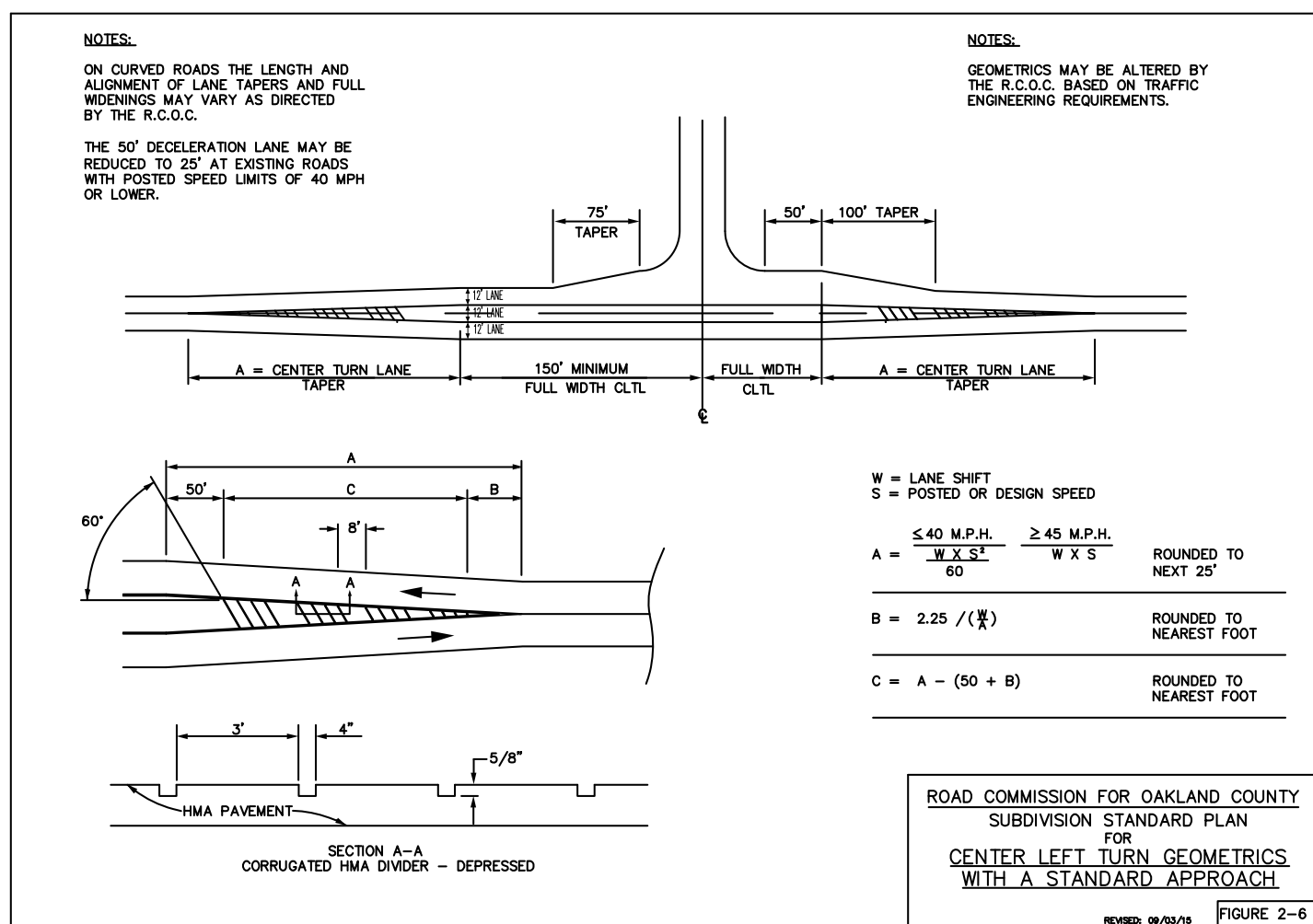
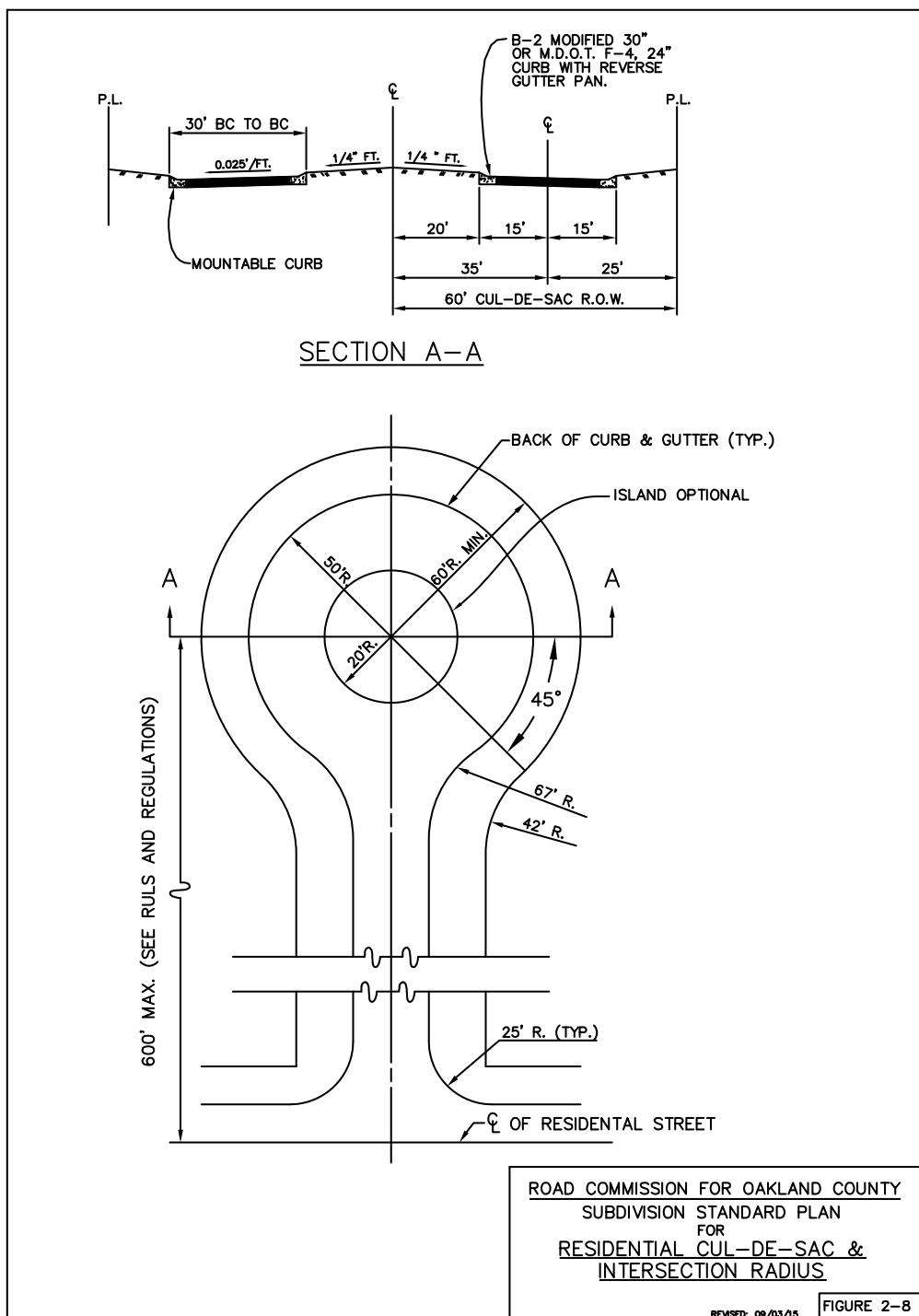
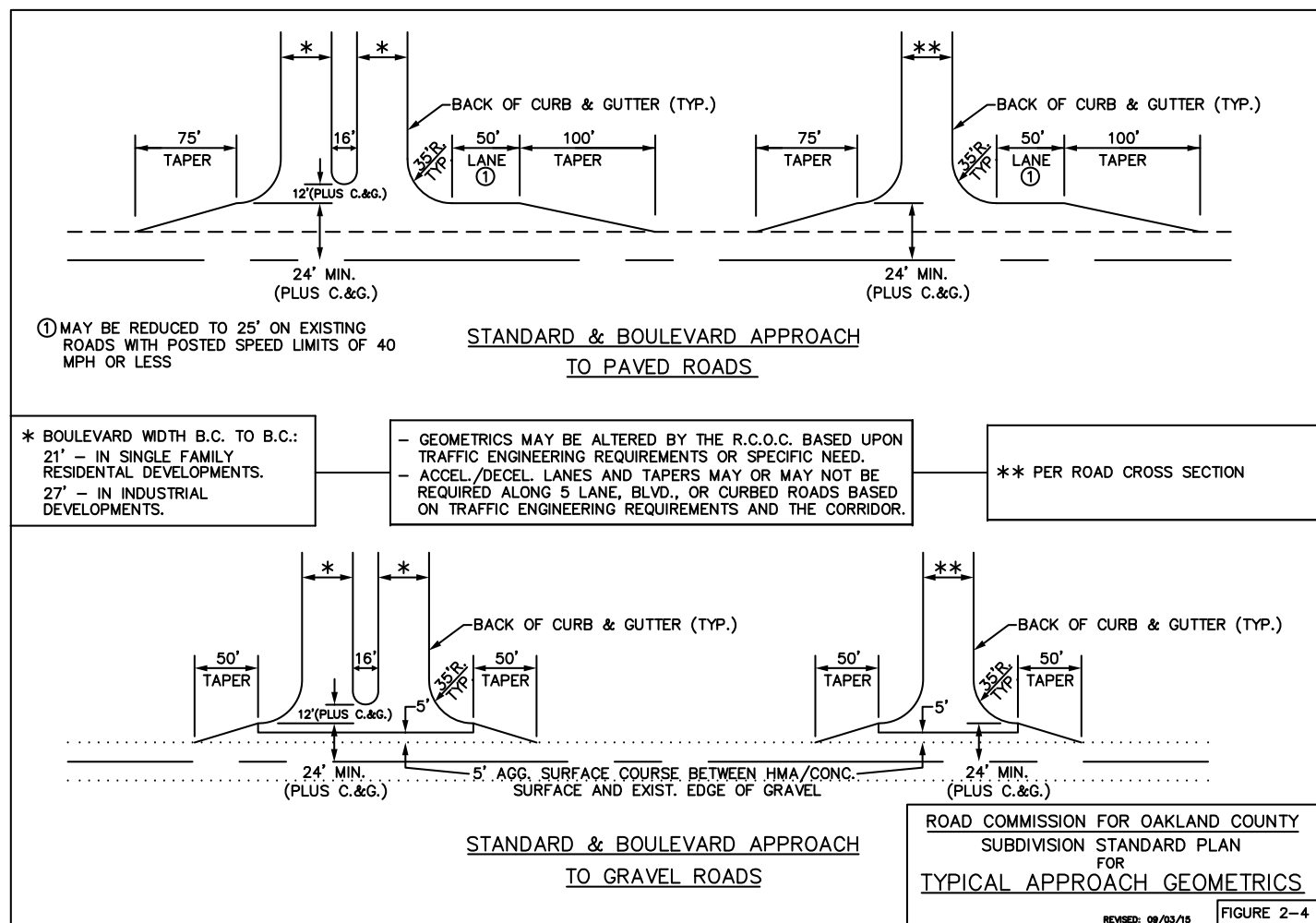
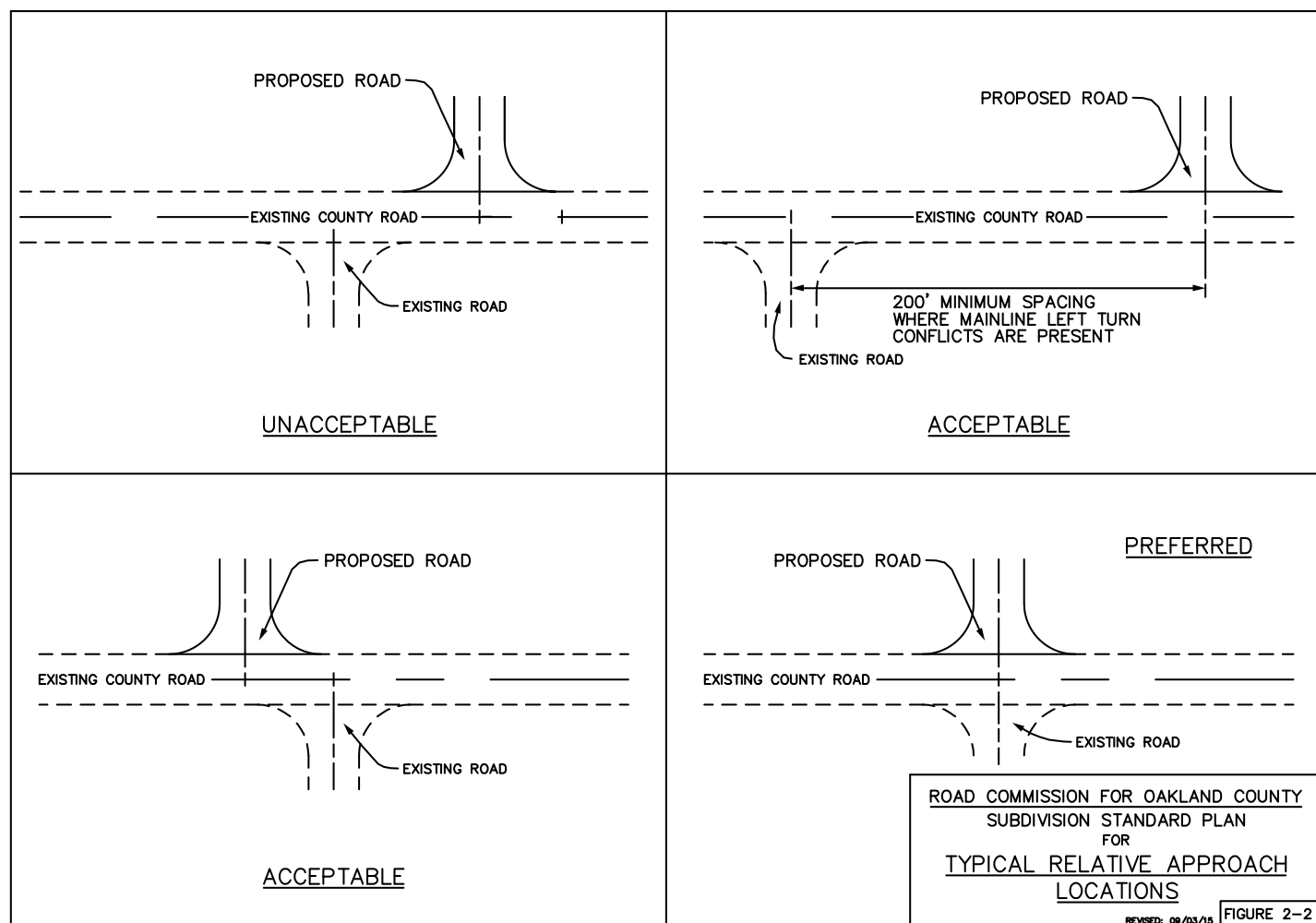
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SHEET NO.

A204

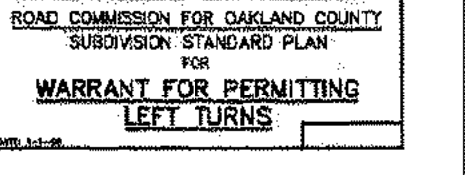
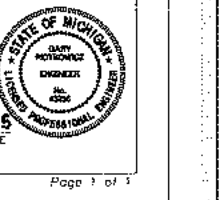
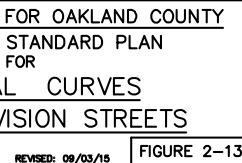
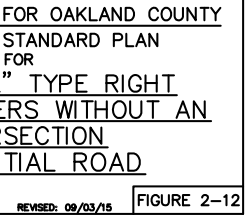
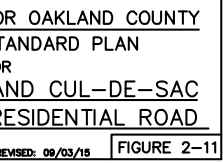
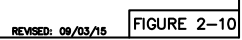
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ROAD COMMISSION
for OAKLAND COUNTY
BEVERLY HILLS, MICHIGAN
PHONE: 877-858-4804 WEB: WWW.RCOCWEB.ORG

THOMAS G. BLUST
DIRECTOR OF ENGINEERING

1 OF 2



ROAD COMMISSION
for OAKLAND COUNTY
BEVERLY HILLS, MICHIGAN
PHONE: 877-858-4804 WEB: WWW.RCOCWEB.ORG

THOMAS G. BLUST
DIRECTOR OF ENGINEERING

NEW DEVELOPMENT

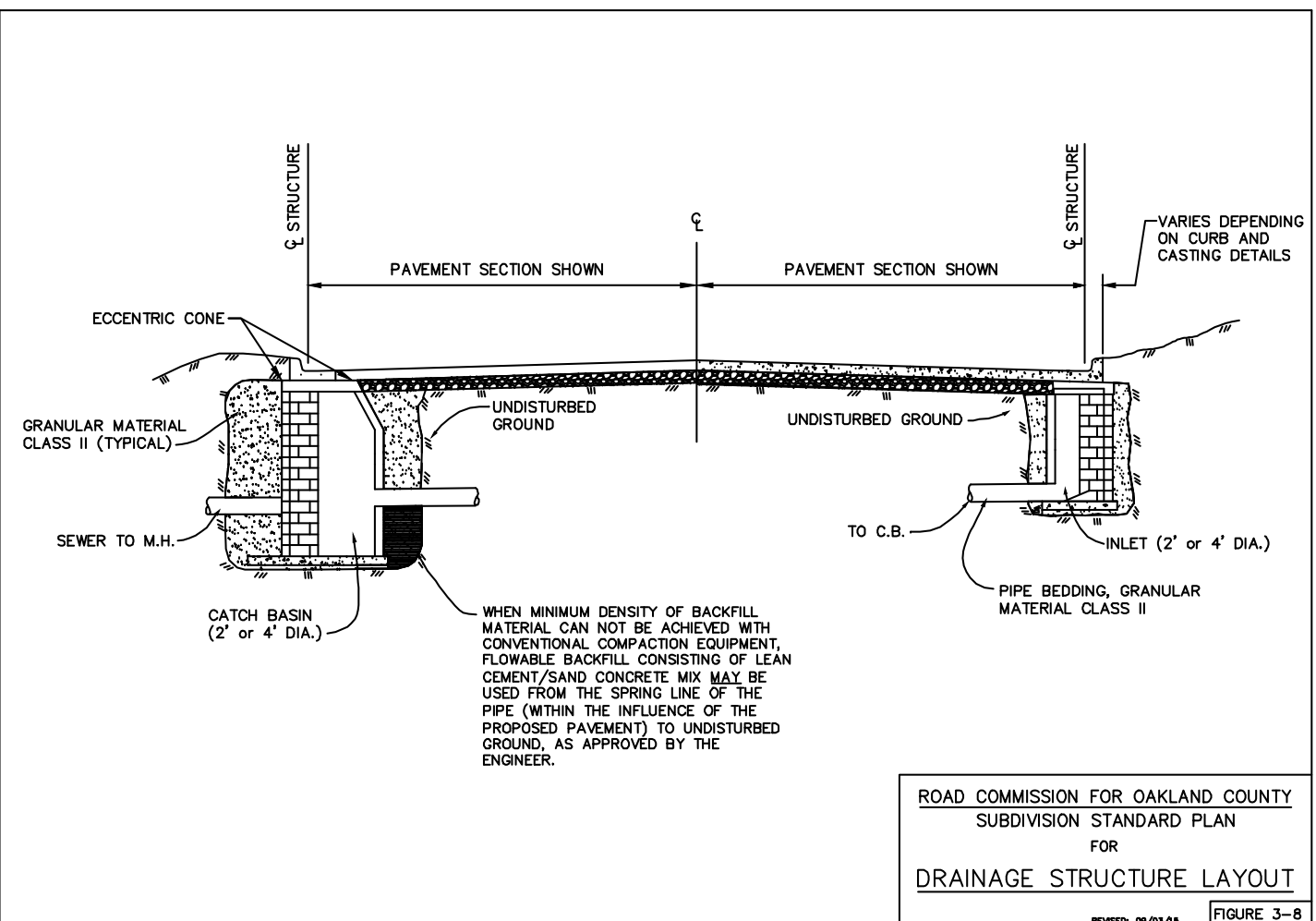
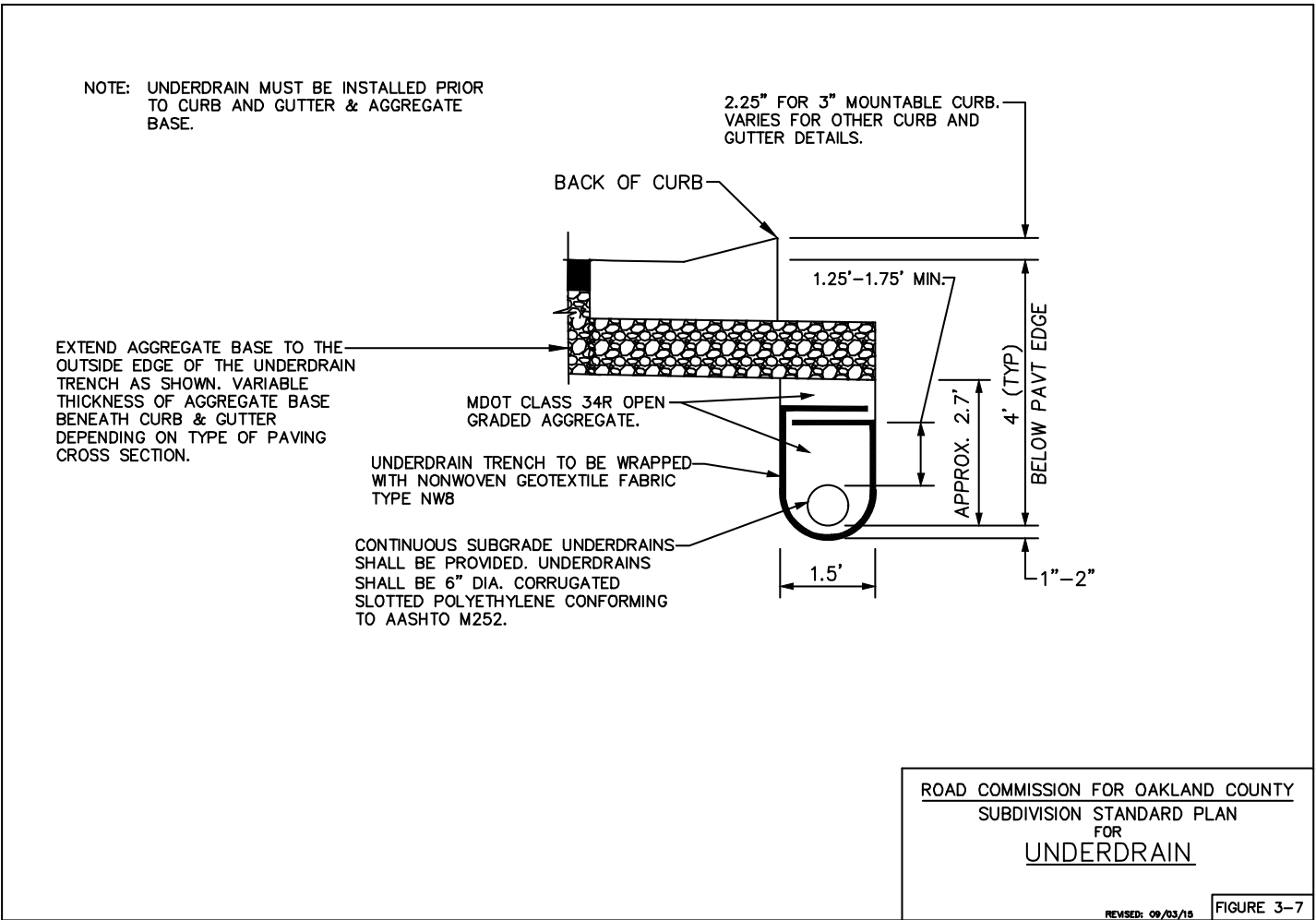
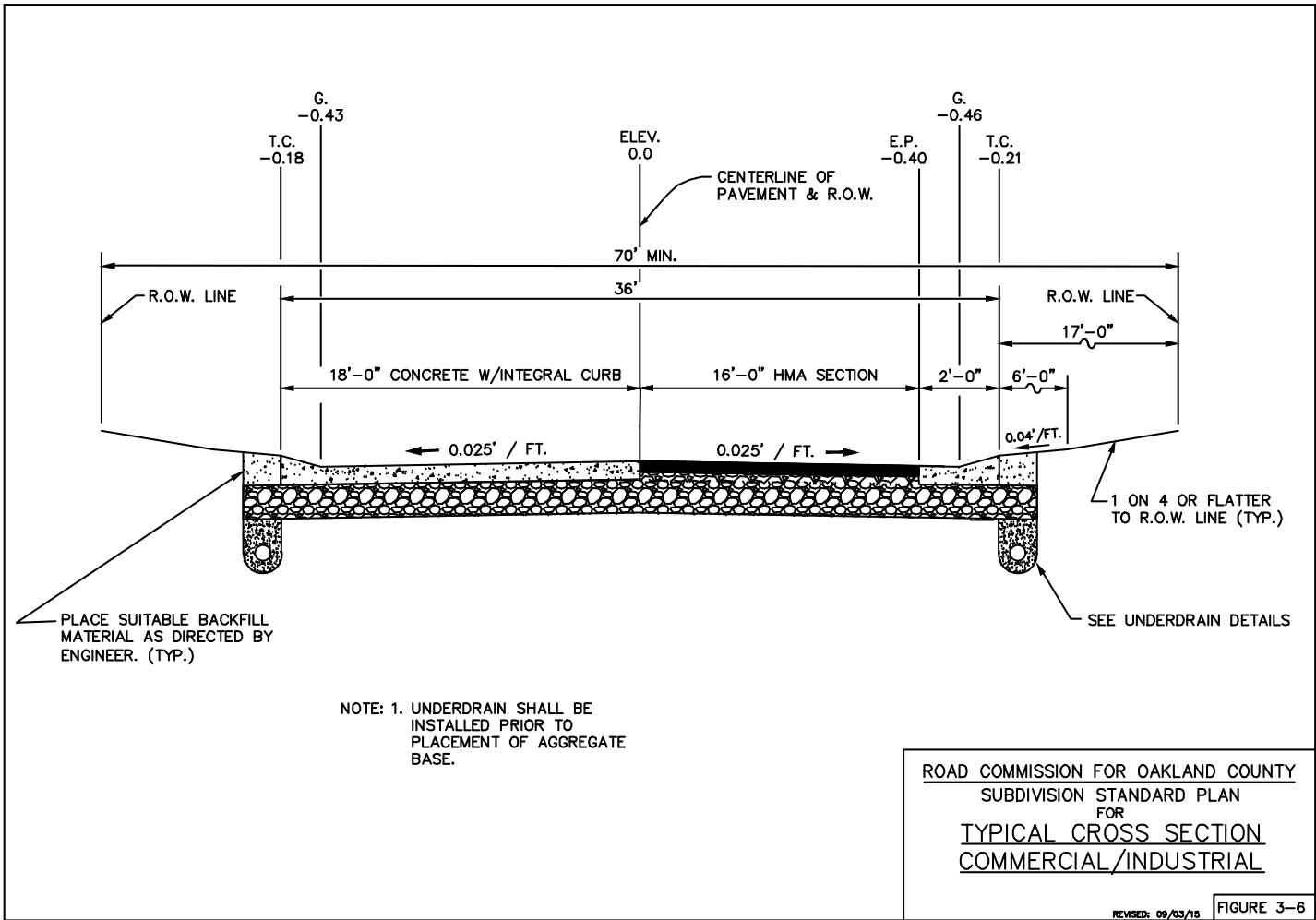
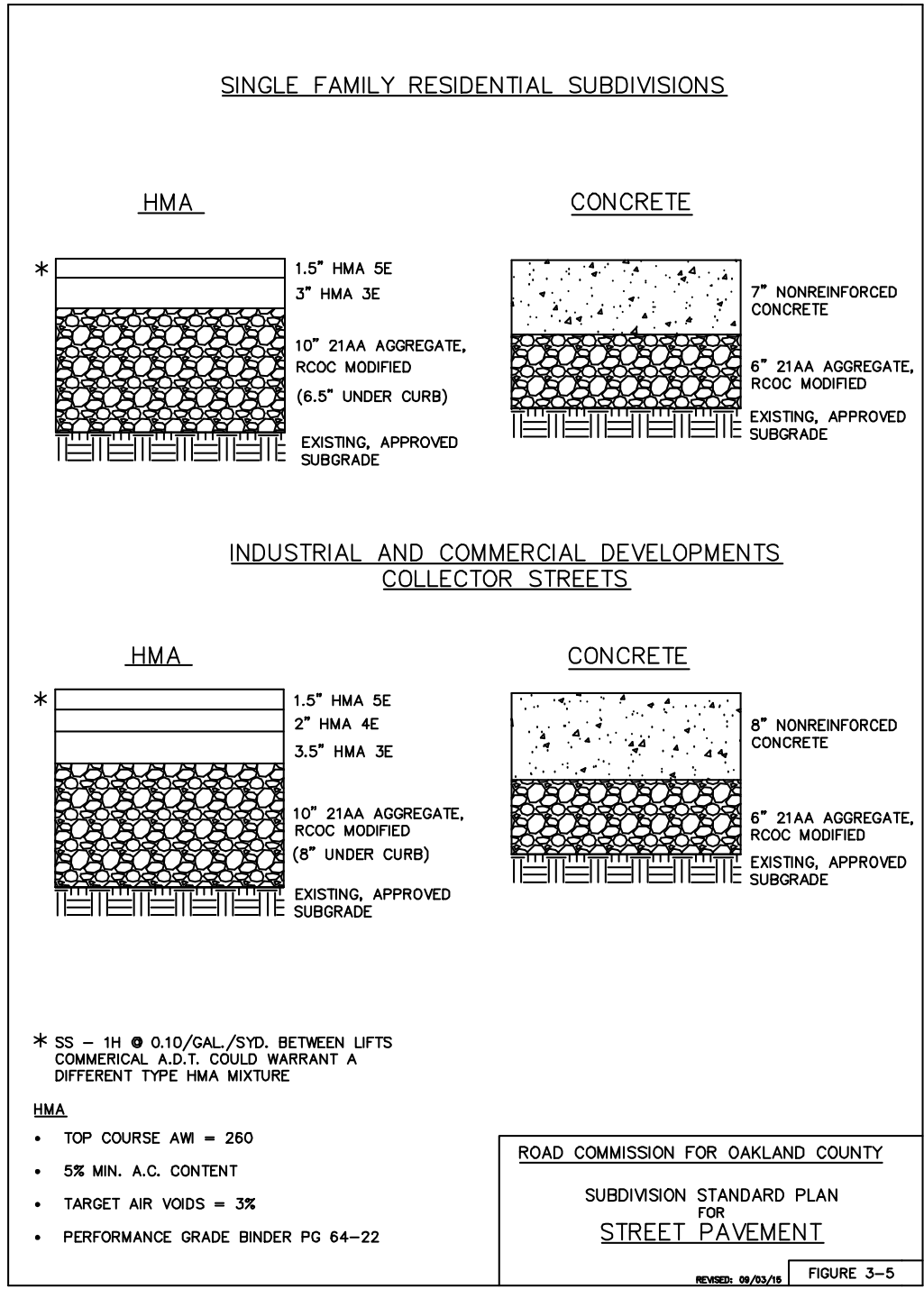
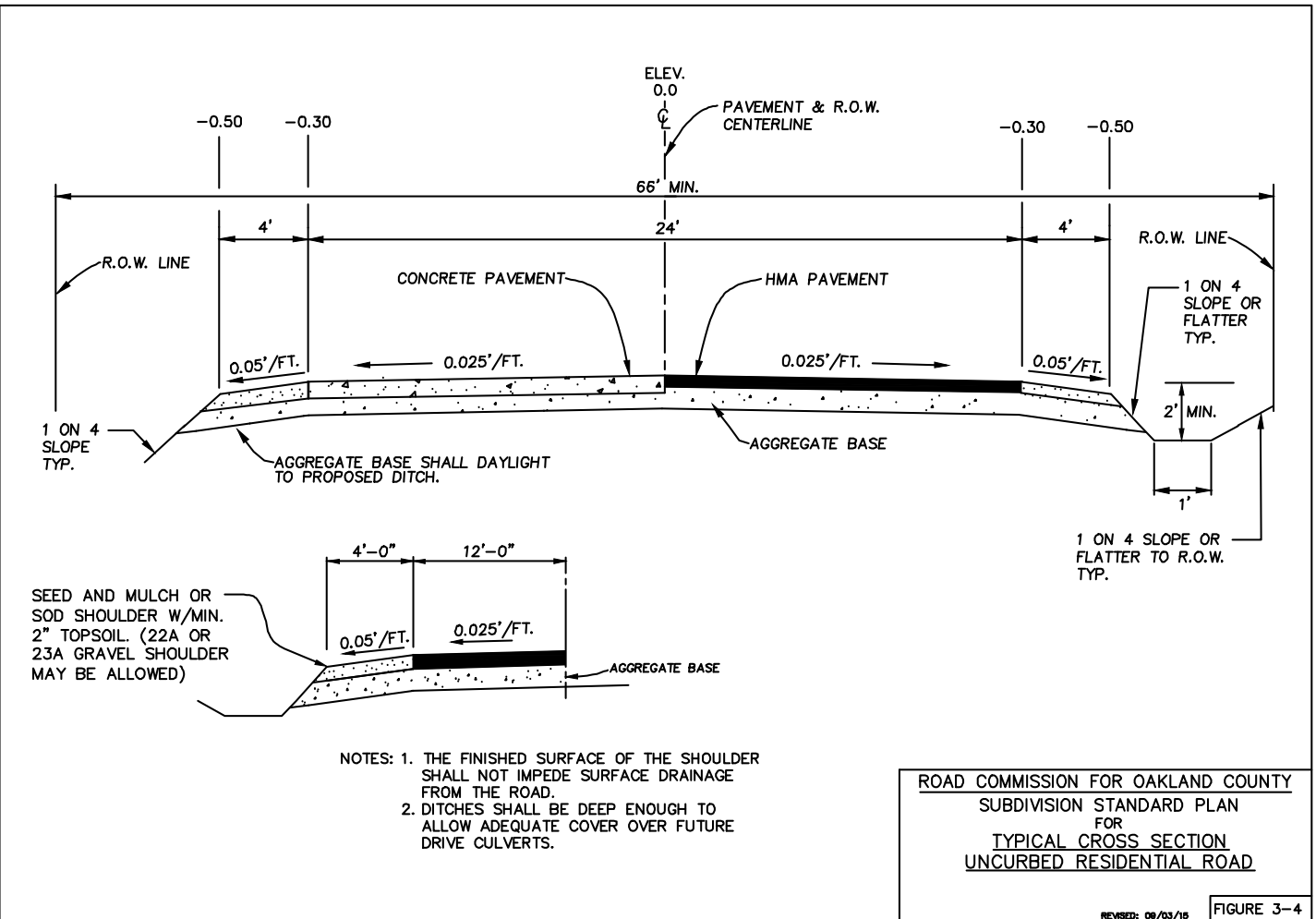
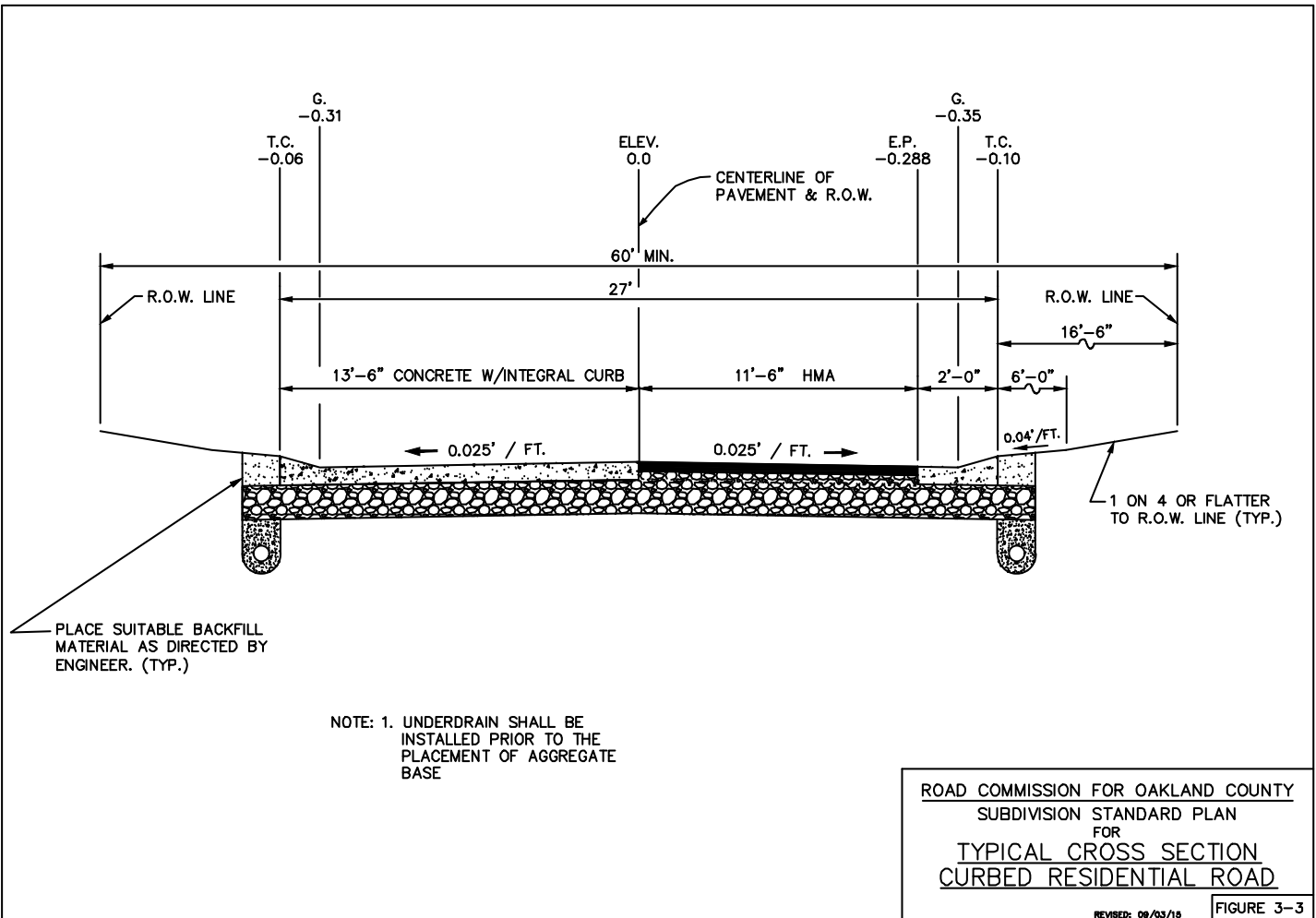
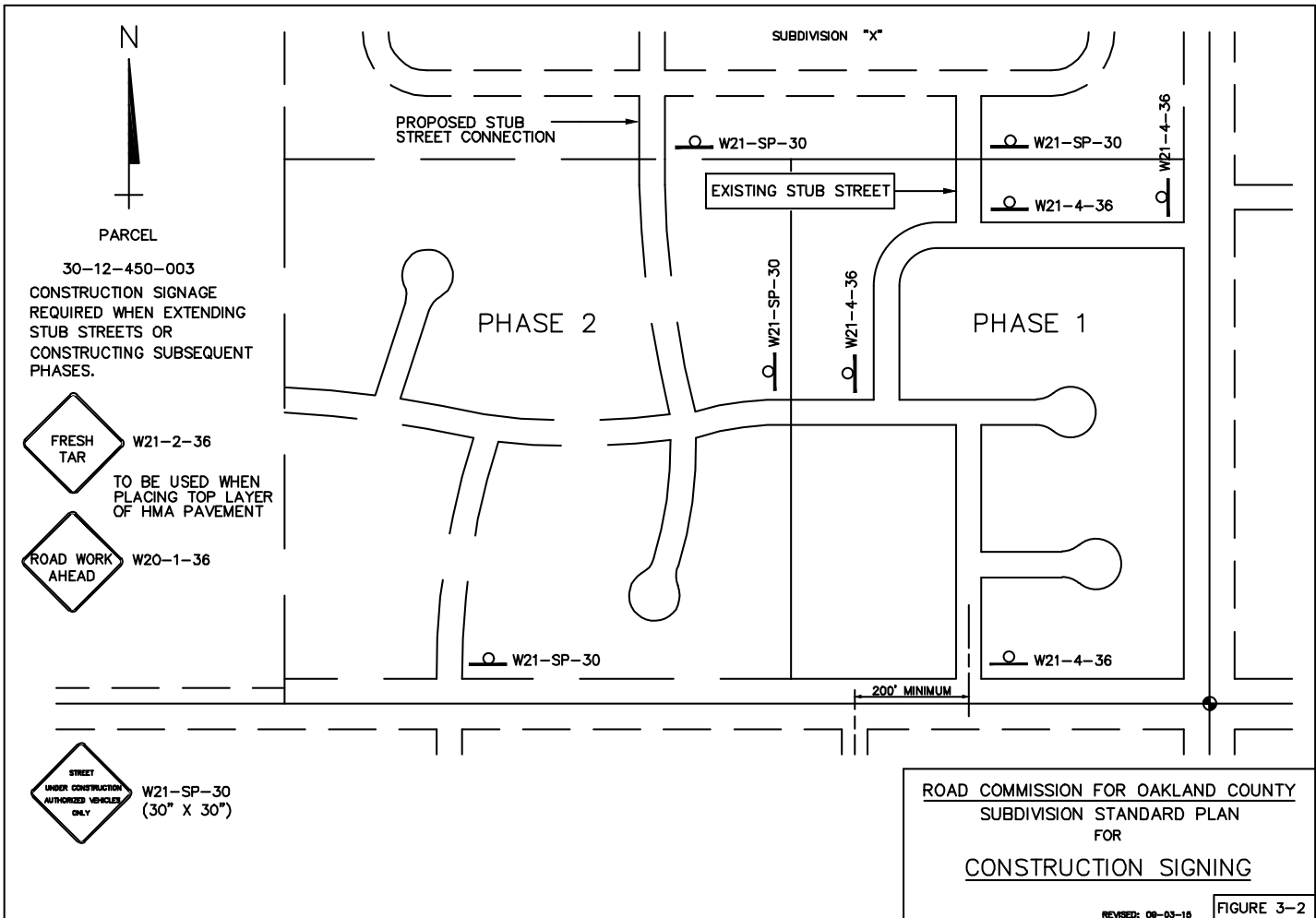
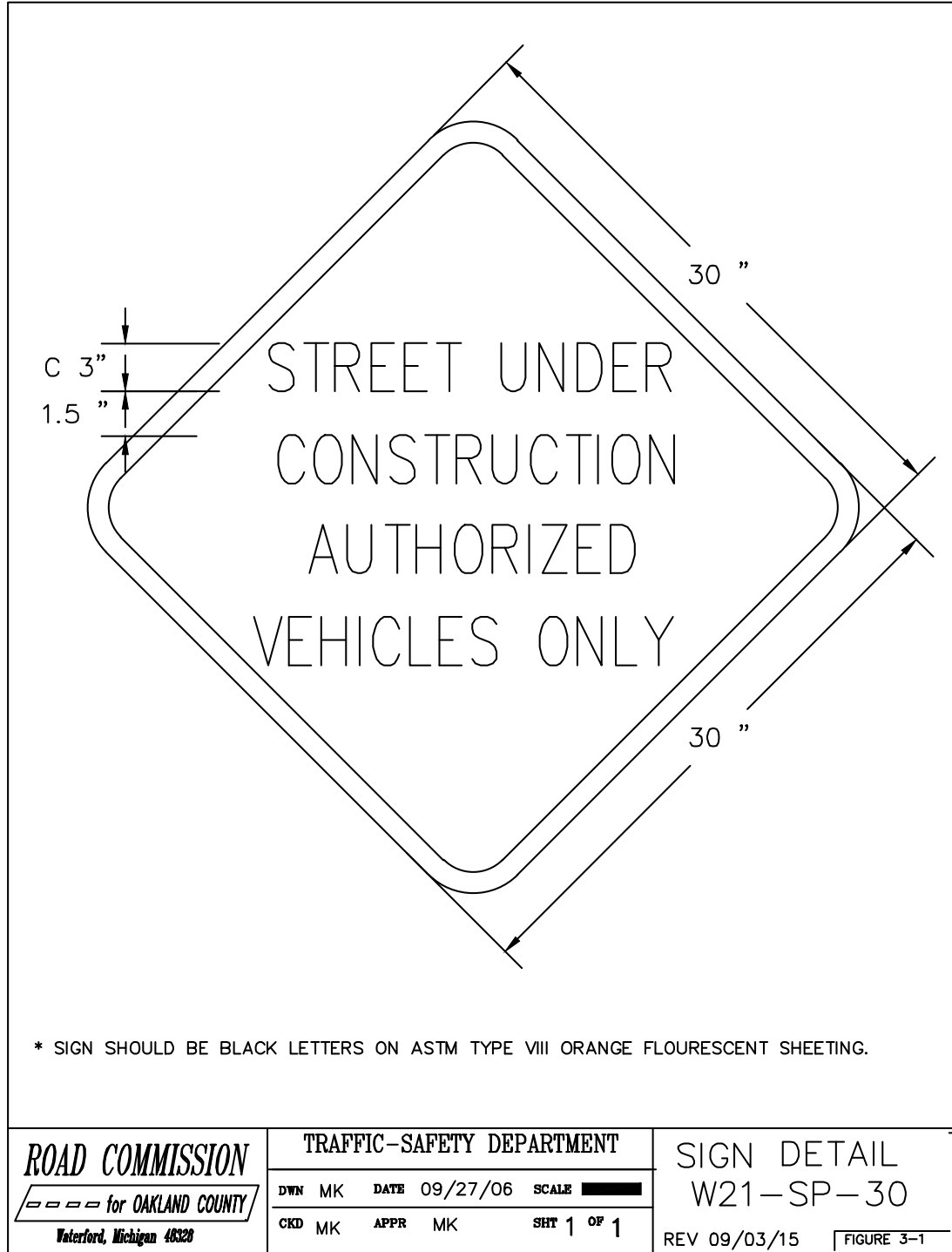
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T:\SID\DEVELOPMENT\NEW SUBDIVISIONS\DESIGN_GUIDES\RULES AND REGULATIONS FOR STREET DEVELOPMENT\2015\SUPPORTING FIGURES SUPPORTING INFO\DRAWING FIGURES SUPPORTING INFO\2014.RCOC STANDARD PLAN SHEETS FOR PLAT DEVELOPMENT May, 29, 19 - 10-43 AM

PROJECT NAME: FIGURE 3 - "s" - GEOMETRIC GUIDES FOR NEW DEVELOPMENT



Know what's below.
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NOTE: CONSTRUCTION SHALL BE PER M.D.O.T. SPECIFICATIONS & PLANS AND AS MODIFIED BY THE R.C.O.C.

ROAD COMMISSION
for OAKLAND COUNTY
BEVERLY HILLS, MICHIGAN
PHONE: 877-858-4804 WEB: WWW.RCOCWEB.ORG

RICHARD J. SAPORSKY
SUBDIVISION IMPROVEMENT
AND DEVELOPMENT

THOMAS G. BLUST
DIRECTOR OF ENGINEERING

DRAWN DATE:
09/03/15
REVISED DATE:
05/29/19

DETAIL SHEETS
NEW DEVELOPMENT

SHEET NO.
1 OF 4

PROJECT NAME: FIGURE 3 - "s" - GEOMETRIC GUIDES FOR NEW DEVELOPMENT

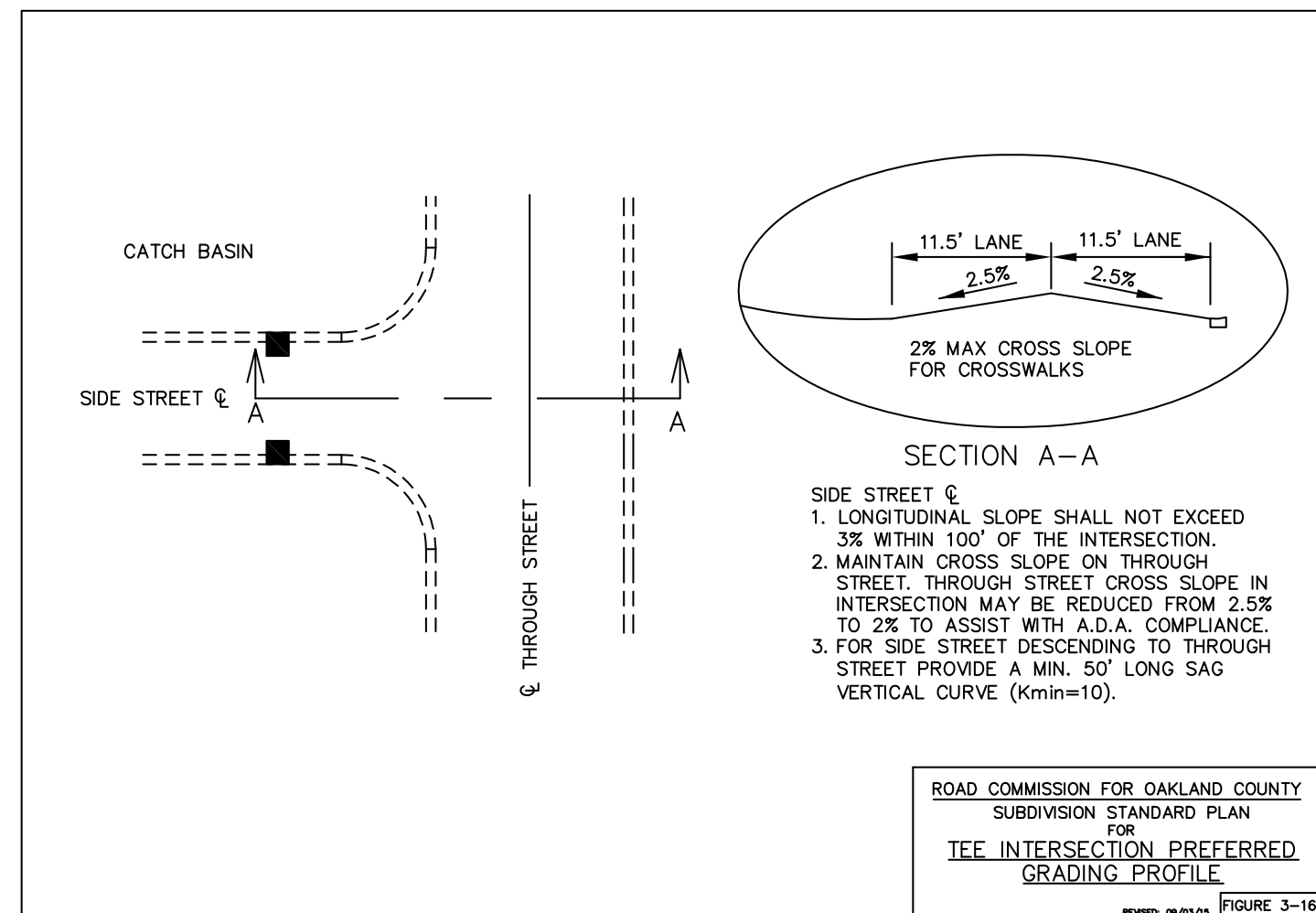
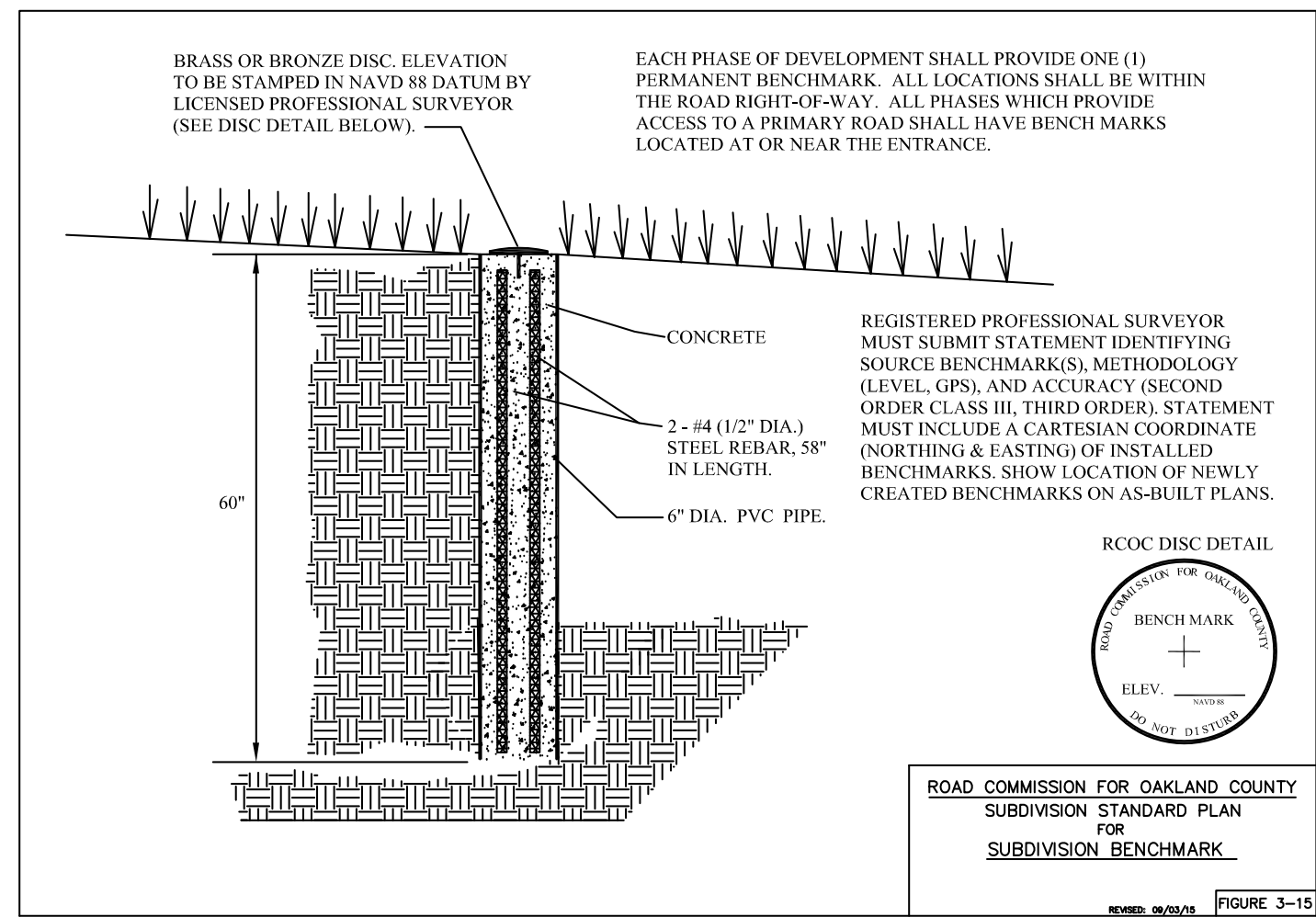
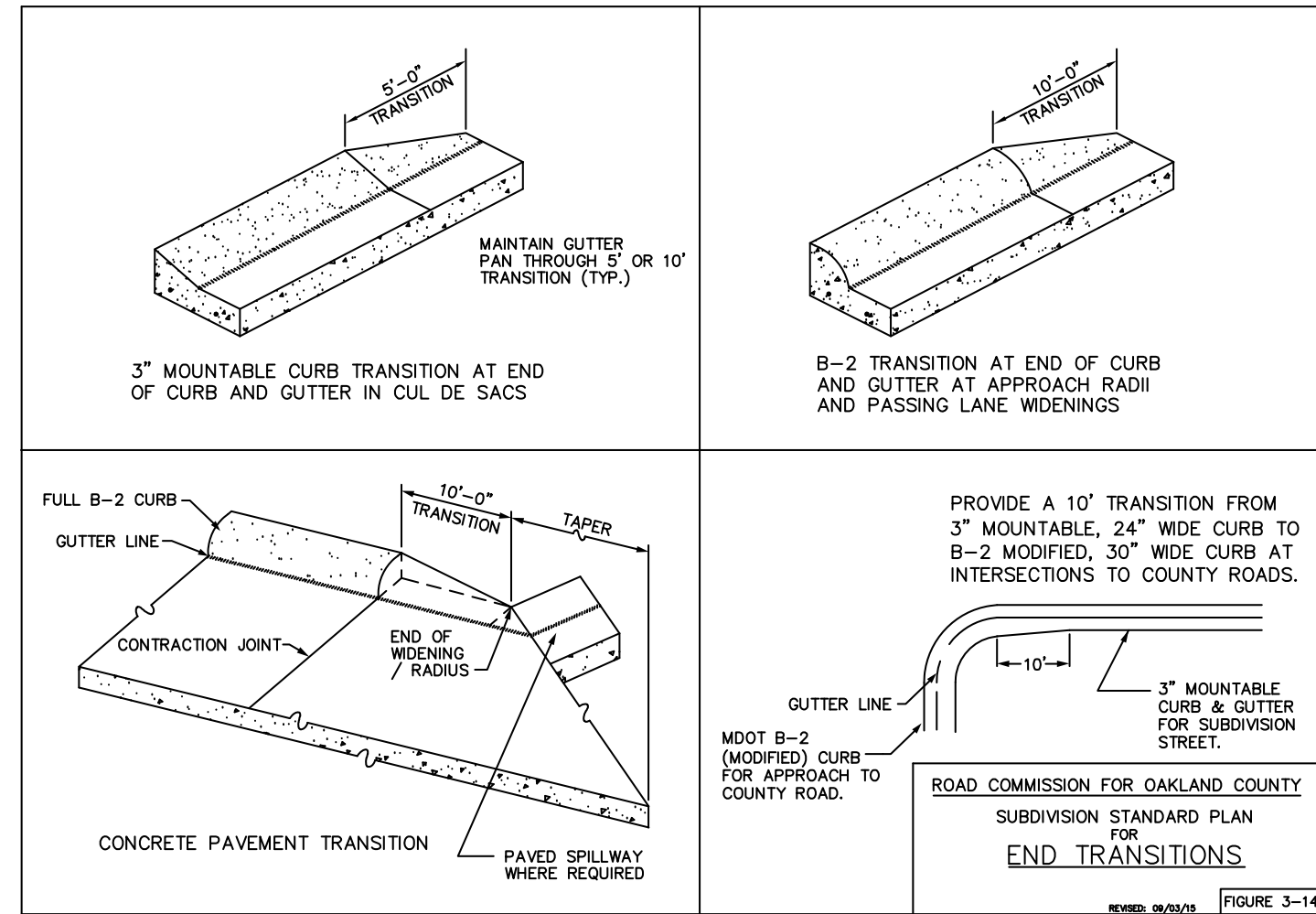
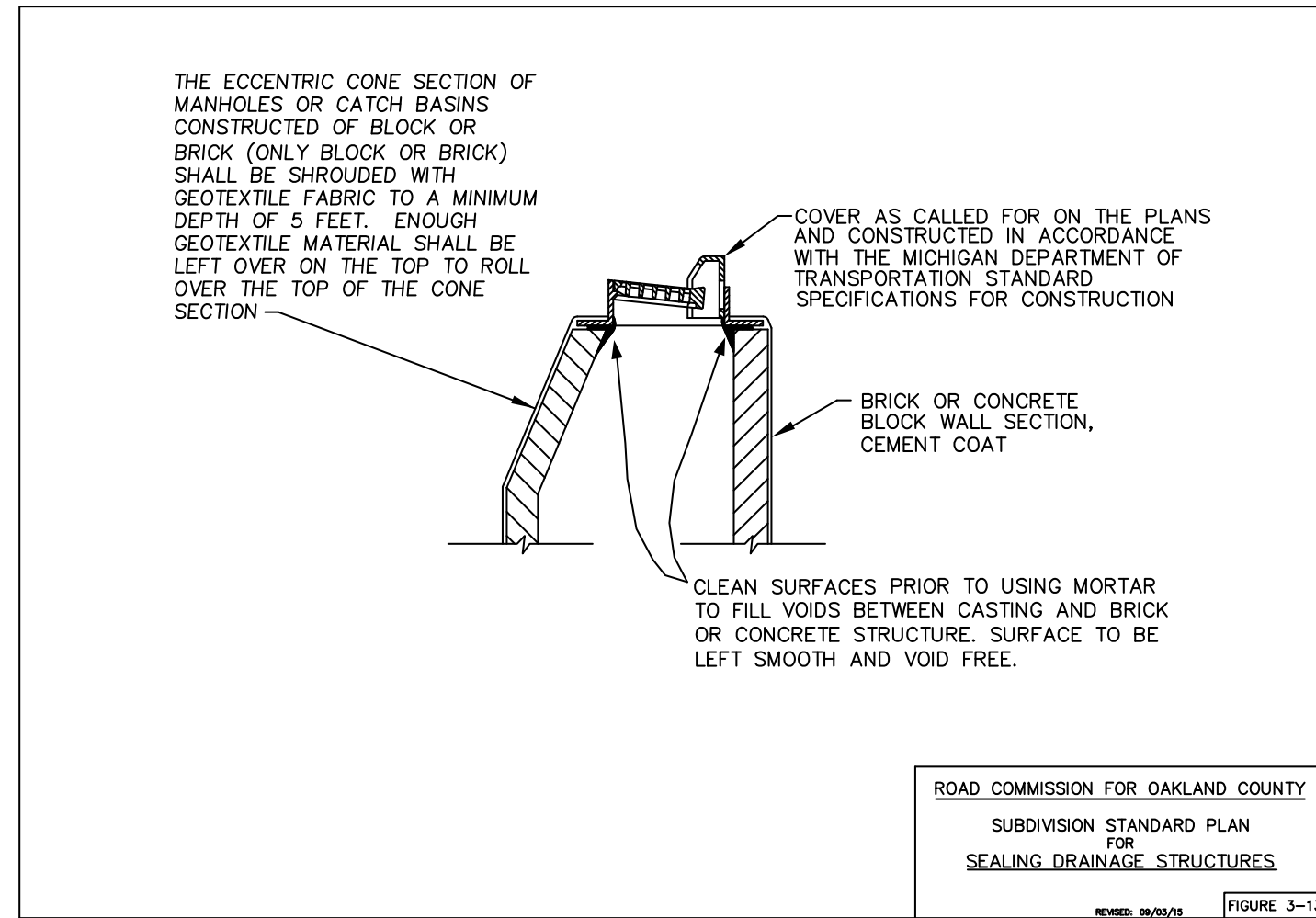
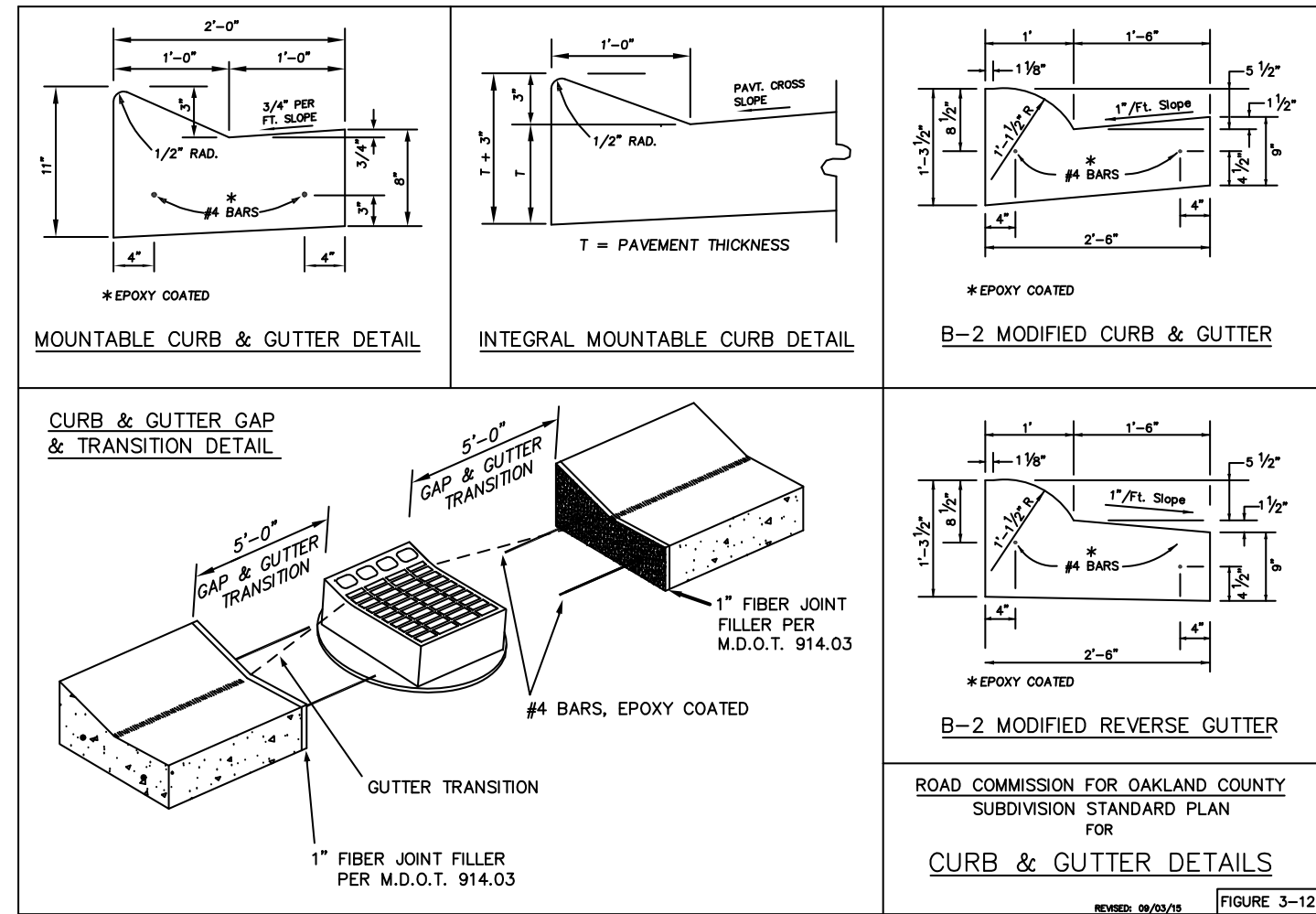
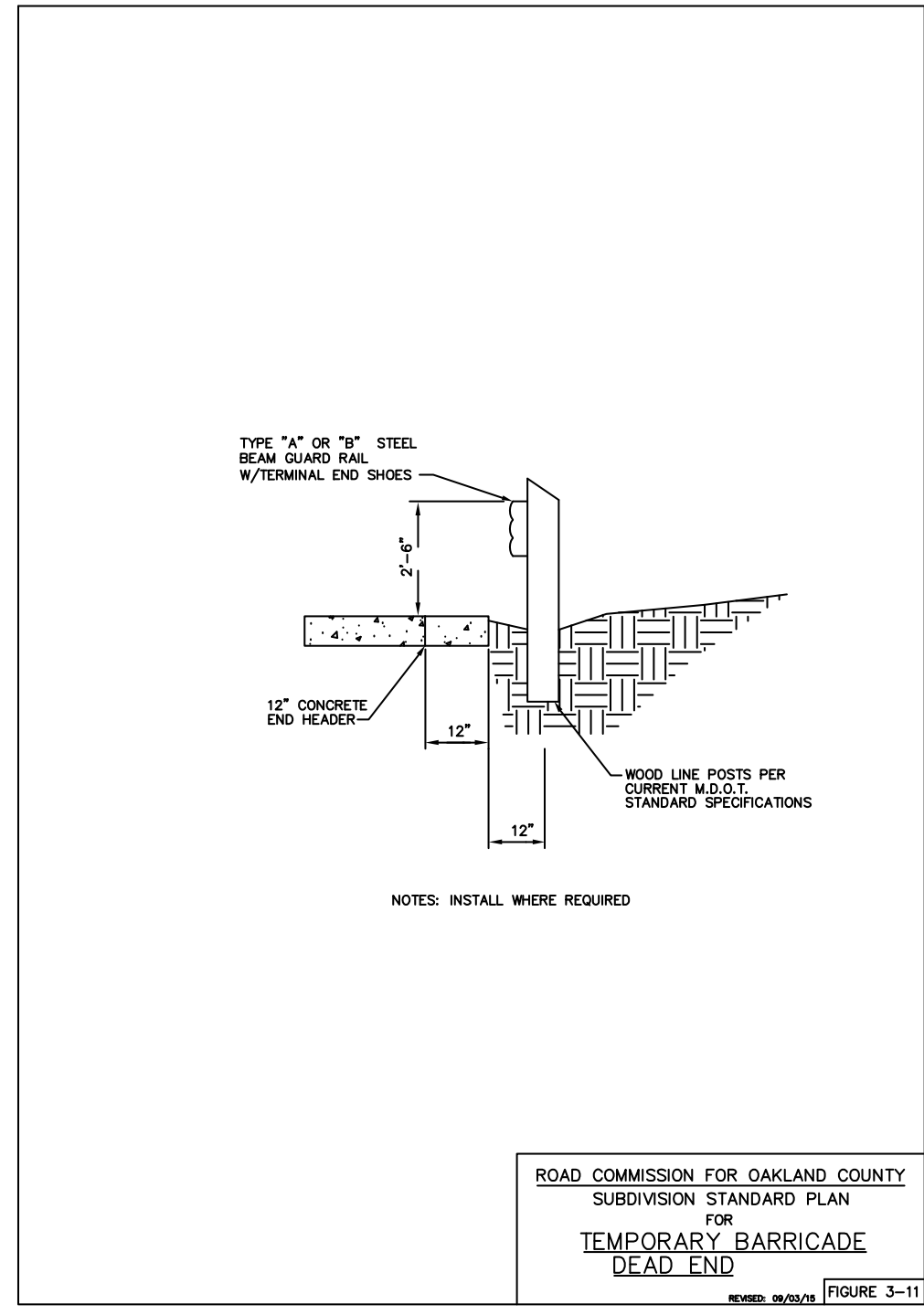
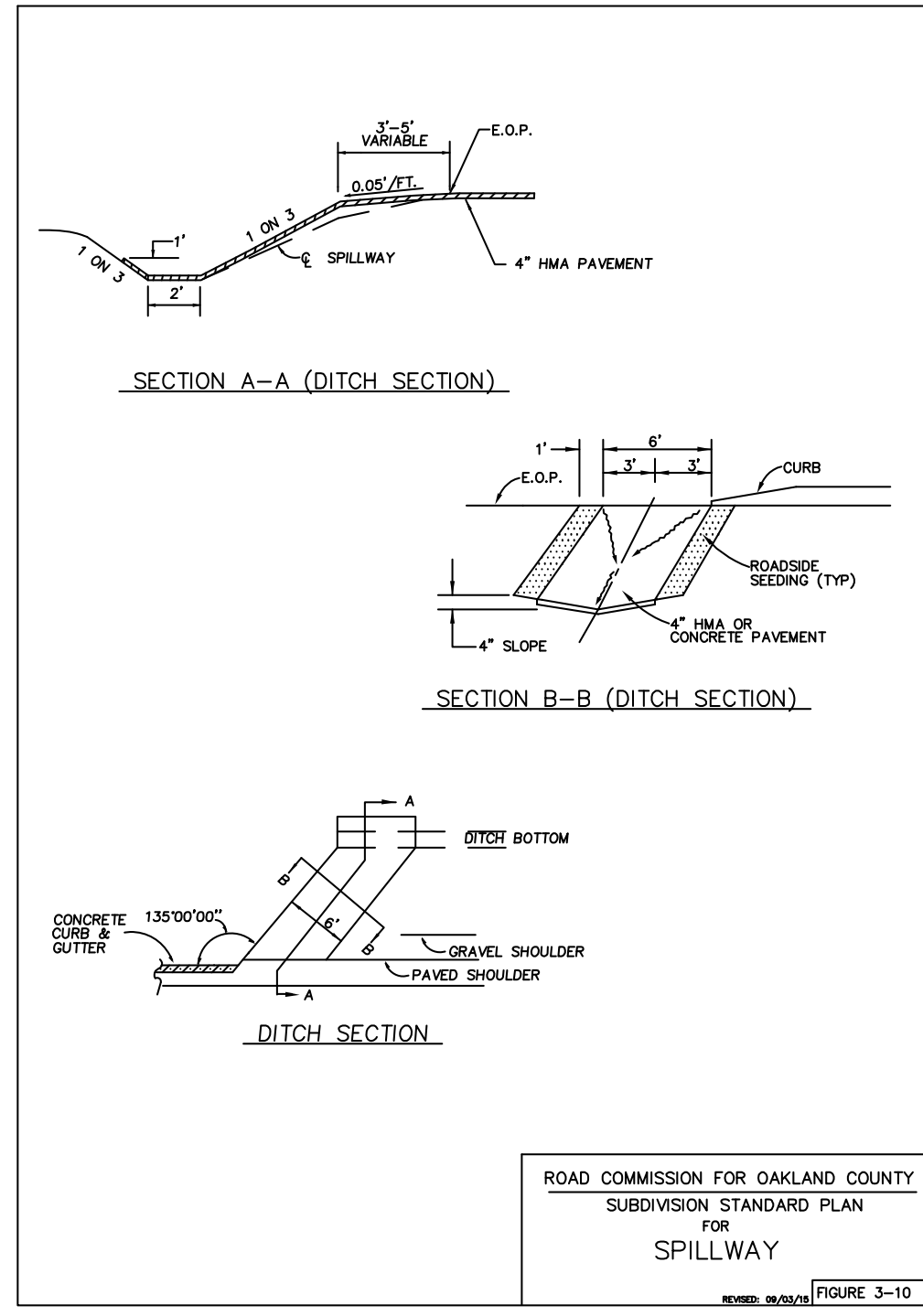
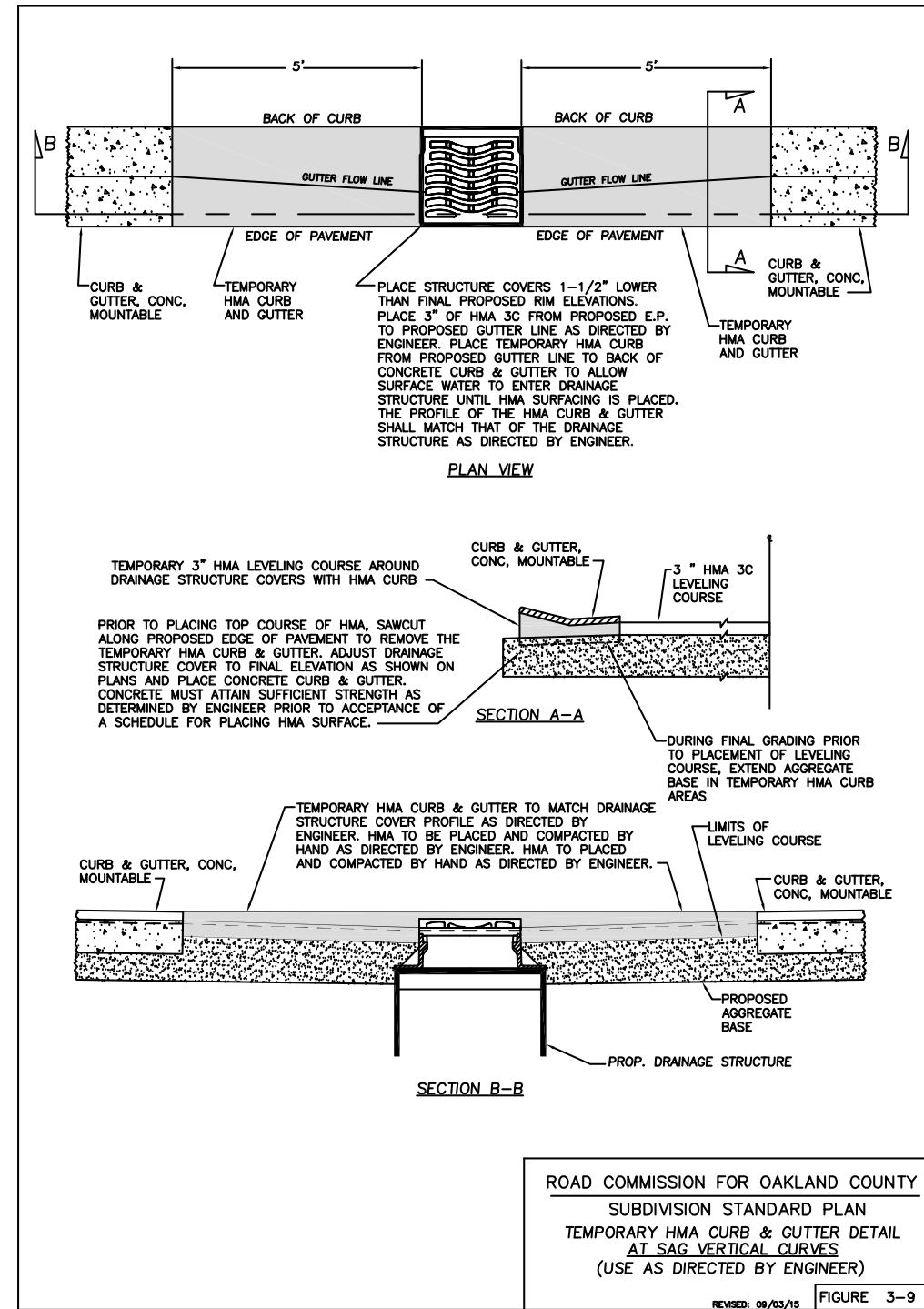
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PROJECT NAME: FIGURE 3 - GEOMETRIC GUIDES FOR NEW DEVELOPMENT



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NOTE: CONSTRUCTION SHALL BE PER M.D.O.T. SPECIFICATIONS & PLANS AND AS MODIFIED BY THE R.C.O.C.

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RICHARD J. SAPORSKY
SUBDIVISION IMPROVEMENT
AND DEVELOPMENT

THOMAS G. BLUST
DIRECTOR OF ENGINEERING

DRAWN DATE:
09/03/15
REVISED DATE:

DETAIL SHEETS
NEW DEVELOPMENT

SHEET NO.
2 OF 4

PROJECT NAME: FIGURE 3 - GEOMETRIC GUIDES FOR NEW DEVELOPMENT
S.I.D. - R.J.S.

T:\SD\DEVELOPMENT\NEW SUBDIVISIONS\DESIGN_GUIDES\RULES AND REGULATIONS FOR STREET DEVELOPMENT\2015\SUPPORTING FIGURES SUPPORTING INFO\2014 ROC STANDARD PLAN SHEETS FOR PLAT DEVELOPMENT Sep. 24, 15 - 7:50 AM



PRIVATELY CONTRACTED CONSTRUCTION

1. A pre–construction meeting shall be held between the developer, their engineer, contractors, utility companies, representatives of the governing body and the R.C.O.C. staff. The meeting is intended to delineate the proposed construction and construction materials, testing requirements, progress inspections, sequence of construction and construction schedule.
2. A permit must be obtained from the R.C.O.C. Permit Division prior to any work being done in existing county road right–of–way. Permits will also be required for residential driveways.
3. 72 hour notice to the R.C.O.C. Subdivision Improvement and Development Division is required prior to the start of each phase of construction.
4. Materials and density testing and inspection will be utilized by the R.C.O.C. at their discretion as a part of the R.C.O.C. acceptance requirements. Contractors shall be responsible for quality control of their work. Failure of the developer/contractor to meet requirements or to provide the R.C.O.C. the required notification to allow scheduling of testing or inspection could result in the rejection of the work by the R.C.O.C.
5. The R.C.O.C. inspection and administration fee must be submitted prior to placement of the aggregate base for the streets.
6. Concrete curbs shall be backfilled prior to placement of aggregate base against the inside edge of the gutter.
7. Verification of Township approval for Sanitary Sewer and Watermain tests must be submitted and found acceptable by R.C.O.C., prior to any concrete paving or surface course of asphalt being placed.
8. A minimum of 1,000’ of road and/or curb subgrade/granular base shall be ready for grade check the day prior to placement of aggregate base/scheduled paving.
9. Permanent signs and pavement markings will be installed by the R.C.O.C. or their agents unless otherwise indicated by the R.C.O.C.
10. The required sight distance shall be provided. The actual sight distance provided will be reviewed in the field during construction. Work that may be needed to demonstrate adequate sight distance during construction shall be performed and the necessary sight distance shall be demonstrated to the satisfaction of the R.C.O.C.’s Traffic and Engineering requirements.
11. Construction plan omissions and errors or changed site conditions identified during construction do not relieve the developer of the requirement to meet design and construction standards.
12. Unacceptable work products shall be removed and replaced.

TRAFFIC

1. All construction signing shall be provided in accordance with the requirements of the current edition of the Michigan Manual of Uniform Traffic Control Devices. All required signs shall be installed prior to the start of any construction activity along existing streets and all costs incurred shall be borne by the developer and/or contractor. The developer shall install the "streets under construction authorized vehicles only" (WP21–SP–30) sign prior to the installation of aggregate base. Where construction of a proposed local road connects to an existing R.C.O.C. local or primary road, the required construction signs as shown in the part 6 of the current MMUTCD shall be mounted on driven posts and shall be maintained by the permit holder until construction along the primary or local road is complete. The construction signs may be temporarily covered if there is no work occurring and no hazards present in the county local primary road right–of–way as directed by the engineer. Where an internal sub local street connection is proposed, required construction signs shall be as shown in the typical signing figures.
2. Through traffic must be maintained at the times and two way traffic restored prior to work end each day.
3. Streets under construction are a work zone. Maintenance of traffic, constructed facilities, and the entire work zone are the responsibility of the developer/contractor.
4. The temporary closure of a public street for construction activities requires approval of the Board of County Road Commissioners.
5. Stumps, brush, fences and other obstructions within the proposed street rights–of–way and along existing county roads shall be removed. All trees shall be removed which are located within 6 feet of the back of curbs or to centerline of ditch along proposed subdivision streets and as directed by the Road Commission along existing county roads for sight distance or other safety concerns

EARTH WORK

1. Soil boring logs shall be shown in the plans.
2. Excavation and embankment under the influence of the roads will require inspection by the R.C.O.C.
3. The R.C.O.C. will determine if soil is suitable for the road foundation. Unsuitable material shall be removed. The subgrade shall be satisfactorily compacted and proof rolled.
4. Embankment material under the influence of the road must be approved by the R.C.O.C. prior to placement.
5. The finished subgrade shall be free of all topsoil, stumps, organic matter, peat, muck, frost heave material, or any other material unstable in nature. During subgrade preparation the Road Commission will make spot inspections to determine the suitability of the subgrade. Upon completion of subgrade preparation, an inspection will be made by the Road Commission for determination of its acceptability. Approval of the subgrade for vertical and horizontal alignment shall be by the proprietor’s engineer.

AGGREGATE BASE

1. Aggregate base course placement shall not commence until the subbase/subgrade has been approved by the Road Commission.
2. Aggregate base course material shall meet the special requirements of the R.C.O.C.’s special provision(s) for aggregate base.

STORM DRAINAGE

1. Corrugated steel pipe, where allowed, shall be from aluminum coated sheets per the M.D.O.T. standard specifications for construction.
2. Storm sewer and cross road culvert pipe shall be reinforced concrete pipe of the appropriate class unless determined that an alternate material would be in the best interest of the R.C.O.C. in a specific situation.
3. Minimum size for cross road culverts shall be 15 inches in diameter to facilitate maintenance.
4. Cross road culverts other than standard pipe classifications shall be designed to carry an HS 20/HL 93 live load as applicable.
5. Cross road culvert pipe shall have end sections.
6. Drainage structures and covers:

| Usage | Frame & Cover |
|---------------------------------------|--|
| Manhole | M.D.O.T. cover "B" |
| R.C.O.C. mountable curb and gutter | 1. EJIW 7065/Neenah R–3034–B or approved equal (M.D.O.T. "K" frame with a "C" curb box) 2. EJIW 7300/Neenah R–3508–A2 or approved equal |
| M.D.O.T. curb and gutter detail F | M.D.O.T. cover "K" |
| M.D.O.T. curb and gutter detail B | M.D.O.T. cover "J" |
| Catch basin/inlet for non–paved areas | M.D.O.T. cover "E" or "G" |

- All manholes, catch basins and inlet castings shall have complete bearing on their respective structures and shall be placed so as to ensure full accessibility to the structure. Drainage structures shall have eccentric cones and appurtenances to allow for a 12 inch adjustment.
7. Open discharge of sump pumps into the road right–of–way will not be allowed. Sump pump discharge pipes can be connected to drainage structures and shall utilize an approved prefabricated connection device. Sump pump discharge pipes shall not be connected directly to storm sewer pipes, and should not cross streets.
 8. R.C.O.C. inspection of all connections to existing drainage facilities will be required before they are backfilled.

TRENCH BACKFILL

1. Storm sewer, utility trenches and cross road culverts, along with their related structures (manholes, catch basins, inlets, headwalls and/or end sections), installed in the area between lines projected down from the top of a curb on a 1 on 1 slope shall be backfilled with a granular material meeting M.D.O.T. granular class II requirements as approved by the Road Commission.
2. Granular trench backfill materials, installed in the area between lines projected down from the top of curb on a 1 on 1 slope shall be placed and compacted in accordance with the current M.D.O.T. standard specifications for construction.
3. Backfill outside the limits of road influence, can be suitable excavated material as determined by the engineer. Backfill shall be placed and compacted in layers in accordance with M.D.O.T. specifications.

NOTE: CONSTRUCTION SHALL BE PER M.D.O.T. SPECIFICATIONS & PLANS AND AS MODIFIED BY THE R.C.O.C.



| | | | | |
|---|-------------------------|-------------------------|---------------|-------------------------|
| RICHARD J. SAPORSKY | THOMAS G. BLUST | DRAWN DATE: 09/03/15 | DETAIL SHEETS | SHEET NO. 3 OF 4 |
| SUBDIVISION IMPROVEMENT AND DEVELOPMENT | DIRECTOR OF ENGINEERING | REVISED DATE: | | |

NEW DEVELOPMENT

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HMA

- HMA work shall be in accordance with R.C.O.C. special requirements.
- Before succeeding courses of asphalt pavement are placed, the preceding course shall be swept clean of all dust, dirt, or other loose material by the use of a mechanical sweeper and/or compressed air or other approved method. The contractor shall then apply an approved bond coat to the HMA surface at the rate of 0.10 gallons per square yard. HMA bond coat shall be applied to the area expected to be paved on the same day as HMA application. HMA bond coat shall not be applied the day prior to paving. The construction of the second and succeeding HMA courses may have to be delayed, as directed by the Road Commission, until the previously placed HMA course has sufficiently cooled. Butt joints shall be provided at connections to existing paved roads and at overnight construction joints, when the final course of HMA surface mixture is being placed. during all other paving operations, joint treatment shall be as directed by the Road Commission.
- Longitudinal pavement joints (e.g. centerline pavement joint) shall be hot joints whenever possible, created while the adjacent mat is still hot. Joints shall not have a tapered edge unless approved for a special scenario by the R.C.O.C.
- No HMA shall be produced or placed in rain or threatening weather. When rain appears imminent, the contractor shall suspend HMA production to prevent placing pavement in wet weather.

CONCRETE

- Concrete work shall be in accordance with R.C.O.C. special requirements including mitigation of potential Alkali–Silica reactivity.
- MATERIALS:
The mix design, materials, quality assurance and quality control used in producing and placing concrete shall be in accordance with the current standards of the R.C.O.C. construction/testing division.
- JOINTS:
 - Typical longitudinal joints will be M.D.O.T. symbol D or B with lane ties.
 - Typical transverse joints will be plane of weakness joints M.D.O.T. symbol W, without load transfer assemblies.
 - "Cold" joints or "end of pour" joints will be tied to the successive pavement placed. Non–integral curb and gutter shall be tied to concrete pavements.
- Single pass sawing is allowed to create ¼ inch wide sawed joints to a depth of 2.25" for a 7" thick slab and 2.5" for an 8" thick slab, (¼ to ½ of the concrete slab thickness).
- Transverse pavement joints shall be spaced at intervals no greater than 12.25' for 7" thick slabs and 14' for 8" thick slabs, and no greater than 1.5 times the longitudinal joint spacing.
- Longitudinal pavement joints shall be spaced as follows:
–22' & 23' wide pavements – at pavement centerline.
–24' & 27' wide pavements – at ½ points.
–36' wide pavements – at ¼ points.
For integral curb the dimensions are measured to the back of the curb. A joint is not required at the edge of integral curb.

CONCRETE (CONTINUED)

- JOINTS (CONTINUED):
 - Intersection side streets will be poured separately from through streets with a "cold" joint. The joint will be parallel to the through street in line with the edge of the lane (inside edge of non–integral curb and gutter)./ For integral curb and gutter the joint offset will be dimensionally equivalent. The ends of (sawed and "cold") joints will be perpendicular to the outside edge of the pavement and back of curb. Intersection jointing will be per approved standard guidelines.
 - Prior to sealing, all joints shall be cleaned with a jet of compressed air supplied at a working pressure of not less than 90 psi in addition to any other cleaning which may be required to insure a thoroughly clean joint. The use of a "heat lance" to dry the joints prior to application of the joint sealant will not be allowed.
 - Pavement joints shall be filled and sealed with a hot poured rubber–asphalt type compound with backer rod per the MDOT standard plans.
- LANE TIE BARS

Number 5 bars, epoxy coated, 30 inches long shall be placed along all longitudinal joints, at a right angle to the joint and at 30 inch intervals. Tie bars shall be supported by chairs sufficiently rigid to support the bar during concrete placement.
- CURB END TRANSITIONS

Curb end transitions shall be provided as directed by the Road Commission for Oakland county and standard plans.

CONSTRUCTION

- All forms or slip form control line shall be set on a true line and on grade with approximately 1,000 lineal feet set prior to and maintained during paving operations.
- A minimum of 1,000 feet of road and/or curb subgrade/granular base (as determined by the R.C.O.C.) shall be ready for grade check the day prior to placement of aggregate base/scheduled paving.
- No concrete shall be produced or placed in rain or threatening weather. When rain appears imminent, the contractor shall take such precautions as are necessary to protect the concrete from damage.
- All manholes, catch basins, inlets and any other utility castings shall be adjusted to line and grade and shall have complete bearing on their respective structures or approved adjustor. A minimum of one (1) day cure time prior to paving shall be provided to ensure mortar has attained sufficient strength.
- Cold weather paving: refer to the M.D.O.T. standard specifications.
- The contractor shall provide cold weather protection as needed to protect the concrete from freezing. Any concrete damaged by freezing or frost action shall be removed and replaced as directed by the road commission.

MISCELLANEOUS

- Overhead wires shall be adjusted as necessary to provide adequate clearance as required by the utility owners, typically 16.5' minimum for telecommunications.
- Hydrants shall have a minimum clear distance of five feet from the back of curb. Hydrants shall be located behind the roadside ditches on uncurbed streets.
- Utility connection tees and manholes should not be under the road.
- All existing Utility Structure Covers within a paved area shall be adjusted to grade and backfilled with approved material prior to laying the pavement surface course.
- All mail boxes are to be temporarily relocated and mail service maintained during construction. Mail boxes are to be permanently reset in accordance with local postal requirements after construction.
- Restore all disturbed areas, driveways, lawns, etc., to a condition at least equal to existing.
- A wood disposal agreement will be required for any tree removal outside the limits of this development. It may be necessary for these trees to be cut in lengths desired by the property owners (5' or longer), and be placed on the property adjacent to the removal location.

SOIL EROSION AND SEDIMENTATION CONTROL

Prior to the start of any construction activity, a soil erosion control permit must be obtained from the O.C.W.R.C. or local municipal enforcement agency (MEA) in accordance with the provisions of public Act 451, Part 91. During all phases of construction, proper soil erosion controls must be installed and maintain by the contractor and/or developer. Acceptable vegetation must be established and all temporary soil erosion controls removed from the road rights–of–way prior to Road Commission acceptance of the streets for maintenance.

ADA

All sidewalks, curb ramps and curb openings shall be in accordance with M.D.O.T. Standard Plan R–28 and A.D.A. requirements. Crosswalks shall have a transverse slope no greater than 2% where they cross streets. Sidewalks that cross driveways shall maintain cross slopes no greater than 2% where they cross a driveway in addition to other areas. Sidewalk curb ramps, curb openings, landings and truncated domes (detectable warning strips) will be inspected by the R.C.O.C. Facilities that are not in compliance with A.D.A. requirements shall be removed and replaced.

ENDANGERED SPECIES

Prior to the start of any work or development, determine if the work or development will impact federally and/or state listed threatened and endangered species and coordinate necessary BMP's with the USFWS and/or DNR. Install any necessary BMP's in accordance with the federal and/or state regulations. When roads will be dedicated to the RCOC, the RCOC is not responsible for ensuring that the necessary environmental clearances were obtained prior to commencing work or development.

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DIRECTOR OF ENGINEERING

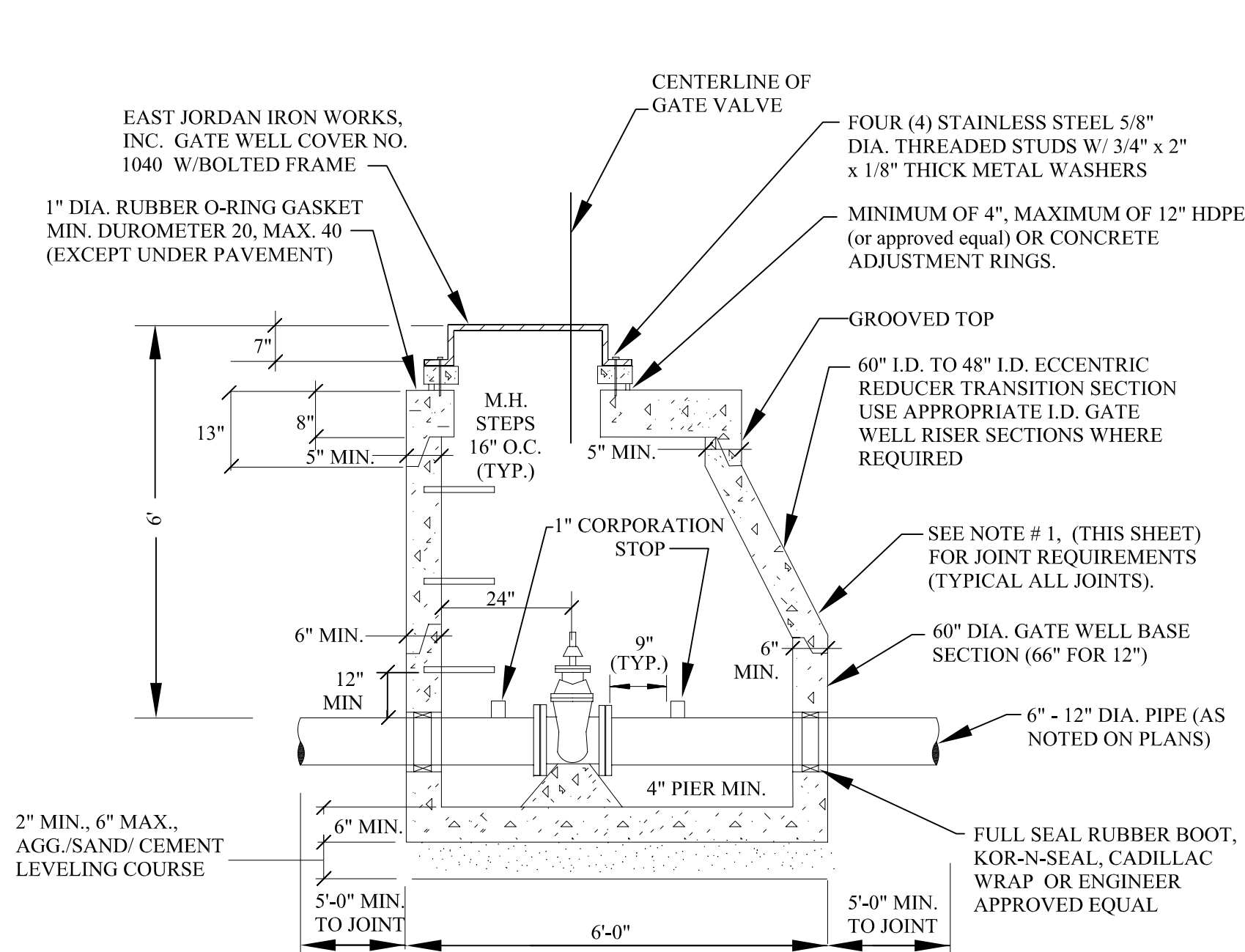
DRAWN DATE:
09/03/15
REVISED DATE:
05/29/19

DETAIL SHEETS
NEW DEVELOPMENT

SHEET NO.
4 OF 4

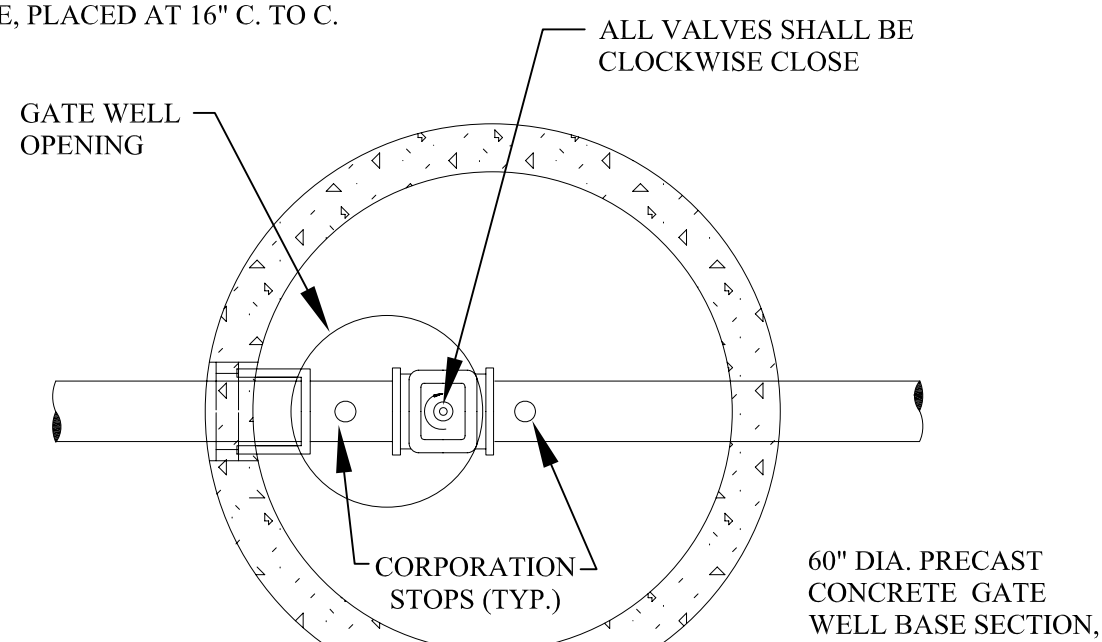


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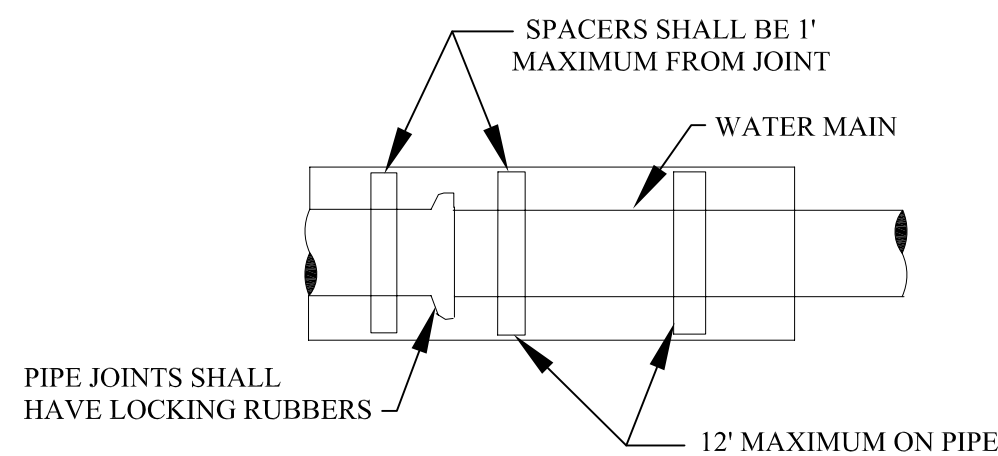


ALL GATE WELLS

MANHOLE STEPS TO BE PLASTIC COATED STEEL MEETING THE REQUIREMENTS IN ASTM D 2146, TYPE II, GRADE 49108. MA. INDUSTRIES P.S.I. POLYPROPYLENE OR APPROVED EQUAL. STEPS TO BE INSTALLED DURING MANHOLE MANUFACTURE, PLACED AT 16" C. TO C.



GATE WELL (TYPICAL)



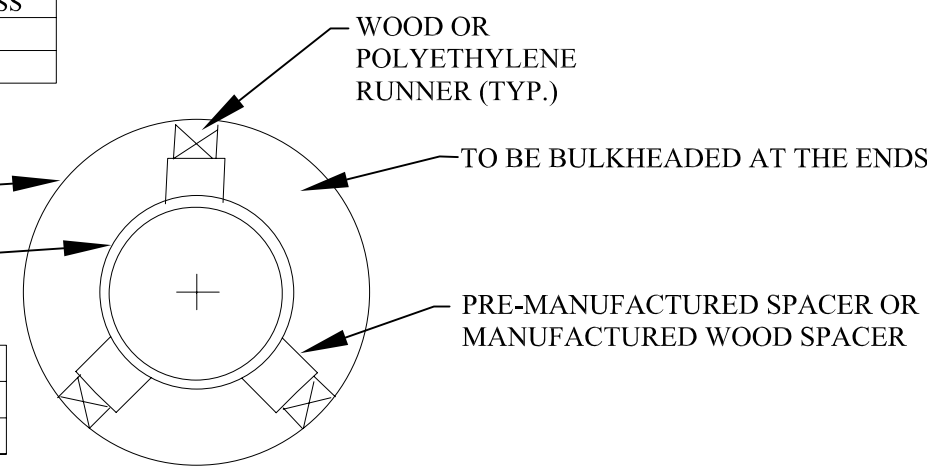
WATER MAIN IN CASING SECTION

UNLESS OTHERWISE SPECIFIED, MINIMUM CASING PIPE SHALL BE ASTM A-139 GRADE B, WALL THICKNESS AS FOLLOWS:

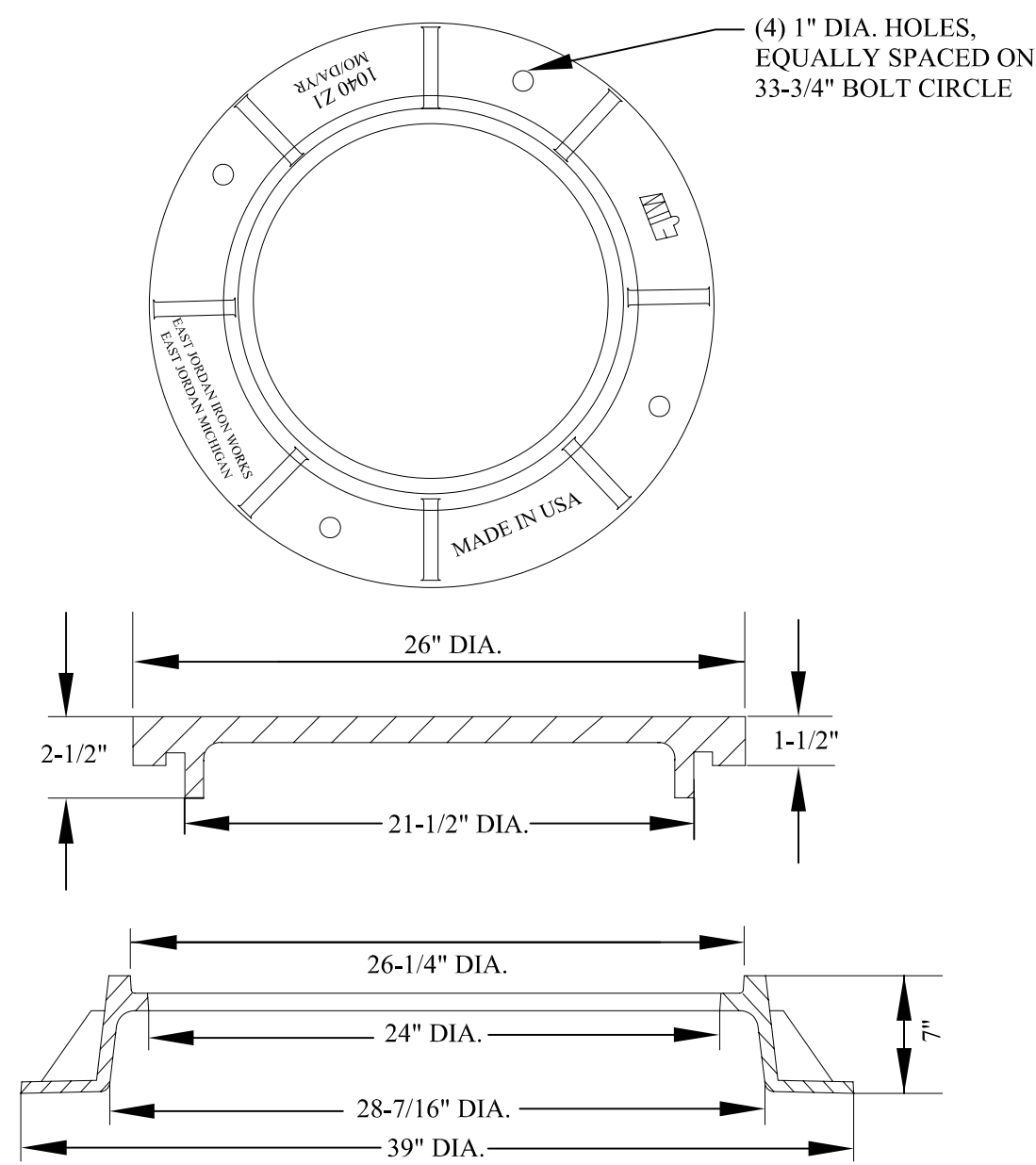
| NOMINAL SIZE | MINIMUM WALL THICKNESS |
|--------------|------------------------|
| 8"- 42" | 0.375 |
| 48"- 60" | 0.500 |

CASING SHOULD BE A MINIMUM OF 1 1/2 TIMES THE PIPE SIZE

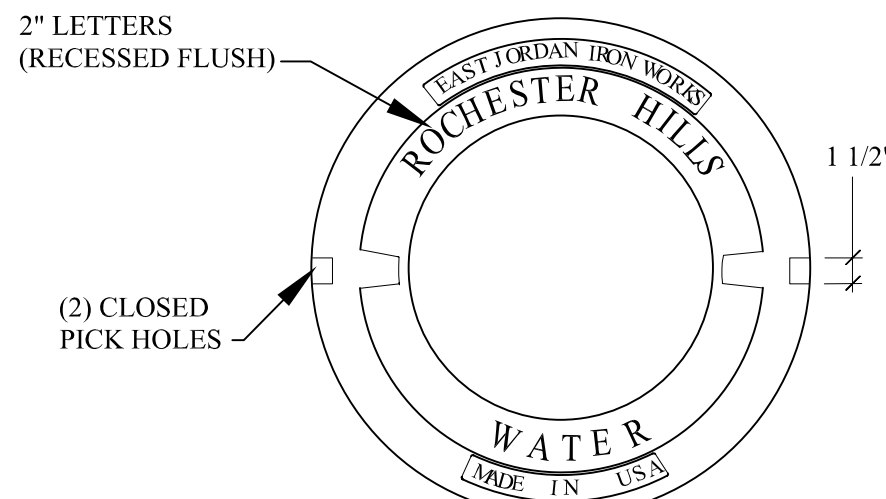
| REQUIRED QUANTITY OF RUNNERS IN ACCORDANCE WITH SIZE | |
|--|-----------|
| TO 14" DIA. | 3 RUNNERS |
| 16" TO 36" DIA | 6 RUNNERS |
| 38" TO 48" DIA. | 8 RUNNERS |



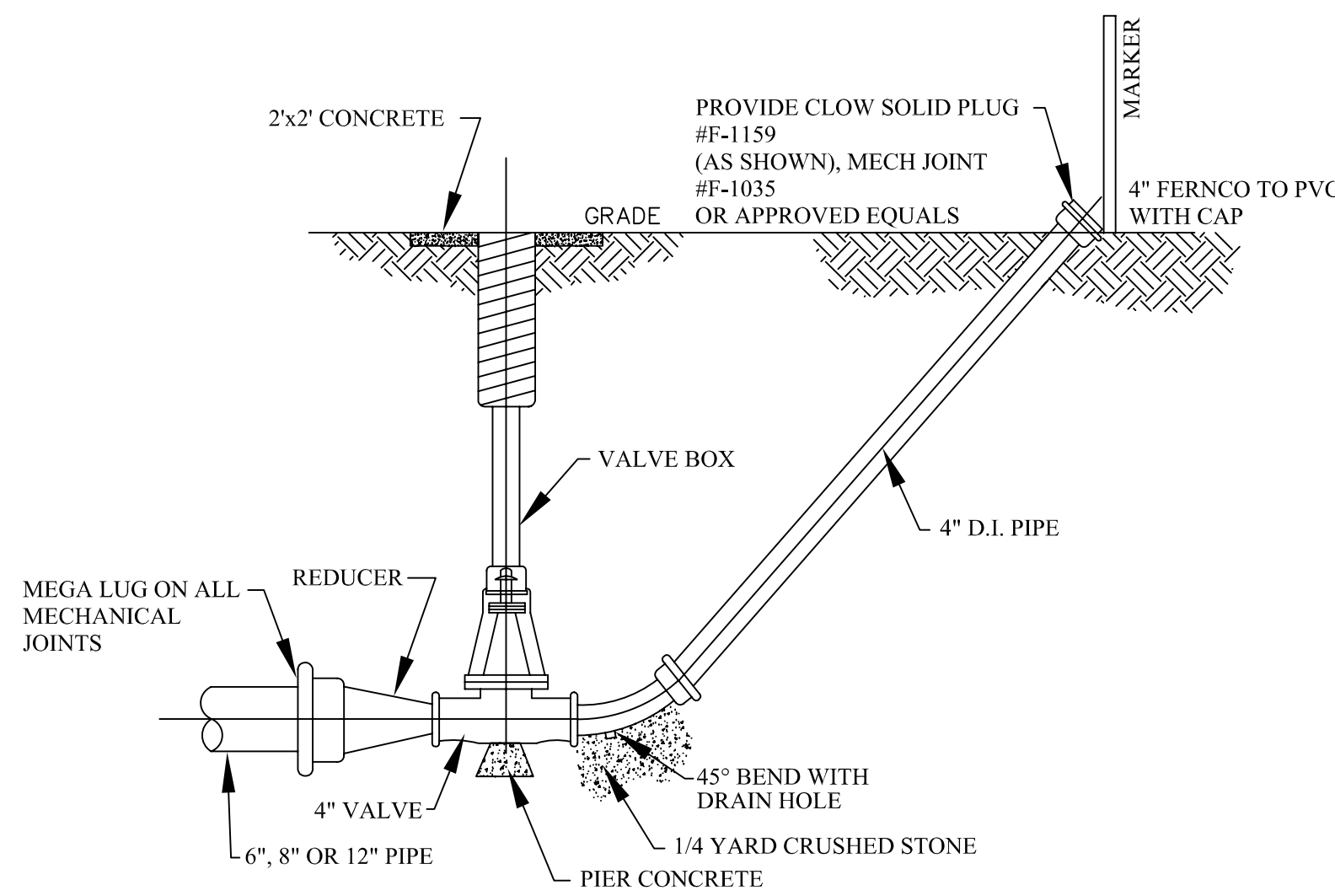
SUPPORT FOR WATER MAIN
CONSTRUCTED IN CASING PIPE



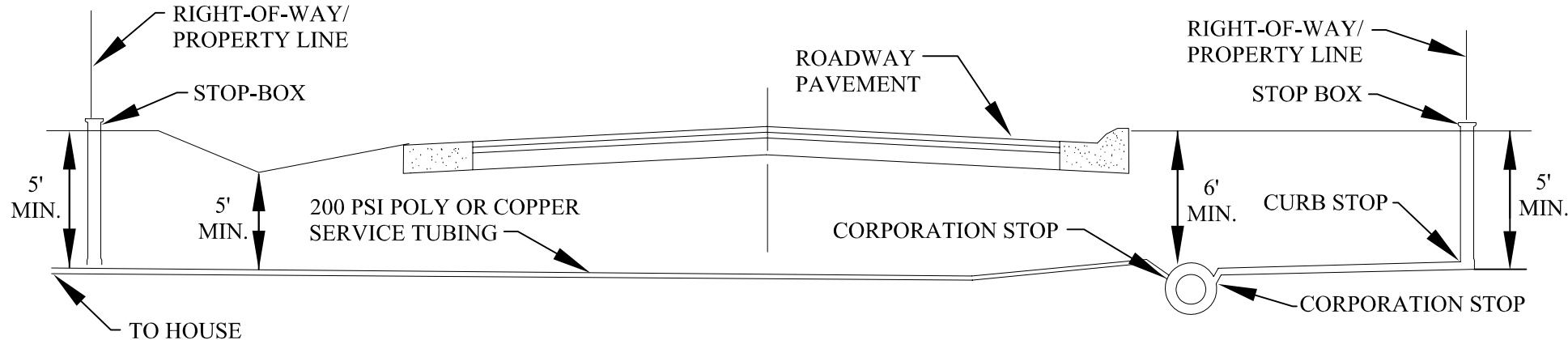
FRAME



LETTERING LAYOUT FOR
GATE WELL COVERS

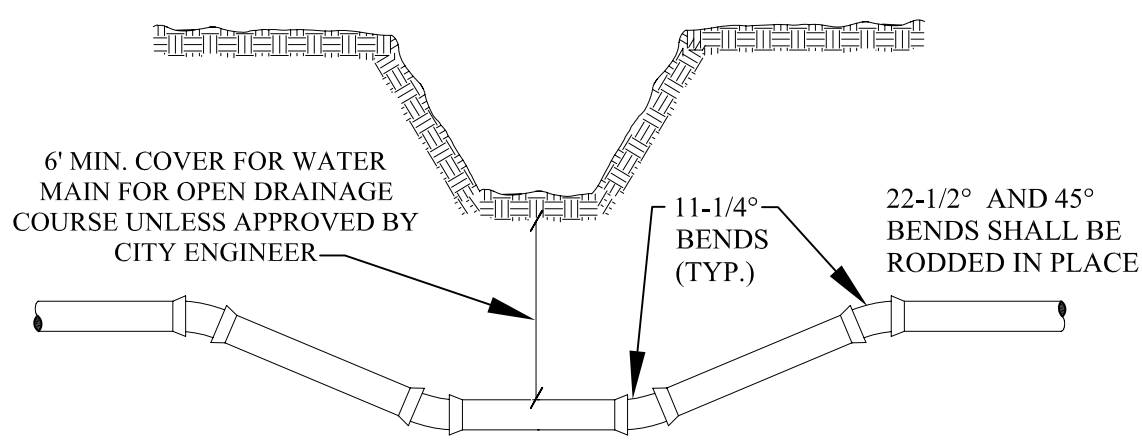


DETAIL OF 4" BLOWOFF

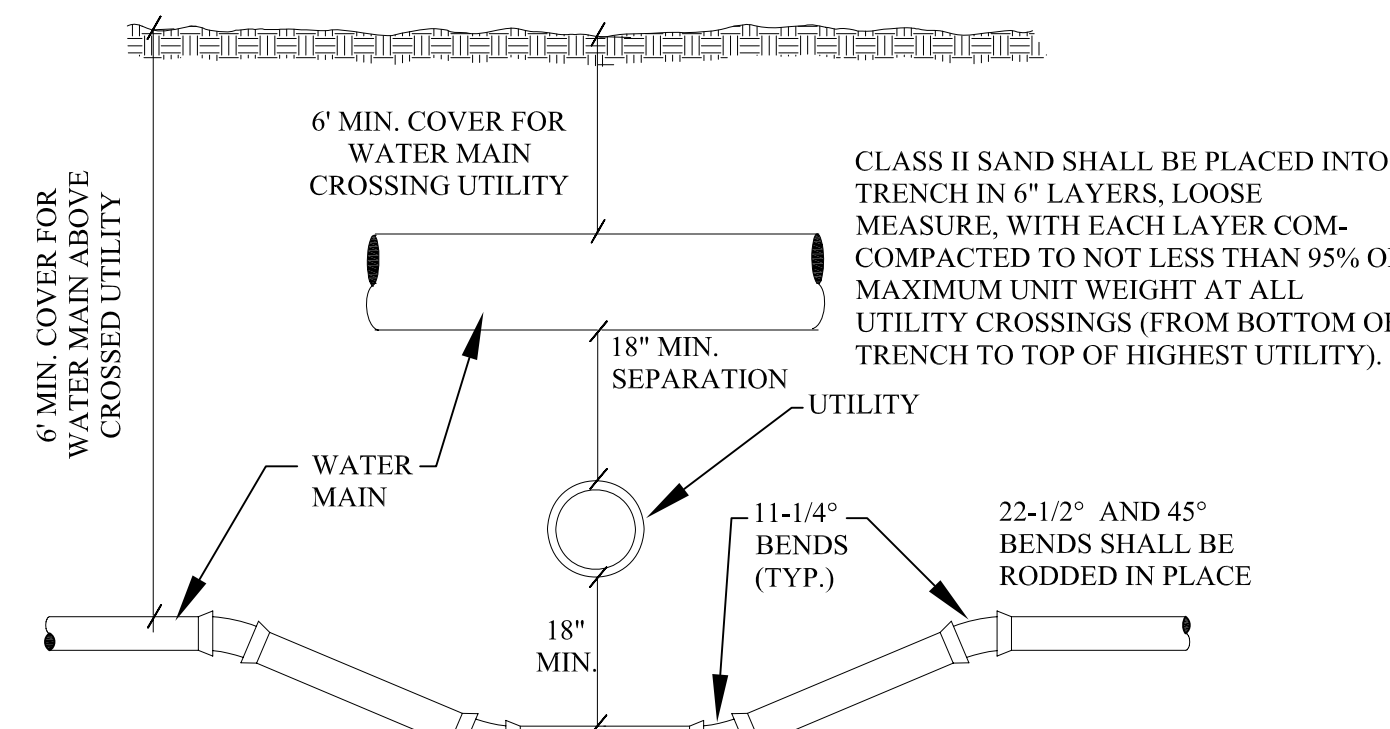


TYPICAL PUBLIC ROAD WATER
SERVICE CONNECTION

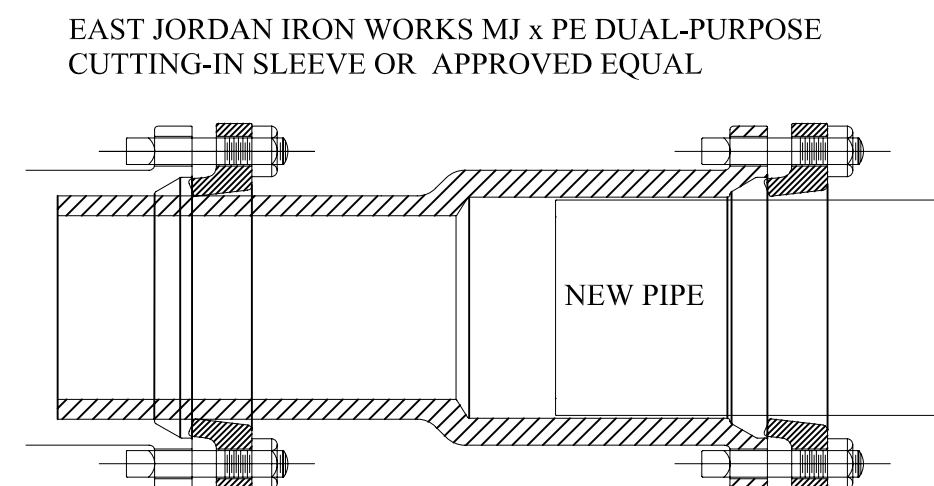
NOTES:
1. WATER SERVICE SHUT-OFF TO BE PLACED AT PROPERTY LINE.
2. LATERAL LOCATION SHALL BE AS REQUESTED BY THE ADJUTING PROPERTY OWNER.
3. ROCHESTER HILLS DPW PERFORMS SERVICE LEAD TAPS UP TO 2" DIAMETER.



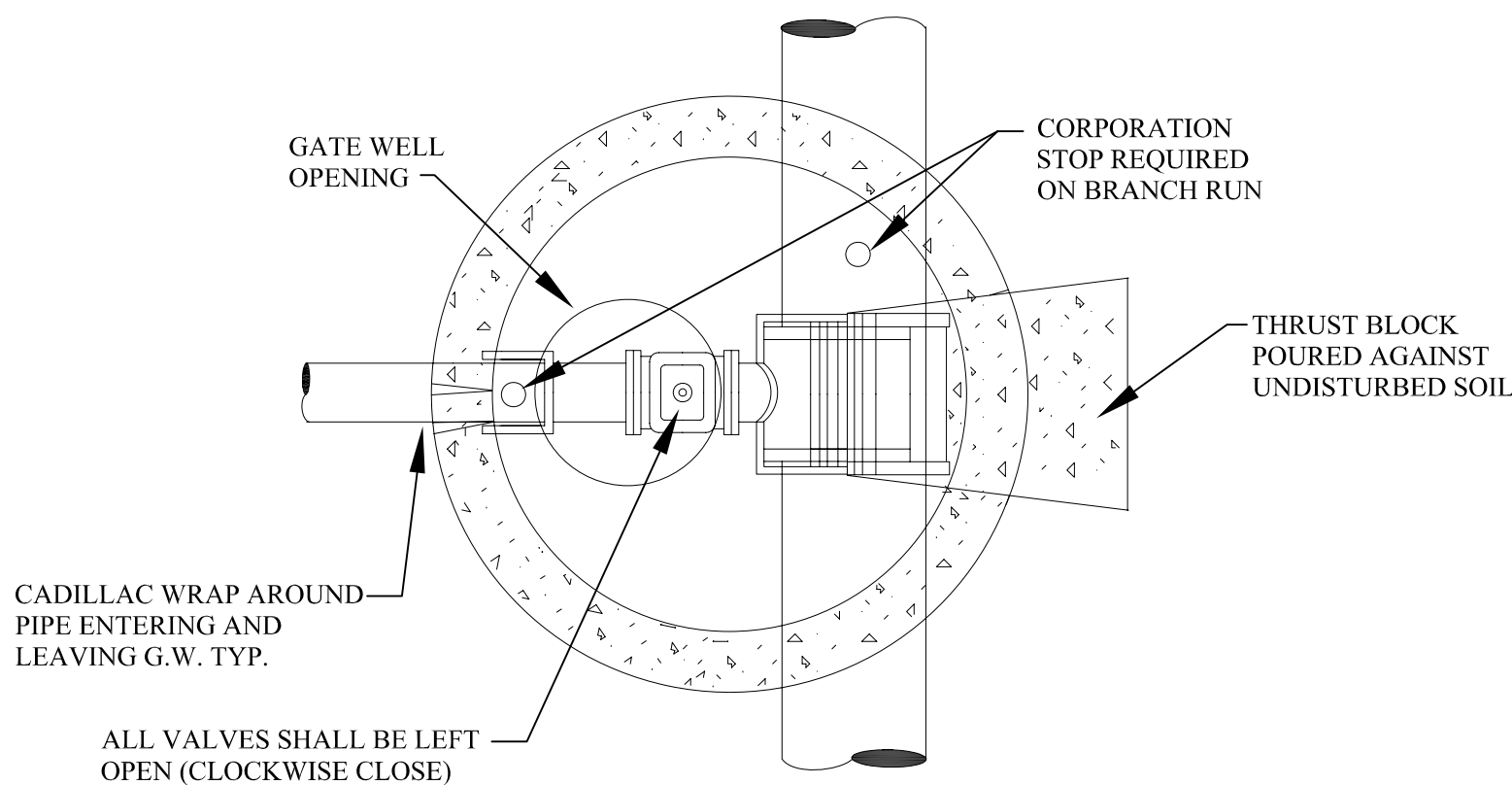
DITCH CROSSING



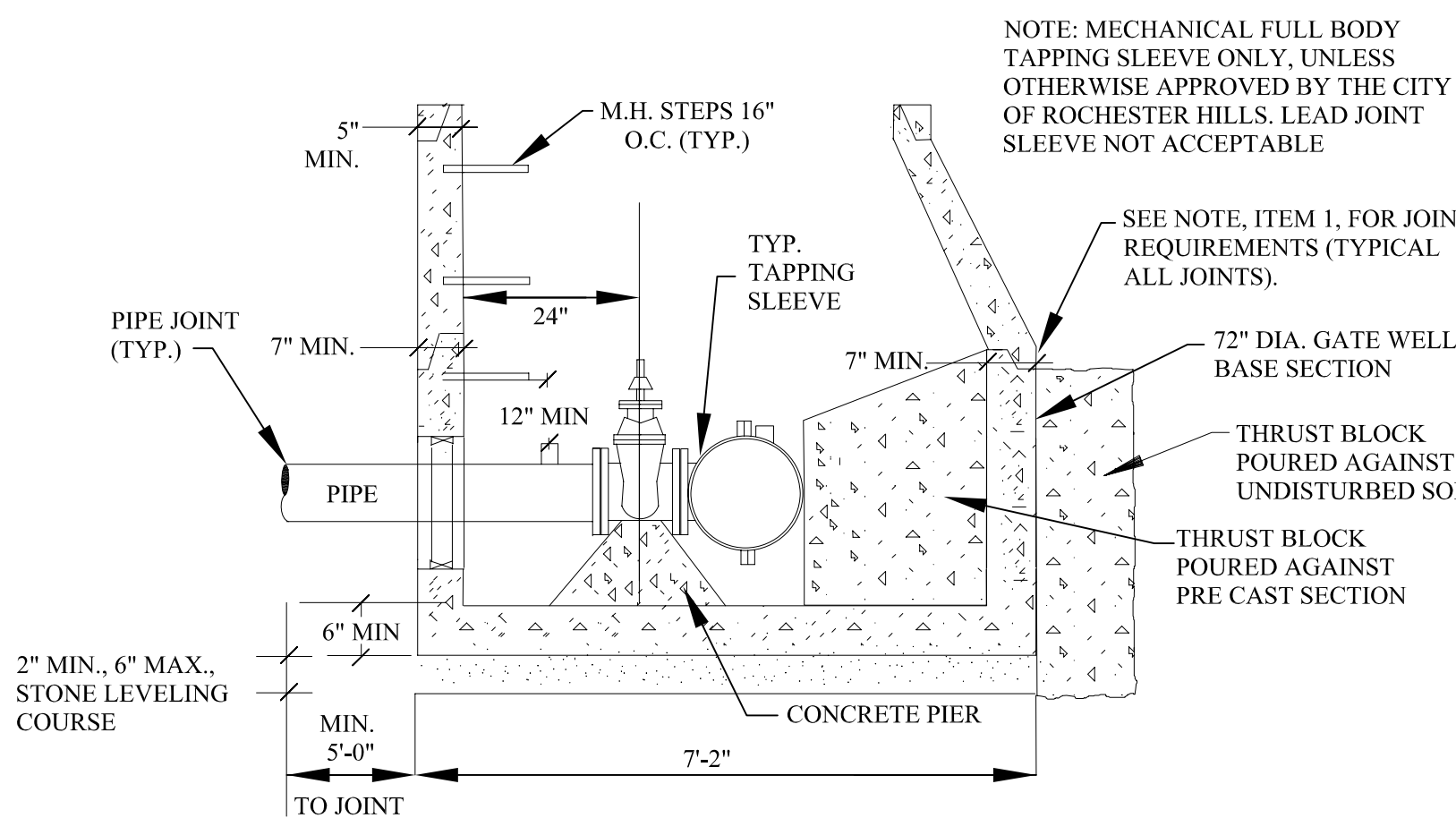
UTILITY CROSSING



BOTTLE SLEEVE



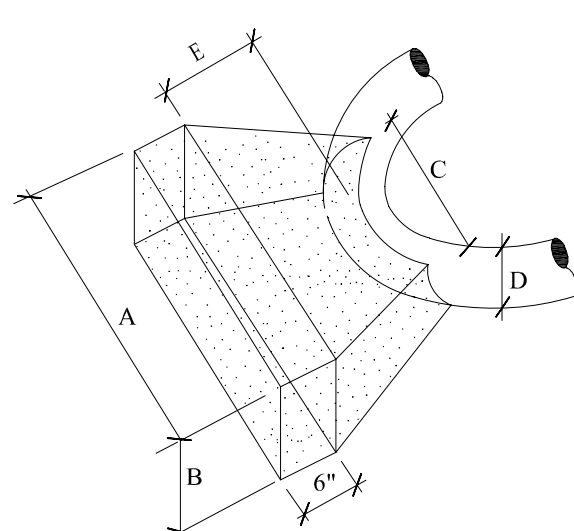
PLAN TAPPING SLEEVE
VALVE & WELL (TYPICAL)



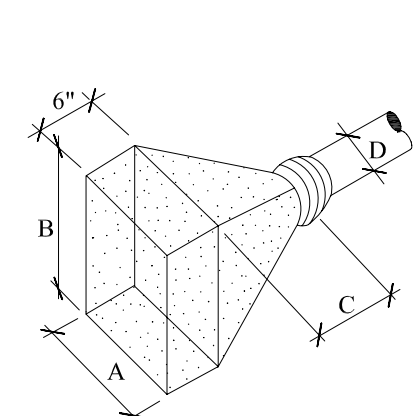
TAPPING SLEEVE, VALVE AND WELL (TYPICAL)

NOTES:

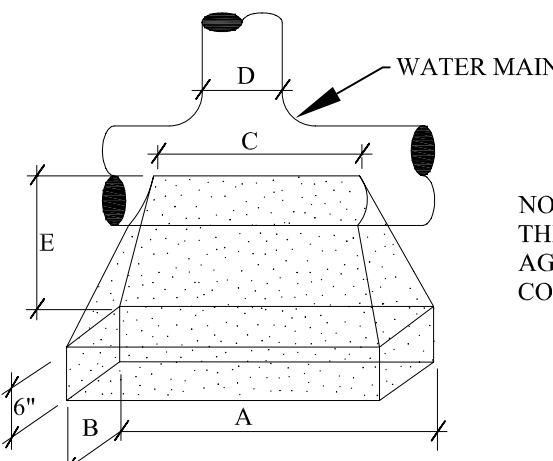
- ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE MANUFACTURED TO CONFORM WITH A.S.T.M. C478, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, EXCEPT WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
- CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 1 (i.e. 2'-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NUT) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATE WELL OPENING. FAILURE TO DO SO WILL REQUIRE CONTRACTOR TO CORRECT AT HIS EXPENSE.
- TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES; MUELLER; EAST JORDAN; SMITH-BLAIR OR APPROVED EQUAL AND APPROVED BY THE CITY OF ROCHESTER HILLS. FULL BODY SLEEVES MUST BE USED EXCEPT FOR REINFORCED CONCRETE PRESSURE PIPE OR A.C. PIPE.
- FOR ALL PIPE USE A 1" CORPORATION STOP. NO CORPS SHALL BE USED IN CONCRETE PRESSURE PIPE.
- RUBBER O-RINGS SHALL NOT BE USED IN PAVEMENT.



| FOR 90° BENDS OR SMALLER | | | | |
|--------------------------|----|------|------|--------|
| D | A | B | C | E MIN. |
| 20" | 8" | 6.5' | 3.5' | 2.5' |
| 16" | 6' | 4' | 2.5' | 2' |
| 12" | 4' | 3' | 2' | 1.75' |
| 10" | 3' | 3' | 2' | 1.75' |
| 8" | 3' | 2' | 2' | 1.5' |
| 6" | 2' | 1.5' | 2' | 1.25' |



| FOR PLUGS | | | |
|-----------|--------|--------|--------|
| D | A | B | C MIN. |
| 20" | 7" | 5' | 2.5' |
| 16" | 4'-10" | 4'-10" | 2' |
| 12" | 4'-4" | 3' | 1'-9" |
| 10" | 3' | 2' | 1'-6" |
| 8" | 2'-10" | 2'-6" | 1'-6" |
| 6" | 1'-6" | 1'-6" | 3' |



| FOR TEES | | | | |
|----------|-------|-------|------|--------|
| D | A | B | C | E MIN. |
| 20" | 6.5' | 4.5' | 3.5' | 3' |
| 16" | 4'-8" | 4'-8" | 2.5' | 2.75' |
| 12" | 4' | 3' | 2.5' | 2.5' |
| 10" | 3' | 2' | 2' | 2.25' |
| 8" | 2'-6" | 2' | 2' | 2.25' |
| 6" | 2' | 2' | 2' | 2.25' |

NOTE: 3000 PSI CONCRETE TO BE USED. THRUST BLOCK TO ABUT & REST AGAINST UNDISTURBED SOIL OR EARTH COMPACTED TO 95% MODIFIED PROCTOR.



THRUST BLOCK DETAILS

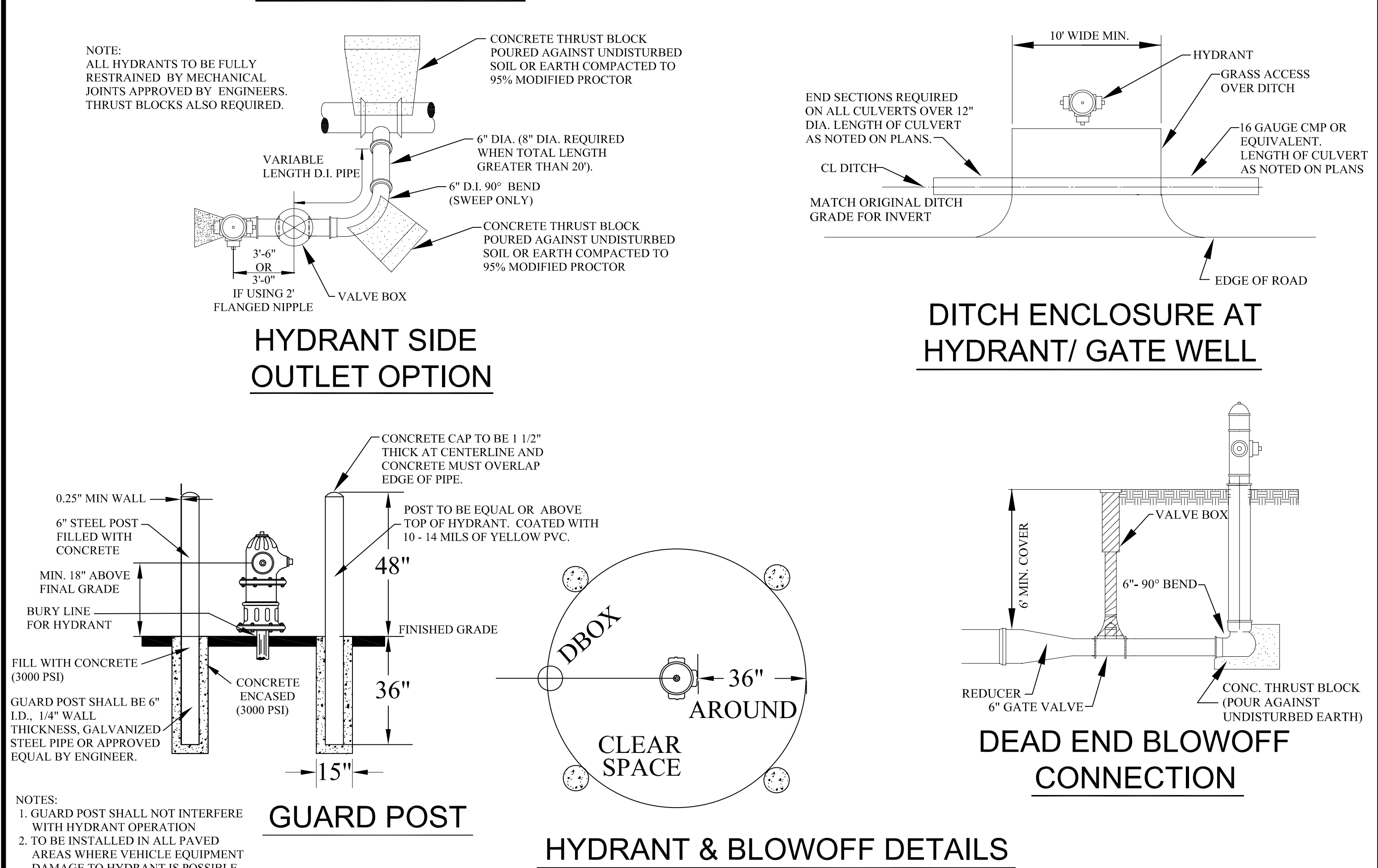
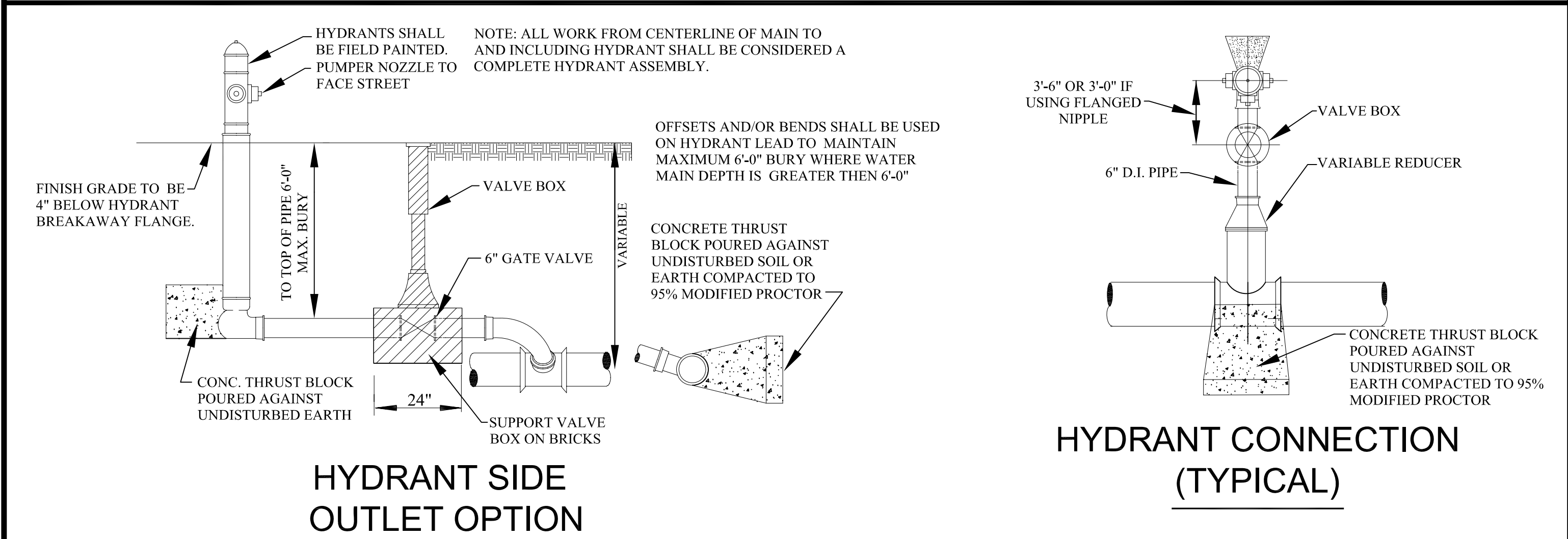
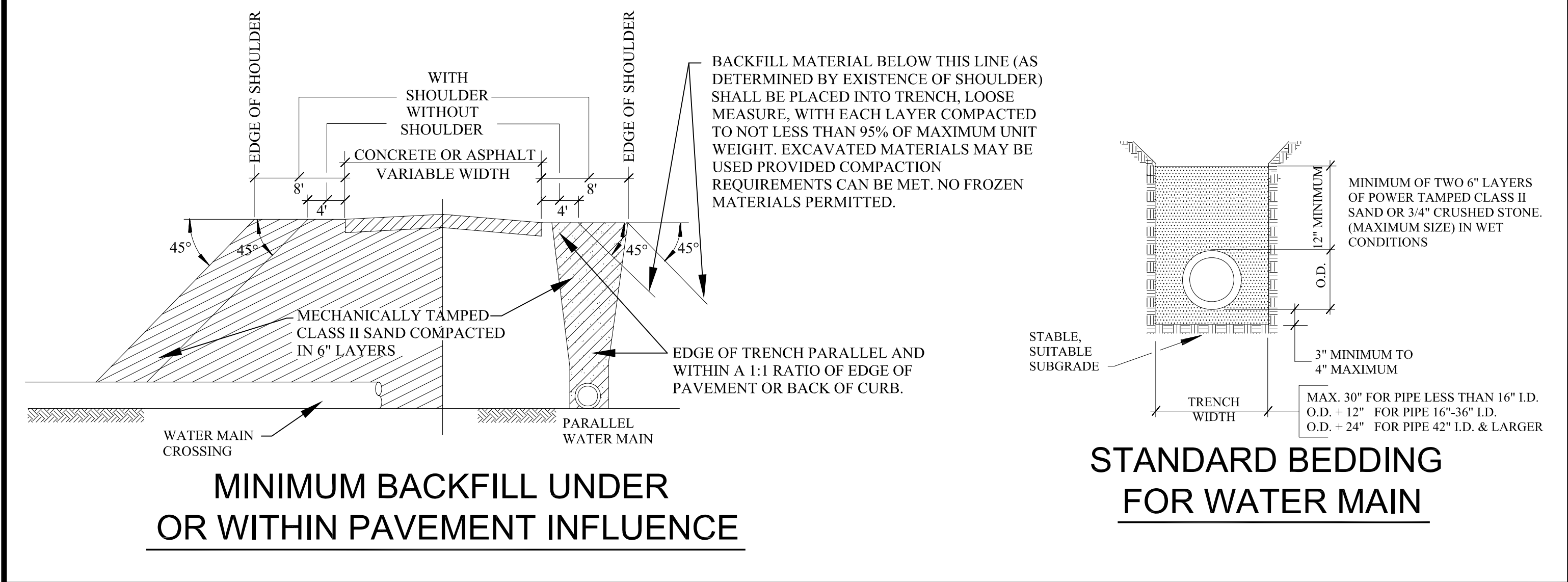
| REVISIONS | DATE | APPROVED BY |
|-----------|------|---|
| | | CITY COUNCIL, DATE: JULY 21, 2008 |
| | | PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES |

NOTIFY ROCHESTER HILLS
ENGINEERING DEPARTMENT
@ 248-841-2510 48 HRS. PRIOR
TO START OF
CONSTRUCTION

City of Rochester Hills
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**WATER MAIN
STANDARD DETAILS**

| | |
|--------------|-----------------|
| NOT TO SCALE | DATE: 7/21/2008 |
| SHEET 1 OF 2 | |



GENERAL NOTES

- ALL CONSTRUCTION PROCEDURES AND MATERIALS SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ROCHESTER HILLS.
- A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED BY THE CITY OF ROCHESTER HILLS AND HELD PRIOR TO THE START OF CONSTRUCTION.
- CONTRACTOR MUST CONTACT MISS DIG (811) AT LEAST THREE WORKING DAYS PRIOR TO THE START OF CONSTRUCTION FOR UNDERGROUND UTILITY LOCATIONS. ALL UTILITIES SHALL BE STAKED BEFORE CONSTRUCTION BEGINS.
- ALL WATER MAIN EASEMENTS SHALL BE PROVIDED PRIOR TO CONSTRUCTION AND ACCEPTANCE OF THE WATER DISTRIBUTION SYSTEM.
- WATER MAINS SHALL BE CONSTRUCTED WITH A MINIMUM COVER OF 6 FEET BELOW FINISHED GRADES, INCLUDING OPEN DRAINAGE COURSES.
- ALL TRENCHES UNDER OR WITHIN A 1:1 RATIO OF EXISTING OR PROPOSED PAVEMENT OR DRIVEWAYS, SHALL BE BACKFILLED WITH COMPACTED CLASS II SAND TO GRADE (95% MAXIMUM UNIT DENSITY).
- WHERE TWO UTILITIES CROSS, PROVIDE CLASS II BACKFILL MATERIAL IN SIX (6) INCH COMPACTED LAYERS TO TOP OF HIGHEST UTILITY.
- WHERE WATER MAINS DIP UNDER OTHER UTILITIES, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE CONSTRUCTED WITH 11-1/4" VERTICAL BENDS, 22 1/2" OR 45° BENDS MUST BE RODDED AND PROPERLY ANCHORED.
- ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE IN ACCORDANCE WITH A.S.T.M. C478, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
- CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 1 (2'-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NUT) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATE WELL OPENING.
- ALL CROSS-CONNECTION CONTROL DEVICES SHALL BE INSTALLED AS REQUIRED BY THE ROCHESTER HILLS PLUMBING INSPECTOR AND IN ACCORDANCE WITH THE STANDARDS OF THE OAKLAND COUNTY DRAIN COMMISSIONER OPERATION AND MAINTENANCE DIVISION AND THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF DRINKING WATER AND RADIOLOGICAL PROTECTION.
- ALL WATER SERVICE CONNECTIONS TWO (2) INCHES AND SMALLER SHALL BE MADE BY THE CITY OF ROCHESTER HILLS, DEPARTMENT OF PUBLIC SERVICES AFTER WATER MAIN ACCEPTANCE AND APPLICABLE PERMITS ARE OBTAINED.
- ALL FITTINGS AND BENDS SHOULD BE BLOCKED IN ACCORDANCE WITH THRUST BLOCK DETAILS, UNLESS ALTERNATE THRUST RESTRAINT SYSTEM, AS INDICATED PLANS AND SPECIFICATIONS, IS APPROVED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICE.

WATER MAIN MATERIALS NOTES

- TEMPORARY CONNECTIONS, WHICH MAY BE MADE FOR CHLORINATING AND FLUSHING PURPOSES, SHALL INCLUDE A TESTABLE DOUBLE CHECK VALVE BACKFLOW PREVENTER WITH CURRENT CERTIFICATION.
- CORPORATION STOPS USED FOR INSERTION INTO MAINS SHALL BE FORD TYPE B-44. ALL STOPS SHALL HAVE BRONZE CAST BODIES, KEYS, STEM WASHERS AND NUTS. INLET THREADS SHALL CONFORM TO THE LATEST VERSION OF AWWA C800.
- ALL DUCTILE IRON PIPE (D.I.P.) WATER MAIN SHALL BE DESIGNED FOR 150 PSI MINIMUM WORKING PRESSURE.
- THE DUCTILE IRON PIPE TO BE FURNISHED AND DELIVERED UNDER THIS SPECIFICATION SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C151 (ANSI A21.5), EXCEPT AS OTHERWISE SPECIFIED HEREIN. PIPE SHALL BE DOUBLE CEMENT-LINED AND SEAL COATED WITH AN APPROVED BITUMINOUS SEAL COAT IN ACCORDANCE WITH AWWA C104 (ANSI A21.4).
- DUCTILE IRON PIPE SHALL BE CLASS 54 FOR SIZES THREE (3) INCH THROUGH TWENTY (20) INCHES SIZE. TWENTY-FOUR (24) INCH AND LARGER SHALL BE CLASS 55 DUCTILE IRON PIPE.
- PIPES TWENTY-FOUR (24) INCHES AND LARGER IN NOMINAL DIAMETER SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C100 FOR DUCTILE IRON WATER PIPE.
- MECHANICAL JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C111 (ANSI A21.11).
- FLANGE JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C110 (ANSI A21.10).
- FITTINGS FOR DUCTILE IRON PIPE SHALL BE DUCTILE IRON AND SHALL MEET REQUIREMENTS OF AWWA C110 (ANSI A21.10) OR AWWA C151 (ANSI A21.5). DUCTILE IRON FITTINGS SHALL BE RATED FOR 350 PSI. PIPE SIZES TWENTY-FOUR (24) INCH DIAMETER AND LESS, AND 250 PSI FOR PIPE SIZES OVER TWENTY-FOUR (24) INCH DIAMETER. DUCTILE IRON FLANGE FITTINGS SHALL BE RATED FOR 250 PSI FOR ALL PIPE DIAMETERS.
- ALL DUCTILE IRON PIPE, FITTINGS AND HYDRANTS SHALL BE ENCASED WITH POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH THE REQUIREMENTS OF A.N.S.I./A.W.W.A. STANDARD SPECIFICATION D1248 AND AWWA C105. POLYETHYLENE TUBE MATERIAL SHALL HAVE A THICKNESS OF .008" (8-MILS). ADHESIVE TAPE SHALL BE A GENERAL PURPOSE ADHESIVE TAPE 2" WIDE AND APPROXIMATELY 10-MILS THICK, SUCH AS SCOTCHRAP. NO.50, POLYKEN NO. 900, OR TAPECOAT CT.

VALVE AND SLEEVE NOTES

- GATE VALVES, SIZES THREE (3) INCH THROUGH SIXTEEN (16) INCH AND TAPPING VALVES SHALL MEET THE CITY OF ROCHESTER HILLS STANDARD AS DETAILED WITH NON-RISEING STEM. (EAST JORDAN IRON WORKS, AMERICAN FLOW CONTROL, MUELLER)
- ALL IN LINE GATE VALVES EIGHT (8) INCH AND LARGER SHALL BE IN WELLS. SPECIFICATIONS SHALL INCLUDE THE DIRECTION OF OPERATION OF ALL VALVES (CLOCKWISE CLOSURE). VALVE BOX USE TO BE APPROVED BY ENGINEERING DIVISION.
- ALL GATE WELL COVERS SHALL BE CITY OF ROCHESTER HILLS STANDARD AS DETAILED.
- ALL GATE VALVES WITH OPERATING NUTS AT A DISTANCE GREATER THAN FIVE (5) FEET BELOW GROUND SURFACE SHALL BE PROVIDED WITH AN EXTENSION STEM. THE LENGTH OF THE EXTENSION STEM SHALL REACH WITHIN FIVE (5) FEET FROM THE GROUND SURFACE. WHEN AN EXTENSION STEM IS USED, IT SHALL BE HELD IN PLACE BY AN EXTENSION STEM GUIDE SUITABLY FASTENED TO THE WALL OF THE GATE WELL. THE EXTENSION STEM SHALL BE MECHANICALLY ATTACHED TO THE OPERATING NUT. DETAILS OF THE EXTENSION SYSTEM AND THE METHOD OF INSTALLATION SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
- BUTTERFLY VALVES SHALL BE USED FOR VALVES GREATER THAN 16-INCH DIAMETER AND SHALL BE MODEL 2F11 AS MANUFACTURED BY HENRY PRATT COMPANY OR APPROVED EQUAL.
- TAPPING VALVES SHALL BE SERIES "A" AS MANUFACTURED BY EAST JORDAN IRON WORKS OR RESILIENT SEATED GATE VALVES AS APPROVED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES.
- TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES; MUELLER; EAST JORDAN; SMITH-BLAIR OR APPROVED EQUAL AND APPROVED BY THE CITY OF ROCHESTER HILLS. FULL BODY SLEEVES MUST BE USED EXCEPT FOR REINFORCED CONCRETE PRESSURE PIPE OR A.C. PIPE.

HYDRANT REQUIREMENTS

- ALL HYDRANTS SHALL BE CONSTRUCTED WITH A SIX (6) INCH COMPANION GATE VALVE IN A THREE (3) PIECE, ADJUSTABLE DUCTILE IRON VALVE BOX, WHICH SHALL INCLUDE A FIVE AND ONE-QUARTER (5-1/4) INCH SCREW SHAFT. VALVE BOXES SHALL BE SERIES 6860 AS MANUFACTURED BY TYLER PIPE OR APPROVED EQUAL.
- ALL HYDRANTS SHALL BE EAST JORDAN IRON WORKS NO. 5-BR-250 TRAFFIC MODEL, OR AMERICAN FLOW CONTROL MODEL WB-67250. SELF-DRAINING HYDRANTS SHALL NOT BE USED. HYDRANTS SHALL HAVE BREAKAWAY FLANGE.
- ALL HYDRANTS SHALL BE PAINTED RED ABOVE GROUND AND BLACK BELOW GROUND WITH A FINISH COAT OF GLAMORTEX 501 ENAMEL, COLOR 314 VERMILION OR APPROVED EQUAL. HYDRANT CAPS SHALL BE PAINTED SAME COLOR AS THE HYDRANT.
- ALL FIRE HYDRANT JOINTS SHALL BE TOTALLY RESTRAINED BY THE USE OF RESTRAINED JOINT. THRUST BLOCKS ARE ALSO REQUIRED.

ACCEPTANCE OF NEW WATER MAINS

- PRIOR TO WATER MAIN ACCEPTANCE THE FOLLOWING CONDITIONS MUST BE MET: 1) PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS 2) ALL EASEMENT AND RIGHT-OF-WAY ACQUISITION MUST BE ACCEPTED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES 3) THE CITY OF ROCHESTER HILLS MUST BE PROVIDED WITH THE BILL OF SALE AND 4) ALL MYLAR "AS - BUILT DRAWINGS" MUST BE ACCEPTED AND APPROVED BY THE CITY OF ROCHESTER HILLS, ENGINEERING SERVICES. THE CITY OF ROCHESTER HILLS INSPECTION DIVISION MUST WITNESS THE CONNECTION OF THE WATER MAIN TO THE EXISTING WATER MAIN, AFTER WHICH RESIDENTIAL AND COMMERCIAL TAPS WILL BE ALLOWED.
- THE CONTRACTOR SHALL NOTIFY THE CITY OF ROCHESTER HILLS, INSPECTION DEPARTMENT (248.841.2510) FOR PRESSURE TESTING, BACTERIOLOGICAL SAMPLING, CONNECTIONS TO EXISTING WATER MAIN AND FINAL FIELD REVIEW. A FORTY-EIGHT (48) HOUR ADVANCE NOTICE IS REQUIRED.
- THE CONTRACTOR SHALL DISINFECT AND PRESSURE TEST ALL NEW WATER MAIN IN ACCORDANCE WITH ROCHESTER HILLS STANDARDS. THE WATER MAIN SHALL PASS A 150 PSI PRESSURE TEST FOR A TWO (2) HOUR PERIOD. WATER LOSS SHALL NOT EXCEED A RATE OF 11.65 U.S. GALLONS PER INCH DIAMETER PER MILE OF WATER MAIN IN TWENTY-FOUR (24) HOURS.
- WHERE CONTRACTOR SUPPLIED GAUGES ARE REQUIRED, MINIMUM SIZE SHALL BE 3 1/2" DIAMETER OR LARGER GRADUATED IN ONE (1) OR TWO (2) POUND INCREMENTS FROM 1 TO 160 P.S.I. OR HIGHER AND HAVE CURRENT CERTIFICATION.
- PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED AND APPROVED PRIOR TO CONNECTING TO THE EXISTING WATER MAIN.

CITY OF ROCHESTER HILLS WATER SYSTEMS AS-BUILT DRAWING SPECIFICATIONS

IN AREAS WHERE WATER SYSTEMS ARE OPERATED AND MAINTAINED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICES, FINAL ACCEPTANCE OF THE WATER SYSTEM MUST BE RENDERED BY THE DEPARTMENT OF PUBLIC SERVICES, BEFORE THE SYSTEM CAN BE USED FOR THE SERVICE INTENDED.

ONE ITEM REQUIRED FOR FINAL ACCEPTANCE SHALL BE THE SUBMISSION OF AS-BUILT DRAWINGS TO THE CITY OF ROCHESTER HILLS, DPS, BY THE DESIGN ENGINEER. AS-BUILT DRAWINGS SHALL BE DEFINED AS AND CONTAIN THE FOLLOWING INFORMATION:

- FINAL AS-BUILT DRAWINGS SHALL BE PROVIDED ON THREE (3) MIL. MYLAR. XEROX OR ANY HEAT PROCESS REPRODUCTIONS WILL NOT BE ACCEPTED.
- ALONG WITH THE MYLAR PLAN SET, PROVIDE THREE (3) SETS OF BLUEPRINTS, PRODUCED FROM THE MYLARS AND THE PLANS ON ELECTRONIC MEDIA IN AUTOCAD FORMAT (LATEST VERSION).
- EACH AND EVERY SHEET SHALL BE SEALED BY THE DESIGN ENGINEER, ALONG WITH THE FOLLOWING CERTIFICATION STATEMENT ON THE COVER SHEET:

I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE AS-BUILT DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE THOSE IMPROVEMENTS NOTED AS "AS BUILT" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS; AND ALSO THAT THE WATER MAIN AND STRUCTURES, AS CONSTRUCTED, LIE WITHIN THE EASEMENT DESCRIPTIONS REQUIRED BY THE CITY OF ROCHESTER HILLS.

(COMPANY NAME)

(ENGINEER'S SIGNATURE)

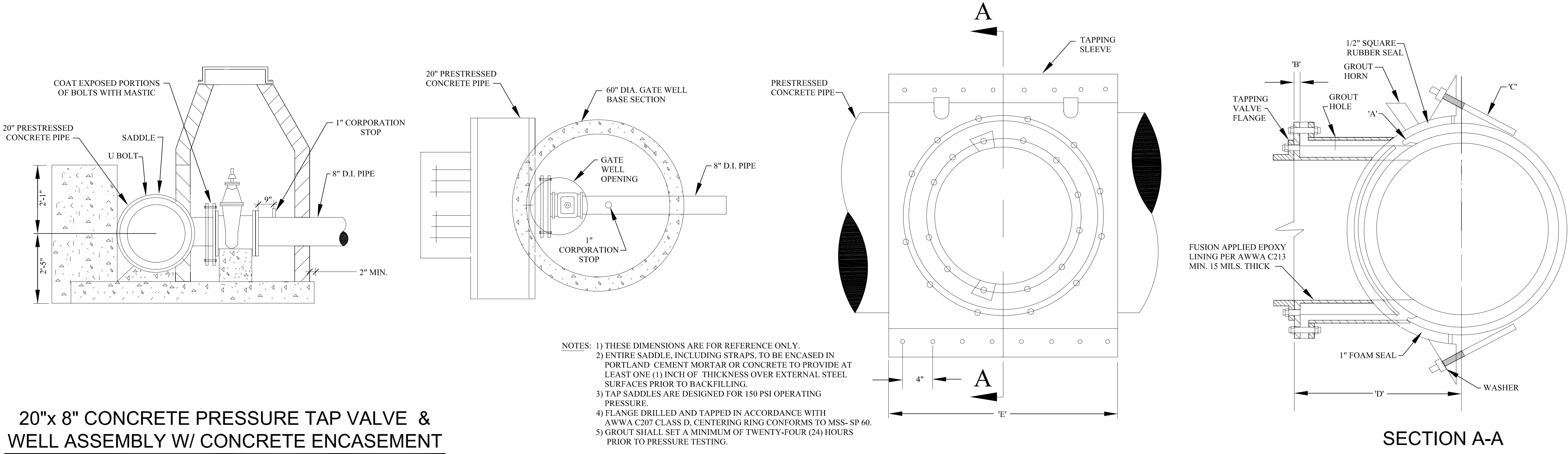
PROFESSIONAL ENGINEER NO. _____

ENGINEER SEAL

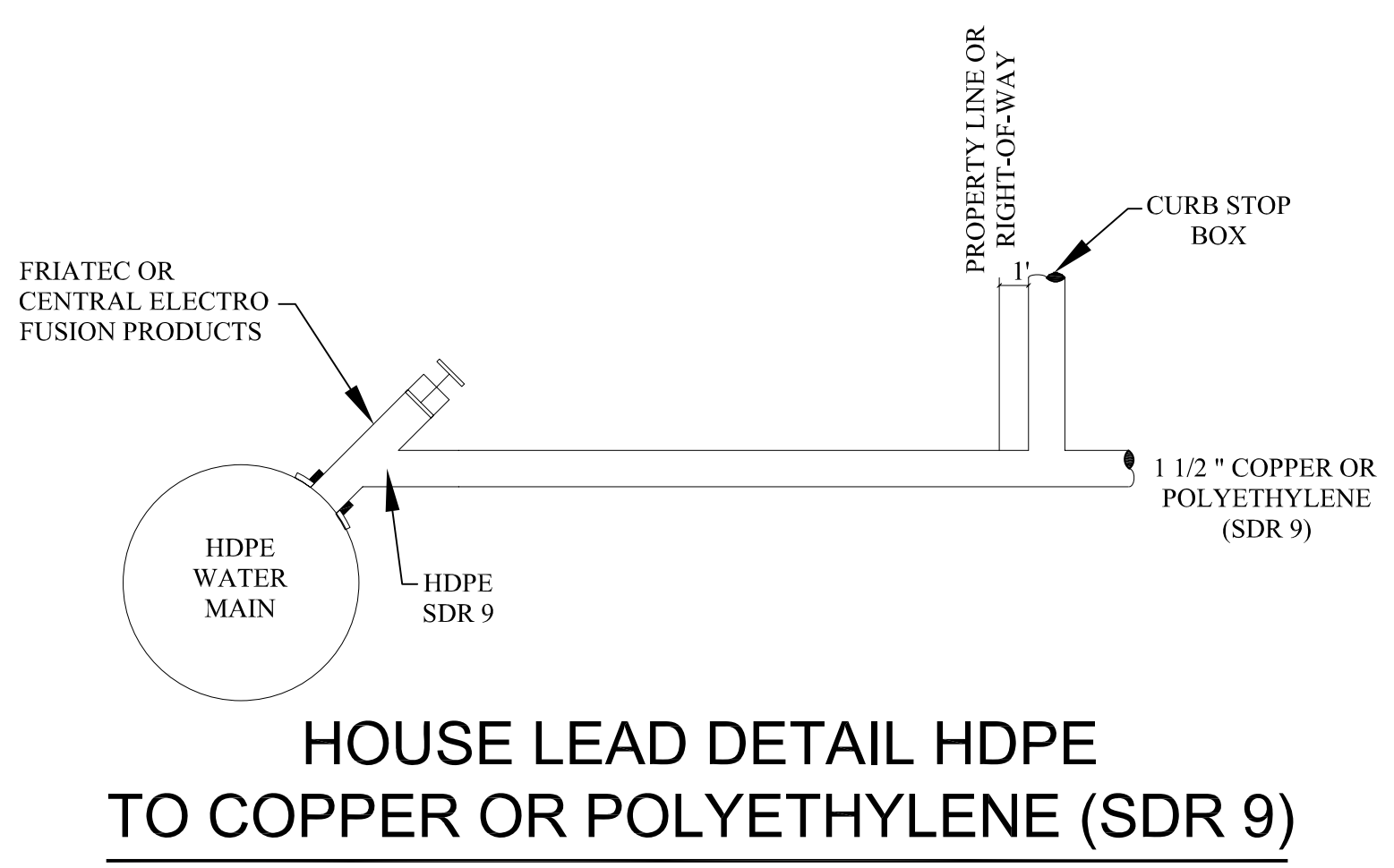
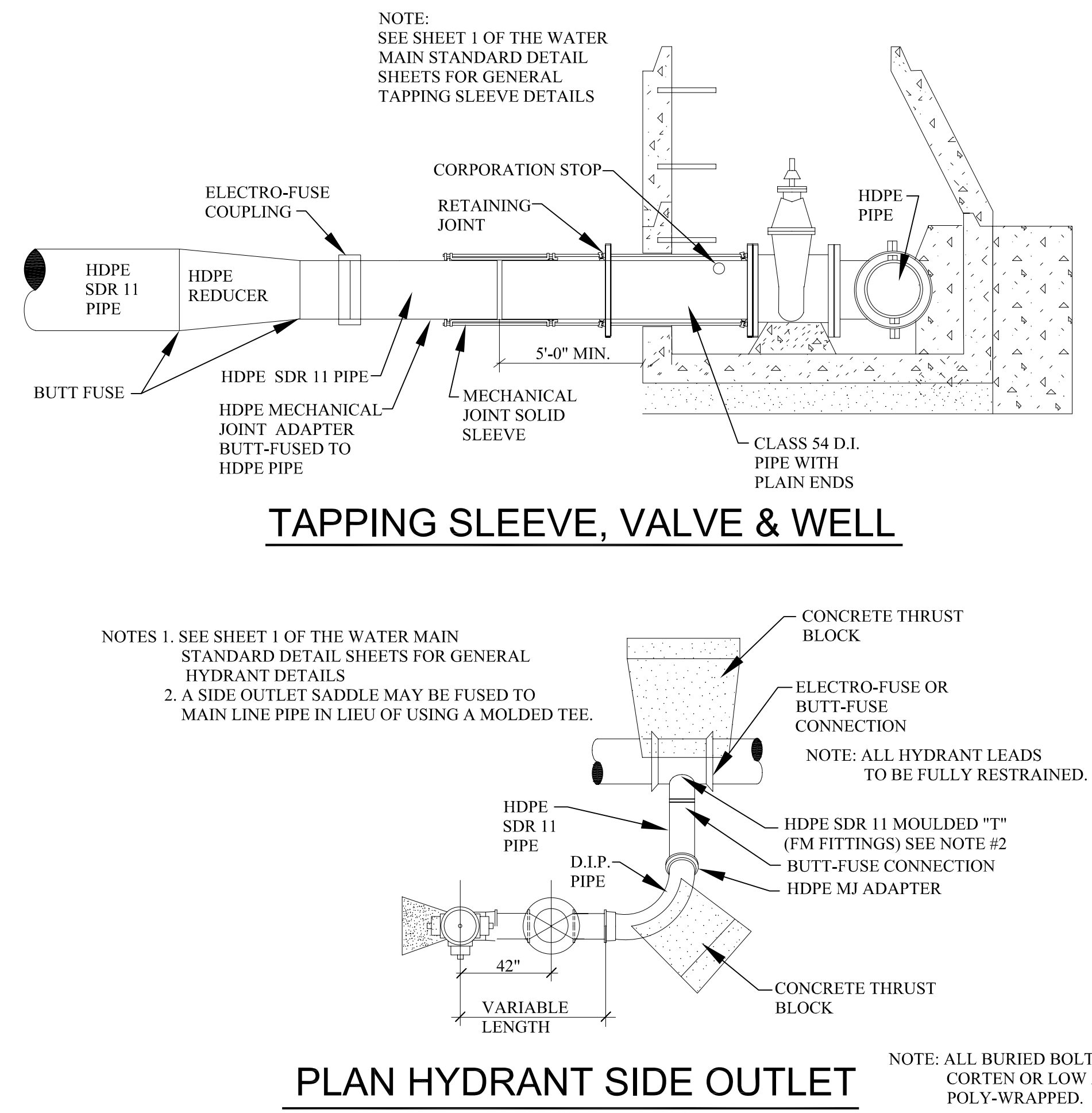
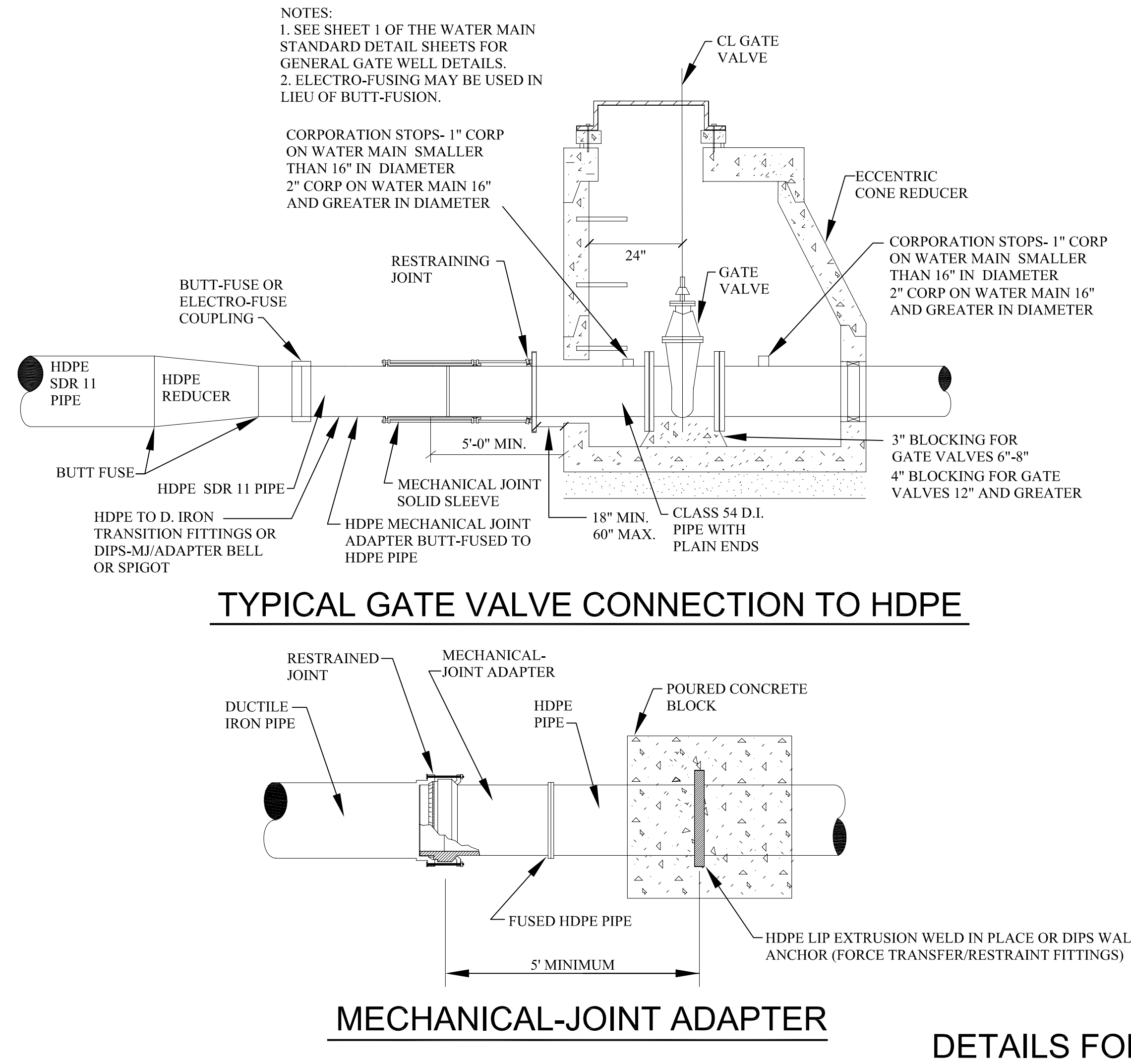
- THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
- THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
- THE SIZE, BRAND AND MODEL NUMBERS OF ALL VALVES AND HYDRANTS INSTALLED SHALL BE INDICATED.
- A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED, AS WELL AS AN AS-BUILT DRAWING QUANTITY LIST ON EACH INDIVIDUAL SHEET.
- THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
- THE OFFSET OF THE WATER MAIN FROM PROPERTY LINES SHALL BE INDICATED.
- ALL GATE VALVE WELLS, HYDRANTS AND ALL WATER SYSTEM APPURTENANCES SHALL BE LOCATED FROM TWO FIXED OBJECTS (MANHOLES, BUILDING CORNERS ECT.).
- ALL UNDERGROUND APPURTENANCES, SUCH AS GATE VALVE WELLS, METER PITS, PRESSURE REDUCING VALVE PITS, ETC. SHALL BE LOCATED FROM THE NEAREST HYDRANT THAT IS CONNECTED TO THE SAME WATER MAIN AS THE APPURTENANCE.
- THE LOCATION AND SIZE OF EVERY RESTRAINED JOINT SHALL BE NOTED.
- THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE VERTICAL SEPARATION, IS LESS THAN 18" SHALL BE NOTED.
- AS-BUILT SHALL BE PREPARED IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS AS-BUILT GUIDELINES AS PROVIDED AT THE PRE-CONSTRUCTION MEETING.

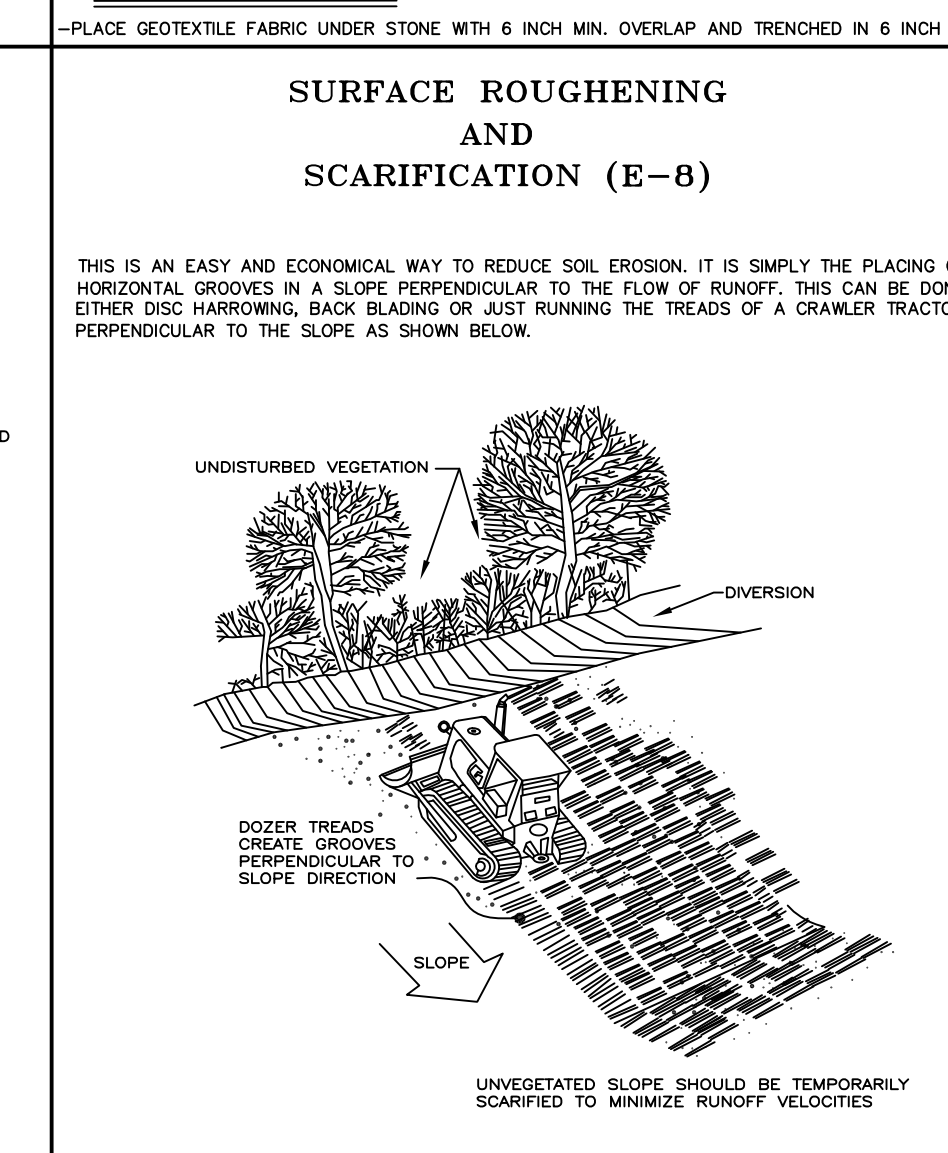
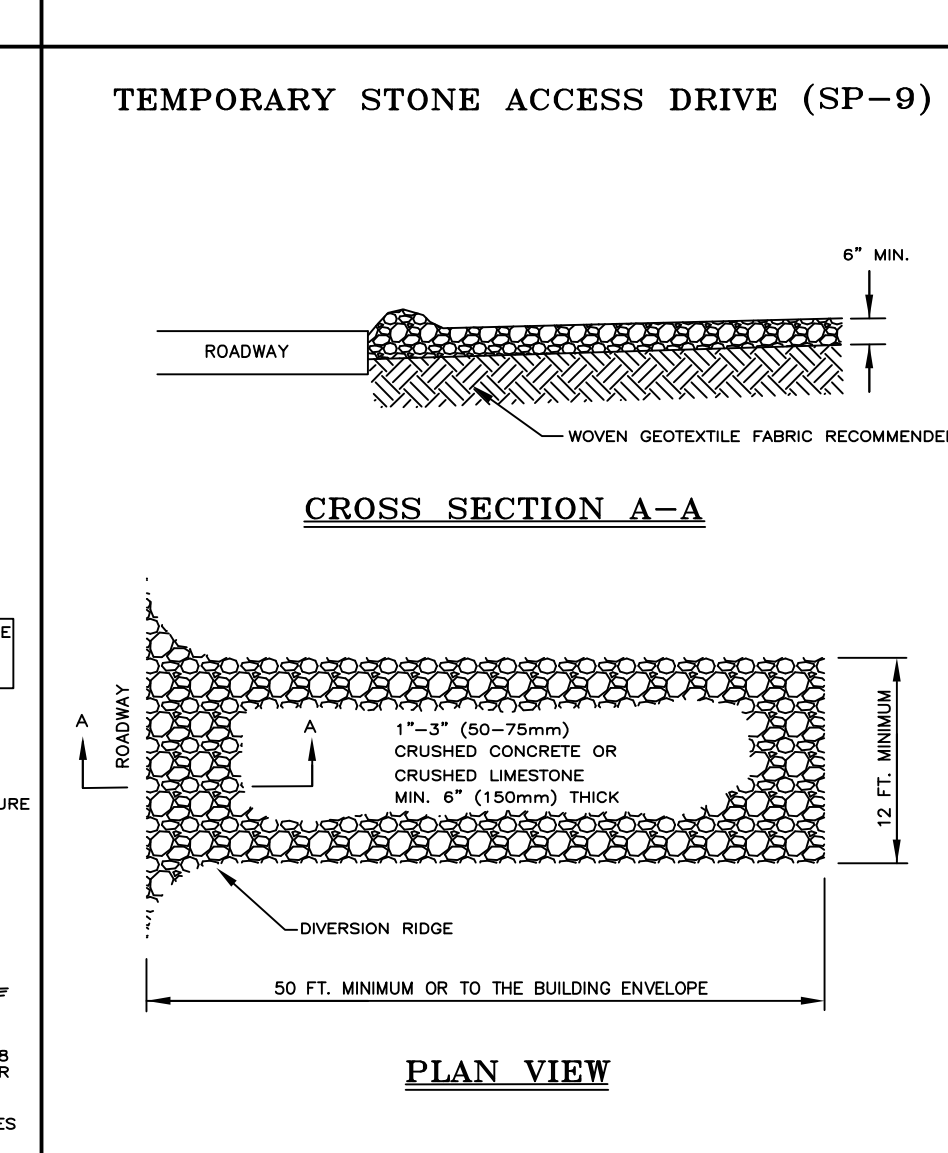
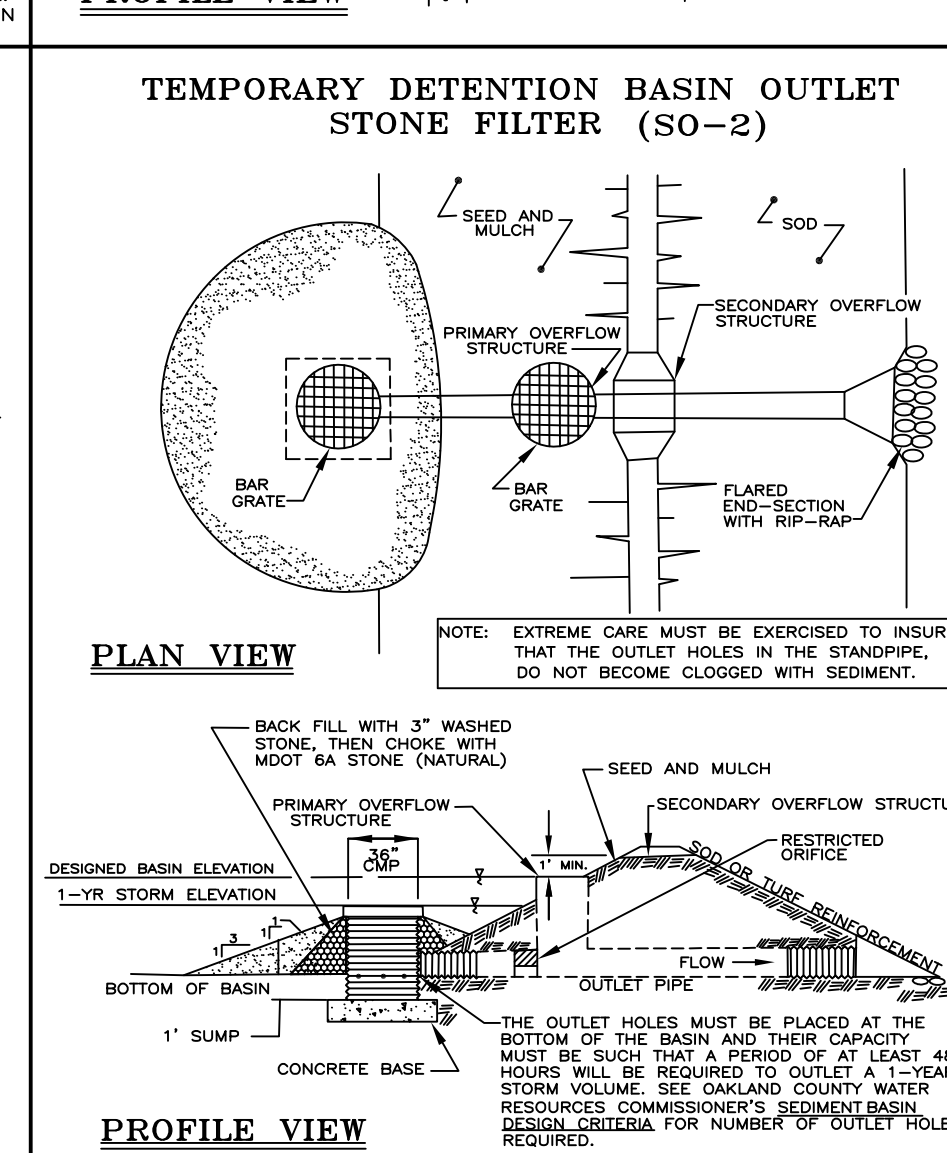
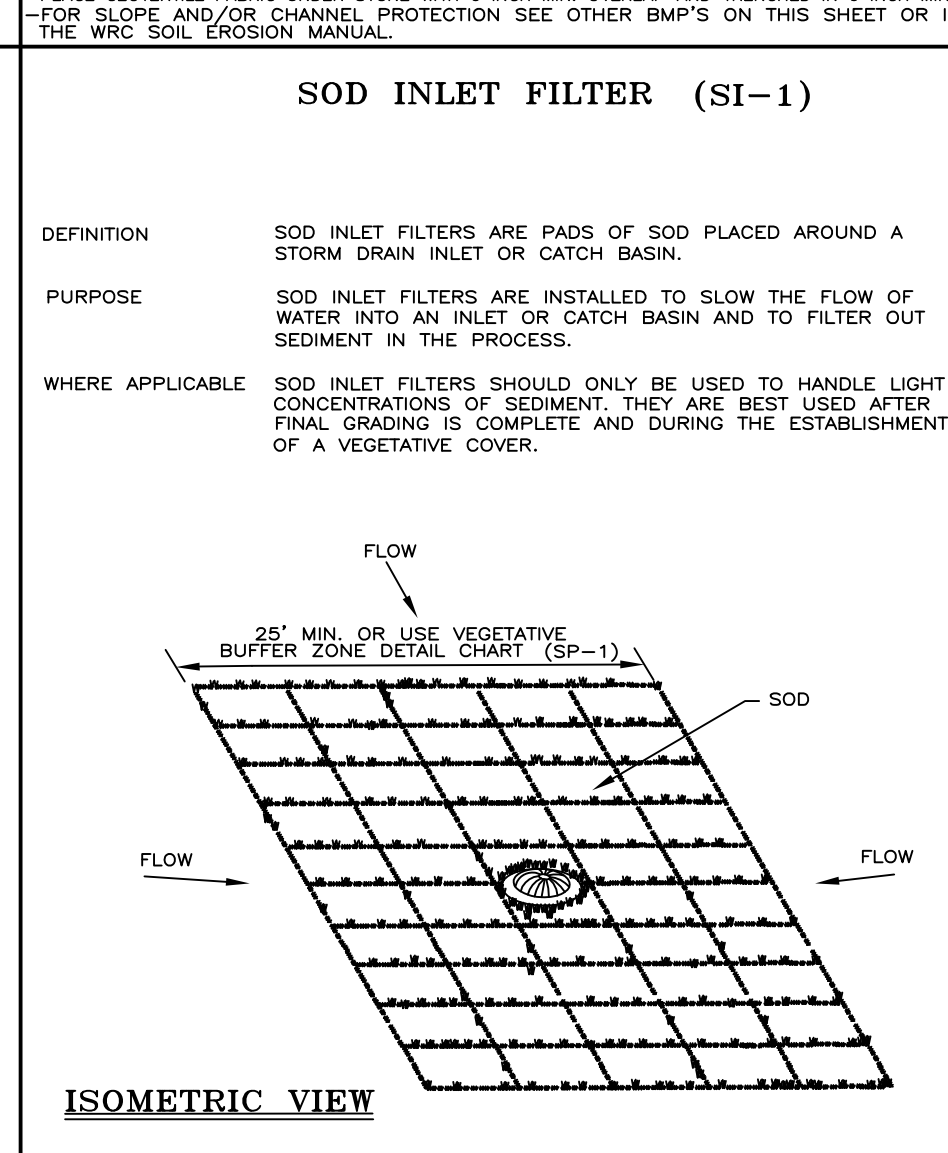
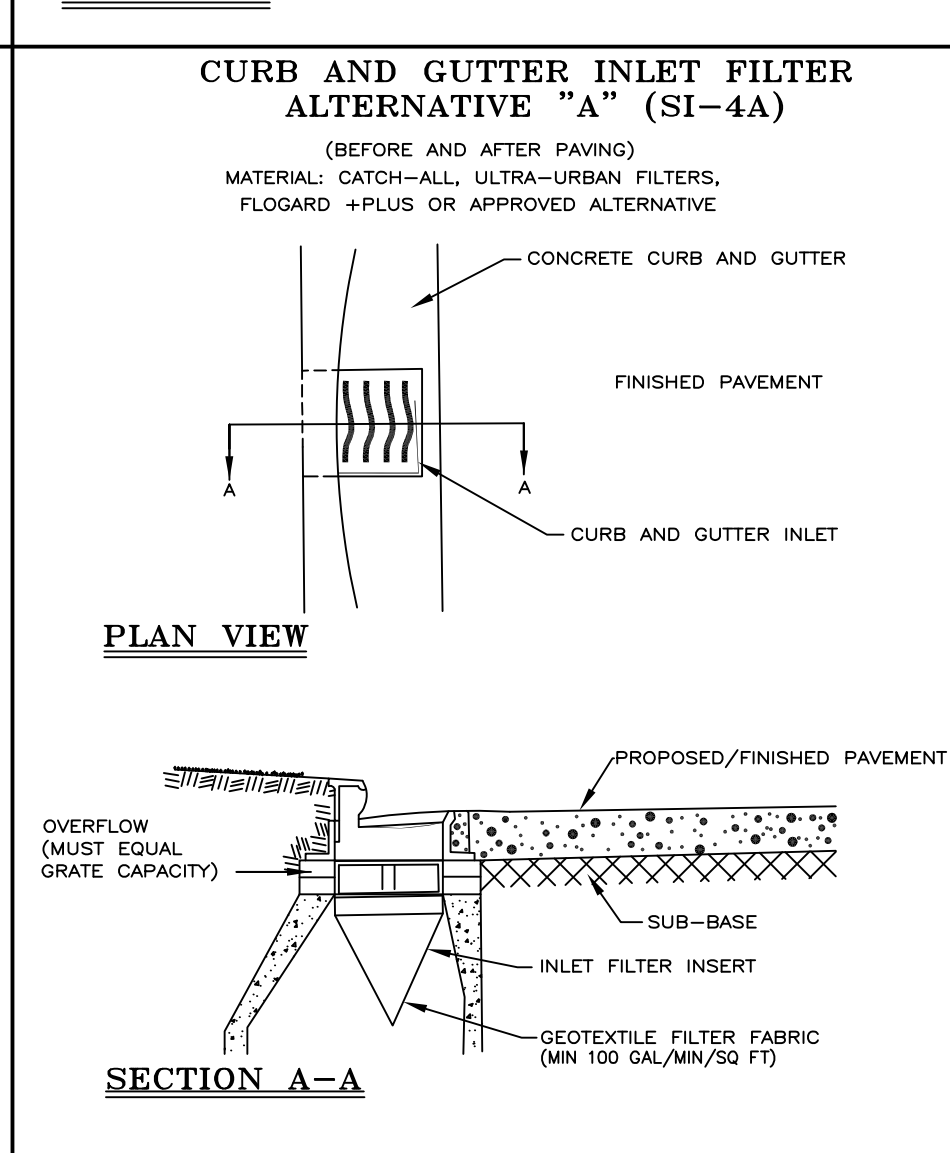
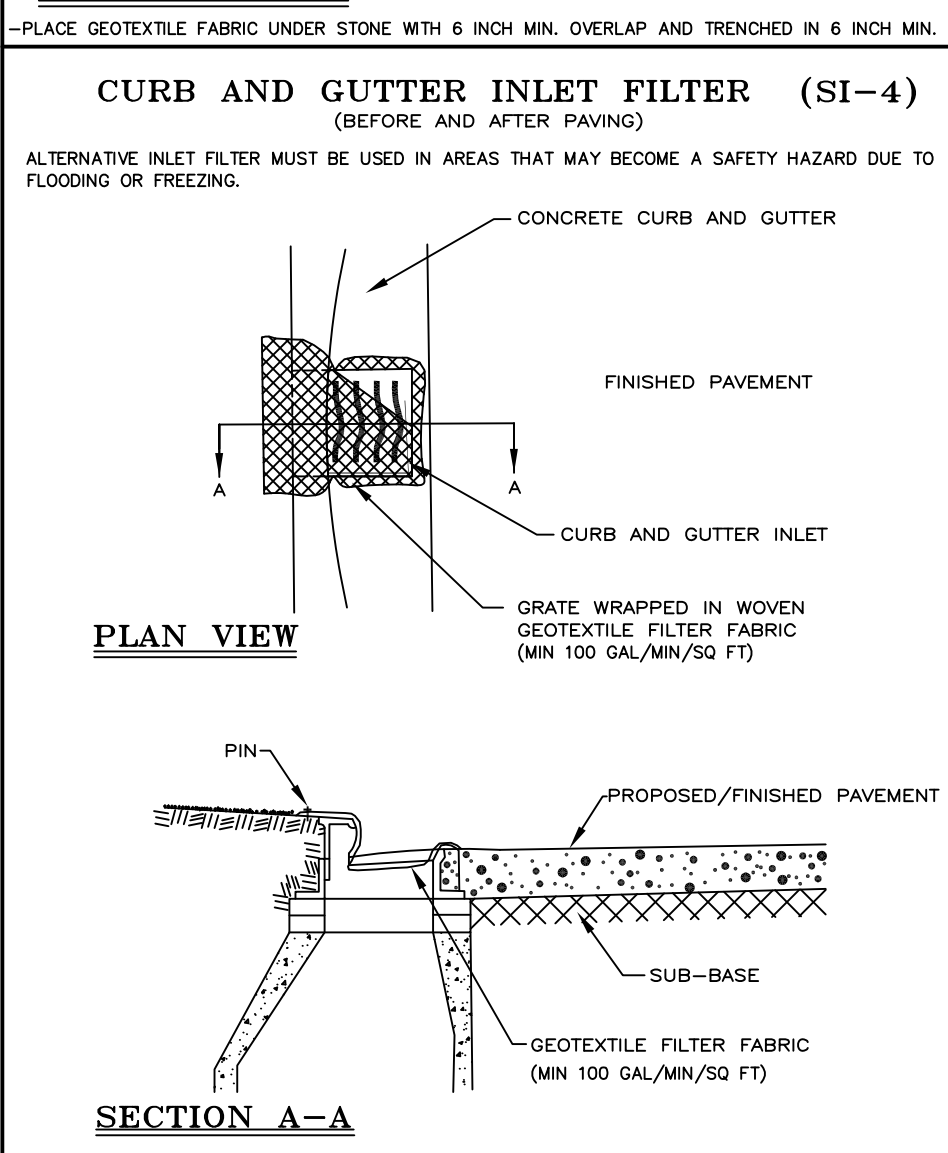
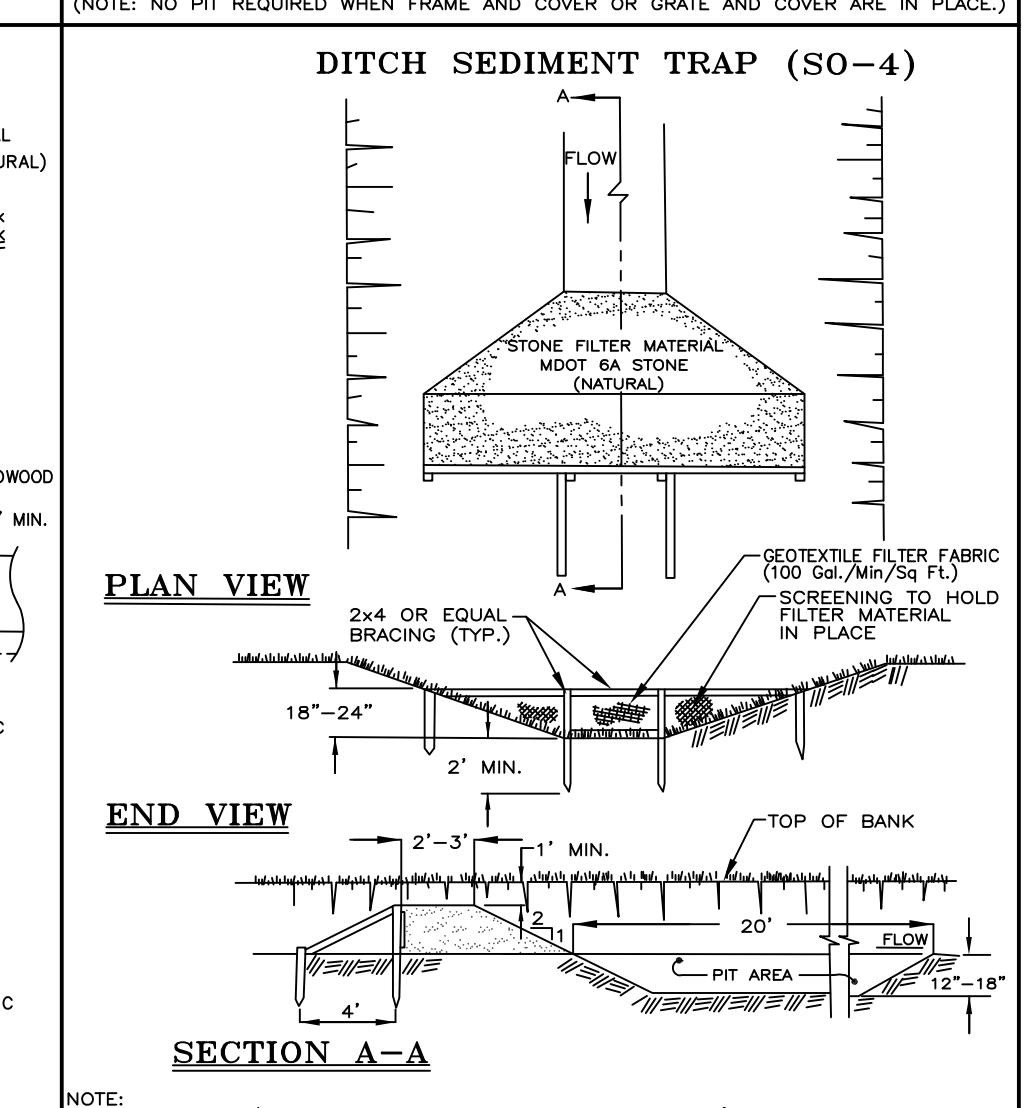
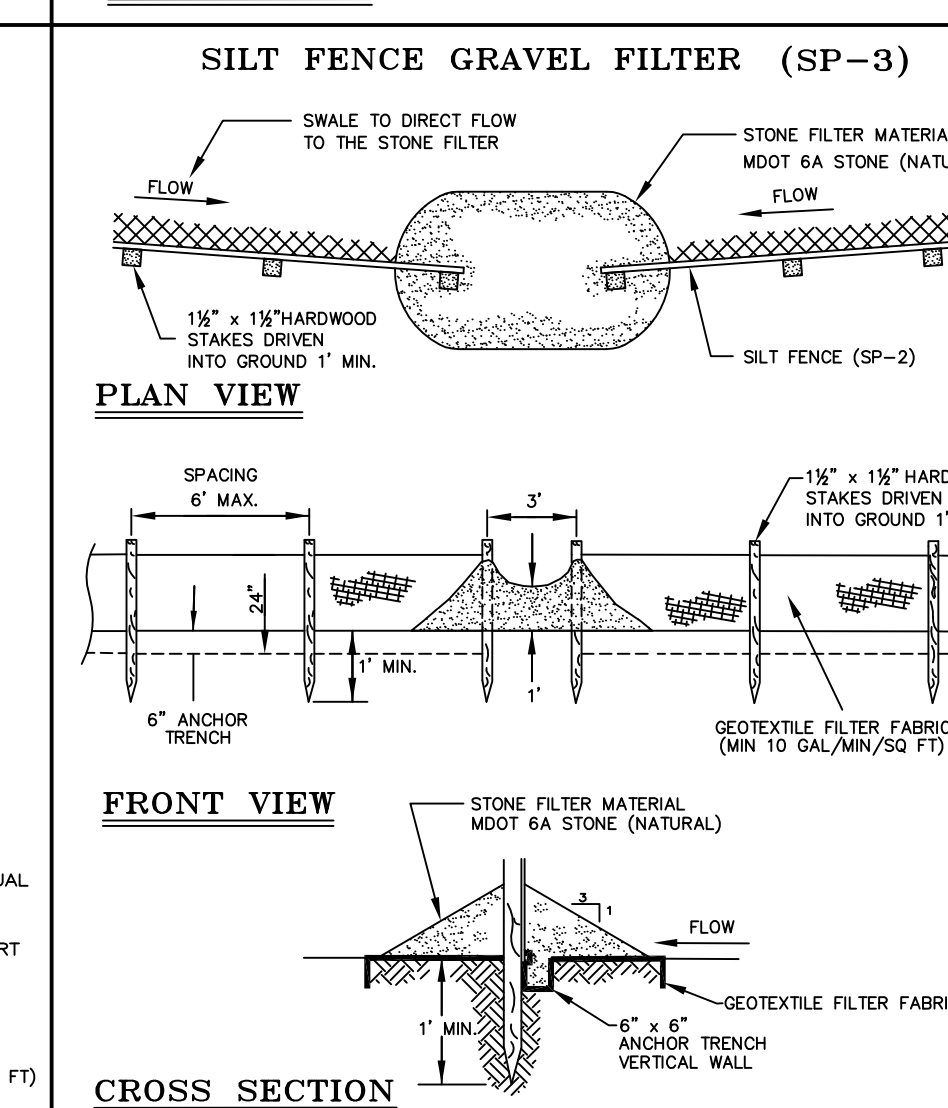
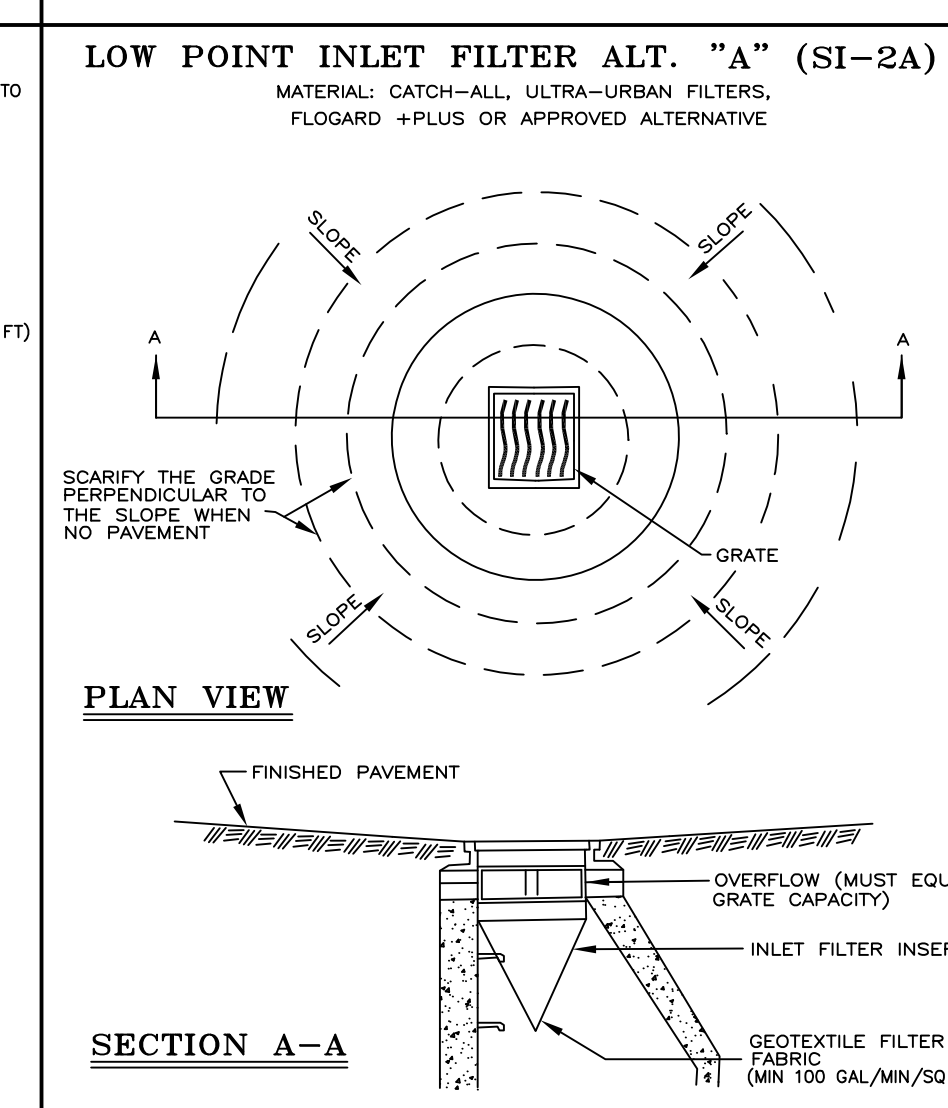
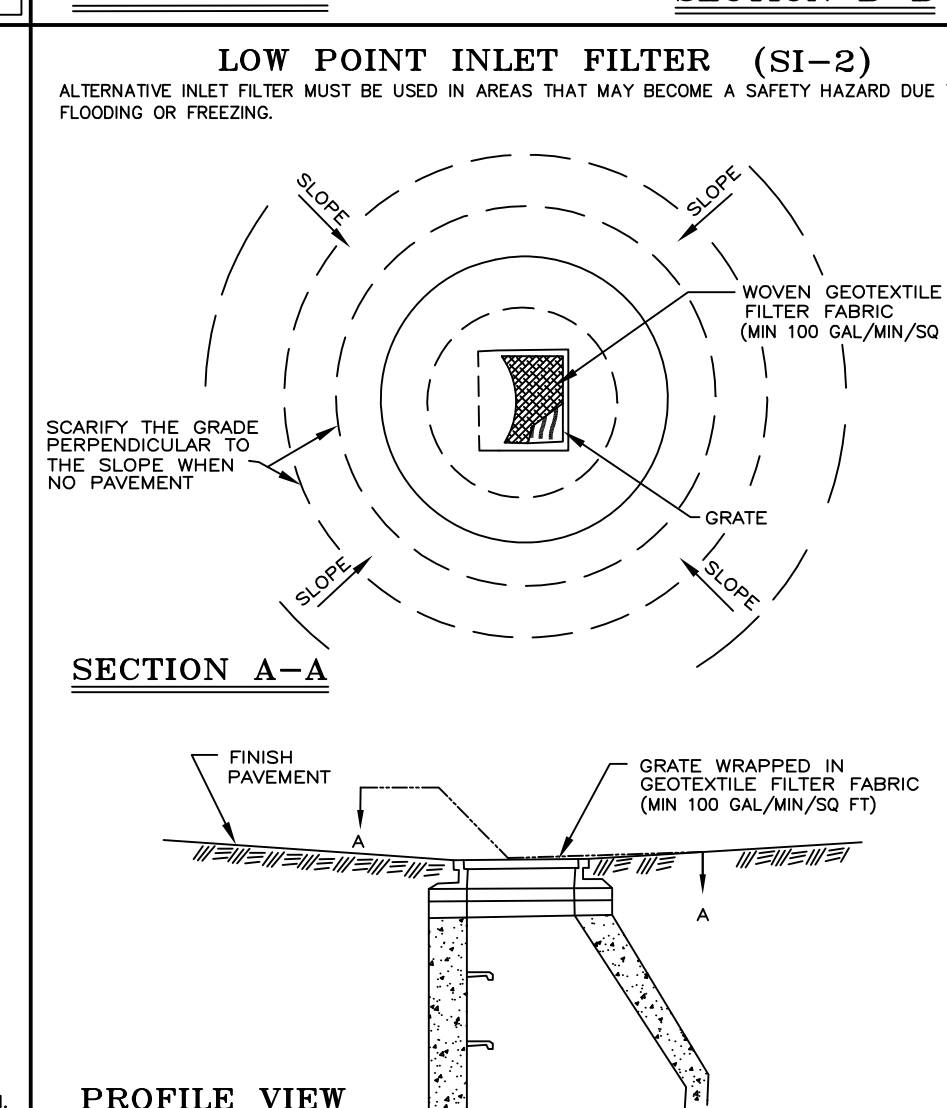
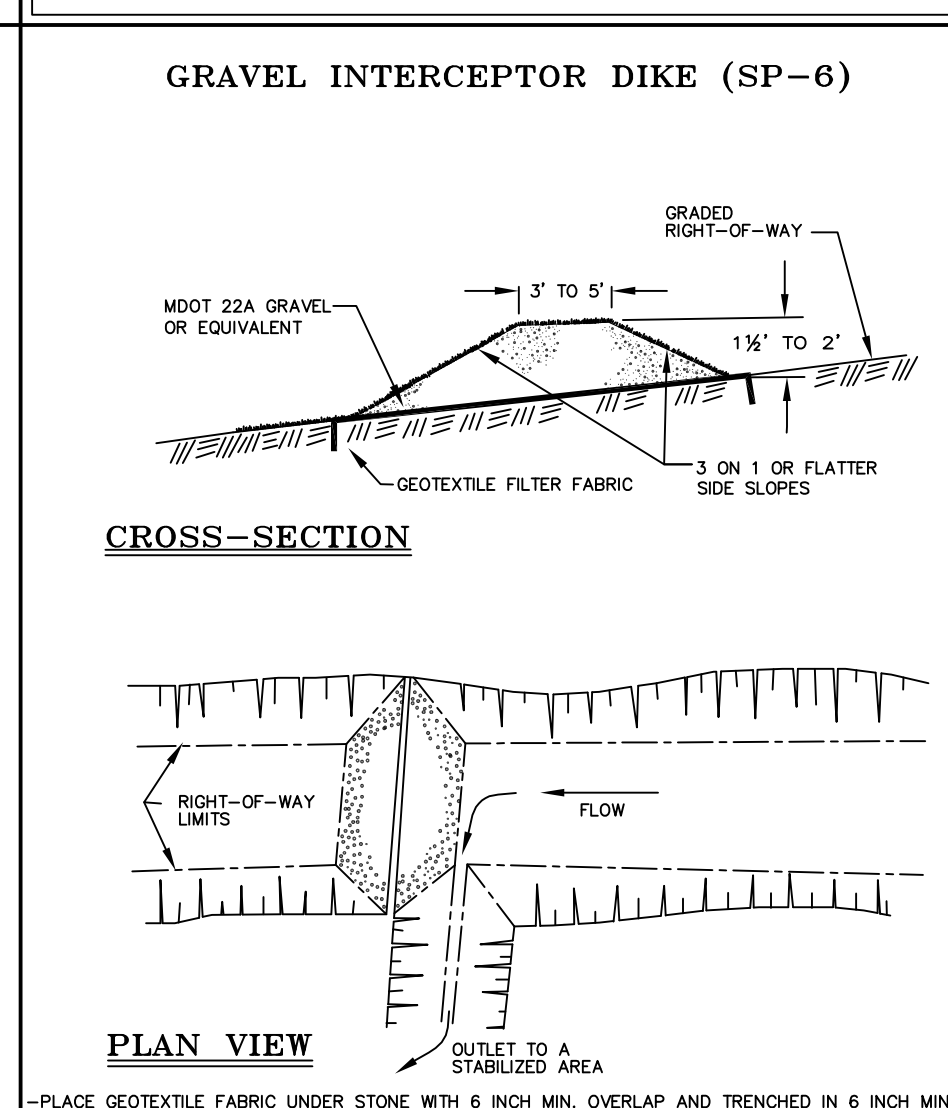
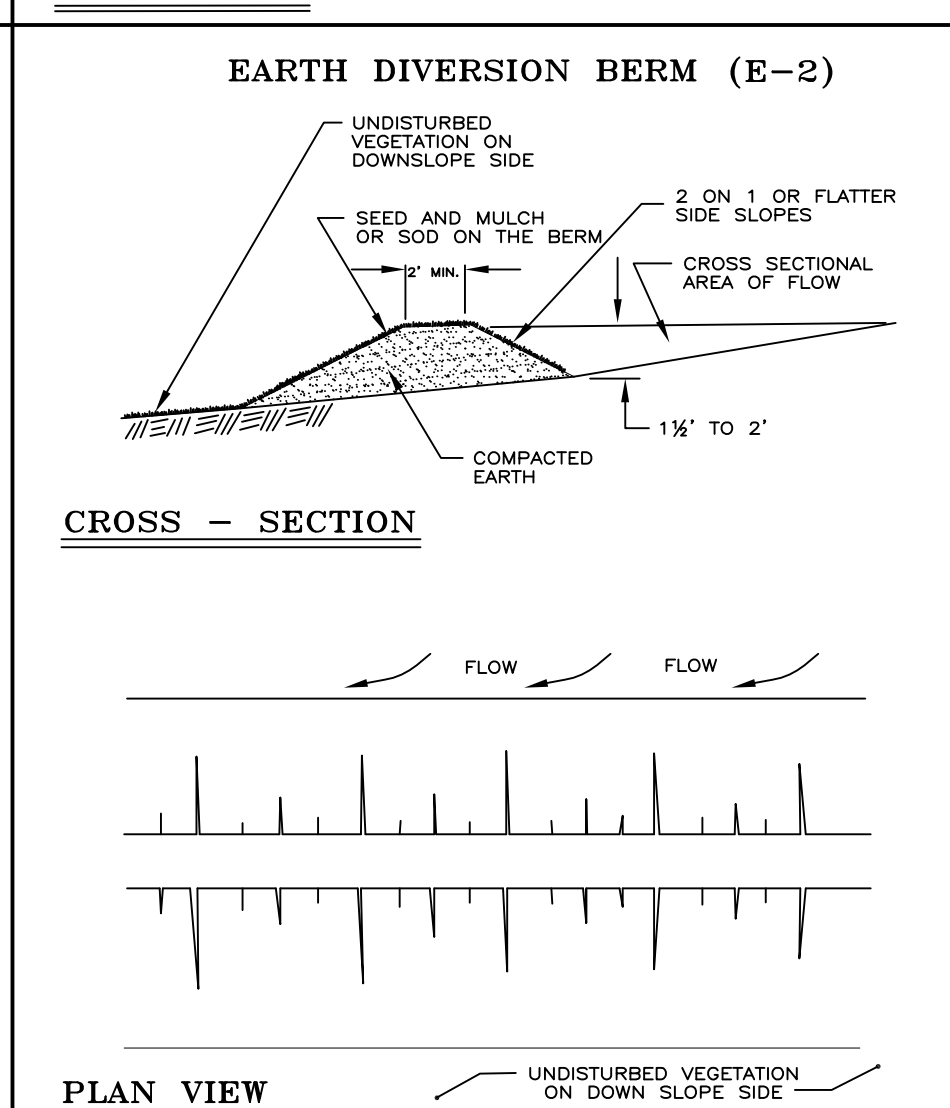
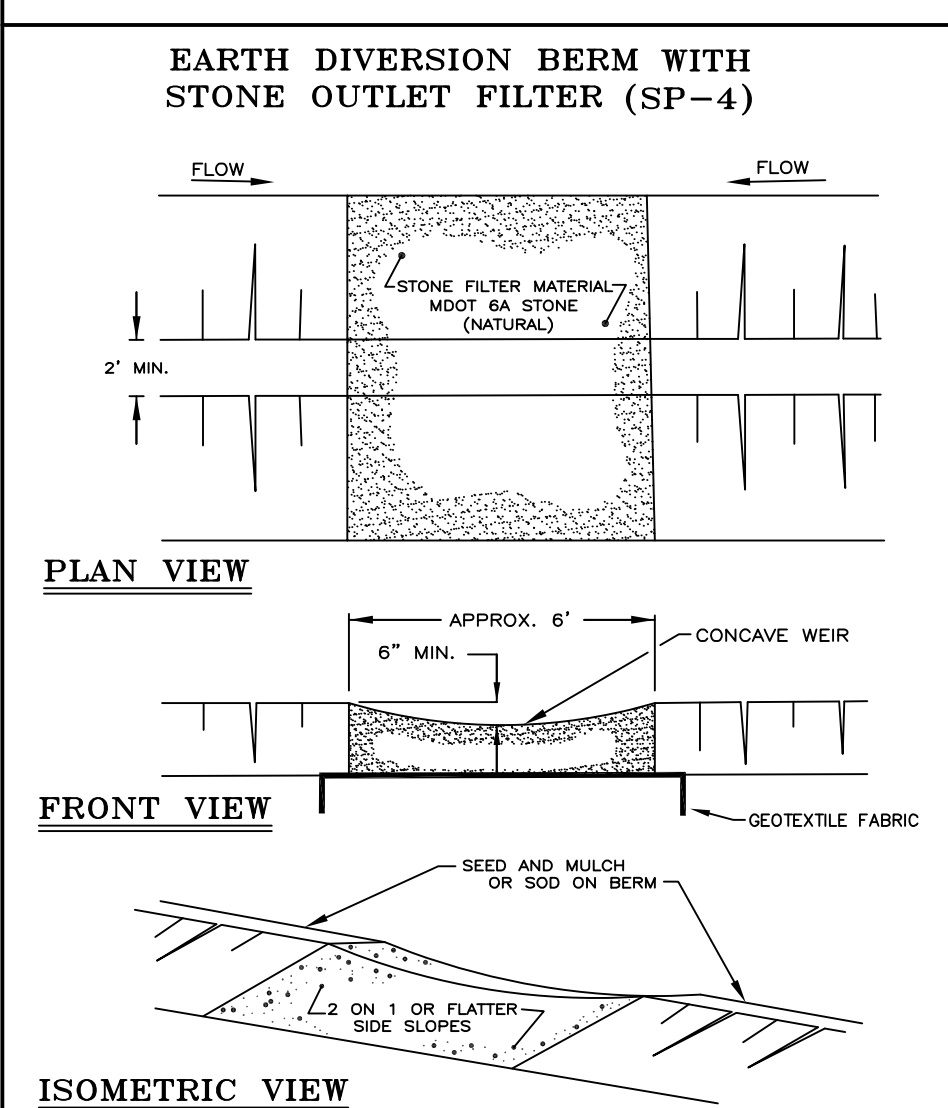
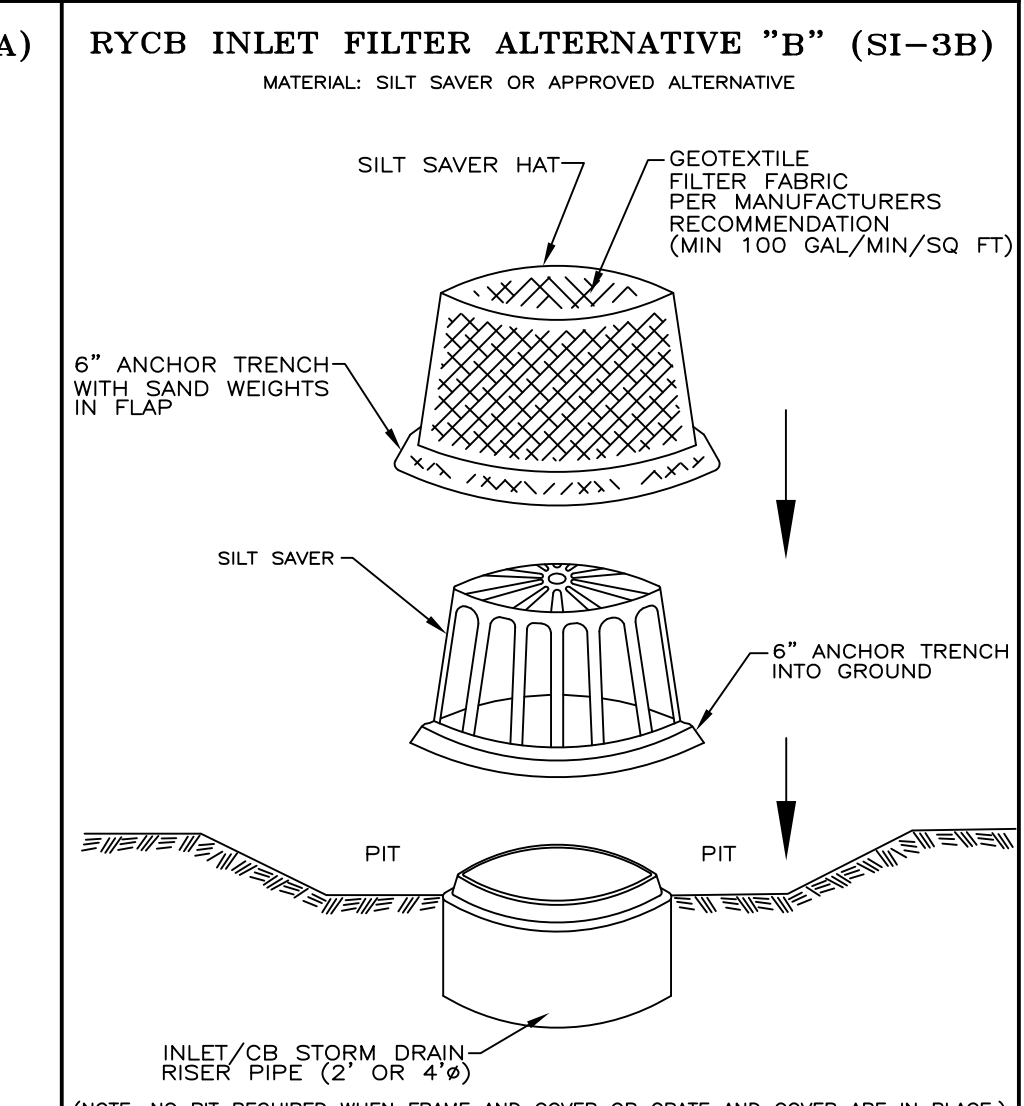
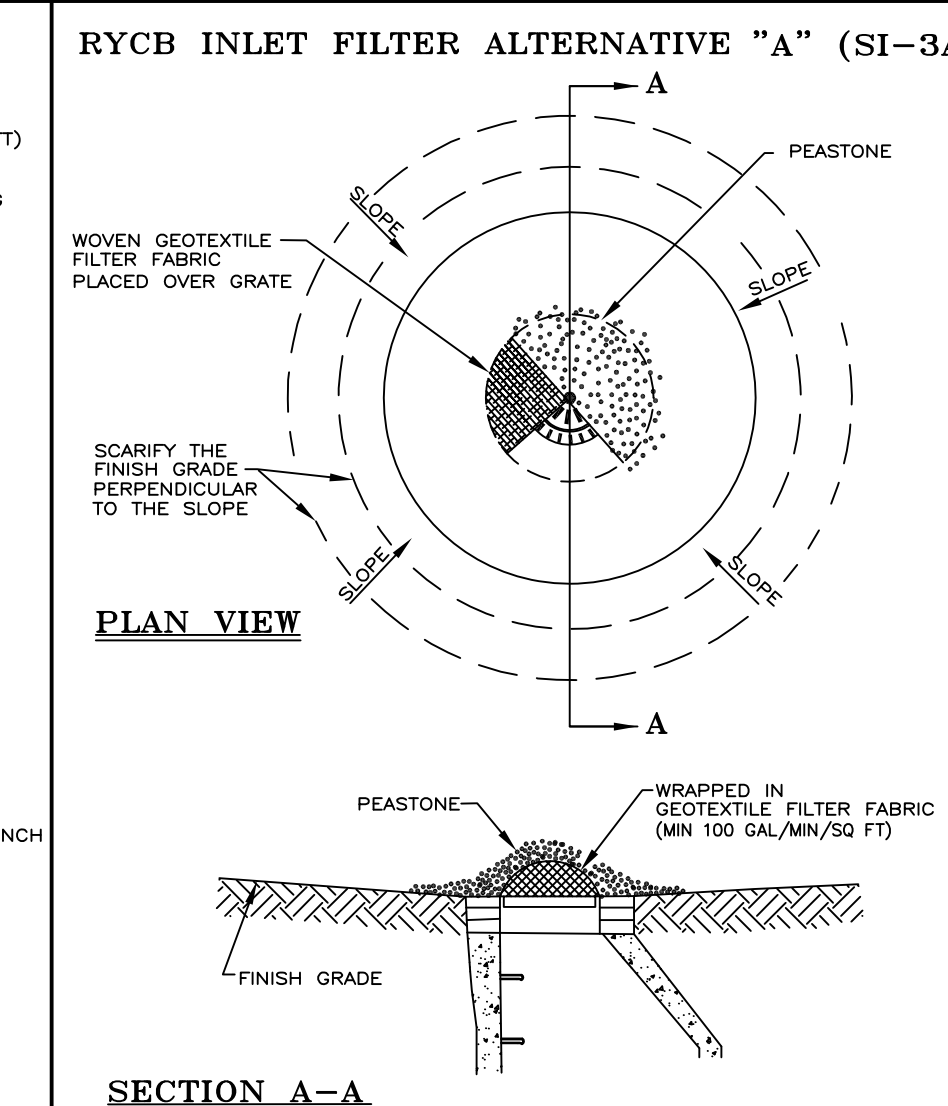
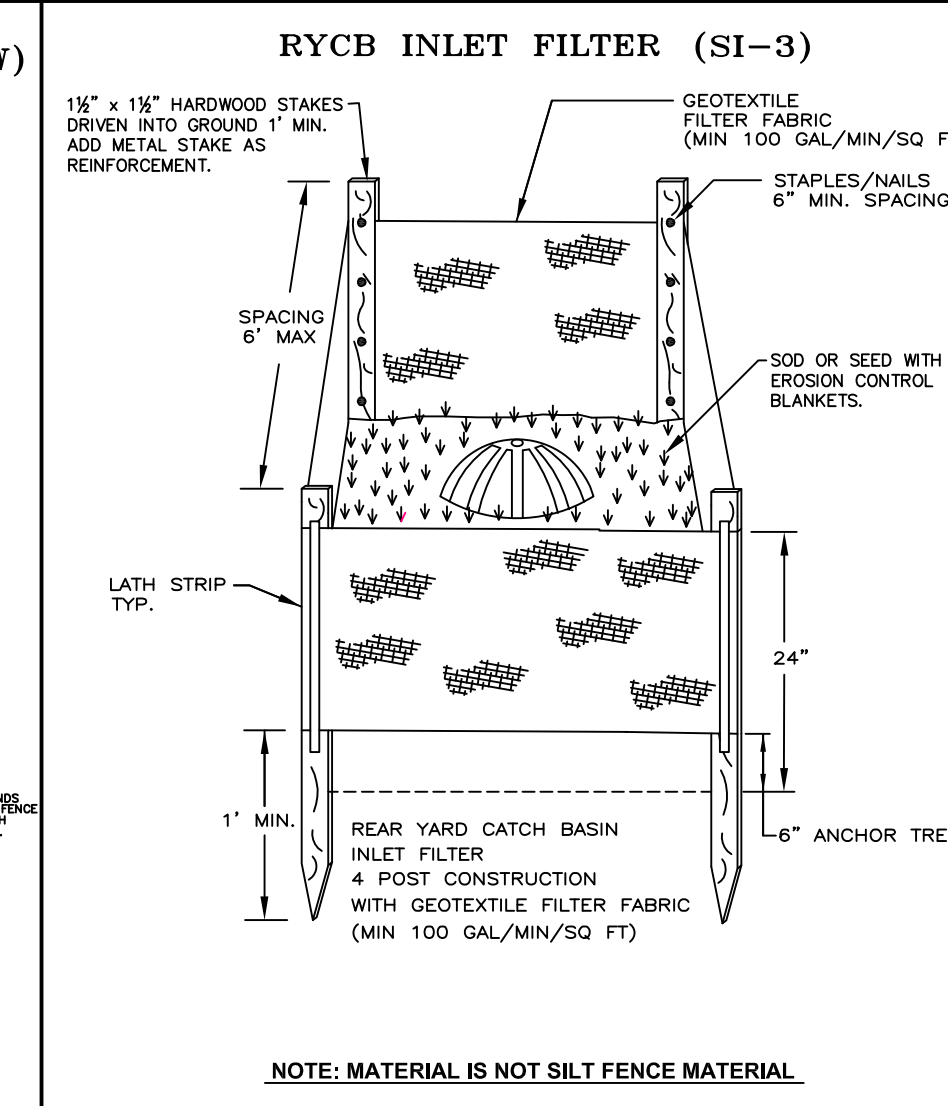
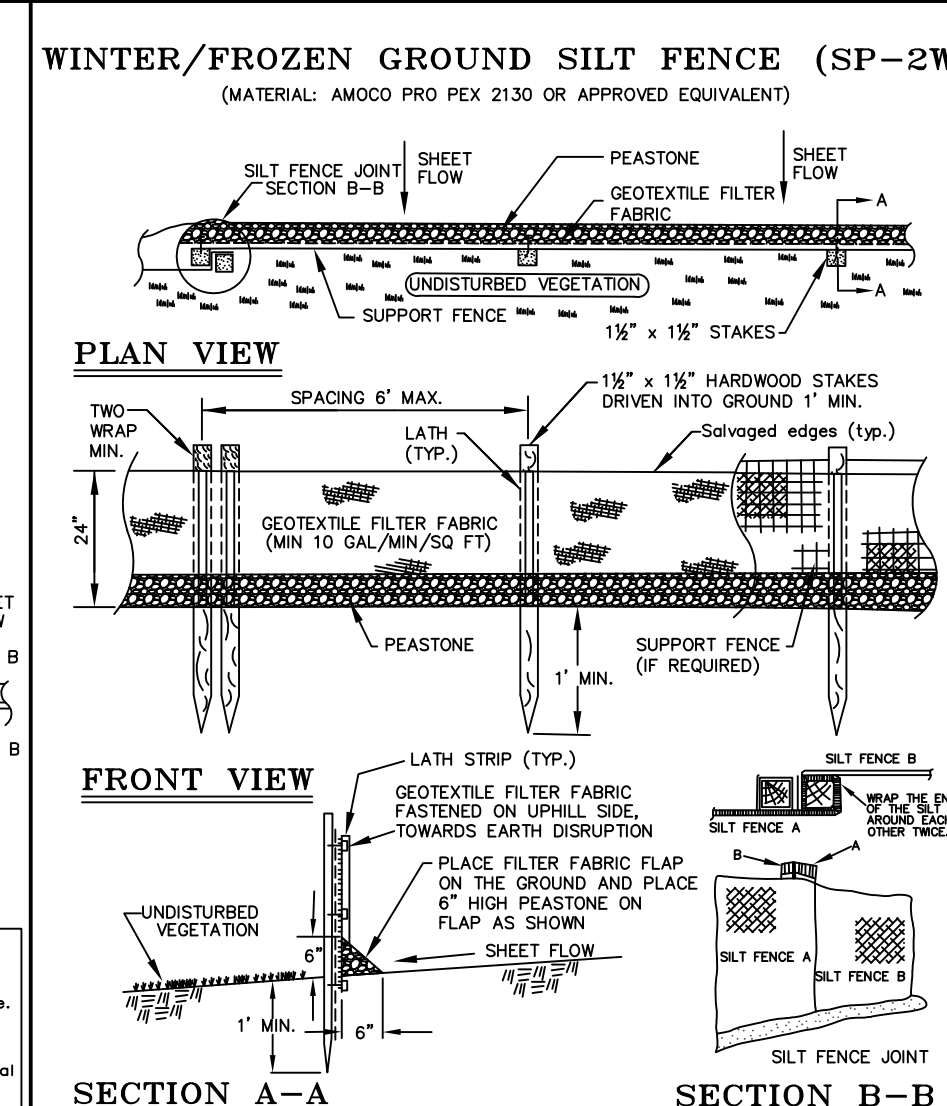
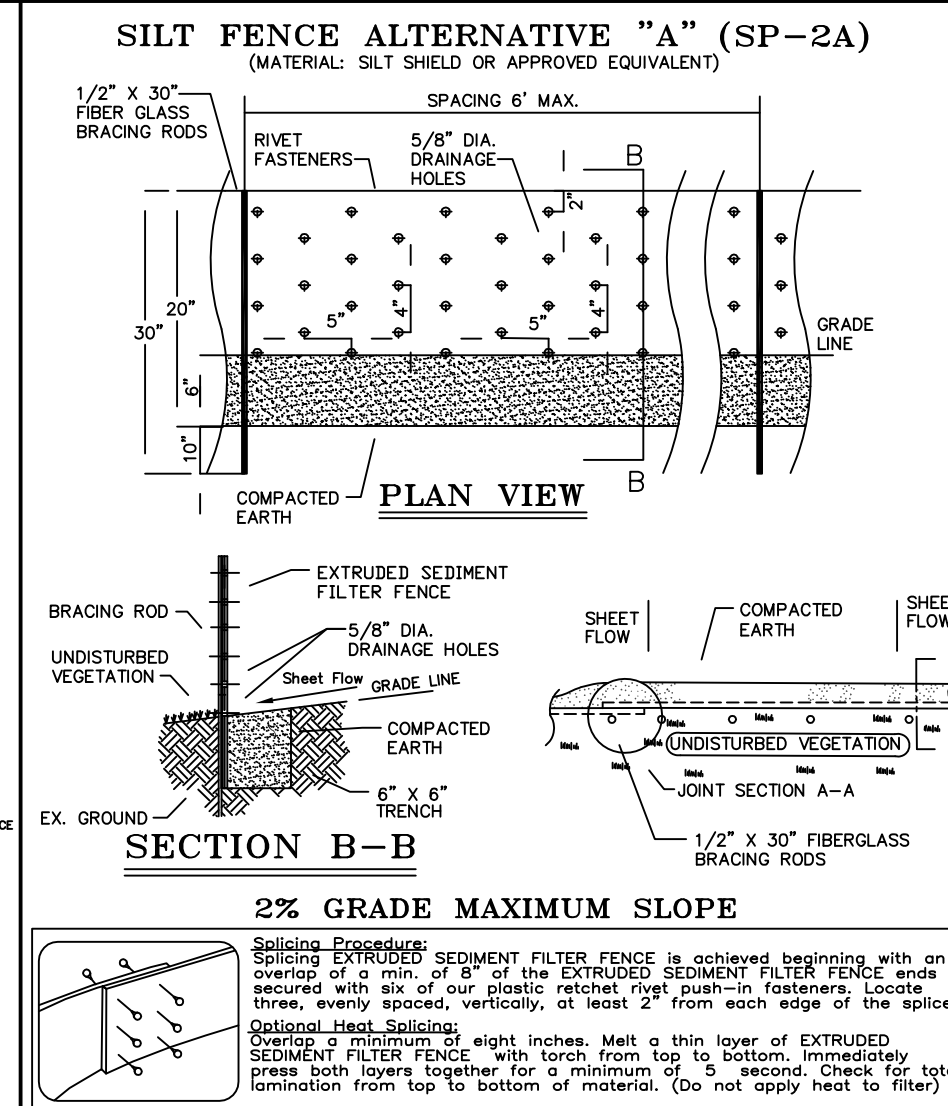
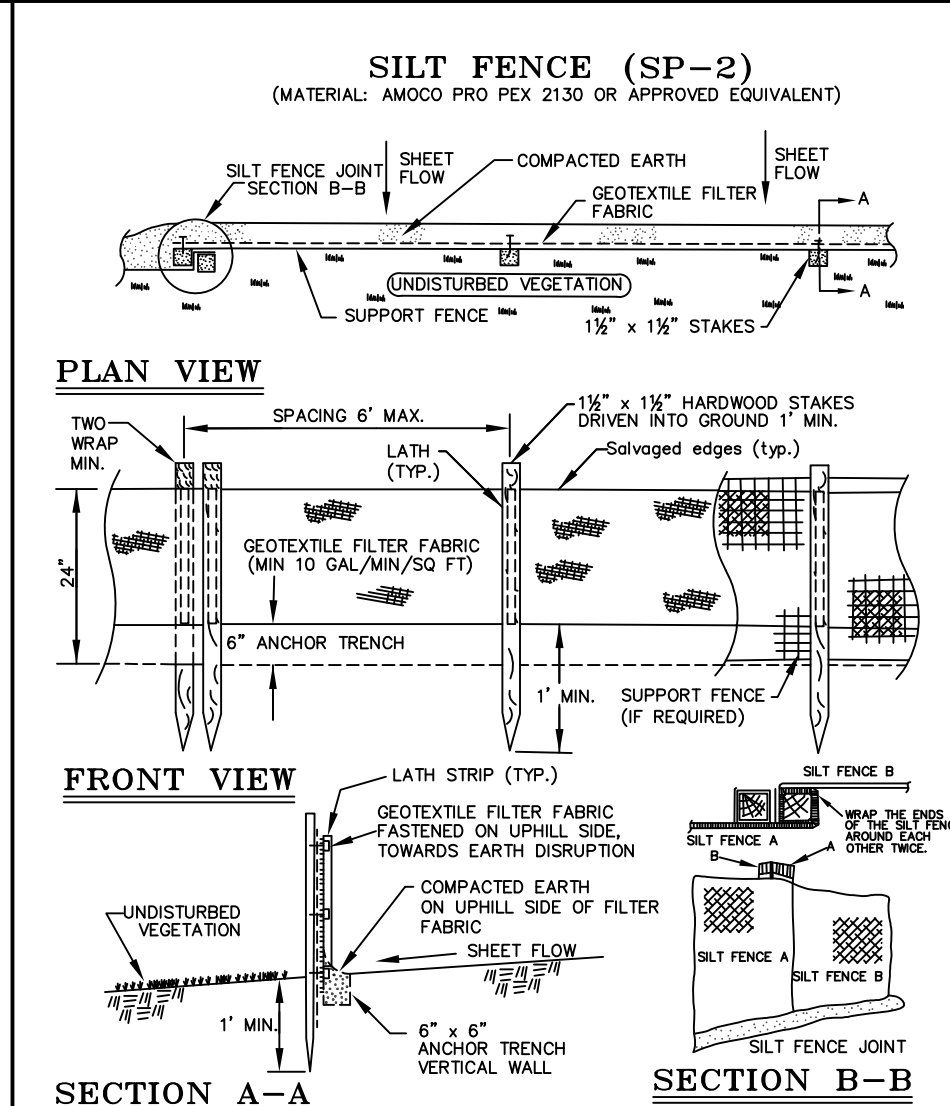
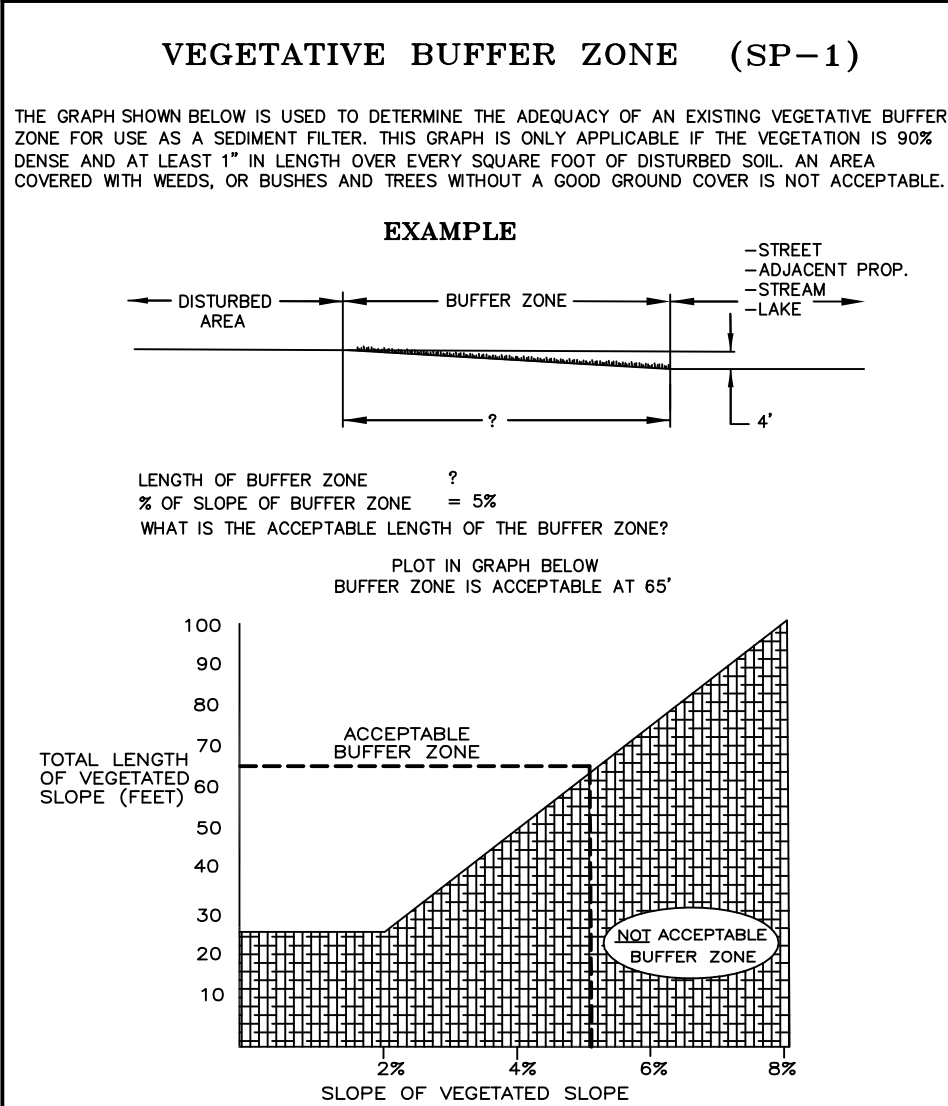
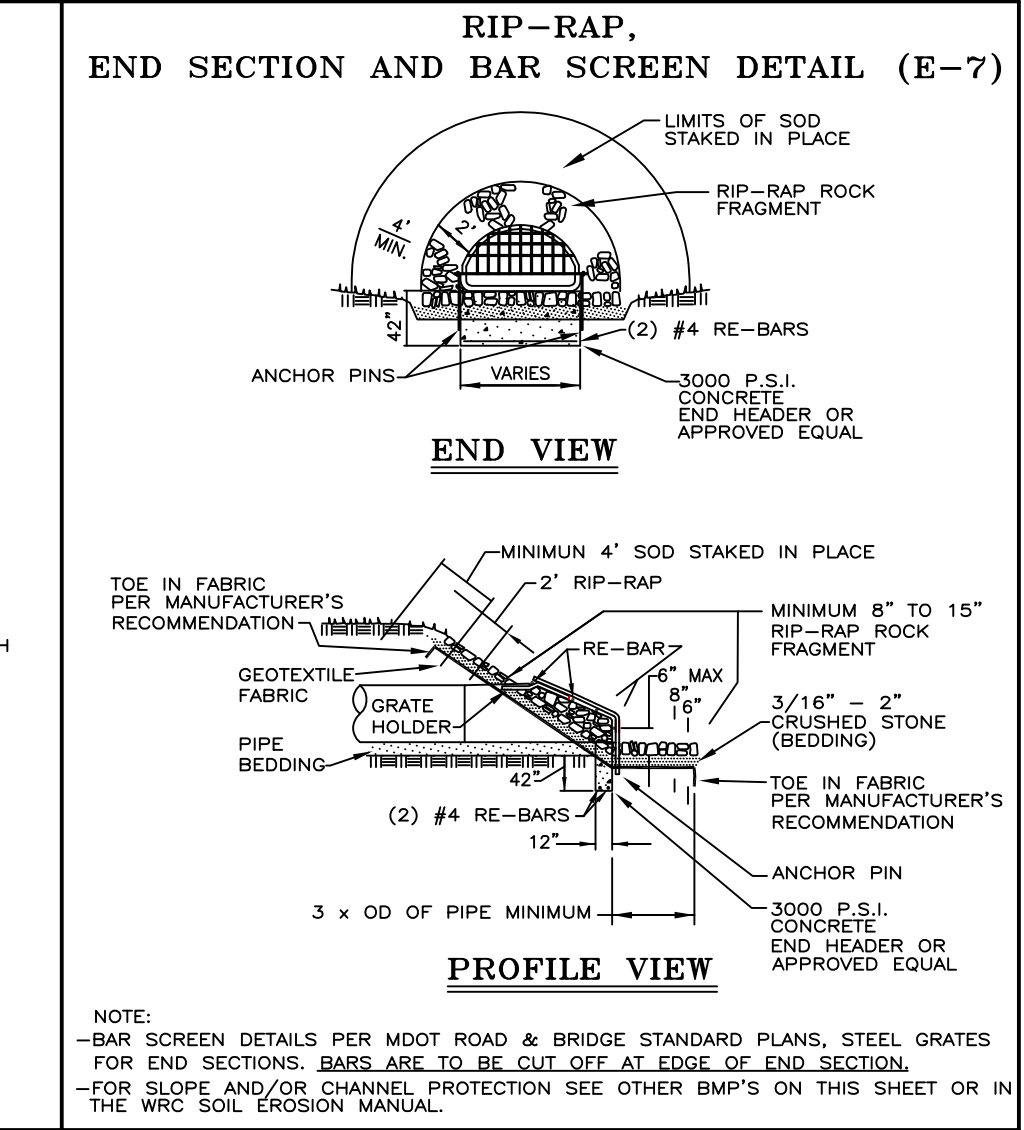
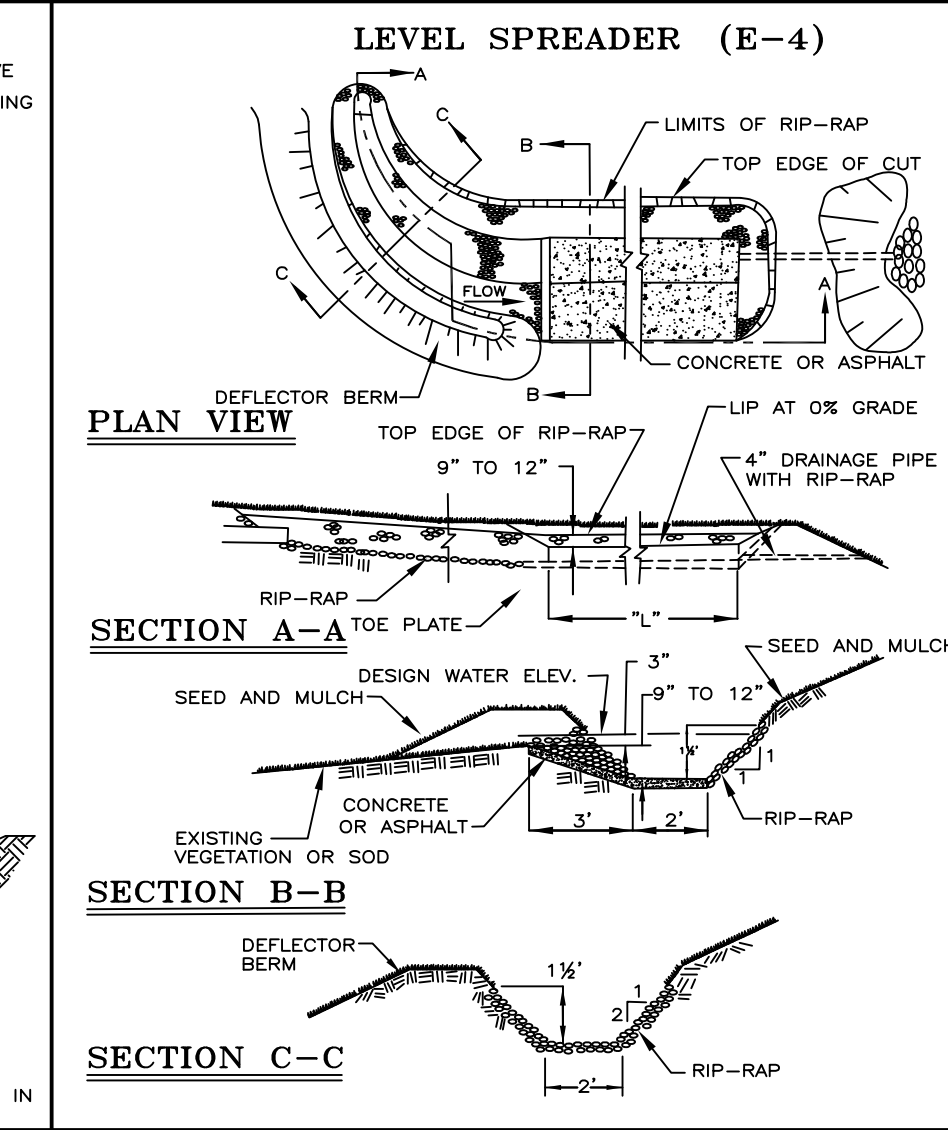
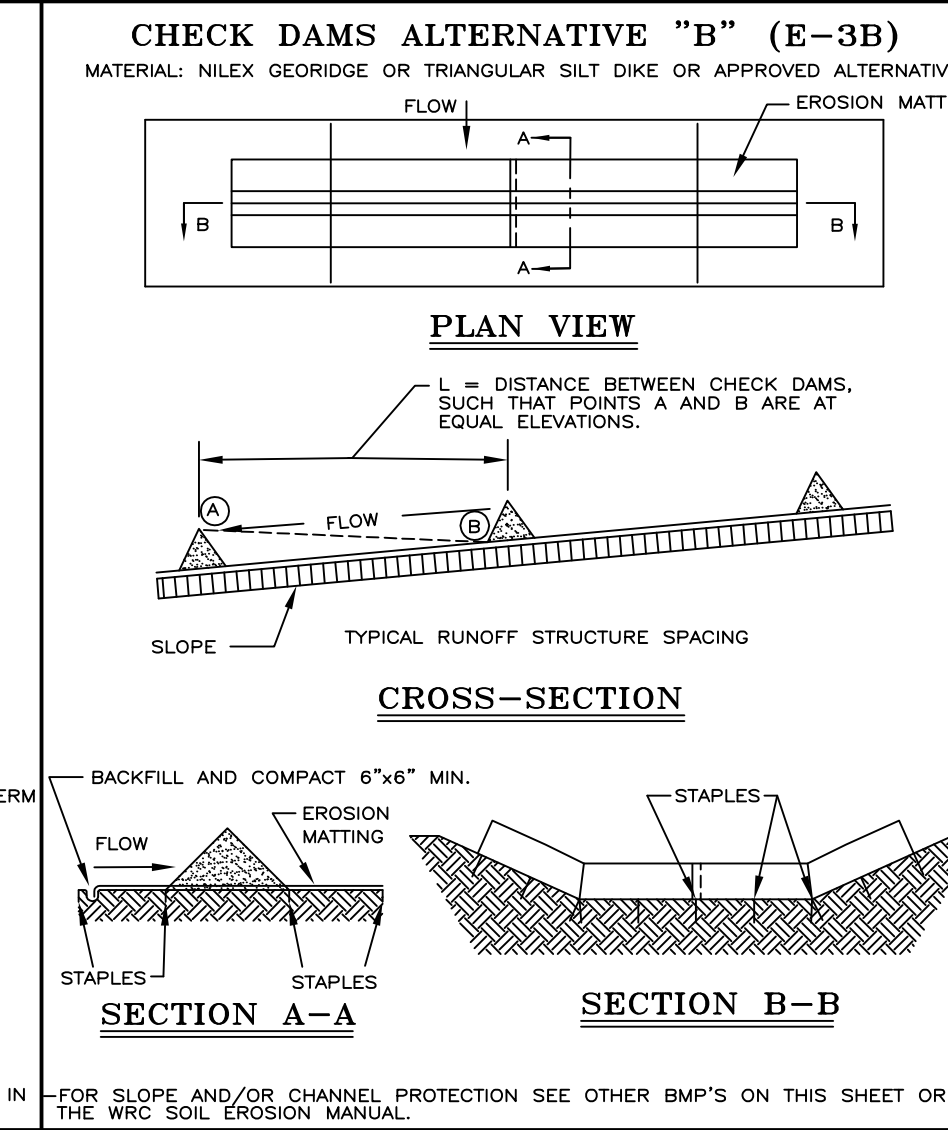
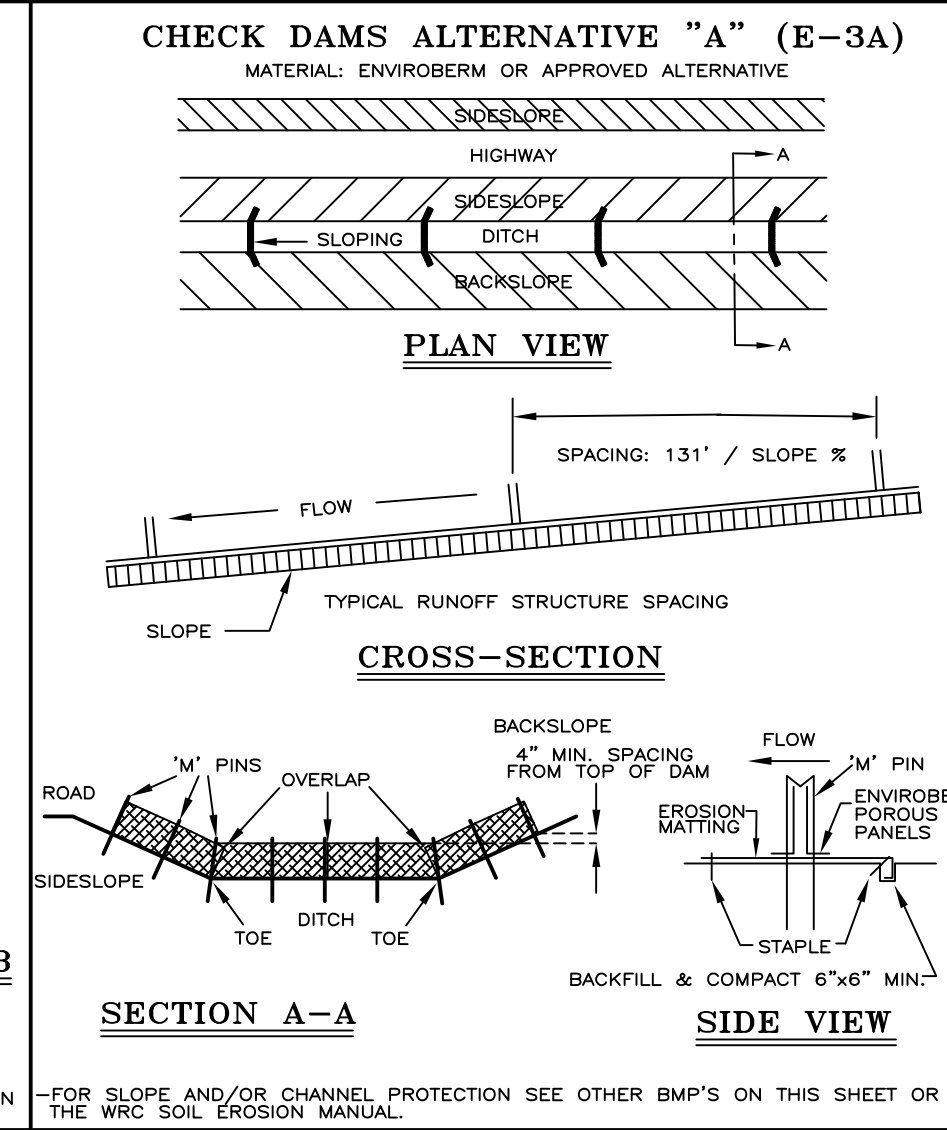
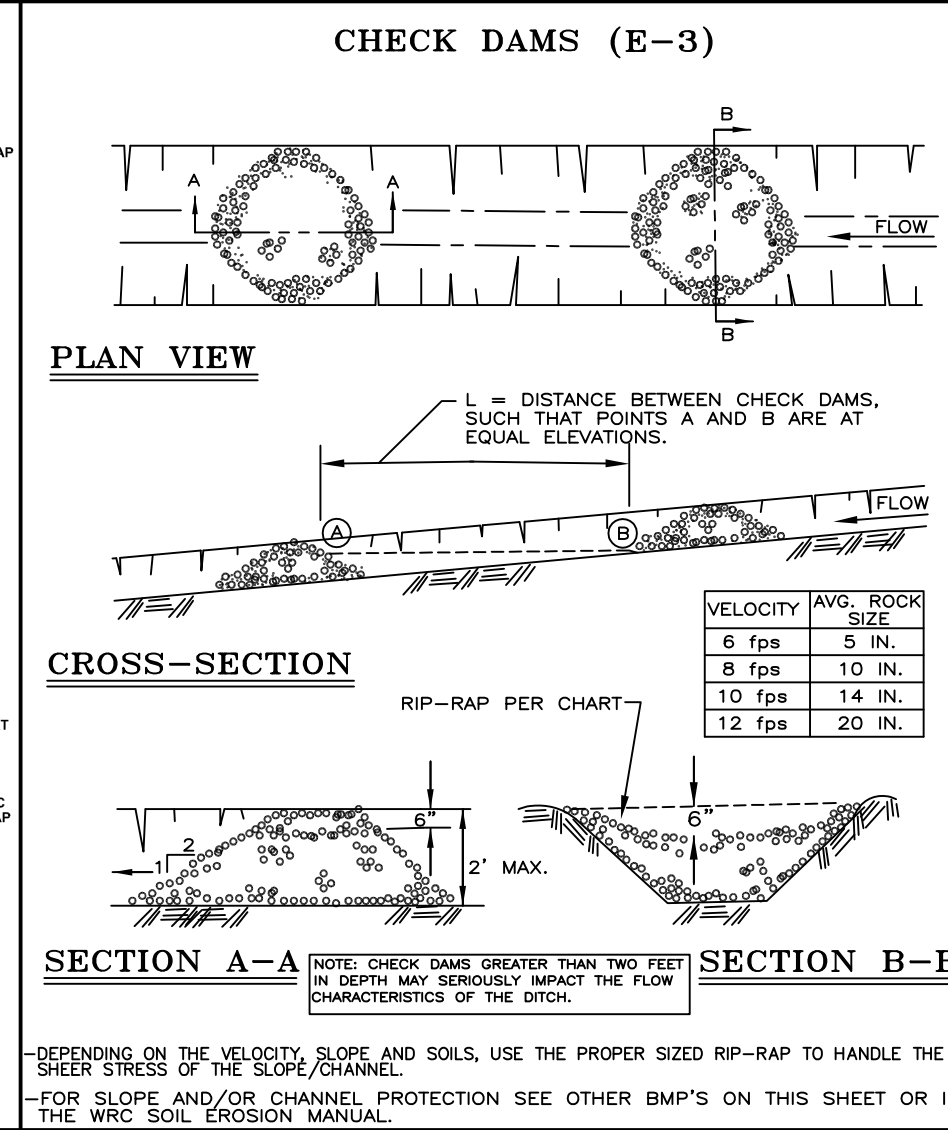
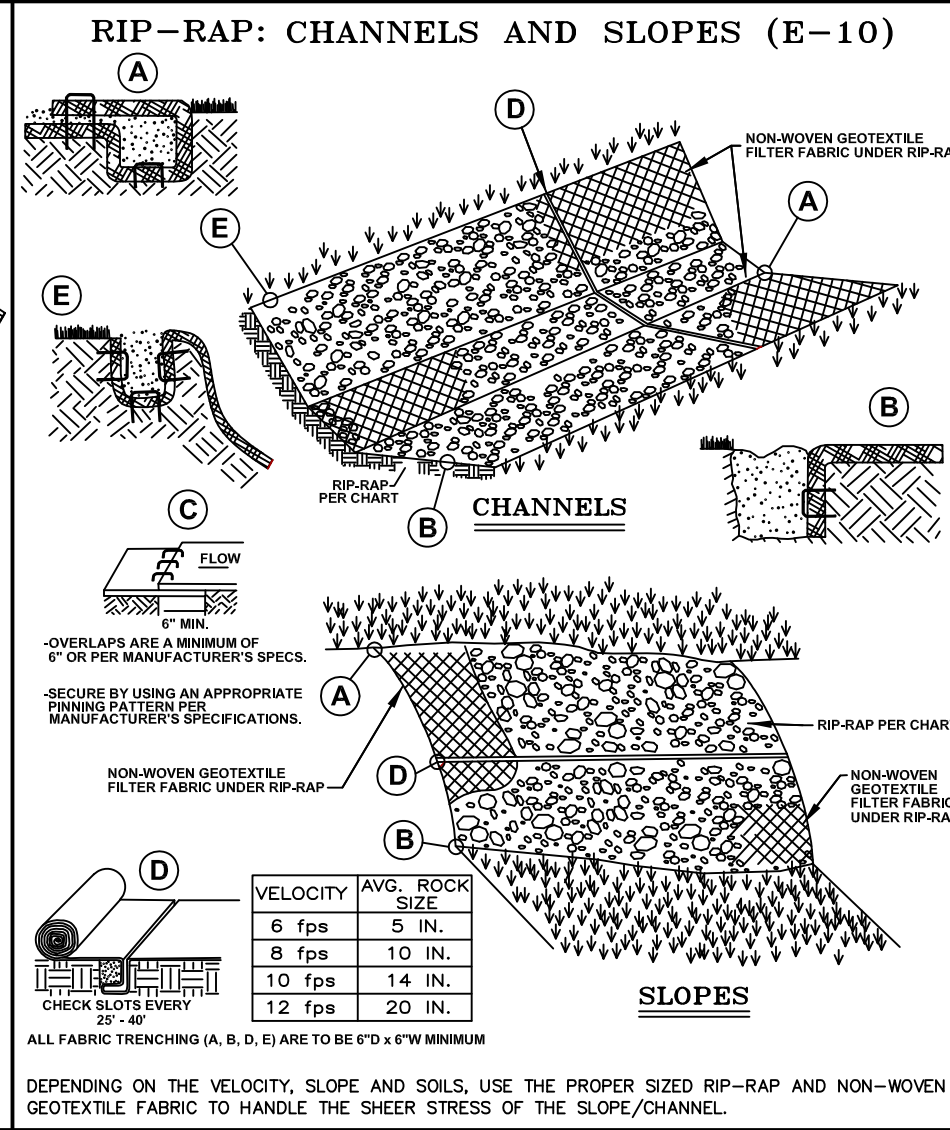
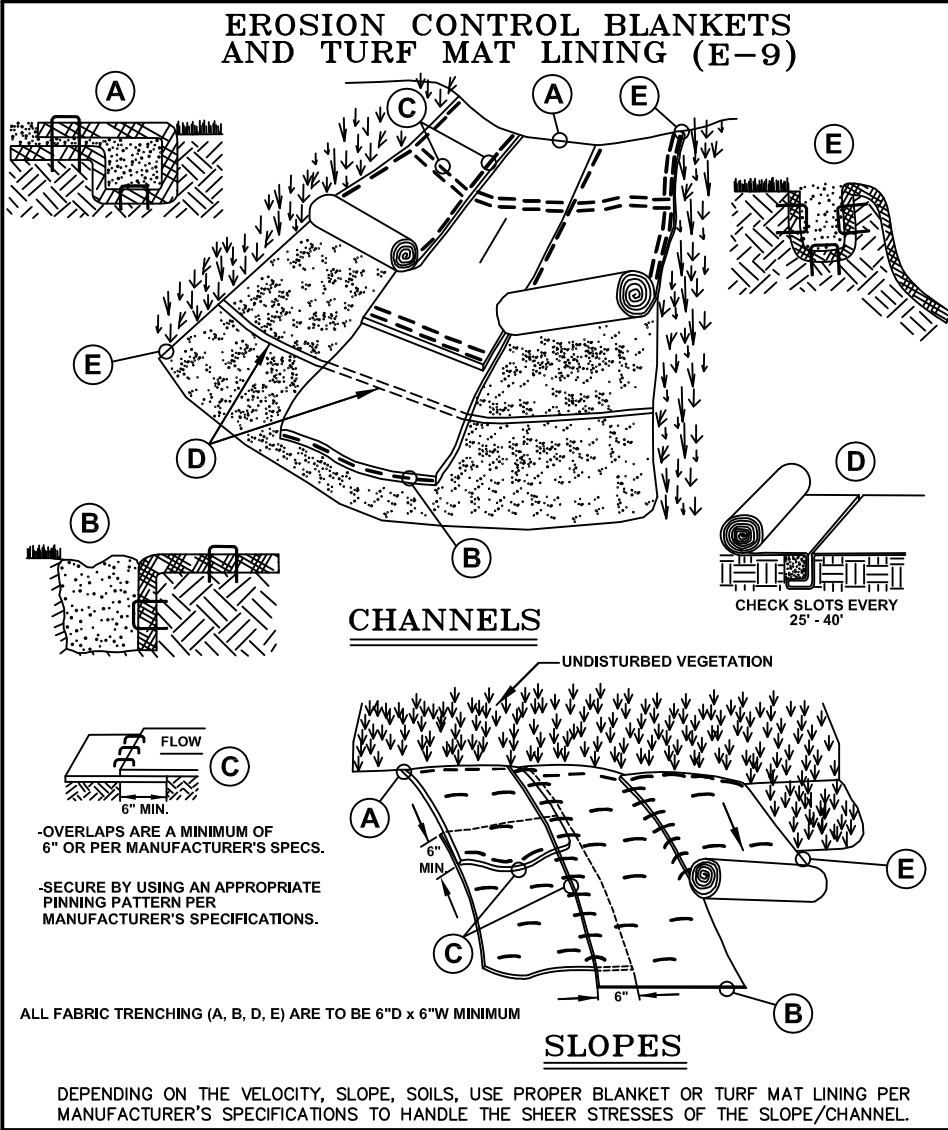


| REVISIONS | DATE | APPROVED BY CITY COUNCIL, DATE: JULY 21, 2008 | NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION | City of Rochester Hills 1000 Rochester Hills Drive, Rochester Hills, Michigan 48309 | | WATER MAIN STANDARD DETAILS | | NOT TO SCALE | DATE: 7/21/2008 |
|-----------|------|---|---|--|--|--------------------------------|--|--------------|-----------------|
| | | PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES | | | | | | SHEET 2 OF 2 | |



| PIPE SIZE X TAP SIZE | A | B | C | D | E |
|----------------------------|------|--------|----|----------|-----|
| 16" X 4" | 1/4" | 7/8" | 6 | 14-1/16" | 24" |
| 16" X 6" | 1/4" | 1-1/8" | 6 | 14-5/16" | 24" |
| 16" X 8" | 1/4" | 1-1/8" | 6 | 14-5/16" | 24" |
| 16" X 10" | 1/4" | 1-3/8" | 7 | 14-9/16" | 28" |
| 16" X 12" | 1/4" | 1-3/8" | 8 | 14-9/16" | 32" |
| 20" X 4" | 1/4" | 7/8" | 6 | 16-1/2" | 24" |
| 20" X 6" | 1/4" | 1-1/8" | 6 | 16-1/2" | 24" |
| 20" X 8" | 1/4" | 1-1/8" | 6 | 16-1/2" | 24" |
| 20" X 10" | 1/4" | 1-3/8" | 7 | 17" | 28" |
| 20" X 12" | 1/4" | 1-3/8" | 8 | 17" | 32" |
| 24" X 4" | 1/4" | 7/8" | 6 | 18-3/4" | 24" |
| 24" X 6" | 1/4" | 1-1/8" | 6 | 19" | 24" |
| 24" X 8" | 1/4" | 1-1/8" | 6 | 19" | 24" |
| 24" X 10" | 1/4" | 1-3/8" | 7 | 19-1/4" | 28" |
| 24" X 12" | 1/4" | 1-3/8" | 8 | 19-1/4" | 32" |
| 30" X 4" | 1/4" | 7/8" | 6 | 22-1/8" | 24" |
| 30" X 6" | 1/4" | 1-1/8" | 6 | 22-3/8" | 24" |
| 30" X 8" | 1/4" | 1-1/8" | 6 | 22-3/8" | 24" |
| 30" X 10" | 1/4" | 1-3/8" | 7 | 22-5/8" | 28" |
| 30" X 12" | 1/4" | 1-3/8" | 8 | 22-5/8" | 32" |
| 36" X 4" | 1/4" | 7/8" | 6 | 25-1/2" | 24" |
| 36" X 6" | 1/4" | 1-1/8" | 6 | 25-3/4" | 24" |
| 36" X 8" | 1/4" | 1-1/8" | 7 | 25-3/4" | 28" |
| 36" X 10" | 1/4" | 1-3/8" | 8 | 26" | 32" |
| 36" X 12" | 1/4" | 1-3/8" | 9 | 26" | 36" |
| 42" X 4" | 1/4" | 7/8" | 6 | 28-7/8" | 24" |
| 42" X 6" | 1/4" | 1-1/8" | 7 | 29-1/8" | 28" |
| 42" X 8" | 1/4" | 1-1/8" | 8 | 29-1/8" | 32" |
| 42" X 10" | 3/8" | 1-3/8" | 9 | 29-3/8" | 36" |
| 42" X 12" | 3/8" | 1-3/8" | 10 | 29-3/8" | 40" |
| 48" X 4" | 3/8" | 7/8" | 7 | 32-1/4" | 28" |
| 48" X 6" | 3/8" | 1-1/8" | 7 | 32-1/2" | 28" |
| 48" X 8" | 3/8" | 1-1/8" | 7 | 32-1/2" | 28" |
| 48" X 10" | 3/8" | 1-3/8" | 7 | 32-3/4" | 28" |
| 48" X 12" | 3/8" | 1-3/8" | 9 | 32-3/4" | 36" |





NOTE:

WHILE PERFORMING WORK INVOLVING GROUNDS MAINTENANCE AND/OR THE CONSTRUCTION/MAINTENANCE OF ANY INFRASTRUCTURE, INCLUDING ROADS, WATER MAINS, SANITARY SEWERS, STORM DRAINS AND STORM WATER BEST MANAGEMENT PRACTICES (BMPs), CONTRACTORS SHALL MINIMIZE POLLUTION FROM STORM WATER RUNOFF THAT CAN AFFECT WATER QUALITY RELATED TO WORK ACTIVITIES. POLLUTANTS THAT COULD IMPAIR WATER QUALITY MAY INCLUDE FUEL, GREASE AND OIL, NUTRIENTS, BACTERIA AND PATHOGENS, LITTER AND DEBRIS, AND SOIL EROSION AND SEDIMENTATION. APPLICABLE BMPs SHALL BE IMPLEMENTED BY THE CONTRACTOR TO THE MAXIMUM EXTENT PRACTICABLE TO PROTECT WATER QUALITY AND WILDLIFE HABITAT.

SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

| Revision | By | Date | Description |
|----------|-----|----------|--|
| 1 | WRC | 01/01/01 | ISSUED FOR CONSTRUCTION |
| 2 | WRC | 01/01/01 | PROPOSED DETAIL CHANGES |
| 3 | WRC | 01/01/01 | FOR CONSTRUCTION APPROVAL / NAME CHANGES |
| 4 | WRC | 01/01/01 | FOR CONSTRUCTION APPROVAL / NAME CHANGES |
| 5 | WRC | 01/01/01 | FOR CONSTRUCTION APPROVAL / NAME CHANGES |

ORIG. DATE: 01/01/01

SCALE: NONE

DESIGNED BY: WRC

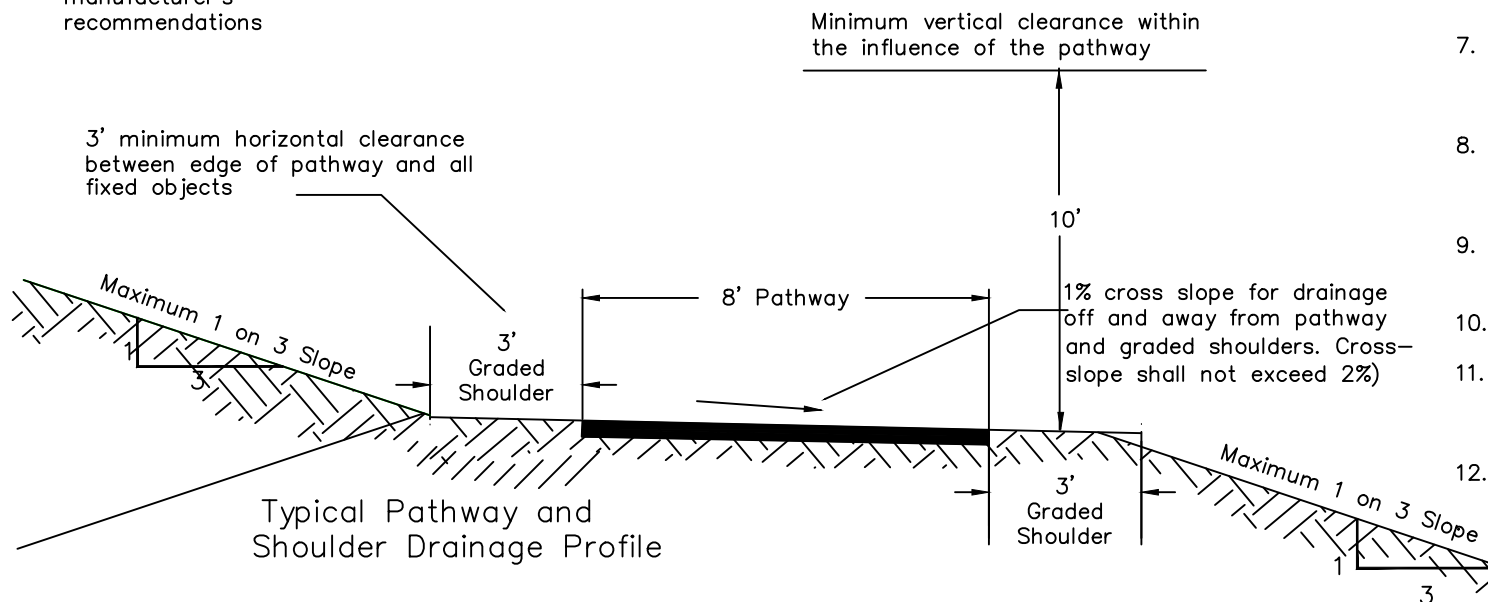
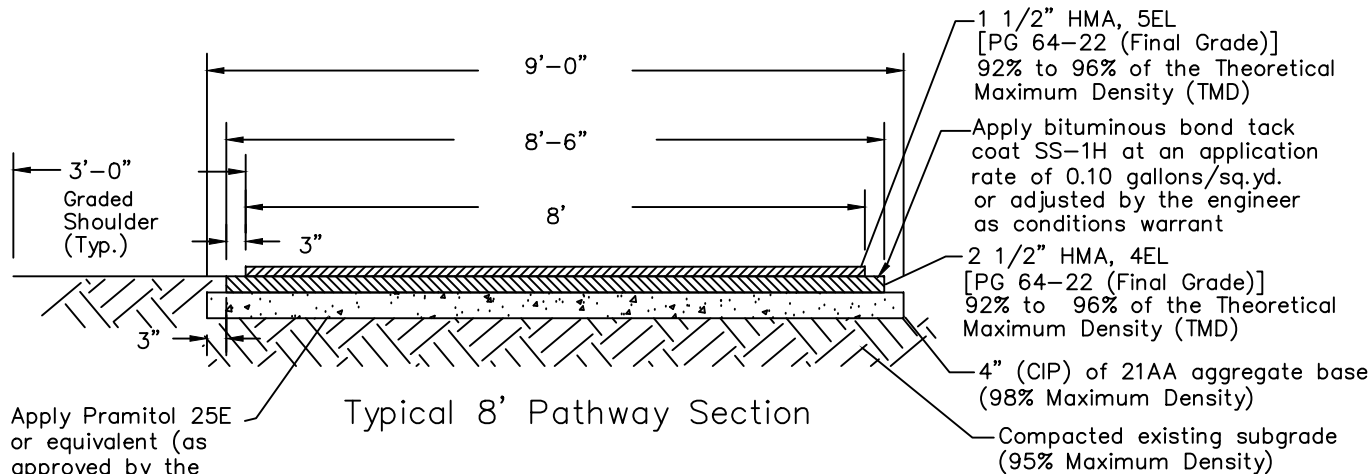
DRAWN BY: Mapping

WRC WATER RESOURCES COMMISSIONERS Jim Nash

ONE PUBLIC WORKS DRIVE, BLDG 95 WEST WATERFORD, MICHIGAN 48308-1907

SHEET NO.: 1 of 1

Standard Details:



Standard Notes:

- Maximum grade of 8.33% along pathway (less than 5% is recommended).
- 1% cross slope (i.e. super elevation) for drainage off and away from pathway and graded shoulders (2% maximum cross-slope).
- 60' minimum center line radii for pathway horizontal alignment.
- Provide a minimum of 3' horizontal clearance and 10' vertical clearance from all fixed objects and the edge of pathway surface. Relocation of existing objects (i.e. mail boxes, signs, etc.) shall be considered incidental work items.
- Pathway ramps shall be constructed in accordance with MDOT standard detail R-28 Series and shall have a minimum clear opening of 8' wide.
- A clean saw cut joint shall be provided wherever new pavement matches existing pavement (incidental work item).
- Utility structures shall be adjusted in accordance with the City of Rochester Hills standards and shall match the proposed grade of the pathway.
- Pathway shall be 6 inch thick HMA or concrete through residential drives and 9 inch thick HMA or 8 inch thick concrete through commercial drives.
- Pathway asphalt shall be paid for as "Shared Use Path, HMA" when part of public improvement project.
- Ramps and landings shall be 6 inch thick concrete.
- ADA detectable warning plates shall be preformed and brick red in color. Acceptable products included ADA Solutions, Inc., Armor-Tile, E.J., or approved equal.
- Irrigation overspray shall not broadcast onto City pathway or sidewalk.

CITY OF ROCHESTER HILLS STANDARD DETAIL FOR:

Pathway Details:

Hot-Mixed Asphalt Pathway
Construction, Extensions and Relocations



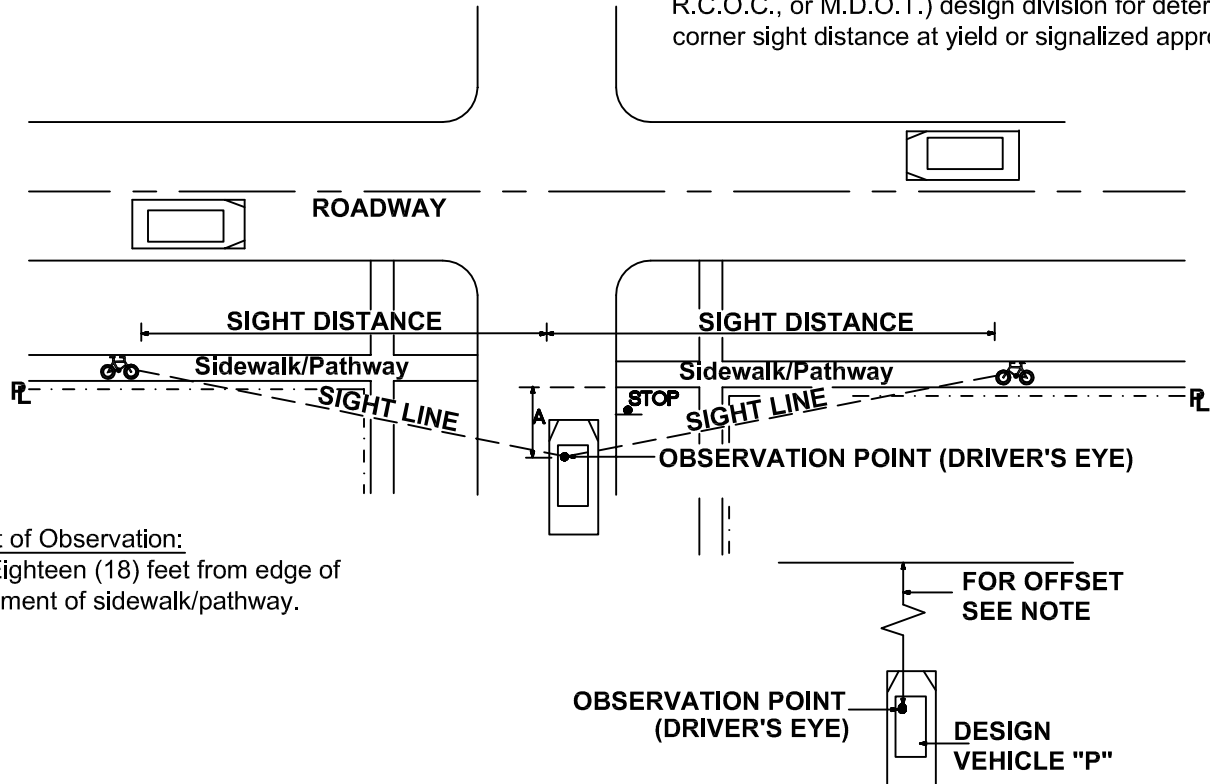
| | | | | | | |
|-------------------------|-------------------------|------------|------------|-----------|------------|------------|
| DRAWN BY: S. BUCHOLZ | PLAN DATE: 8/28/1996 | REVISIONS: | 10/30/2024 | 2/8/2022 | 8/22/2018 | 01/12/2022 |
| | | | 4/12/2012 | 2/25/2016 | 11/12/2019 | 01/25/2022 |

APPROVED BY:
SETH BUCHOLZ, CITY TRANSPORTATION TECHNICIAN
KEITH DEPP, CITY PROJECT ENGINEER

NOT TO SCALE

SHEET
1 OF 1

Different sight distances are required for yield or signal controlled intersections. Contact road agency's (City, R.C.O.C., or M.D.O.T.) design division for determining corner sight distance at yield or signalized approaches.



Point of Observation:

(A) Eighteen (18) feet from edge of pavement of sidewalk/pathway.

The point of vision shall be from the height of eye, 3.5 feet above the proposed intersecting elevation to a height of object 3.5 feet above the existing or proposed road centerline and shall be continuously visible within the specified limits.

| MINIMUM CORNER SIGHT DISTANCE FOR STREETS AT INTERSECTIONS | |
|---|--|
| PATHWAY GRADE APPROACHING INTERSECTION (%) | MINIMUM SIGHT DISTANCE IN FEET, BOTH DIRECTIONS |
| 0 | 135 |
| -1 | 140 |
| -2 | 145 |
| -3 | 150 |
| -4 | 160 |
| -5 | 165 |
| -6 | 175 |
| -7 | 190 |
| -8 | 205 |

NOTES

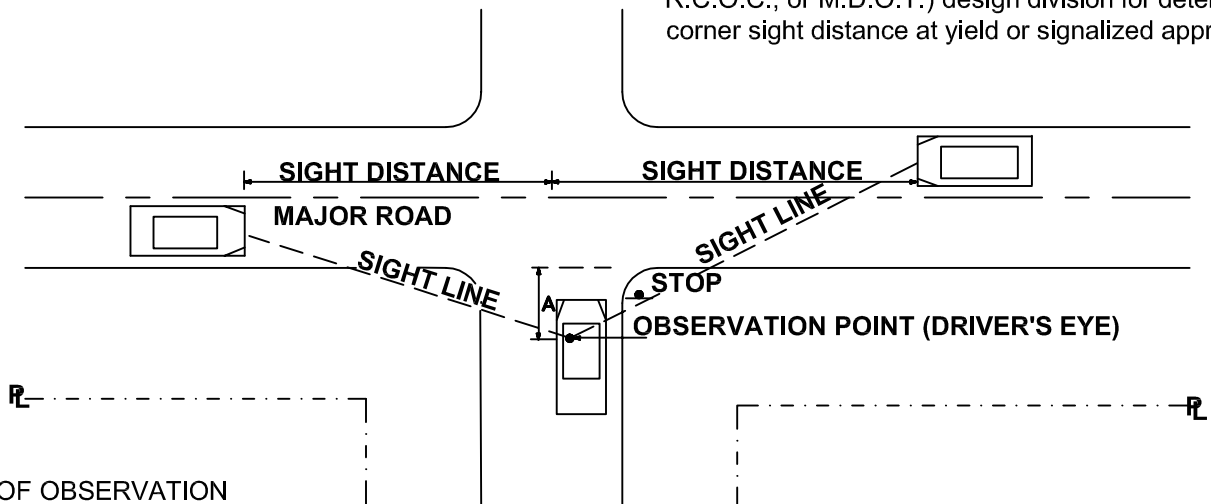
1. Any deviation from given data requires an engineering study approved by the road agency (City, R.C.O.C., or M.D.O.T.) in accordance with the latest edition AASHTO Guide for the Development of Bicycle Facilities.
2. This design guide also applies to new Permit and Plat construction projects.
3. The bicycle design speed used in the chart is 18 MPH.
4. Approach pathway slope greater than 8% is not allowed due to ADA compliance.
5. Existing site conditions may require an engineering study to determine sight distance.

CITY OF ROCHESTER HILLS
STANDARD DETAIL FOR:
Sight Distance Pathways



| | | | | | |
|---|------------------------|-------------------------|-------------------|-------------------|-----------------|
| DRAWN BY: B. SMITH | FILE NAME: CIRC DRV | PLAN DATE: 8/28/1996 | REV. 4/12/2012 | REV. 3/15/2014 | REV. |
| APPROVED BY: PAUL SHUMEJKO, P.E., PTOE CITY TRANSPORTATION ENGINEER | | | NOT TO SCALE | | SHEET 2 OF 2 |

Different sight distances are required for yield or signal controlled intersections. Contact road agency's (City, R.C.O.C., or M.D.O.T.) design division for determining corner sight distance at yield or signalized approaches.



POINT OF OBSERVATION

Paved Surface:

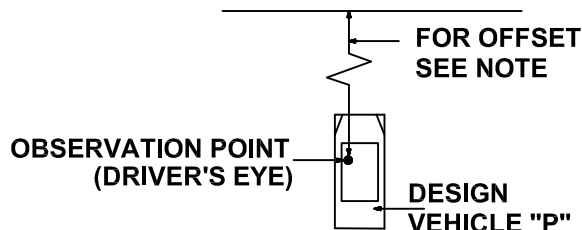
(A) Eighteen (18) feet from edge of pavement of through lane.

Gravel Surface:

(A) Eighteen (18) feet from edge of gravel road.

* For residential driveways approaching gravel or paved roads (A) is 10' from the edge of gravel/pavement.

The point of vision shall be from the height of eye, 3.5 feet above the proposed intersecting elevation to a height of object 3.5 feet above the existing or proposed road centerline and shall be continuously visible within the specified limits.



MINIMUM CORNER SIGHT DISTANCE FOR DRIVEWAYS AND STREETS AT MAJOR ROAD INTERSECTIONS FOR PASSENGER VEHICLES

| MAJOR ROAD POSTED OR 85% SPEED IN MPH | MINIMUM SIGHT DISTANCE IN FEET, BOTH DIRECTIONS | |
|---------------------------------------|---|-------------------------------|
| | 2 OR 3 LANE THRU ROAD IN FEET | 4 OR 5 LANE THRU ROAD IN FEET |
| 25 | 280 | 295 |
| 30 | 335 | 355 |
| 35 | 390 | 415 |
| 40 | 445 | 470 |
| 45 | 500 | 530 |
| 50 | 555 | 590 |
| 55 | 610 | 650 |

The basic prima facia speed shall be used for gravel roads, unless otherwise approved by the Engineer.

NOTES

1. Any deviation from given data requires an engineering study approved by the road agency (City, R.C.O.C., or M.D.O.T.) in accordance with the latest edition AASHTO policy on geometric design.
2. This design guide also applies to new Permit and Plat construction projects.
3. The above data is based on a left turn maneuver into the intersecting roadway as described in AASHTO. Due to the higher potential accident severity, the left turning sight distance was used to determine the corner sight distance required. Right turn onto major roads shall have the same sight distances.
4. Existing site conditions may require an engineering study to determine sight distance.

CITY OF ROCHESTER HILLS STANDARD DETAIL FOR:

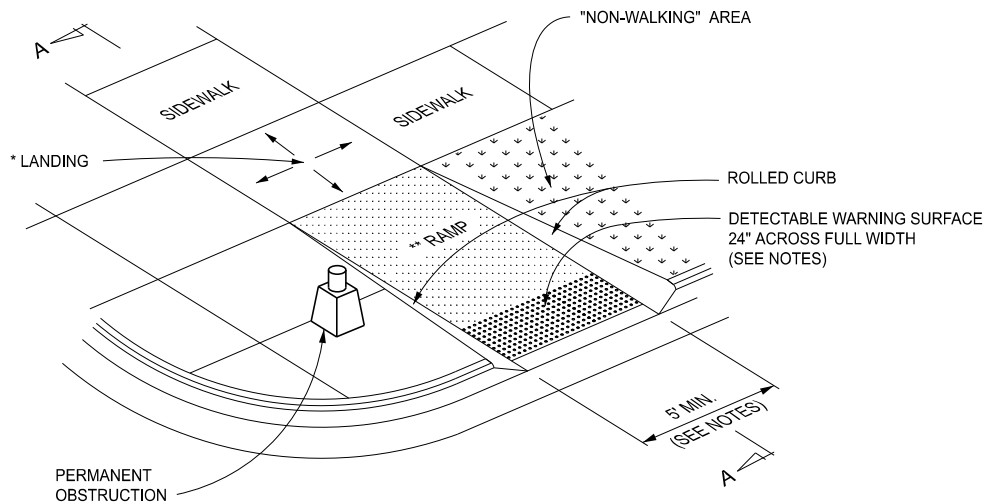
Sight Distance Roadways



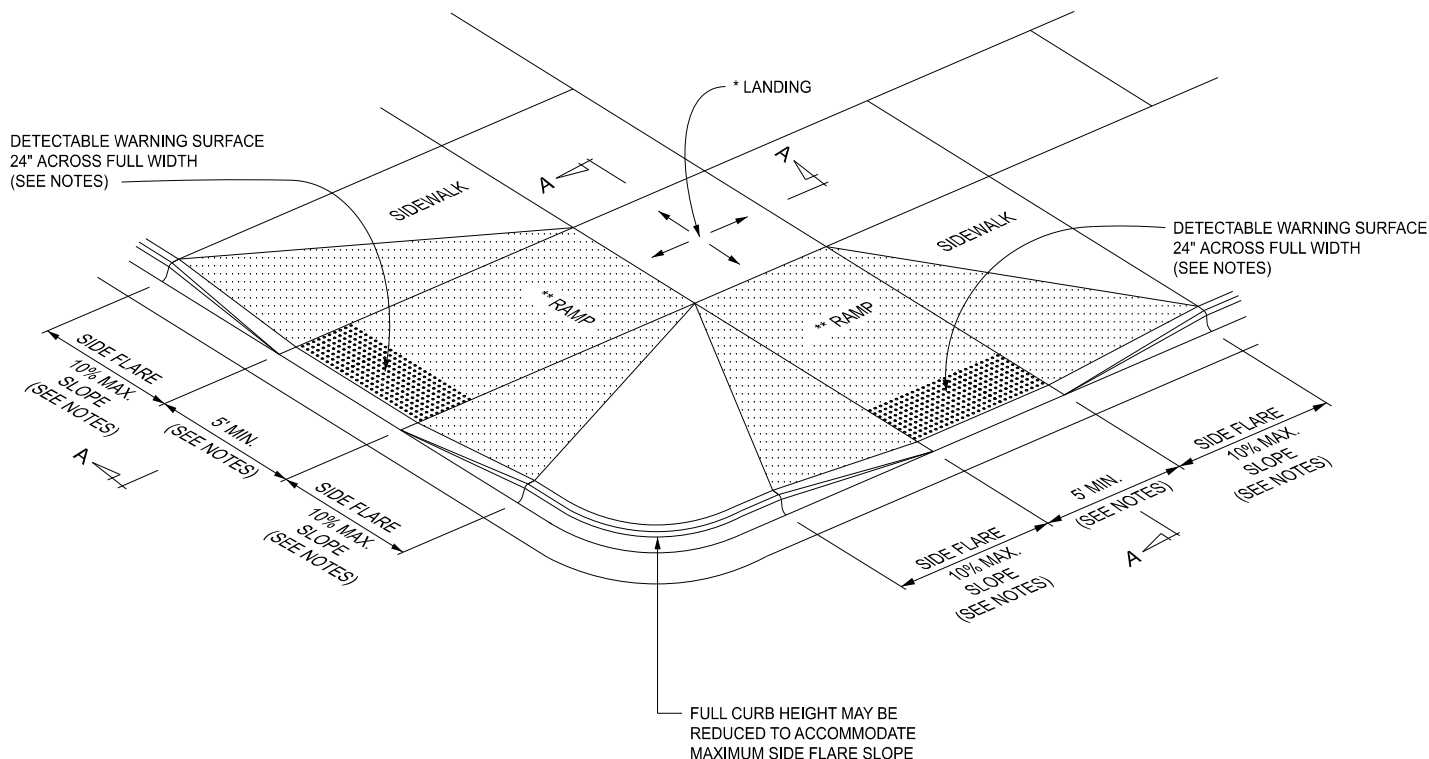
| | | | | | |
|---|------------------------|-------------------------|-------------------|-------------------|-----------------|
| DRAWN BY: B. SMITH | FILE NAME: CIRC DRV | PLAN DATE: 8/28/1996 | REV. 4/12/2012 | REV. 3/15/2014 | REV. |
| APPROVED BY: PAUL SHUMEJKO, P.E., PTOE CITY TRANSPORTATION ENGINEER | | | NOT TO SCALE | | SHEET 1 OF 2 |

* MAXIMUM LANDING SLOPE IS 2.1% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

** MAXIMUM RAMP CROSS SLOPE IS 2.1%, RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



CURB RAMP TYPE R
(ROLLED SIDES)



CURB RAMP TYPE F
(FLARED SIDES, TWO RAMPS SHOWN)

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
**CURB RAMP AND
DETECTABLE WARNING DETAILS**

(SPECIAL DETAIL)
FHWA APPROVAL

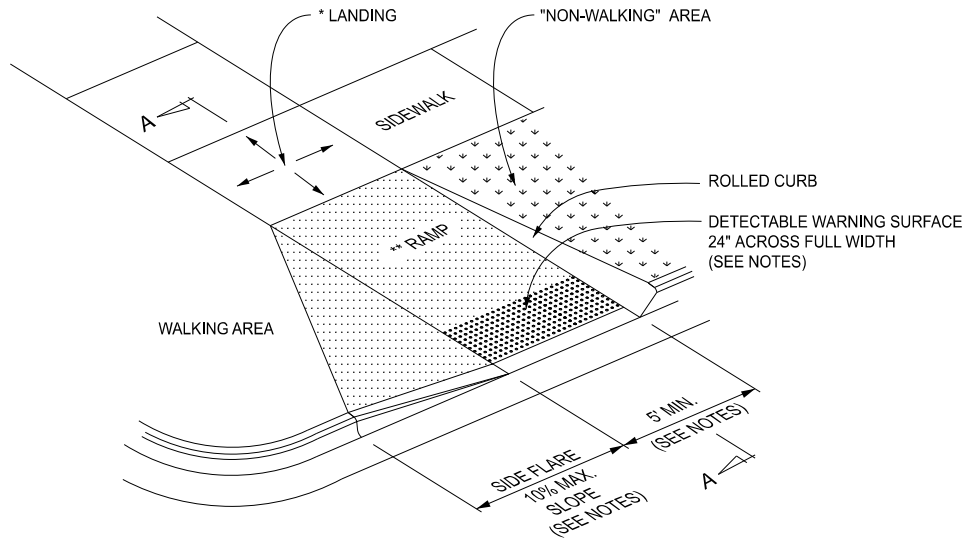
11/08/2023
PLAN DATE

R-28-K

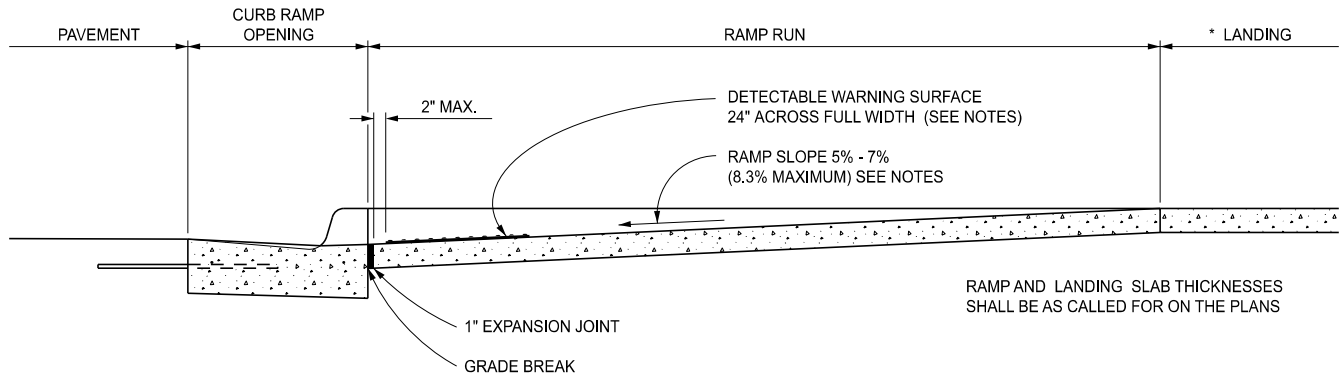
SHEET
1 OF 7

* MAXIMUM LANDING SLOPE IS 2.1% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

** MAXIMUM RAMP CROSS SLOPE IS 2.1%, RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



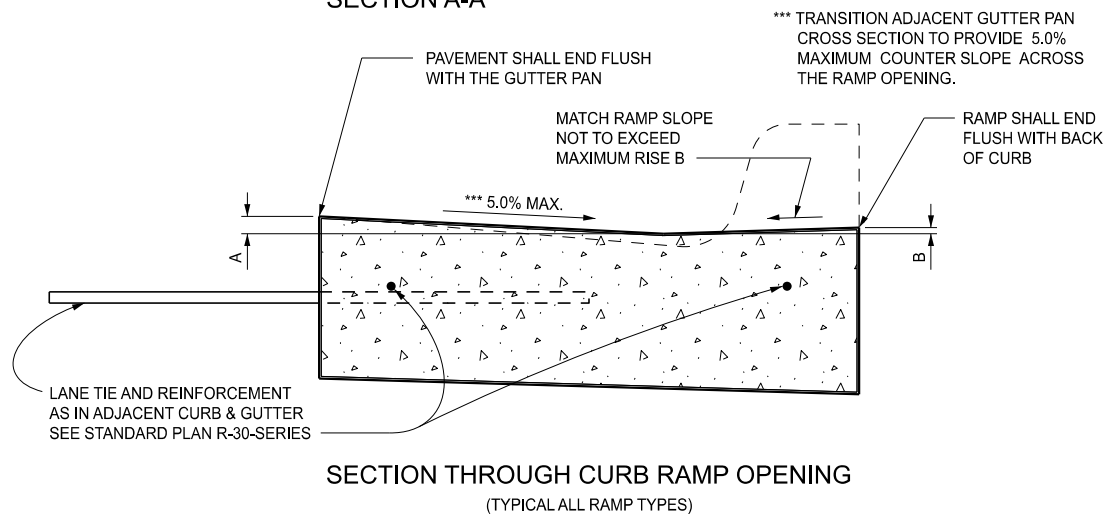
CURB RAMP TYPE RF
(ROLLED / FLARED SIDES)



SECTION A-A

| CURB TYPE | MAXIMUM RISE (INCHES) | |
|-----------|-----------------------|---|
| | A | B |
| B1 | ¾ | 1 |
| B2 | ¾ | 1 |
| B3 | ¾ | 1 |
| D1 | ¾ | 1 |
| D2 | ¾ | 1 |
| D3 | ¾ | 1 |
| C1 | ½ | ½ |
| C2 | ½ | ½ |
| C3 | ¾ | ½ |
| C4 | ¾ | ½ |
| C5 | 1 | ½ |
| C6 | 1 | ½ |
| F1 | ½ | ½ |
| F2 | ½ | ½ |
| F3 | ¾ | ½ |
| F4 | ¾ | ½ |
| F5 | 1 | ½ |
| F6 | 1 | ½ |

FOR CURB TYPES SEE
STANDARD PLAN R-30-SERIES



SECTION THROUGH CURB RAMP OPENING
(TYPICAL ALL RAMP TYPES)



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
**CURB RAMP AND
DETECTABLE WARNING DETAILS**

(SPECIAL DETAIL)
FHWA APPROVAL

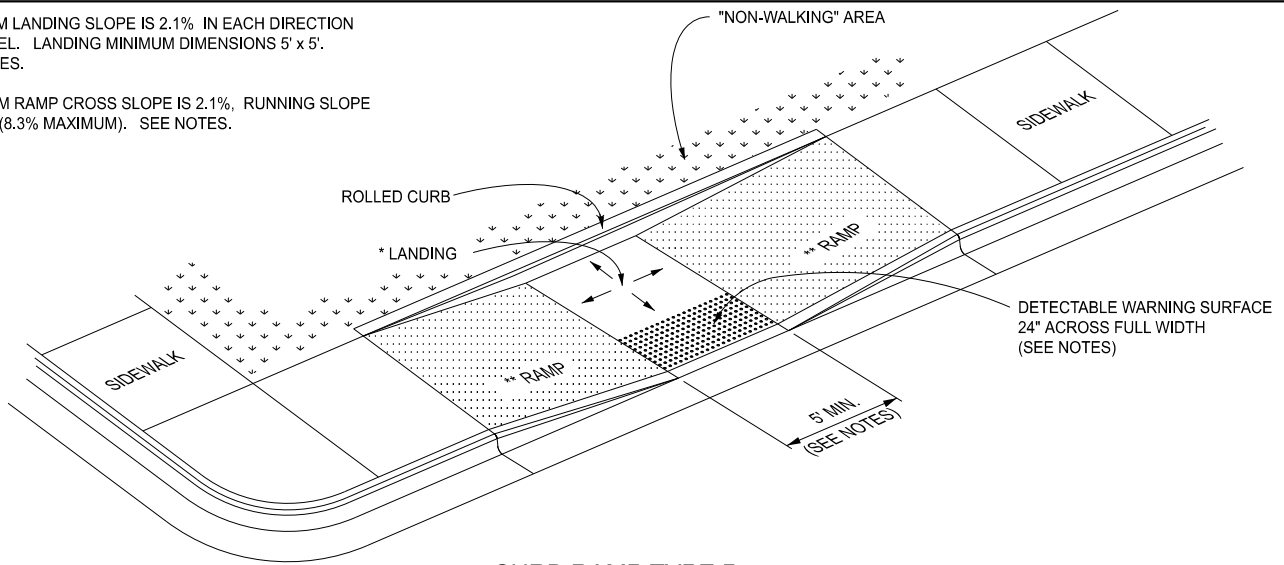
11/08/2023
PLAN DATE

R-28-K

SHEET
2 OF 7

* MAXIMUM LANDING SLOPE IS 2.1% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

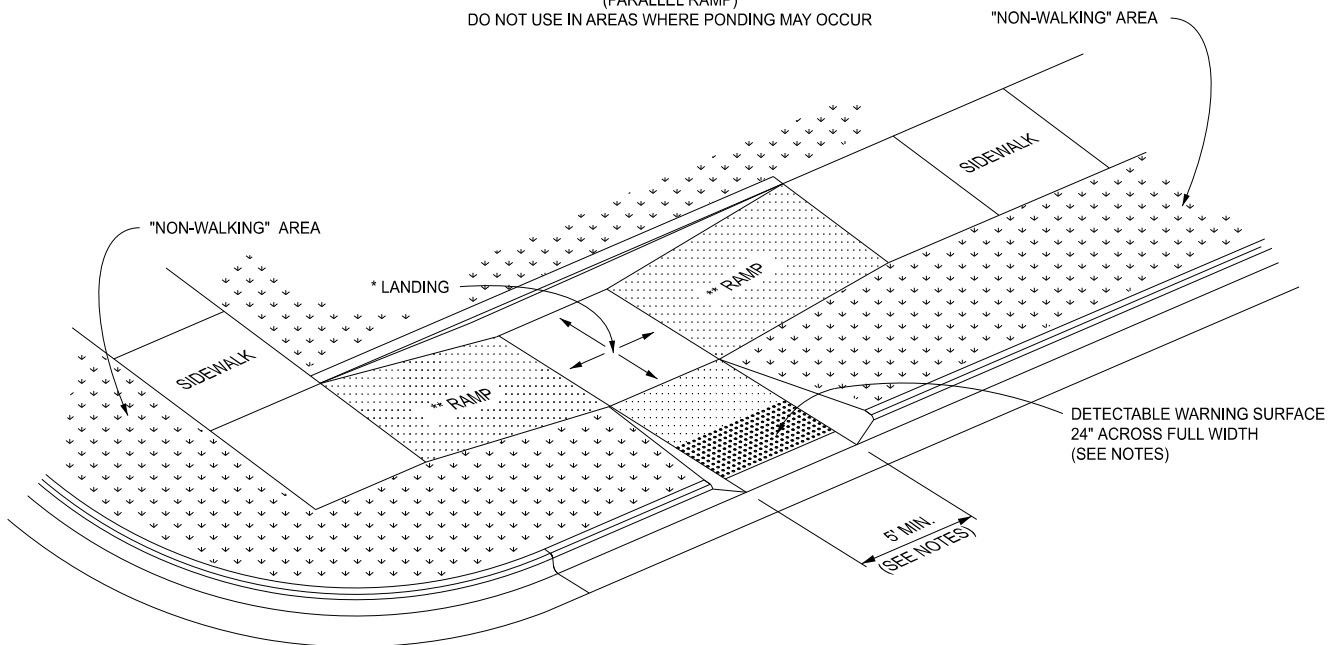
** MAXIMUM RAMP CROSS SLOPE IS 2.1%, RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



CURB RAMP TYPE P

(PARALLEL RAMP)

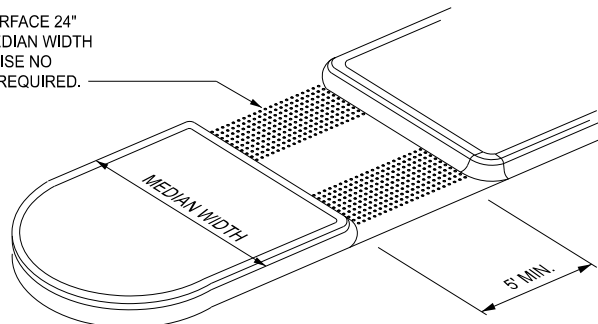
DO NOT USE IN AREAS WHERE PONDING MAY OCCUR



CURB RAMP TYPE C

(COMBINATION RAMP)

DETECTABLE WARNING SURFACE 24" ACROSS FULL WIDTH IF MEDIAN WIDTH IS AT LEAST 6'-0". OTHERWISE NO DETECTABLE WARNING IS REQUIRED.



CURB RAMP TYPE M

(MEDIAN ISLAND)



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS

(SPECIAL DETAIL)
FHWA APPROVAL

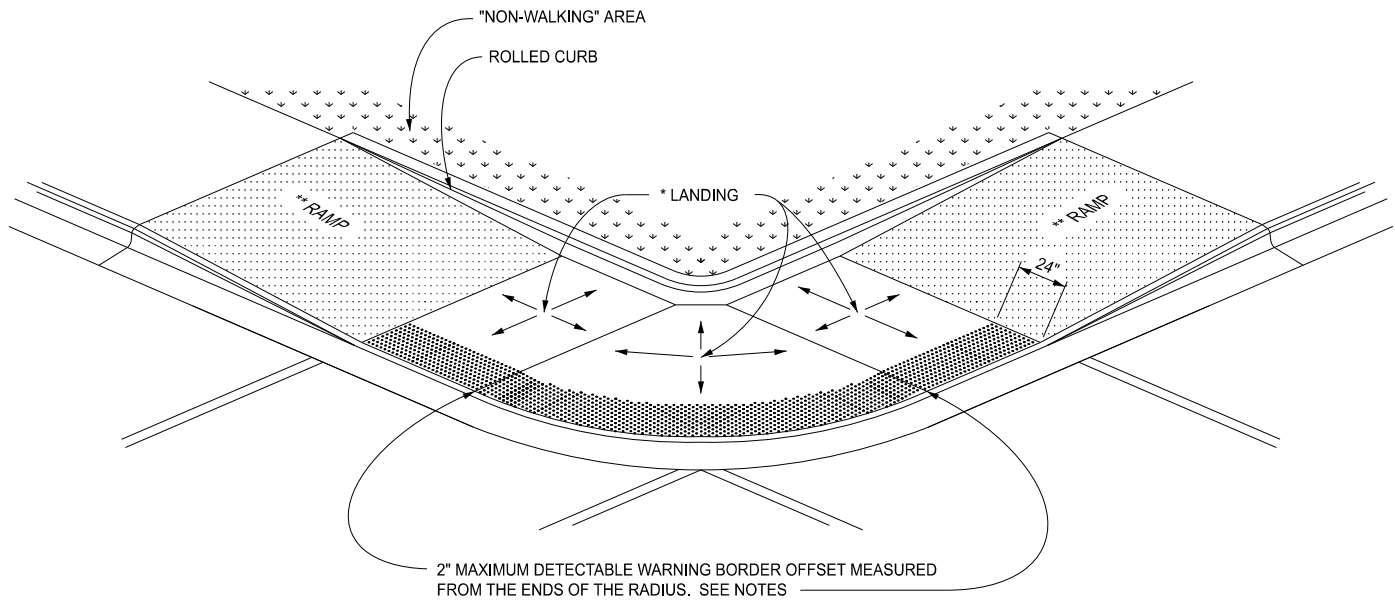
11/08/2023
PLAN DATE

R-28-K

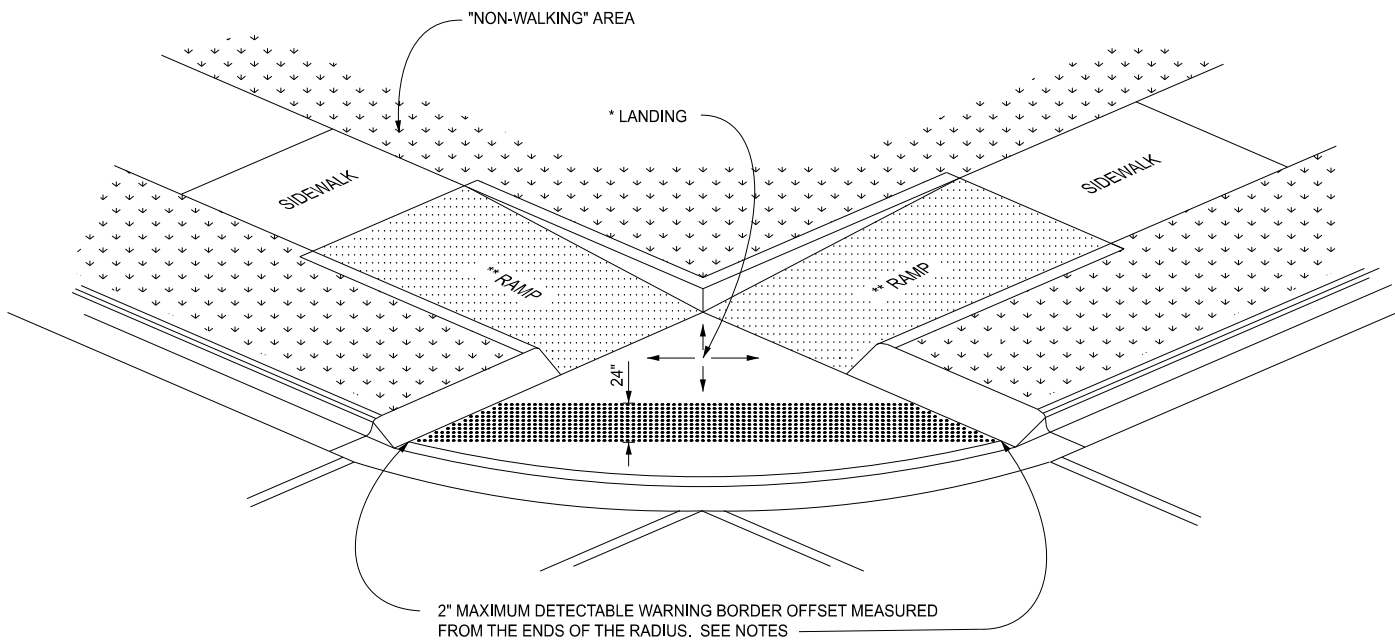
SHEET
3 OF 7

* MAXIMUM LANDING SLOPE IS 2.1% IN EACH DIRECTION OF TRAVEL. LANDING MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

** MAXIMUM RAMP CROSS SLOPE IS 2.1%, RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



(RADIAL DETECTABLE WARNING SHOWN)



(TANGENT DETECTABLE WARNING SHOWN)

CURB RAMP TYPE D (DEPRESSED CORNER)

USE ONLY WHEN INDEPENDENT DIRECTIONAL RAMPS CAN NOT BE CONSTRUCTED FOR EACH CROSSING DIRECTION



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS

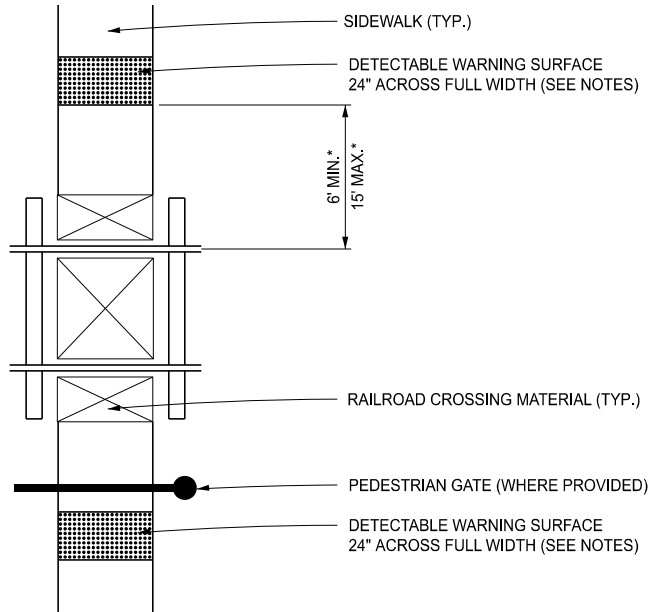
(SPECIAL DETAIL)
FHWA APPROVAL

11/08/2023
PLAN DATE

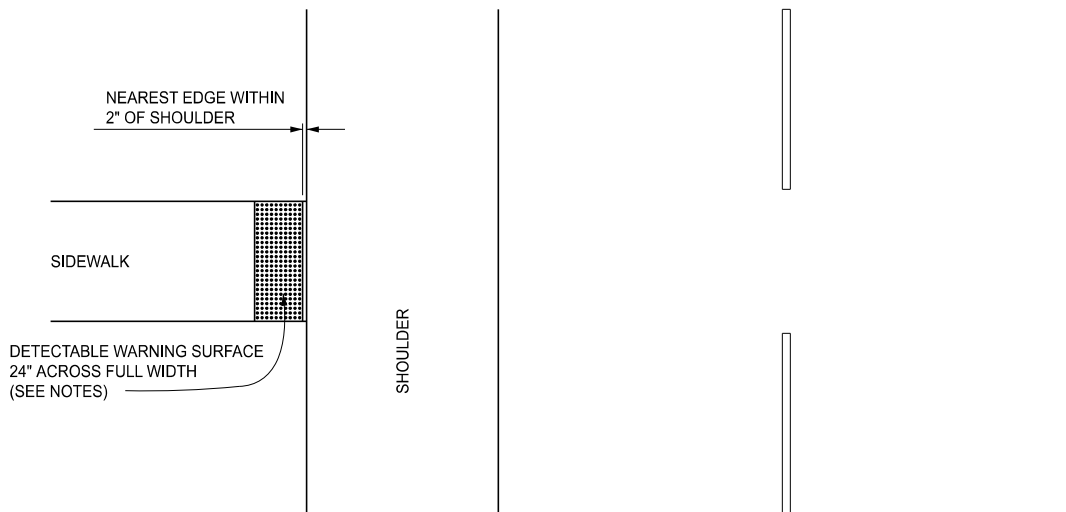
R-28-K

SHEET
4 OF 7

* THE DETECTABLE WARNING SURFACE SHALL BE LOCATED SO THAT THE EDGE NEAREST THE RAIL CROSSING IS 6' MINIMUM AND 15' MAXIMUM FROM THE CENTERLINE OF THE NEAREST RAIL. DO NOT PLACE DETECTABLE WARNING ON RAILROAD CROSSING MATERIAL.



DETECTABLE WARNING AT RAILROAD CROSSING



DETECTABLE WARNING AT FLUSH SHOULDER OR ROADWAY



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

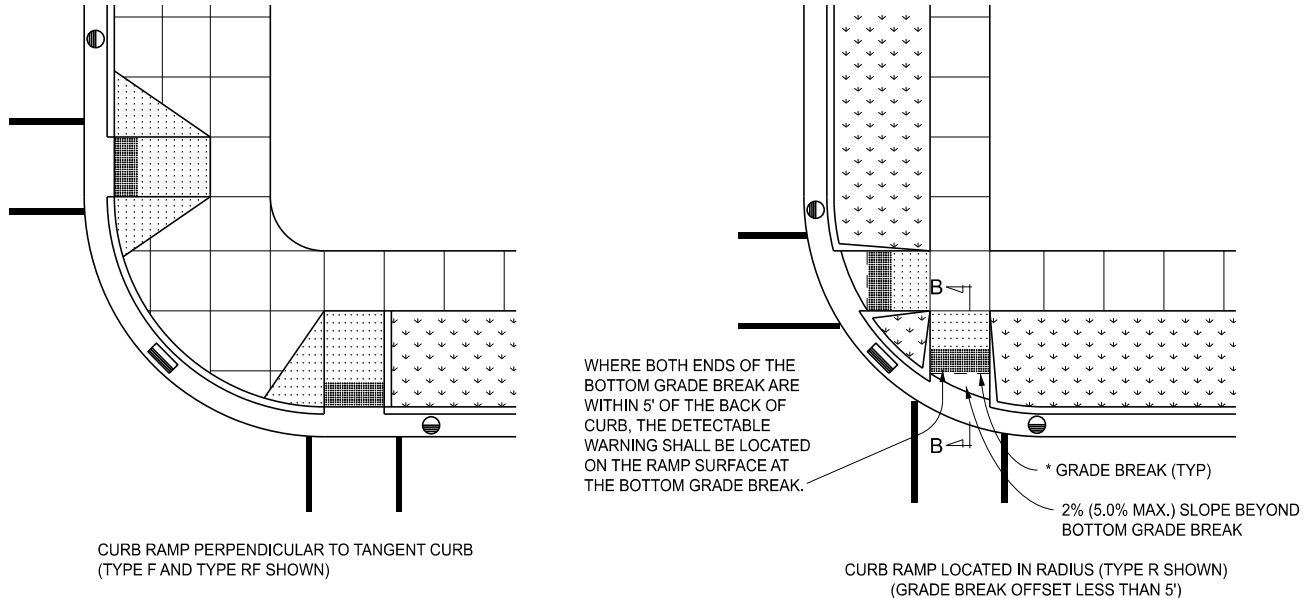
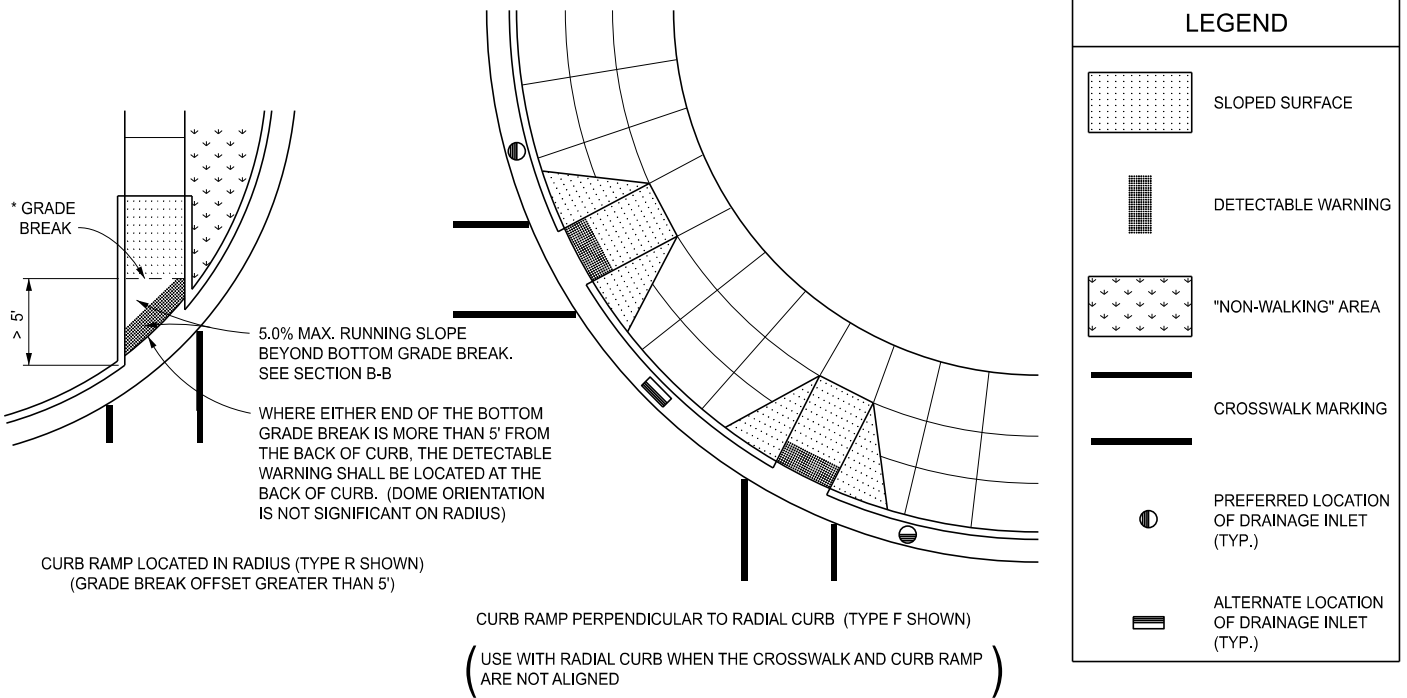
STANDARD PLAN FOR
CURB RAMP AND
DETECTABLE WARNING DETAILS

(SPECIAL DETAIL)
FHWA APPROVAL

11/08/2023
PLAN DATE

R-28-K

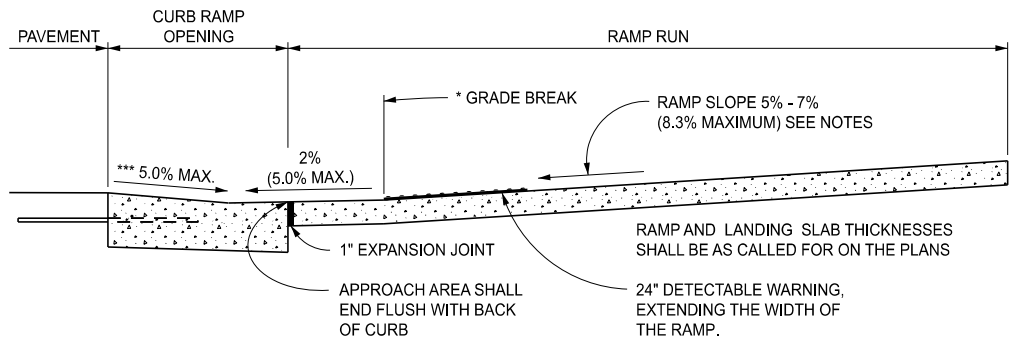
SHEET
5 OF 7



* GRADE BREAKS AT THE TOP AND BOTTOM OF CURB RAMPS SHALL BE PERPENDICULAR TO THE DIRECTION OF TRAVEL.

*** TRANSITION ADJACENT GUTTER PAN CROSS SECTION TO PROVIDE 5.0% MAXIMUM COUNTER SLOPE ACROSS THE RAMP OPENING.

SEE SHEET 2 FOR CURB RAMP OPENING DETAILS.



SECTION B-B

CURB RAMP ORIENTATION



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

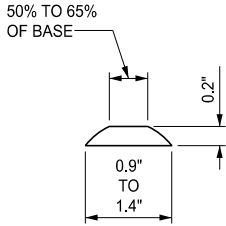
STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS

(SPECIAL DETAIL)
FHWA APPROVAL

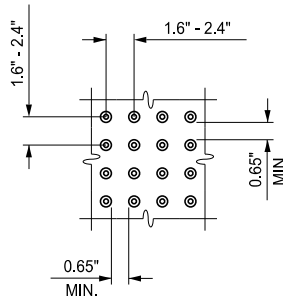
11/08/2023
PLAN DATE

R-28-K

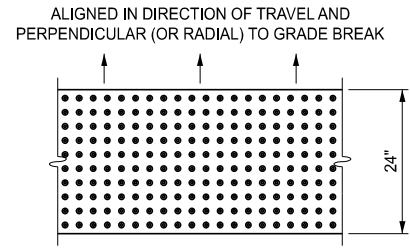
SHEET
6 OF 7



DOME SECTION



DOME SPACING



DOME ALIGNMENT

DETECTABLE WARNING DETAILS

NOTES:

DETAILS SPECIFIED ON THIS PLAN APPLY TO ALL CONSTRUCTION, RECONSTRUCTION, OR ALTERATION OF STREETS, CURBS, OR SIDEWALKS IN THE PUBLIC RIGHT OF WAY.

CURB RAMPS ARE TO BE LOCATED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

RAMPS SHALL BE PROVIDED AT ALL CORNERS OF AN INTERSECTION WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT MARKED AND/OR SIGNALIZED MID-BLOCK CROSSINGS.

SURFACE TEXTURE OF THE RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING, TRANSVERSE TO THE RUNNING SLOPE.

SIDEWALK SHALL BE RAMPED WHERE THE DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.

CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP. WHERE CONDITIONS PERMIT, IT IS DESIRABLE THAT THE SLOPE OF THE RAMP BE IN ONLY ONE DIRECTION, PARALLEL TO THE DIRECTION OF TRAVEL.

RAMP WIDTH SHALL BE INCREASED, IF NECESSARY, TO ACCOMMODATE SIDEWALK SNOW REMOVAL EQUIPMENT NORMALLY USED BY THE MUNICIPALITY.

WHEN 5' MINIMUM WIDTHS ARE NOT FEASIBLE, RAMP WIDTH MAY BE REDUCED TO NOT LESS THAN 4' AND LANDINGS TO NOT LESS THAN 4' x 4'.

CURB RAMPS WITH A RUNNING SLOPE $\leq 5\%$ DO NOT REQUIRE A TOP LANDING. HOWEVER, ANY CONTINUOUS SIDEWALK OR PEDESTRIAN ROUTE CROSSING THROUGH OR INTERSECTING THE CURB RAMP MUST INDEPENDENTLY MAINTAIN A CROSS SLOPE NOT GREATER THAN 2.1% PERPENDICULAR TO ITS OWN DIRECTION(S) OF TRAVEL.

DETECTABLE WARNING SURFACE COVERAGE IS 24" MINIMUM IN THE DIRECTION OF RAMP/PATH TRAVEL AND THE FULL WIDTH OF THE RAMP/PATH OPENING EXCLUDING CURBED OR FLARED CURB TRANSITION AREAS. A BORDER OFFSET NOT GREATER THAN 2" MEASURED ALONG THE EDGES OF THE DETECTABLE WARNING IS ALLOWABLE. FOR RADIAL CURB THE OFFSET IS MEASURED FROM THE ENDS OF THE RADIUS.

FOR NEW ROADWAY CONSTRUCTION, THE RAMP CROSS SLOPE MAY NOT EXCEED 2.1%. FOR ALTERATIONS TO EXISTING ROADWAYS, THE CROSS SLOPE MAY BE TRANSITIONED TO MEET AN EXISTING ROADWAY GRADE. THE CROSS SLOPE TRANSITION SHALL BE APPLIED UNIFORMLY OVER THE FULL LENGTH OF THE RAMP.

THE MAXIMUM RUNNING SLOPE OF 8.3% IS RELATIVE TO A FLAT (0%) REFERENCE. HOWEVER, IT SHALL NOT REQUIRE ANY RAMP OR SERIES OF RAMPS TO EXCEED 15 FEET IN LENGTH NOT INCLUDING LANDINGS OR TRANSITIONS.

DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH RAMPS. THE LOCATION OF THE RAMP SHOULD TAKE PRECEDENCE OVER THE LOCATION OF THE DRAINAGE STRUCTURE. WHERE EXISTING DRAINAGE STRUCTURES ARE LOCATED IN THE RAMP PATH OF TRAVEL, USE A MANUFACTURER'S ADA COMPLIANT GRATE. OPENINGS SHALL NOT BE GREATER THAN $\frac{1}{2}$ ". ELONGATED OPENINGS SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

THE TOP OF THE JOINT FILLER FOR ALL RAMP TYPES SHALL BE FLUSH WITH THE ADJACENT CONCRETE.

CROSSWALK AND STOP LINE MARKINGS, IF USED, SHALL BE SO LOCATED AS TO STOP TRAFFIC SHORT OF RAMP CROSSINGS. SPECIFIC DETAILS FOR MARKING APPLICATIONS ARE GIVEN IN THE "MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

FLARED SIDES WITH A SLOPE OF 10% MAXIMUM, MEASURED ALONG THE ROADSIDE CURB LINE, SHALL BE PROVIDED WHERE AN UNOBSTRUCTED CIRCULATION PATH LATERALLY CROSSES THE CURB RAMP. FLARED SIDES ARE NOT REQUIRED WHERE THE RAMP IS BORDERED BY LANDSCAPING, UNPAVED SURFACE OR PERMANENT FIXED OBJECTS. WHERE THEY ARE NOT REQUIRED, FLARED SIDES CAN BE CONSIDERED IN ORDER TO AVOID SHARP CURB RETURNS AT RAMP OPENINGS.

DETECTABLE WARNING PLATES MUST BE INSTALLED USING FABRICATED OR FIELD CUT UNITS CAST AND/OR ANCHORED IN THE PAVEMENT TO RESIST SHIFTING OR HEAVING.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR CURB RAMP AND DETECTABLE WARNING DETAILS









(SPECIAL DETAIL)
FHWA APPROVAL




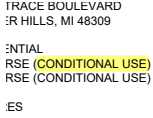
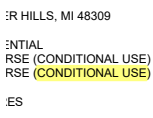
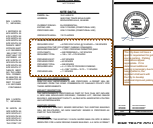
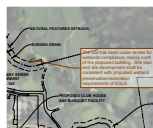


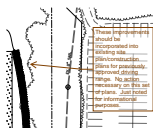
11/08/2023
PLAN DATE

R-28-K

SHEET
7 OF 7

SITE PLAN - REV.pdf Markup Summary

| | | |
|---|---|---|
| C.McLeod (58) | | |
|  | Subject: Group Author: C.McLeod Date: 6/23/2025 8:37:28 AM Status: | Site Plan |
|  | Subject: Group Author: C.McLeod Date: 6/23/2025 8:37:42 AM Status: | Conditional Use |
|  | Subject: Group Author: C.McLeod Date: 6/23/2025 8:37:50 AM Status: | |
|  | Subject: Group Author: C.McLeod Date: 6/23/2025 8:37:54 AM Status: | LB |
|  | Subject: Group Author: C.McLeod Date: 6/23/2025 8:38:03 AM Status: | Tree Removal Permit |
|  | Subject: Group Author: C.McLeod Date: 6/23/2025 8:38:08 AM Status: | LIP |
|  | Subject: Group Author: C.McLeod Date: 6/23/2025 8:38:19 AM Status: | |
|  | Subject: Planning Department Author: C.McLeod Date: 6/23/2025 4:36:39 PM Status: | Maintenance. The owner, tenant, occupant or person responsible for any property which was the subject of an approved site plan shall maintain the property and the improvements thereon in accordance with the approved site plan or an approved amendment thereof. This responsibility shall include the duty to maintain in a condition substantially similar as approved, including the duty to replace, if necessary, all improvements such as, but not by way of limitation, all greenbelts, planting, walls, fences, paving, trash receptacles, handicapped parking areas, etc. |

| | | | |
|---|---|---|-----|
|  | Subject: Planning Department Author: C.McLeod Date: 6/24/2025 3:29:35 PM Status: | Assessing | Yes |
|  | Subject: Planning Department Author: C.McLeod Date: 6/27/2025 8:56:02 AM Status: | | |
|  | Subject: Group Author: C.McLeod Date: 6/23/2025 8:42:29 AM Status: | Received 6/13/2025 City of Rochester Hills Planning & Economic Development | |
|  | Subject: Contractor Author: C.McLeod Date: 6/23/2025 9:06:09 AM Status: | CONDITIONAL USE | |
|  | Subject: Contractor Author: C.McLeod Date: 6/23/2025 9:06:13 AM Status: | CONDITIONAL USE | |
|  | Subject: Planning Department Author: C.McLeod Date: 6/23/2025 9:26:13 AM Status: | The City does not have a specific requirement for golf course parking. Parking calculations appear appropriate. If it is determined additional parking is necessary due to usage patterns, the applicant shall work with the City to develop additional improved parking areas. | |
|  | Subject: Planning Department Author: C.McLeod Date: 6/23/2025 9:30:34 AM Status: | The site has been under review for wetlands compliance, mainly north of the proposed building. Site plan and site development shall be consistent with proposed wetland preservation/restoration requirements of EGLE. | |
|  | Subject: Group Author: C.McLeod Date: 6/23/2025 8:42:24 AM Status: | Received 6/13/2025 City of Rochester Hills Planning & Economic Development | |
|  | Subject: Group Author: C.McLeod Date: 6/23/2025 8:42:20 AM Status: | Received 6/13/2025 City of Rochester Hills Planning & Economic Development | |
|  | Subject: Planning Department Author: C.McLeod Date: 6/23/2025 9:32:46 AM Status: | These improvements should be incorporated into existing site plan/construction plans for previously approved driving range. No action necessary on this set of plans. Just noted for informational purposes. | |



Subject: Planning Department
Author: C.McLeod
Date: 6/23/2025 9:35:16 AM
Status:

All ground mounted utilities shall be fully screened from view. No action necessary on this set of plans. Just noted for informational purposes in case additional utilities are added during construction.



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:42:15 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:42:10 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic Development



Subject: Planning Department
Author: C.McLeod
Date: 6/23/2025 9:41:36 AM
Status:

Defined as wetland on City mapping. If any work is proposed in or around wetland area, delineation will be required and appropriate wetland use permit will be required (as applicable). No action necessary at this time. Comment is informational only and shall become applicable if work is required either in the defined wetland area, within the natural features setback, etc.



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:42:05 AM
Status:

Received
6/13/2025

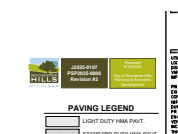
City of Rochester Hills Planning & Economic Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:59 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:55 AM
Status:

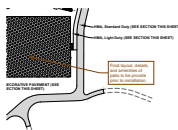
Received
6/13/2025

City of Rochester Hills Planning & Economic Development



Subject: Planning Department
Author: C.McLeod
Date: 6/23/2025 9:38:02 AM
Status:

Provide cut sheet showing type of brick paver, color, layout, etc.



Subject: Planning Department
Author: C.McLeod
Date: 6/23/2025 9:39:28 AM
Status:

Final layout, details, and amenities of patio to be provide prior to installation.



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:50 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:45 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:40 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:35 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Planning Department
Author: C.McLeod
Date: 6/23/2025 9:44:29 AM
Status:

Pursuant to conversations with applicant and
design team, specific, branded signage will be
proposed for onsite turning movements.



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:30 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:26 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:22 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development

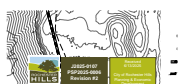


Subject: Planning Department
Author: C.McLeod
Date: 6/25/2025 8:42:21 AM
Status:

Replacement trees required as a result of this site
plan proposal shall be in addition to the those trees
already required as a result of the development of
the golf course driving range



Subject: Planning Department
Author: C.McLeod
Date: 6/25/2025 8:43:39 AM
Status:



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:16 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:11 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:06 AM
Status:

Received
6/13/2025

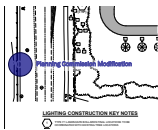
City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:41:01 AM
Status:

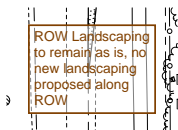
Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



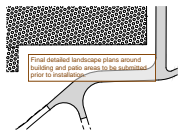
Subject: Group
Author: C.McLeod
Date: 6/27/2025 8:57:31 AM
Status:

PCM



Subject: Planning Department
Author: C.McLeod
Date: 6/27/2025 8:58:09 AM
Status:

ROW Landscaping to remain as is, no new
landscaping proposed along ROW



Subject: Planning Department
Author: C.McLeod
Date: 6/27/2025 8:59:29 AM
Status:

Final detailed landscape plans around building and
patio areas to be submitted prior to installation.



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:55 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:50 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:45 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:41 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:34 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:29 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:24 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:18 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:12 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:07 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:40:01 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:39:56 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:39:51 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development



Subject: Group
Author: C.McLeod
Date: 6/23/2025 8:39:35 AM
Status:

Received
6/13/2025

City of Rochester Hills Planning & Economic
Development

J Rhoades (3)



Subject: Building Department
Author: J Rhoades
Date: 6/24/2025 3:32:48 PM
Status:

During the site plan review of the proposed building addition it has been determined that it does not comply with Table 506.2 of the 2021 Michigan Building Code for allowable area. Applicant has acknowledged they will address these requirements during building permit review with the following comment. "we are requesting the site plan package be approved contingent upon satisfying these comments during building permit review."

It will be the responsibility of the design professional to demonstrate compliance during the building permit application process. Building approves the site plan with the condition that this issue will be resolved during the building permit review process.

Jason Rhoades 248-656-4615
RhoadesJa@RochesterHills.org

Subject: Building Department
Author: J Rhoades
Date: 6/24/2025 3:21:12 PM
Status:

Jason Rhoades 248-656-4615
RhoadesJa@RochesterHills.org

Yes with conditions

Subject: Building Department
Author: J Rhoades
Date: 6/24/2025 3:20:45 PM
Status:

Yes with conditions

Jason Boughton (3)

Jason Boughton 248-641-2400
BoughtonJB@RochesterHills.org

Subject: Engineering Department
Author: Jason Boughton
Date: 6/24/2025 3:56:36 PM
Status:



Subject: Underground Utilities
Author: Jason Boughton
Date: 6/23/2025 8:46:17 AM
Status:

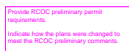
At time of construction plan review, the plans will need to include profiles for the water main and storm sewer systems.



Subject: Underground Utilities
Author: Jason Boughton
Date: 6/23/2025 8:47:30 AM
Status:

Provide documentation from the WRC stating that this narrative is acceptable to them. If no letter/email from WRC is provided then all storm sewer standards need to be met fully.

Keith (2)



Subject: Traffic, Pathways, Sidewalks
Author: Keith
Date: 6/24/2025 10:48:28 AM
Status:

Provide RCOC preliminary permit requirements.

Indicate how the plans were changed to meet the RCOC preliminary comments.

Keith Dugg 248-641-2000
DuggK@RochesterHills.org

Subject: Traffic
Author: Keith
Date: 6/24/2025 10:48:59 AM
Status:

Lieutenant W. Murphy (1)

Lt. Walter Murphy - 248.641.2712 Yes
Murphy@RochesterHills.org

Subject: Fire Department
Author: Lieutenant W. Murphy
Date: 6/17/2025 8:31:26 AM
Status:

macdonaldj (1)



Subject: Group
Author: macdonaldj
Date: 6/13/2025 12:04:45 PM
Status:

City of Rochester Hills Planning & Economic Development

Matt Einheuser (16)

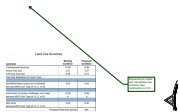
Matt Einheuser - 248.641.2551 Yes
Einheuser@RochesterHills.org

Subject: Natural Resources
Author: Matt Einheuser
Date: 6/24/2025 4:00:38 PM
Status:

w/ conditions

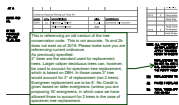
Subject: Natural Resources
Author: Matt Einheuser
Date: 6/24/2025 4:01:33 PM
Status:

w/ conditions



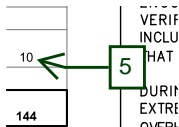
Subject: Natural Resources
Author: Matt Einheuser
Date: 6/24/2025 4:05:08 PM
Status:

Replacement credits and calculations are incorrect. See comments on L101.



Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:25:52 PM
Status:

This is referencing an old version of the tree conservation code. This is not accurate. 1b and 2b does not exist as of 2019. Please make sure you are referencing current ordinance.
As previously specified:
2" trees are the standard used for replacement trees. Larger caliper deciduous trees can, however, be used to account for specimen tree replacement, which is based on DBH. In those cases 3" tree would account for 3" of replacement (not 2 trees). Evergreen replacement are to be 8'. No Credit is given based on taller evergreens (unless you are proposing 16' evergreens, in which case we have allowed those to account for 2 trees in the case of specimen tree replacement.

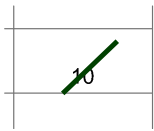


Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:16:52 PM
Status:

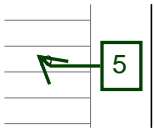
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Subject: Callout
Author: Matt Einheuser
Date: 6/18/2025 3:16:45 PM
Status:

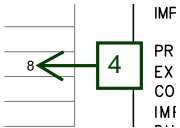


Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:16:57 PM
Status:



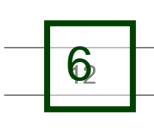
Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:17:13 PM
Status:

5



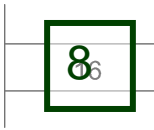
Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:17:29 PM
Status:

4



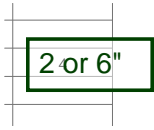
Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:17:49 PM
Status:

6



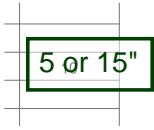
Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:19:21 PM
Status:

8



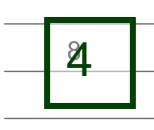
Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:20:11 PM
Status:

2 or 6"



Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:20:31 PM
Status:

5 or 15"



Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:20:44 PM
Status:

4



Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:20:54 PM
Status:

3



Subject: Natural Resources
Author: Matt Einheuser
Date: 6/18/2025 3:25:41 PM
Status:

update based on comments

Seth Bucholz (1)

Subject: Jenny McGuckin - YES

Author: Seth Bucholz

Date: 6/27/2025 8:49:26 AM

Status:

Page 1 of 1

1/1