



Engineering Design & Construction Standards

Public Works Department
Engineering Division
200 East Cook Avenue
Libertyville, Illinois 60048
(847) 918-2100

Effective Date: 02/15/2023



Table of Contents

STANDARD SPECIFICATIONS	6
DEFINITIONS & ACRONYMS	7
SECTION 1 – GENERAL REQUIREMENTS.....	8
1.1 Applicability	8
1.2 Subdivision General Design Standards.....	8
1.2.1 Streets.....	8
1.2.2 Blocks	9
1.2.3 Lots	9
1.3 Preliminary Engineering Plans.....	10
1.3.1 Minimum Preliminary Plan Requirements.....	10
1.3.2 Submittal of Preliminary Engineering Plans.....	10
1.4 Final Engineering Plans.....	11
1.4.1 Minimum Final Plan Requirements	11
1.4.2 Submittal of Final Engineering Plans	12
SECTION 2 – EARTHWORK.....	13
2.1 Earthwork and Grading.....	13
2.1.1 General Earthwork Requirements	13
2.1.2 Grading Plan Standards.....	13
2.1.3 Slope Requirements	14
2.1.4 Emergency Overland Flow Routes and Maximum Ponding.....	14
2.2 Soil Erosion and Sediment Control	15
2.2.1 NPDES Permit and SWPPP Requirements.....	15
2.2.2 Soil Erosion and Sediment Control Plan Standards	15
SECTION 3 – WATER DISTRIBUTION SYSTEM	17
3.1 General Water Distribution Requirements	17
3.1.1 Utility Locates.....	17
3.1.2 Damage to Existing Utilities	17
3.1.3 Wells	17
3.2 Horizontal & Vertical Separation for Water Lines.....	17
3.2.1 Parallel Installation	17
3.2.2 Pipe Crossings.....	18
3.3 Design Standards for Water Utilities	18



ENGINEERING DESIGN & CONSTRUCTION STANDARDS

3.3.1	Water Main	18
3.3.2	Water Services	20
3.3.3	Valve Vaults.....	21
3.3.4	Valve Boxes	21
3.3.5	Fire Hydrants	21
3.4	Water Utilities Testing & Inspection.....	22
3.5	Water Service Abandonments	23
SECTION 4 – SANITARY SEWER		24
4.1	General Sanitary Requirements	24
4.1.1	Utility Locates.....	24
4.1.2	Damage to Existing Utilities	24
4.1.3	Floor Drains	24
4.1.4	Grease Traps and Oil Water Separators	24
4.2	Design Standards for Sanitary Utilities	25
4.2.1	Sanitary Sewer Pipe (Main Lines and Services).....	25
4.2.2	Sanitary Manholes.....	27
4.3	Sanitary Utilities Testing, Televising & Inspections	28
4.4	Sanitary Service Abandonments.....	28
SECTION 5 – STORM SEWER		29
5.1	General Storm Sewer Requirements	29
5.1.1	Utility Locates.....	29
5.1.2	Damage to Existing Utilities	29
5.1.3	Existing Drainage Tile	29
5.1.4	Downspouts.....	29
5.1.5	Sump Pumps	30
5.2	Design Standards for Storm Utilities	30
5.2.1	Storm Sewer Pipe:.....	30
5.2.2	Storm Manholes / Inlets / Catch Basins	33
5.3	Storm Sewer Testing, Televising, & Inspections	33
SECTION 6 – STORMWATER MANAGEMENT		34
6.1	Stormwater Introduction	34
6.2	Stormwater Design Standards	34
6.2.1	Detention System Outfalls:	34



ENGINEERING DESIGN & CONSTRUCTION STANDARDS

6.2.2	Minimum Restrictor Orifice Diameter.....	35
6.2.3	Retention Basins	35
6.2.4	Detention Basins	35
6.2.5	Rain Gardens.....	35
6.2.6	Underground Detention Systems	36
6.3	Stormwater Management Easements.....	36
SECTION 7 – PAVEMENT.....		37
7.1	Pavement Introduction.....	37
7.1.1	Soil Borings & Geotechnical Recommendation	37
7.1.2	Subgrade Testing (Proof Rolling).....	37
7.1.3	Rough Grading.....	38
7.1.4	Curb Return at Intersection	38
7.2	Public Roadways	38
7.3	Private Roadways and Parking Lots.....	38
7.3.1	Private Roadway Pavement Section.....	39
7.3.2	Parking Lot Drive Aisles / Fire Lanes.....	39
7.3.3	Parking Lot Stalls.....	39
7.4	Driveways.....	39
7.5	Sidewalk.....	40
7.6	Bike Ways	40
7.7	Structural Number Calculation.....	41
SECTION 8 – EXTERIOR LIGHTING		42
8.1	General Lighting Standards.....	42
8.1.1	General Lighting Code and Submittal Requirements	42
8.1.2	Parking Lot Lighting.....	42
8.1.3	Existing Street Light Relocations and Modifications	42
8.2	Street Light Systems	43
8.2.1	General Street Lighting Requirements.....	43
8.2.2	Street Light Easements.....	43
8.2.3	Street Light Material Specifications.....	43
8.2.3	Street Lighting Location and Spacing.....	44
8.2.5	Street Lighting Circuit Design	44
8.2.6	Street Lighting System Control.....	45



ENGINEERING DESIGN & CONSTRUCTION STANDARDS

SECTION 9 – DEVELOPMENT AGREEMENTS.....	46
9.1 Development Agreement Requirements and Process	46
9.2 Resident Engineer	46
9.3 Reduction of Performance Security	47
9.4 Guarantee Period	47
SECTION 10 – CONSTRUCTION PHASE REQUIREMENTS	48
10.1 As-Built Record Drawing Requirements	48
10.1.1 As-Built Plans Format and Standards	48
10.1.2 Intermediate As-Built Plans	50
10.1.3 Final As-Built Plans	51
10.2 Construction Site Requirements.....	51
10.2.1 Construction Site Security and Safety.....	51
10.2.2 Construction Site Hours, Noise, Lighting, and Waste	51
10.2.3 Water Usage.....	52
10.2.4 Illicit Discharge.....	52
10.3 Inspections	52
10.3.1 Soil Erosion & Sediment Control (SESC) Inspections	52
10.3.2 Storm and Sanitary Utility Inspections	54
10.3.3 Water Main Utility Inspections.....	55
10.3.4 Other Inspections	56

APPENDICES

APPENDIX A	Village of Libertyville General Notes
APPENDIX B	Standard Details
APPENDIX C	Utility Installation Observation Form



INTRODUCTION

This manual of *Engineering Design & Construction Standards* has been prepared by the Village of Libertyville's Public Works Department to assist developers, builders, contractors, and their design professionals (architects, engineers, and planners) in the preparation, submittal, review and execution of plans, specifications, and other documents required for the improvement of land as prescribed in Chapter 22 of the Village of Libertyville Municipal Code, "Subdivisions and Other Developments." The purpose of this document is to present standards and specifications for the design of public and private improvements that will result in uniform, long lasting, quality construction.

The design and construction of certain types of improvements also fall under the legal responsibility of other public agencies in addition to the Village. The requirements of these other public agencies must also be met while being in conformance with these Village standards. In addition, any and all permits and bonds required by these other agencies must also be secured in addition to providing the bonds and guarantees required to protect the Village.

All interpretations of this manual are reserved for the Village Engineer or his duly appointed representative. The Village Engineer is authorized to approve an alternative to a particular improvement standard based on his/her professional engineering judgment that the alternative equals or exceeds the standard, or to require an equivalent alternative in any circumstance when the standard is deemed inappropriate.

This manual of *Engineering Design & Construction Standards* is adopted by the Village's Mayor and Board of Trustees with the passage of Resolution 23-R-24. The Village of Libertyville reserves the right to amend the contents of the manual, from time to time, as deemed necessary.

All terms used herein shall have the definitions ascribed to them in the Municipal Code, or the manuals and handbooks referenced herein. A list of commonly used definitions and acronyms can be found on [Page 7](#) of this document.



STANDARD SPECIFICATIONS

All improvements shall be designed and constructed in accordance with the applicable sections of the following manuals, design handbooks, standard specifications, and ordinances:

- a. Village of Libertyville Municipal Code, current edition.
- b. "Standard Specifications for Water and Sewer Main Construction in Illinois," published by the Illinois Society of Professional Engineers, latest edition.
- c. "AWWA Standards," published by the American Water Works Association, latest edition.
- d. "Guide for Determination of Required Fire Flow," published by the Insurance Services Office, latest edition.
- e. "Standard Specifications for Road and Bridge Construction," published by the Illinois Department of Transportation (IDOT), latest edition.
- f. "Highway Standards," published by the Illinois Department of Transportation (IDOT), latest edition.
- g. "Manual on Uniform Traffic Control Devices for Streets and Highways," published by the Federal Highway Administration (FHWA), latest edition.
- h. Supplement to "Manual on Uniform Traffic Control Devices for Streets and Highways," published by the Illinois Department of Transportation (IDOT), latest edition.
- i. "Design Manual", published by the Illinois Department of Transportation (IDOT), latest edition.
- j. "Annual Book of ASTM Standards," published by the American Society for Testing and Materials, latest edition.
- k. "American National Standard Practice for Roadway Lighting," published by the Illuminating Engineering Society, latest edition.
- l. "Landscape Specification, a Uniform Set of Workmanship Standards," published by the Illinois Landscape Contractors Association, latest edition.
- m. "American Standard for Nursery Stock," published by the American Association of Nurserymen, latest edition.
- n. "Procedures and Standards for Urban Soil Erosion and Sediment Control in Illinois," latest edition.
- o. "Illinois Urban Manual", latest edition

In the case of conflicts between the above listed references, the standard which is most stringent shall govern.

The aforementioned standards are supplemented by the following detailed requirements, and in the case of conflict the detailed requirements will take precedence and shall govern:



DEFINITIONS & ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ADA	(In compliance with the) Americans with Disabilities Act
(The) Agreement	Within this Section 9, “The Agreement” shall refer to the Development Agreement
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials (ASTM International Organization)
AWWA	American Water Works Association
(The) Board	The Village of Libertyville Board of Trustees
BFE	Base Flood Elevation
CAD	Computer-Aided Design (electronic file format “.dwg”)
(The) Code	The Village Libertyville Municipal Code (also “Village Code”, “Municipal Code”)
Detention	Temporary, on-site storage of storm water to be released at a controlled rate by means of facilities engineered for that purpose
Developer	Within this document, “Developer” shall include the owner, applicant, or similar party who is responsible for a subject development.
Development	Per Code: Any man-made change to improved or unimproved real estate other than maintenance of existing structures, paved areas and landscaping, and interior remodeling of existing structures, including, without limitation, the construction or installation of new, or enlargement of existing, structures, paved areas, or utilities; dredging, filling, drilling, mining, grading, paving, or excavating operations; installation of new landscaping; and open storage of materials.
DIP	Ductile Iron Pipe
Engineering Design Standards	Refers to this document, the “Engineering Design & Construction Standards”
GIS	Geographic Information System
HDPE	High Density Poly Ethylene (pipe material)
HMA	Hot-Mix Asphalt
HWL	High-Water Level
IDOT	Illinois Department of Transportation
IEPA	Illinois Environmental Protection Agency
Impervious Area	The area within a parcel that prevents or significantly impedes the infiltration of stormwater into the soil. Impervious area includes, without limitation, buildings, roofed structures, sidewalks and walkways, parking lots, patios, decks, swimming pools, roads, bridges, medians, driveways, gravel areas, other paved areas, and other similar non-porous areas.
IUM	Illinois Urban Manual
JULIE	J.U.L.I.E. (Joint Utility Locating Information for Excavators)
LCSMC	Lake County Stormwater Management Commission
LED	Light-Emitting Diode
NAVD 88	North American Vertical Datum of 1988
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWL	Normal Water Level
PCC	Portland Cement Concrete
PDF	Portable Document Format (electronic file format “.pdf”)
PVC	Polyvinyl Chloride (pipe material)
RE	Resident Engineer
Retention	Area containing a permanent pool of water as well as capacity to detain additional storm water for long periods of time.
SESC	Soil Erosion and Sediment Control
SN	Structural Number
SWPPP	Stormwater Pollution Prevention Plan
(The) Village	The Village of Libertyville
WDO	Lake County Watershed Development Ordinance, current edition



SECTION 1 – GENERAL REQUIREMENTS

1.1 Applicability

The specific Village of Libertyville Design Standards contained in this document apply to the following situations, which fall under the jurisdiction of the Village of Libertyville:

- Proposed Subdivisions (as defined by Chapter 22 of the Village Code)
- Proposed Developments (as defined by Chapter 22 of the Village Code)
- Site modifications to existing subdivisions/developments
- Proposed single-family home construction or exterior renovation/improvements
- Repair or replacement of infrastructure (private or public)

Note that private infrastructure and public infrastructure might have different standards, which are expressly specified in this document. If no distinction is made, it is understood that both private and public improvements are held to the same standards for that section (or sub-section).

1.2 Subdivision General Design Standards

1.2.1 Streets

- a. Refer to Chapter 22, Art V, Sec. 22-87 of the Village Code for general street standards.
- b. Refer to Village Standard Details “**Typical Residential Roadway Section**” & “**Typical Non-Residential Roadway Section**”.
- c. Refer to [Section 7](#) of these Engineering Design Standards for pavement standards.
- d. Right-of-way at intersections of Village streets shall be rounded with a minimum twenty-five foot (25’) radius, or as otherwise required by traffic conditions or geometric requirements.
- e. Where a Village street intersects a route under the jurisdiction of the Lake County Division of Transportation (LCDOT) or the Illinois Department of Transportation (IDOT), the right-of-way shall be rounded or chamfered as required by the appropriate agency.
- f. All streets (including access roads), both public and private, shall be paved (gravel roads are not acceptable). At the sole discretion of the Village Engineer, alternative paving materials may be used for access roads not meant for use by the general public.
- g. Street classifications shall be assigned by the Village Engineer and may be subject to reclassification based on usage and traffic patterns.



ENGINEERING DESIGN & CONSTRUCTION STANDARDS

- h. Geometric Standards for private streets or public streets (Village Jurisdiction) shall follow the table below, unless otherwise approved by the Village Engineer:

Geometric Standard	Residential	Non-Residential (or Residential Collector per Village Engineer)
Minimum width of right-of-way	60 feet	80 feet
Cul-de-sac right-of-way radius	60 feet	80 feet
Horizontal curves of street line	200 feet	400 feet
Vertical curves of surface of pavement	100 feet	200 feet
Minimum length of tangents between reverse curves	100 feet	200 feet
Minimum grade	0.5%	0.5%
Maximum grade	5%	5%
Minimum nonpassing sight distance	200 feet	250 feet

- i. Pavement Widths for private streets or public streets (Village Jurisdiction) shall follow the table below, unless otherwise approved by the Village Engineer.

Street Classification	Minimum Street Width*
(i) Primary /Arterial	(Per Jurisdictional DOT)
(ii) Non-Residential (or Residential Collector per Village Engineer)	40 feet
(iii) Residential	27 feet
(iv) Cul-de-sac	43 feet radius (residential) 60 feet radius (all others)

**Note: Street width is measured from the back-of-curb*

1.2.2 Blocks

Blocks shall be laid out so as to provide lots which meet all zoning requirements, and which do not include through lots. Refer to Chapter 22, Art V, Sec. 22-88 of the Village Code for general block standards.

1.2.3 Lots

Refer to Chapter 22, Art V, Sec. 22-89 of the Village Code for general lot standards and Sec. 22-90 for monumentation requirements.

Refer to the Chapter 26 (Zoning) of the Village Code for lot requirements based on applicable zoning district.



1.3 Preliminary Engineering Plans

1.3.1 Minimum Preliminary Plan Requirements

Should a development be seeking 'preliminary' approval of any kind from the Village, preliminary engineering plans shall be provided in accordance with the following:

- a. The scale used for plans may range between 1"=10', and 1"=60' for horizontal, and between 1"=2' and 1"=5' for vertical.
- b. Plans shall be prepared by a licensed professional engineer.
- c. Plans shall be submitted on sheets not exceeding 24" x 36" in size.
- d. Existing Conditions Plan: The plans should include a stand-alone sheet to reflect the pre-development 'Existing Conditions'. This plan should depict all existing site features along with existing topographical information and lot coverage calculations.
- e. Site Improvement Plan: The plans should include a stand-alone sheet to reflect the post-development conditions. At a minimum, this plan should reflect all site features intended to remain and/or be constructed, proposed lot coverage calculations, utility and/or service layouts, and sufficient site grading information to demonstrate how all applicable stormwater detention requirements, general drainage patterns, and emergency overland flow routes will be accommodated.
- f. All plan elevations shall be based on the NAVD 88 datum, and a reference benchmark must be identified on the plans.
- g. If the project is intended to be constructed in separate phases, the Preliminary Engineering Plans shall identify the limits, scope, and timing of each phase accordingly.

The above-listed requirements represent minimum requirements for preliminary design plans. Applicants are encouraged to provide additional plans sheets and/or information beyond these requirements as needed to demonstrate the function of the development. Village staff also reserves the right to request additional information beyond the above-listed items dependent on the scope and scale of the project.

1.3.2 Submittal of Preliminary Engineering Plans

The required number of full-size (24"x36") and reduced-size (11"x17") copies required for submittal shall be coordinated with the Community Development Department. An electronic copy (PDF format) of all submittal material should be provided along with all submittals via email, file share application, or on an appropriate device. Refer to Chapter 22, Art III the Village Code for general application requirements.



1.4 Final Engineering Plans

1.4.1 Minimum Final Plan Requirements

Submittals for Final Engineering shall include, at a minimum, the following items:

- a. Plans shall be signed and sealed by a licensed professional engineer.
- b. The scale used for plans may range between 1"=10', and 1"=60' for horizontal, and between 1"=2' and 1"=5' for vertical.
- c. Plans shall be submitted on sheets not exceeding 24" x 36" in size.
- d. The following plan sheets are recommended for inclusion in the final design plans. The design engineer shall ultimately determine which sheets are required to appropriately depict the full extent of the proposed improvements. The Village also reserves the right to request any additional plan sheets dependent on scope and scale of the project.

1. Title Sheet
2. General Notes / Specifications

(All plans shall include the "Village of Libertyville – General Notes")

3. Existing Conditions
4. Demolition / Tree Removal Plan
5. Geometry / Paving Plan
6. Grading Plan
7. Utility Plan
8. Erosion / Sediment Control Plan
9. Tree Preservation Plan
10. Photometric Plan
11. Standard Details
12. Landscape Plan

- e. All plan elevations shall be based on the NAVD 88 datum, and reference benchmarks must be identified on the plans (Source Benchmark and Site Benchmark).



- f. If the project is intended to be constructed in separate phases, the Final Engineering Plans shall identify the limits, scope, and timing of each phase accordingly.

The above-listed requirements represent minimum requirements for final design plans. Applicants are encouraged to provide additional plans sheets and/or information beyond these requirements as needed to demonstrate the function of the development. Village staff also reserves the right to request additional information beyond the above-listed items dependent on the scope and scale of the project.

1.4.2 Submittal of Final Engineering Plans

The required number of full-size (24"x36") and reduced-size (11"x17") copies required for submittal shall be coordinated with the Community Development Department. An electronic copy (PDF format) of all submittal material shall be provided along with all submittals via email, file share application, or on an appropriate device.

If the project requires approvals from additional permitting entities (i.e. Illinois Dept. of Transportation (IDOT), Illinois Environmental Protection Agency (IEPA), etc.) copies of all correspondence with said agency shall be provided to the Village for reference. Permit approvals from outside agencies may be required prior to Village permit issuance, subject to the scope of said improvements and discretion of the Village Engineer.

Refer to subsequent sections within this document for further information on plan requirements related to specific topics.



SECTION 2 – EARTHWORK

2.1 Earthwork and Grading

2.1.1 General Earthwork Requirements

- a. All developed sites shall be designed to be self-draining, but shall not adversely affect adjacent properties.
- b. Drainage shall be designed to avoid concentrations of stormwater to adjacent lots.
- c. Stormwater detention/retention basins shall be constructed during the initial phase of mass grading activities.
- d. All lots shall be designed to provide positive drainage away from all buildings, and individual lot drainage shall be coordinated with the general storm drainage pattern for the area.
- e. Prior to commencement of grading activities, sediment/erosion control measures as identified on the design plans must be implemented, installed, and inspected by the Village. Refer to [Subsection 10.3.1](#) of these Engineering Design Standards for more details on the SESC Inspection requirements.

2.1.2 Grading Plan Standards

- a. Benchmark and Datum info must be clear on plans
- b. Plans must identify the limits of all grading work and show existing and proposed contours at intervals no greater than one-foot (1’).
- c. Spot grades shall be provided along all proposed curb lines at the top-of-curb and gutter ‘flow line’, unless noted otherwise on the plans.
- d. All exterior ADA accessible areas/routes must be graded in detail, with all necessary spot grades, cross slopes, longitudinal slopes, ramp areas, and landing areas clearly labeled. Depending on the scale of the drawings, these areas may be required to be enlarged to show the required level of detail. These areas of enhanced detail often include, but are not limited to:
 - Public Sidewalk (particularly at driveway crossings and curb ramps)
 - ADA parking stalls and exterior ADA Route
 - Sidewalk near building entrances



ENGINEERING DESIGN & CONSTRUCTION STANDARDS

- e. Emergency overland flow routes shall be identified on the grading plan – see [section 2.1.4](#) below for more detail
- f. Calculations shall be provided indicating the quantities of earth which must be imported to and/or exported from the site.
- g. Top-of-foundation elevations shall be identified for all adjacent existing buildings.

2.1.3 Slope Requirements

- a. Minimum slopes for final grading shall be one percent (1%) in all locations. Exceptions can be made by the Village Engineer for curb and gutter, provided that the adjacent pavement drains properly into the gutter.
- b. Slopes shall not be steeper than 3:1 (horizontal to vertical), unless otherwise approved by the Village Engineer.
- c. Village will not accept As-Built slopes greater than 2.0% cross slope for ADA routes / ADA Stalls / Public Sidewalk. Therefore, it is recommended that cross slopes are designed at 1.5% cross slope or less to allow for construction tolerance.
- d. Refer to [Section 6](#) of these Engineering Design Standards for slope requirements specific to detention basin design.

2.1.4 Emergency Overland Flow Routes and Maximum Ponding

Emergency overland flow routes must be identified throughout the site. These should be identified by large arrows or other appropriate symbology to demonstrate how stormwater can safely pass through the site in instances where sewer or inlet capacities may be exceeded/blocked. Overland flow routes should be designed to facilitate the conveyance of stormwater through the site and to stormwater management basins wherever feasible.

The maximum ponding depth before an individual catchment area activates the emergency overland flow route should be in correspondence with the requirements below, unless specifically reviewed and approved by the Village Engineer:

- a. Commercial/Residential Pavement Ponding = 9” max
- b. Industrial Pavement Ponding = 12” max
- c. Swale/Yard Ponding = 12” max



Freeboard shall be maintained in accordance with the Lake County Watershed Development Ordinance (WDO) at all overflow points. This should be confirmed with weir-modeling software when applicable to ensure conveyance capacity at the overflow point maintains the freeboard requirement.

2.2 Soil Erosion and Sediment Control

2.2.1 NPDES Permit and SWPPP Requirements

- a. It is the responsibility of the developer/owner and their consultants/contractors to determine if proposed improvements require a National Pollutant Discharge Elimination System (NPDES) permit issued by the Illinois Environmental Protection Agency (IEPA).
- b. All applicable projects shall provide a Stormwater Pollutant Prevention Plan (SWPPP) in accordance with IEPA requirements, which shall be fully executed and kept on-site and updated with weekly inspection reports. Refer to [Subsection 10.3.1](#) of these Design Standards for more details on the SWPPP Inspection requirements.
- c. Soil Erosion measures and inspection reports must be maintained until permanent stabilization is achieved per IEPA standards and the site's NPDES permit is closed with the IEPA.

2.2.2 Soil Erosion and Sediment Control Plan Standards

These standards shall be utilized, as applicable, for projects requiring an NPDES Permit and/or a Watershed Development Permit in accordance with the WDO.

- a. All measures necessary to prevent erosion and contain sediment on-site shall be specifically noted on the Final Engineering Plans, on a dedicated sheet.
- b. At any time during construction, if sediment-laden water is observed leaving the site, the plan should be updated with the new measures required, and installed accordingly.
- c. Lake County Stormwater Management Commission (LCSMC) "Soil Erosion and Sediment Control Construction Notes" shall be added to the plans, along with any relevant details from LCSMC, Natural Resources Conservation Service (NRCS), and Illinois Urban Manual (IUM). Refer to Village Standard Detail "**Erosion / Sediment Control Standards**", which should be filled out accordingly and added to the plans.



ENGINEERING DESIGN & CONSTRUCTION STANDARDS

- d. All permanent swales and overflow routes should be stabilized with Erosion Control Blanket or other approved method. Larger swales (temporary or permanent) might require check dams.
- e. Overflow weirs and spillways should be analyzed for peak flow/velocity and stabilized with an appropriate method/product.
- f. All slopes 4:1 (H:V) or steeper shall be stabilized with Erosion Control Blanket or other approved method, to be installed immediately after grading is completed (Per NPDES General Permit stabilization time-frame requirements).
- g. Inlet protection should be specified for any existing/proposed storm structure with an open grate that is within the project disturbance area or within proximity of the construction entrance.
- h. The use of filter fabric draped underneath a structure frame and grate is unacceptable. Filter baskets must meet LCSMC standards.
- i. Filter baskets must be regularly cleaned/maintained, and shall not reach the point of being two-thirds (2/3) full before the sediment is removed.
- j. During construction, a temporary perforated riser shall be maintained in the outfall of any detention basin which is proposed, disturbed, or subject to sediment-laden stormwater runoff. Refer to the Village's "**Temporary Perforated Riser**" standard detail for further information.
- k. Plans shall adequately identify the limits of stripping, locations of topsoil or other material stock piles, and all proposed haul roads. Areas of the site which are to be protected from disturbance and the means of protection shall be noted.



SECTION 3 – WATER DISTRIBUTION SYSTEM

The water distribution system shall be designed in accordance with Illinois Environmental Protection Agency and other applicable requirements. The design of all water main systems shall incorporate the more stringent requirements of agency requirements or the following standards:

3.1 General Water Distribution Requirements

For additional information and regulations related to water utilities, refer to Chapter 25, Article II (“Municipal Water System”) in the Village Code.

3.1.1 Utility Locates

No excavation shall commence until all existing public and private utilities are field located. Call JULIE (811 OR 800-892-0123) at least forty-eight (48) hours in advance.

3.1.2 Damage to Existing Utilities

All necessary precautions shall be taken against damage to existing utilities.

In the event of a break in an existing water main, gas main, sewer, or underground cable, the contractor shall immediately notify a responsible official from the organization operating the utility interrupted. The contractor or developer shall lend all possible assistance in restoring service and shall assume all costs, charges, or claims connected with the interruption and repair of such services.

Should repair work need to be performed by the Village for any reason, the cost of such repair work will be billed to the contractor or developer on a time and material basis plus, fringe, overhead, and administrative costs.

3.1.3 Wells

Wells which are currently not in use or whose use will be discontinued shall be abandoned and sealed in accordance with Lake County and State of Illinois requirements. No part of any existing private well shall be connected to the Village’s water system.

3.2 Horizontal & Vertical Separation for Water Lines

3.2.1 Parallel Installation

Any sanitary sewer, storm sewer, or sewer manhole shall be located at least 10 feet (10’) horizontally from water mains, whenever possible; the distance shall be measured from edge to edge. When conditions prevent a horizontal separation of ten feet (10’), a storm or sanitary sewer may be laid closer to a water main provided that:



- a. The bottom of the water main is at least 18 inches (18”) above the top of the sewer.
- b. Where this vertical separation cannot be obtained, the sewer shall be constructed of materials and with joints that are equivalent to water main standards of construction.

3.2.2 Pipe Crossings

Sanitary and storm sewers crossing water mains shall be laid to provide a vertical separation of at least eighteen inches (18”) between the bottom of the water main and the top of the sewer. When conditions prevent a vertical separation as described above, or the sewer is above the water main, the following construction shall be used:

- a. Sewers passing over or under water mains should be constructed of the materials and joints that are equivalent to water mains standards of construction.
- b. Construction of sewers crossing over water mains shall insure additional protection to the water main by providing:
 - i. A vertical separation of at least 18 inches (18”) between the bottom of the sewer and the top of the water main.
 - ii. Adequate structural support for the sewer to prevent excessive settling and breakage of the water main.

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

3.3 Design Standards for Water Utilities

3.3.1 Water Main

- a. Material:
 - i. Within Public Right-of-Way: Ductile Iron Pipe, Class 52 conforming to ANSI A21.51 or AWWA C151 with cement lining in conformance with ANSI A21.4 or AWWAC104.
 - ii. Within Easements: Ductile Iron Pipe, Class 55 conforming to ANSI A21.51 or AWWA C151 with cement lining in conformance with ANSI A21.4 or AWWAC104.



ENGINEERING DESIGN & CONSTRUCTION STANDARDS

- iii. Special consideration of alternate pipe materials may be allowed by the Village Engineer if highly corrosive soils or special site conditions exist.
- b. Fittings:
 - i. All fittings shall be mechanical joint ductile iron and shall conform to ANSI 21.10 or AWWA C110.
 - ii. Grade #304 stainless steel bolts and Grade #300 stainless steel nuts to be utilized for all connections.
- c. Rubber Gasket Joints:
 - i. Rubber gasket joints shall be utilized and shall conform to AWWA C111.
- d. Looped Systems:
 - i. All new water main systems must be looped. The maximum allowable length for a dead-end main is one hundred fifty feet (150’).
- e. Thrust Blocking:
 - i. Thrust blocking shall be installed on watermains at all bends, tees, elbows, offsets, etc.
 - ii. Refer to Village’s “**Thrust Blocking**” standard detail for further information.
- f. Depth:
 - i. All water main and water service pipe shall have a minimum depth of cover of five and one-half feet (5 ½’) as measured from the proposed or existing ground surface elevation to the top of pipe.
- g. Pipe Bedding:
 - i. All pipe backfill and bedding shall be performed in accordance with the Village’s “**Typical Trench & Bedding**” standard detail. All utilities installed under or within three feet (3’) of pavement shall be backfilled with compacted CA-6 crushed stone, or flowable fill as applicable per detail, to finished subgrade.
- h. Polyethylene Encasement:
 - i. All DIP water mains shall be encased in an 8-mil V-Bio Polywrap, or approved equal. The polywrap is to be secured to the pipe in



accordance with manufacturer recommendations. Material and installation shall adhere to applicable AWWA and ANSI standards. Refer to the Village's "**Water Main Polyethylene Encasement**" standard detail for further information.

- i. Tracer Wire:
 - i. Any non-metal watermain or service shall be installed with a minimum 10-gauge stranded copper tracer wire, type RHW-2. The wire shall be continuous through the valve vaults and boxes and shall be accessible at grade within the vault frame or box. 3M DBR splice kits, or approved equals, shall be used for splicing cable ends.

3.3.2 Water Services

Refer to the Village's "**Water Service**" standard detail for further information.

- a. Material:
 - i. All water services between 1" and 2" diameter shall be Type K soft copper tubing (conforming to ASTM B88 and ASTM B251) from the public main to the service valve (b-box).
 - ii. Materials for the private (customer) section of the service, from the b-box to the building, shall be per plumbing code.
- b. Fittings:
 - i. Compression fittings shall be used to connect new copper pipe to existing service pipe.
- c. Tracer Wire:
 - i. Any non-metal watermain or service shall be installed with a minimum 10-gauge stranded copper tracer wire, type RHW-2. The wire shall be continuous through the valve vaults and boxes and shall be accessible at grade within the vault frame or box. 3M DBR splice kits, or approved equals, shall be used for splicing cable ends.
 - ii. Tracer wire shall extend along the entire service (both private and public portions) from the public water main to the building. It shall be accessible at the "Tracer Wire Access Box" as shown in the Village's "Water Service" standard detail.



3.3.3 Valve Vaults

Refer to the Village's "**Valve Vault**" standard detail for further information.

- a. Pressure Connections:
 - i. Refer to the Village's "**Pressure Connection & Vault**" standard detail for further information on valve and structure requirements for pressure connections.
- b. Spacing:
 - i. Valves shall be located along water mains so as to effectively isolate sections from the system with minimal disruption should a break or other failure occur.
 - ii. The maximum spacing between water valves shall be seven hundred fifty feet (750') or less as deemed necessary by the Village Engineer.
 - iii. The Village Engineer may permit spacing at greater intervals or require spacing at lesser intervals if deemed warranted.

3.3.4 Valve Boxes

Refer to the Village's "**Valve Box**" standard detail for further information.

All valves shall be designed to be located within Valve Vaults, unless there is a specific reason or conflict in which a Valve Box is deemed necessary, at the discretion of the Village Engineer.

Valve Boxes are only to be installed on mains 8" or smaller in diameter, and will not be permitted for mains larger than 8".

3.3.5 Fire Hydrants

Refer to the Village's "**Hydrant Assembly**" standard detail for further information.

- a. Hydrant structure:
 - i. Fire hydrant shall meet requirements of AWWA C-502.



- b. Color:
 - i. All fire hydrants shall be painted 'red'.
 - ii. All paint shall be reflective-type.
 - iii. All hydrants should be primed and painted at the factory (prior to site delivery) whenever possible. On-site priming and painted should be reserved for necessary maintenance only.
- c. Marker:
 - i. All fire hydrants in non-residential areas shall be installed with a 5' tall reflective hydrant marker.
- d. Spacing:
 - i. Hydrants shall be spaced not more than three hundred feet (300') apart, as measured along the water main. A hydrant shall be placed within one hundred feet (100') of the center of each street intersection.
 - ii. Hydrant coverage shall ultimately be reviewed and approved by the Village of Libertyville Fire Department, and the Fire Department reserves the right to request additional hydrants as deemed necessary for proper building or site fire protection coverage.
 - iii. A hydrant is required to be located within one hundred fifty feet (150') of the building's Fire Department Connection, unless otherwise approved by the Fire Department.
 - iv. Fire hydrants should be installed such that each residential property is within one hundred fifty feet (150') of a fire hydrant (measured to the property line).

3.4 Water Utilities Testing & Inspection

Refer to [Section 10 \("Construction Phase Requirements"\)](#) of this manual for further information on testing and inspection requirements related to the water distribution system.



3.5 Water Service Abandonments

Existing service connections to the public water main that are no longer intended for use shall be permanently disconnected and abandoned in accordance with the following, provided however that alternative measures may be required if warranted by circumstances.

- a. Tap Connection – Typically Service Lines of 2-1/2” or smaller: The B-Box shall be removed, and the service line shall be disconnected from the corporation stop. Threaded cap to be installed on corporation stop at location of disconnected service.
- b. Pressure Connection - Service Lines between 3” and 6”: The top section of the valve vault or valve box shall be removed and the structure can be filled and abandoned in place. The service line shall be disconnected at the main, and the pressure connection sleeve and valve shall be removed and disposed entirely. A stainless steel repair sleeve with a minimum length of four times the size of the connection shall be installed on the water main. The Village reserves the right to require full removal of the existing valve vault or valve box and service line as well as potential capping or plugging of the valve in place if deemed warranted by field conditions.
- c. Pressure Connection - Service Lines larger than 6”: The top section of the valve vault or valve box shall be removed and the structure can be filled and abandoned in place. The service line shall be disconnected at the main, and a section of the water main as measured five feet (5') from each end of the pressure connection sleeve shall be removed. The main shall be replaced with proper ductile iron water main and fittings. The Village reserves the right to require full removal of the existing valve vault or valve box and service line as well as potential capping or plugging of the valve in place if deemed warranted by field conditions.
- d. 'Tee' Fitting Connection: The top section of the valve vault or valve box (if present) shall be removed and the structure can be filled and abandoned in place. The service line shall be disconnected at the main, and a section of the water main as measured five feet (5') from each end of the tee fitting shall be removed. The main shall be replaced with proper ductile iron water main and fittings. The Village reserves the right to require full removal of the existing valve vault or valve box and service line as well as potential capping or plugging of the tee in place if deemed warranted by field conditions.



SECTION 4 – SANITARY SEWER

The sanitary sewer system shall be designed in accordance with Illinois Environmental Protection Agency and other applicable requirements. The design of all sanitary sewers shall incorporate the more stringent requirements of agency requirements or the following standards:

4.1 General Sanitary Requirements

For additional information and regulations related to Sanitary Sewage, refer to Chapter 25, Article III (“Sanitary Sewers and Sanitary Sewage Disposal”) in the Village Code.

4.1.1 Utility Locates

No excavation shall commence until all existing public and private utilities are field located. Call JULIE (811 OR 800-892-0123) at least forty-eight (48) hours in advance.

4.1.2 Damage to Existing Utilities

All necessary precautions shall be taken against damage to existing utilities. In the event of a break in an existing water main, gas main, sewer, or underground cable, the contractor shall immediately notify a responsible official from the organization operating the utility interrupted. The contractor or developer shall lend all possible assistance in restoring service and shall assume all costs, charges, or claims connected with the interruption and repair of such services. Should repair work need to be performed by the Village for any reason, the cost of such repair work will be billed to the contractor or developer on a time and material basis plus, fringe, overhead, and administrative costs.

4.1.3 Floor Drains

All building floor drains shall discharge into the sanitary sewer.

4.1.4 Grease Traps and Oil Water Separators

Grease Traps and/or Oil Water Separators will be required where deemed necessary by Village Staff based on the nature of the effluent sewage.

Grease, oil, or sand traps shall be in accordance with Subsection 25-106 of the Village Code.



4.2 Design Standards for Sanitary Utilities

4.2.1 Sanitary Sewer Pipe (Main Lines and Services)

Refer to the Village's "Sanitary Service" standard detail for further information on service lines.

a. Material:

- i. PVC SDR 26: Polyvinylchloride plastic gravity sewer pipe (PVC) SDR 26 (standard ASTM D-3034 with ASTM 3212 joints or water quality ASTM D-2241 with ASTM D-3139 joints).
- ii. PVC C900: Polyvinylchloride plastic gravity sewer pipe (PVC) conforming to AWWA C900 pressure class with gaskets conforming to ASTM F477 and ASTM D-3139 joints.
- iii. (Alternate) Ductile Iron: Ductile Iron Pipe Class 52 (ANSI A21.51 with ANSI 21.11 joints) – Upon approval by Village Engineer

b. Depth:

- i. All sanitary sewers and service pipes shall have a minimum depth of cover of three feet (3') as measured from the proposed or existing ground surface elevation to the top of pipe.

c. Pipe Bedding:

- i. All pipe backfill and bedding shall be performed in accordance with the Village's "**Typical Trench & Bedding**" standard detail. All utilities installed under or within three feet (3') of pavement shall be backfilled with compacted CA-6 crushed stone, or flowable fill as applicable per detail, to finished subgrade.

d. Pipe Slope:

- i. All service lines 6" in diameter or smaller shall be constructed with a minimum slope of one percent (1%).
- ii. All sanitary sewer mains 8" in diameter or greater shall be constructed with slopes conforming to IEPA regulations (0.40% or greater).
- iii. Sewers shall be designed and installed with a uniform slope between manholes.



- e. Alignment:
 - i. All sewers shall be laid with straight alignments between manholes.
- f. Connections for Dissimilar Materials:
 - i. Neoprene non-shear (Fernco or similar) connections with stainless steel bands shall be required on all pipe connections when dissimilar pipe materials are joined. Follow manufacturer's recommendations for the installation.
- g. Connections to Sanitary Main Line:
 - i. Main-to-main connections: All connections between two (2) main lines shall occur with a sanitary manhole being provided at the connection point.
 - ii. Service-to-main connections: One of the following methods shall be used when connecting a sewer service to an existing sewer main by means other than an existing wye, tee, or manhole, provided however, that an alternate service tap method may be required if warranted by circumstances.:
 - 1. Circular saw-cut of sewer main by proper tools ('Sewer-Tap' machine or similar) and proper installation of hub-wye saddle or hub-tee saddle.
 - 2. With pipe cutter, neatly and accurately cut out desired length of pipe for insertion of proper fitting, using non-shear (Fernco or similar) couplings to hold it firmly in place.
 - iii. Connection into existing manhole:
 - 1. Circular saw-cut into existing manhole by proper tools. Proper installation of new pipe into existing manhole shall use hydraulic cement (not traditional mortar) to provide a water-tight seal.
- h. Private Sanitary Structures:
 - i. Structures serving private sanitary sewer lines (e.g. inspection manholes, cleanouts) shall be located within the subject property and not within the public right-of-way. (Building sewers, including all portions of underground service lines within the public right-of-way, are the responsibility of the owner of the premises served.)



4.2.2 Sanitary Manholes

Refer to the Village's "**Sanitary Manhole**" standard detail for further information.

- a. Structure:
 - i. Precast concrete structure with the diameter dependent on pipe size as determined by design engineer.
- b. Frame/Lid:
 - i. All structure frames & lids shall be in accordance with the Village's "**Frame & Grate/Lid Standards**" detail. "Sanitary" shall be imprinted on the lid for all manholes. If the utility is to be maintained by the Village, the cover shall also include "Village of Libertyville" imprinted as well.
- c. Chimney Seal:
 - i. All manholes shall have a rubber gasket external neoprene chimney seal installed between the frame and cone section. If conditions prohibit installation, an internal chimney seal may be allowed with Village permission.
- d. Spacing:
 - i. The maximum spacing between manholes shall be four hundred feet (400') or less as deemed necessary by the Village Engineer.
 - ii. The Village Engineer may permit spacing at greater intervals or require spacing at lesser intervals if deemed warranted.
- e. Drop Manhole:
 - i. A drop manhole (or drop connection) will be required for any incoming pipes that are twelve inches (12") or more above the bench of the structure. Refer to the Village's "**Sanitary Manhole Drop Connection**" standard detail for more information.
- f. Inspection Manholes:
 - i. An inspection manhole is required to be installed on any service line that is six inches (6") in diameter or greater. The inspection manhole shall be a 'flow through' structure and is additional to manholes located along the main sewer line.



- ii. The Village Engineer may waive the requirement for inspection manholes if installations are restricted by site conditions.

4.3 Sanitary Utilities Testing, Televising & Inspections

Refer to [Section 10 \("Construction Phase Requirements"\)](#) of this manual for further information on testing and inspection requirements related to the sanitary sewer system.

4.4 Sanitary Service Abandonments

Existing service connections to the public sanitary sewer system that are no longer intended for use shall be permanently disconnected and abandoned in accordance with the following, provided however that an alternate method of abandonment may be required if warranted by circumstances:

- a. 'Tee' or 'Wye' Connection to Existing Main (Good Condition):
 - i. The 'Tee' or 'Wye' shall be sealed appropriately by installing a mechanical plug at opening of the 'Tee' or 'Wye' fitting and then hydraulic cement placed on the outside of the plug
 - ii. No existing clay service shall be considered "in good condition". All clay services shall be removed entirely, as described below.
- b. Any other lateral connection was performed (or existing Tee/Wye is damaged):
 - i. The main must be cut out on both sides of the old service connection and replaced with PVC SDR26 or better.
 - ii. Use of non-shear mission couplings is required.
 - iii. New PVC main must be supported by means of pipe bedding. The pipe bedding shall be placed so that the entire length of the pipe would have full bearing. No blocking of any kind shall be used to adjust the pipe to grade.
- c. Connection within Existing Manhole:
 - i. The lateral pipe inside the manhole structure shall be sealed appropriately by installing a mechanical plug in the pipe and then hydraulic cement placed on the outside of the plug.
- d. Septic System Abandonment:
 - i. Existing septic systems shall be abandoned in accordance with Lake County Health Department requirements.



SECTION 5 – STORM SEWER

5.1 General Storm Sewer Requirements

For additional information and regulations related to storm utilities, refer to Chapter 20.5 (“Stormwater Management”) in the Village Code.

5.1.1 Utility Locates

No excavation shall commence until all existing public and private utilities are field located. Call JULIE (811 OR 800-892-0123) at least forty-eight (48) hours in advance.

5.1.2 Damage to Existing Utilities

All necessary precautions shall be taken against damage to existing utilities. In the event of a break in an existing water main, gas main, sewer, or underground cable, the contractor shall immediately notify a responsible official from the organization operating the utility interrupted. The contractor or developer shall lend all possible assistance in restoring service and shall assume all costs, charges, or claims connected with the interruption and repair of such services. Should repair work need to be performed by the Village for any reason, the cost of such repair work will be billed to the contractor or developer on a time and material basis plus, fringe, overhead, and administrative costs.

5.1.3 Existing Drainage Tile

All existing field drainage tile encountered or damaged during construction shall be restored to their original condition, properly rerouted and/or connected to the storm sewer system or drainage way. All locations of encountered field drainage tile shall be properly indicated on a set of record drawings.

If the nature of a proposed development is such that encountering drain tile is likely, the Village Engineer can request that a drain tile survey be performed prior to permit issuance, and that the results of the drain tile survey be incorporated into the Final Engineering Plans.

5.1.4 Downspouts

Refer to subsection 20.5-108 in the Village Code for additional downspout regulations.

Residential downspouts shall splash on-grade and be directed towards the front or rear of the property, unless otherwise permitted by the Village Engineer. In no instance will downspouts be permitted to discharge to the sanitary sewer system. All roof downspouts shall discharge on grade in the front, rear, or corner side yard direction as defined by the Libertyville Zoning Code with a maximum extension of 5-feet from the structure and no closer than 5-feet from any property line. Any modifications to these requirements shall be approved by the Village Engineer.

Commercial downspouts shall be designed not to cause a trip-hazard in sidewalk areas or a slip-hazard due to freezing discharge.



5.1.5 Sump Pumps

All sump pumps shall be directly connected to the stormwater management system or directly to a Village storm sewer; where possible. Each property shall have a single storm service to the public storm system (public storm sewer if available or roadside swale if appropriate), unless a single service is not feasible or practical as determined by the Village Engineer.

Cross connections to the sanitary sewer system are expressly prohibited.

Refer to the Village's "**Sump Pump Connection**" detail for further information.

Where no storm sewer is available for connection of the sump pump discharge, installation of a dry well to receive the sump pump discharge should be considered. Please refer to the Village's "**Residential Dry Well**" detail for further information.

5.2 Design Standards for Storm Utilities

5.2.1 Storm Sewer Pipe:

- a. Material (for publicly owned or maintained sewers):
 - i. RCP: Reinforced concrete pipe (ASTM C76 with ASTM C443 joints) of the class identified on the plans.
 - ii. PVC SDR 26: Polyvinylchloride plastic gravity sewer pipe (PVC) SDR 26 (ASTM D-3034 or water quality ASTM D-2241 with ASTM D-3139 joints).
 - iii. PVC C900: Polyvinylchloride plastic gravity sewer pipe (PVC) conforming to AWWA C900 pressure class with gaskets conforming to ASTM F477 and ASTM D-3139 joints.
 - iv. Ductile Iron: Ductile Iron Pipe Class 52 (ANSI A21.51 with ANSI 21.11 joints).



- b. Material (for privately owned or maintained sewers):
 - i. RCP: Reinforced concrete pipe (ASTM C76 with ASTM C443 joints) of the class identified on the plans.
 - ii. PVC SDR 26: Polyvinylchloride plastic gravity sewer pipe (PVC) SDR 26 (ASTM D-3034 or water quality ASTM D-2241 with ASTM D-3139 joints).
 - iii. PVC C900: Polyvinylchloride plastic gravity sewer pipe (PVC) conforming to AWWA C900 pressure class with gaskets conforming to ASTM F477 and ASTM D-3139 joints.
 - iv. Ductile Iron: Ductile Iron Pipe Class 52 (ANSI A21.51 with ANSI 21.11 joints).
 - v. HDPE: High density polyethylene pipe (HDPE), Type S, double wall (smooth interior, corrugated outer wall), utilizing a bell-and-spigot joint system and providing a water tight joint.
- c. Diameter:
 - i. All storm sewers shall be sized to accommodate design flows as regulated by the Lake County Watershed Development Ordinance.
- d. Pipe Bedding:
 - i. All pipe backfill and bedding shall be performed in accordance with the Village's "**Typical Trench & Bedding**" standard detail. All utilities installed under or within three feet (3') of pavement shall be backfilled with compacted CA-6 crushed stone, or flowable fill as applicable per detail, to finished subgrade.
- e. Alignment:
 - i. All sewers shall be laid with straight alignments between manholes.
- f. Connections for Dissimilar Materials:
 - i. Neoprene non-shear (Fernco or similar) connections with stainless steel bands shall be required on all pipe connections when dissimilar pipe materials are joined. Follow manufacturer's recommendations for the installation.



- g. Connections to Storm Sewer Main Line:
- i. Main-to-main connections: All connections between two (2) main lines shall occur with a sanitary manhole being provided at the connection point.
 - ii. Service-to-main connections: One of the following methods shall be used when connecting a sewer service to an existing sewer main by means other than an existing wye, tee, or manhole, provided however, that an alternate service tap method may be required if warranted by circumstances.:
 1. Circular saw-cut of sewer main by proper tools ('Sewer-Tap' machine or similar) and proper installation of hub-wye saddle or hub-tee saddle.
 2. With pipe cutter, neatly and accurately cut out desired length of pipe for insertion of proper fitting, using non-shear 'Band-Seal' or similar couplings to hold it firmly in place.
 - iii. Connection into existing manhole:
 1. Circular saw-cut into existing manhole by proper tools. Proper installation of new pipe into existing manhole shall use hydraulic cement (not traditional mortar) to provide a water-tight seal.
- h. Private Storm Sewers
- i. Any structures serving private storm sewers or systems (e.g. manholes, cleanouts, etc.) shall be located within the subject property and not within the public right-of-way. (Private storm sewers, including all portions of underground service lines within the public right-of-way, are the responsibility of the owner of the premises served.)



5.2.2 Storm Manholes / Inlets / Catch Basins

Refer to the Village's "**Storm Manhole Standards**", "**Catch Basin Standards**", and "**Storm Inlet Standards**" details for further information. Storm structures are to be in conformance with Illinois Department of Transportation (IDOT) standards. The diameter of all proposed storm structures shall be determined by the design engineer, based on the pipe size and angle, accordingly.

- a. Frame/Lid:
 - i. All structure frames & lids shall be in accordance with the Village's "**Frame & Grate/Lid Standards**" detail.
- b. Steps:
 - i. Steel reinforced plastic steps to be provided at sixteen inches (16") on-center embedded three inches (3") into the structure wall.
 - ii. First step to be provided eight inches to twelve inches (8"-12") below the frame.
- c. Adjusting Rings:
 - i. No more than three (3) precast concrete adjusting rings with twelve inch (12") maximum height adjustment shall be allowed.
- d. Size / Diameter:
 - i. Structures shall have a minimum inner diameter of sixty inches (60") for connecting sewers with an inner diameter of twenty-one inches (21") or larger.
- e. Spacing:
 - i. The maximum spacing between manholes shall be four hundred feet (400') or less as deemed necessary by the Village Engineer.
 - ii. The Village Engineer may permit spacing at greater intervals or require spacing at lesser intervals if deemed warranted.

5.3 Storm Sewer Testing, Televising, & Inspections

Refer to [Section 10 \("Construction Phase Requirements"\)](#) of this manual for further information on testing and inspection requirements related to the storm sewer system.



SECTION 6 – STORMWATER MANAGEMENT

6.1 Stormwater Introduction

The purpose of stormwater management is to minimize impacts of additional stormwater that may be created by new developments. In instances where a development would result in a net increase of impervious area, the project may be required to provide stormwater management facilities to address the increased runoff that would result.

All stormwater management facilities, including but not limited to storm sewers and appurtenances, overland flow routes, and detention basins and reservoirs, shall be designed to meet Lake County Watershed Development Ordinance, Village, and other applicable agency requirements. The most stringent of these requirements shall take precedence.

Regardless of impervious area, all developments are subject to the applicable provisions of the WDO, which is adopted as part of the Village Municipal Code. In addition, the Village has adopted supplemental stormwater management regulations within “Appendix P”, which is available on the Village website.

"Appendix P" regulates additional impervious surface area compared to existing conditions in 2015 and requires stormwater detention for any modifications or improvements that result in a net impervious increase in excess of four hundred square feet (400 sq. ft.)

6.2 Stormwater Design Standards

For additional information and regulations related to stormwater, refer to Chapter 20.5 (“Stormwater Management”) in the Village Code.

6.2.1 Detention System Outfalls:

All detention/retention systems shall provide a direct connection to the public storm sewer system wherever feasible.

If it is determined that a connection is not practical, the following may apply:

- a. The Village may require, at its sole discretion, that the public storm sewer system be extended to accommodate the site (at the developer’s expense); or
- b. The required detention/retention storage may be accommodated within a Rain Garden in accordance with the requirements noted below; or
- c. A case-specific discharge situation as approved by the Village Engineer



6.2.2 Minimum Restrictor Orifice Diameter:

The minimum allowable restrictor diameter shall be two inches (2"). Restrictor systems shall be designed to be accessible and to prevent failure due to clogging or other maintenance issues.

6.2.3 Retention Basins

- a. Storm water retention basins which will maintain a permanent pool of water shall have a "safety ledge" measuring at least 10' horizontally, at a point not more than three feet (3') below the normal pool level.
- b. The side slopes above the safety ledge shall be no steeper than one foot (1') to five feet (5') horizontal, to an elevation one foot (1') above the design high water level; and shall be no steeper than one foot (1') vertical to three feet (3') horizontal above that point.
- c. Side slopes below the safety ledge shall not be steeper than one foot (1') vertical to two and one-half (2.5') horizontal.
- d. A minimum of 25% of the pond bottom elevation shall be 10' below the NWL to promote aquatic life, reduce odors, and reduce algae growth.

6.2.4 Detention Basins

- a. Basins which are designed to completely dewater shall have side slopes not exceeding one foot (1') vertical in three feet (3') horizontal.
- b. Bottom slopes shall be 1% minimum, or an underdrain system shall be provided.

6.2.5 Rain Gardens

- a. Refer to the Village's "**Rain Garden**" standard detail for further information.
- b. Presuming a storm sewer outfall cannot be provided, the required detention volume must be provided 'above ground' only. Storage volume will not be counted below ground within void spaces.
- c. The design engineer shall provide a list of the intended plant types on the "**Rain Garden**" standard detail.
- d. Confirmation of the installed plant types will be required upon completion of installation.



6.2.6 Underground Detention Systems

a. Pipe or Vault Storage:

Pre-fabricated underground detention systems shall be designed and constructed in accordance with manufacturer specifications.

b. Infiltration Systems (i.e. buried stone):

Sub-surface stone can be utilized for stormwater storage at thirty-three percent (33%) porosity, subject to the provision of a proper gradation of stone (CA-7 or approved equivalent) and perforated underdrain system with an outlet connection to the Village public storm sewer system or alternative outlet location approved by the Village Engineer.

6.3 Stormwater Management Easements

All new stormwater detention/retention areas shall require an easement or restrictive covenant to be recorded over the entirety of the stormwater management facility.

The Applicant shall be required to have the easement or restrictive covenant document recorded with the Lake County Recorder of Deeds, and will need to provide a copy of the executed and recorded document to the Village prior to project close-out.



SECTION 7 – PAVEMENT

7.1 Pavement Introduction

The geometric design of all roadways, sidewalks, bikeways, rights-of-way, and parking lots shall be in conformance with the requirements set forth in the Village's Municipal Code. Specific geometric and pavement width requirements for public and private streets are listed in [Section 1.2](#) of these Design Standards.

The following standards have been established with regards to pavement sections or other applicable requirements not defined within the Municipal Code. Should any requirements overlap or conflict, the most stringent requirements shall apply.

7.1.1 Soil Borings & Geotechnical Recommendation

A soil analysis and report, prepared by an Illinois-licensed professional geotechnical engineer, shall be required for public and private roadways. This report shall include pavement section recommendations based on anticipated traffic loading and recent soil borings at intervals not exceeding five hundred feet (500') along the proposed pavement centerline to determine if the soils above an elevation of 6 feet (6') below the proposed pavement subgrade are suitable. The analysis and report, including proposed pavement design, shall be submitted to the Village for review not later than the time final engineering plans are submitted.

Additional soil borings shall also be taken at other locations where information such as strength, elevation of the water table, or variability of moisture content are relevant.

7.1.2 Subgrade Testing (Proof Rolling)

Subgrade Testing is required for all public and private roadway projects, and highly recommended for parking lots and similar projects. This is particularly important in "Cut" areas or any environment which shows signs of moisture/instability. A common method of subgrade testing is Proof Rolling.

During proof rolling, a qualified inspector should observe the subgrade performance at all times. A fully loaded truck (50,000 LB gross vehicle weight, Tandem Axel) or other approved construction equipment should be driven over the subgrade. The last truck pass is usually performed at walking speed so that the Inspector may follow to observe the rebound deflections, and rutting and/or pumping of the subgrade. The inspector should ensure that the finished subgrade does not exhibit more than 0.5 inch (12.5 mm) of rutting. If the subgrade does not pass proof-roll, soil treatment and/or undercutting may be required before proof-rolling again. Refer to the IDOT Subgrade Stability Manual for more information.



7.1.3 Rough Grading

The area behind the curb and gutter shall be backfilled and rough graded to eliminate standing water.

7.1.4 Curb Return at Intersection

All curb returns at intersections shall have a radius not less than twenty-five feet (25'), unless otherwise approved by the Village Engineer.

7.2 Public Roadways

All new public roadways shall be designed and constructed in conformance with the Village's "**Typical Residential Roadway Section**" or "**Typical Non-Residential Roadway Section**" standard details, depending on the classification and use.

The installation of the roadway shall be in accordance with the most recent IDOT specifications (Mix Design, Temperature, Testing, etc).

The Village reserves the right to enforce modifications to the aforementioned details in order to provide consistency with existing adjacent neighborhoods. These modifications may include, but not be limited to, differing sidewalk widths or curb types.

Where a Village street intersects a route under the jurisdiction of the Lake County Division of Transportation or the Illinois Department of Transportation, the right-of-way shall be rounded or chamfered as required by the appropriate agency.

Specific geometric and pavement width requirements for public and private streets are listed in [Section 1.2](#) of these Design Standards.

7.3 Private Roadways and Parking Lots

The pavement sections listed on the Village's "**Typical Residential Roadway Section**" standard detail is acceptable for design of private roadways and parking lots. It is recommended that a Geotechnical Engineer provide pavement section design recommendations upon evaluations of subbase conditions from soil borings.

Alternate pavement sections can be approved by the Village Engineer, if the pavement design is submitted along with Structural Number Calculations as detailed below. All pavement designs must be supported by design calculations which are to be submitted together with the final engineering plans.



7.3.1 Private Roadway Pavement Section

All private roadways shall be designed with a **minimum structural number of 3.2**. For flexible pavement designs, a combined asphalt depth of 4” should be used at minimum. See “Structural Number Calculations” section below for further details.

7.3.2 Parking Lot Drive Aisles / Fire Lanes

All drive aisles and fire lanes shall be designed with a **minimum structural number of 3.0**. For flexible pavement designs, a combined asphalt depth of 3.5” should be used at minimum. This applies to any drive aisle that could potentially see delivery truck, fire truck, or other large vehicle traffic. See “Structural Number Calculations” section below for further details.

7.3.3 Parking Lot Stalls

All parking stall areas beyond the main drive aisle and identified fire lanes shall be designed with a **minimum structural number of 2.5**. This applies to areas which will strictly accommodate only standard passenger cars/vehicles. See “Structural Number Calculations” section below for further details.

Specific geometric and pavement width requirements for public and private streets are listed in [Section 1.2](#) of these Design Standards.

7.4 Driveways

All single-family residential driveway approaches shall be designed and constructed (or modified) in conformance with the Village’s “**Residential Driveway Apron**” standard detail. A paved driveway approach between curb and sidewalk, or between curb and lot line, shall be provided at each residential lot before an occupancy permit is issued.

For any non-standard driveway apron pavement material or pattern, the property owner will be required to execute a letter of waiver, in a form provided by Village staff, due to the potential for disturbance of the apron for future maintenance within the public right-of-way or easement.

All driveway approaches which provide access to a commercial, industrial, institutional, or multi-family residential facility shall be designed and constructed (or modified) in conformance with the Village’s “**Commercial Driveway Apron**” standard detail. A paved driveway approach between curb and sidewalk, or between curb and lot line, shall be provided at each commercial lot before an occupancy permit is issued.



7.5 Sidewalk

Refer to the Village’s “**P.C.C. Sidewalk**” detail for further information. Sidewalks shall be constructed of Portland cement concrete (PCC) in accordance with the standard details included in this manual and the Libertyville Municipal Code. Sidewalks shall extend through all new/modified driveways in accordance with the Village’s “**Residential Driveway Apron**” and “**Commercial Driveway Apron**” details.

At all pedestrian roadway crossing locations, sidewalks shall be ramped in accordance with the Illinois Accessibility Code. Detectable warnings shall be installed in accordance with the applicable IDOT details, adhering to all gap and curb setback requirements. Refer to the Village’s “**Sidewalk Curb Ramp Standards**” standard detail for more information, including detectable warning material specifications.

7.6 Bike Ways

- a. Location: Bike ways (or multi-use paths) shall be installed as required by the Village.
- b. Width: All bike ways shall be a minimum of eight feet (8’) in width.
- c. Pavement Section: All bike ways shall consist of six inch (6”) thick aggregate base course (CA-6) and a two inch (2”) thick bituminous surface course, Class I.
- d. Curb ramps: At locations where bituminous bike ways are proposed to connect to an intersection and where a depressed accessible connection is required, a Portland Cement Concrete (PCC) section and detectable warning panels shall be provided. The concrete section must be a minimum of five feet (5’) in length, as measured along the shortest side off of the back of curb, and shall be constructed in accordance with the pavement section shown on the Village’s “**P.C.C. Sidewalk**” standard detail. The detectable warning panels are required to extend across the entire width of the concrete section (8’ minimum). Refer to the Village’s “**Sidewalk Curb Ramp Standards**” standard detail for more information, including detectable warning material specifications.



7.7 Structural Number Calculation

Calculations will be required from the design engineer to verify the structural number of the proposed pavement section. The following AASHTO Structural Number Equation shall be utilized, along with the below-listed coefficients:

$$SN = (a_1 \times D_1) + (a_2 \times D_2) + \dots + (a_x \times D_x)$$

SN = Structural Number for the pavement

a_x = layer coefficient

D_x = thickness of layer (inches)

Table of Common Proposed Pavement Section Layer Coefficients

(MS)=Marshall Stability Number / (IBR)=Illinois Bearing Ratio

LAYER MATERIAL	MINIMUM STRENGTH REQUIREMENT	COEFFICIENTS
<u>Bituminous Surface</u> Hot-Mix Asphalt	1700 (MS)	0.40
<u>Bituminous Binder</u> HMA Binder	1700 (MS)	0.30
<u>Base Course</u> HMA Base Course	1700 (MS)	0.28
Crushed (Graded) Stone Base	50 (IBR)	0.14
Reclaimed Asphalt Pavement (RAP)	Geotech Analysis Req'd	0.22
<u>Sub-Base</u> Granular Material (type A - crushed)	50 (IBR)	0.12
Granular Material (type B)	30 (IBR)	0.11
<u>Concrete</u> P.C.C. Pavement	3,500 psi @ 14 days (IDOT)	0.50

Alternative pavement designs, using geogrids or other reinforcing methods, can be approved by the Village Engineer if structural design analysis is provided. This also applies to Concrete (P.C.C.) Pavement, with or without reinforcing, which may require a jointing plan at the discretion of the Village.



SECTION 8 – EXTERIOR LIGHTING

8.1 General Lighting Standards

8.1.1 General Lighting Code and Submittal Requirements

All lighting shall be in accordance with Chapter 7, Article III (Appearance Code) Section 7-89 of the Libertyville Municipal Code. Case-specific lighting regulations found within the Municipal Code must also be adhered to.

Exterior lighting systems are often subject to review and approval pursuant to different codes depending on the nature of the development/improvement and its location within the community (Zoning Code, Electrical Code, Appearance Review Committee, etc). Most proposed exterior lighting systems will require the following, at a minimum, to be reviewed and approved:

- a. Photometric Plan
- b. Light fixture cut-sheets
- c. Light fixture pole height and/or mounting height
- d. Light pole foundation details

8.1.2 Parking Lot Lighting

All parking lot lighting shall be in accordance with Chapter 26, Article 10 (Parking and Loading) of the Libertyville Municipal Code., as well as any district-specific lighting regulations within Chapter 26 (Zoning Ordinance).

Please note that all footcandle, fixture style, and mounting height requirements are located within the Zoning Ordinance. Review and approval of a photometric plan and fixture cut sheets is required for any proposed parking lot lighting system.

8.1.3 Existing Street Light Relocations and Modifications

- a. Existing Street Lights to be relocated/modified shall be updated to current Village standards (Refer to Village’s “**Residential Street Light**”, “**Street Lighting Control Box**”, and “**Primary Street Light**” standard detail for further information)
- b. For conduit systems, conduit shall be maintained in full for the entire length between light poles/electrical control boxes. Buried splices are strictly prohibited.



8.2 Street Light Systems

8.2.1 General Street Lighting Requirements

All street lighting shall be in accordance with Chapter 22, Article VI (Public Improvements) Section 22-112 of the Libertyville Municipal Code. All street lighting shall be installed in accordance with the Village of Libertyville's Electrical Code.

In all applicable developments, street lighting shall be provided throughout the development by the developer, per village standards. (Refer to Village's "**Residential Street Light**", "**Street Lighting Control Box**", and "**Primary Street Light**" standard detail for further information).

8.2.2 Street Light Easements

A minimum easement width of ten feet (10') shall be granted to the Village wherever cables are planned to cross privately-owned land. A properly recorded document granting this easement shall be furnished to the Village.

The design engineer shall be responsible for coordinating the work, correcting faulty construction and consulting with the Village Engineer on all matters concerning the improvement.

8.2.3 Street Light Material Specifications

Refer to the Village's "**Residential Street Light**" standard detail for further information on Roadway Light poles and fixtures for residential streets.

Refer to the Village's "**Primary Street Light**" standard detail for further information on Roadway Light poles and fixtures for collector/arterial streets. The Village's "**Primary Street Light Pole Foundation**" standard detail contains associated information regarding foundations.

All street lighting circuits shall have a control box prior to connection into the ComEd power supply. Refer to the Village's "**Street Lighting Control Box**" standard detail for further information.

Note that in areas of the Village such as the "Heritage Area", there are different standards for street lighting aesthetic that will require the usage of non-standard pole and fixture equipment.



8.2.3 Street Lighting Location and Spacing

Proposed street lighting systems within Village public right-of-way shall include lights according to the following location criteria:

- a. All street light foundations shall be offset from the curb in accordance with the appropriate Village standard detail. Deviations can be approved on a case specific basis by the Village Engineer, but a minimum of two-feet (2') from the back of curb is always required.
- b. Residential Streets shall have at least one (1) luminaire at each street intersection, curve, and cul-de-sac.
- c. Commercial/Industrial Streets shall have at least two (2) luminaires at each street intersection, curve, and cul-de-sac.
- d. If case-specific conditions render the typical street light locations impractical, the Village Engineer may approve alternate locations.
- e. Street lights shall be installed on both sides of streets in a staggered arrangement.
- f. Distance between street lights shall not exceed 300' maximum on any street.
- g. Distance between street lights shall not exceed 180' on secondary/collector streets .
- h. Distance between street lights shall not exceed 120' on primary/arterial streets.
- i. The Village Engineer reserves the right to enforce additional street light spacing requirements depending on the case-specific nature of the street and its usage.

8.2.5 Street Lighting Circuit Design

- a. Circuits
Each street light circuit shall be served by underground conductors from an approved Street Lighting Control Box (See Village Detail). Street lights on opposite sides of streets shall be served by separate circuits, unless otherwise approved by the Village Engineer.
- b. Length of circuit
No circuit shall be greater than one thousand feet (1,000') from power supply to the most distant luminaire in the circuit, unless otherwise approved by the Village Engineer.



- c. Conduit
All cable shall be installed in a conduit as approved by the Village Engineer, with a minimum I.D. of one and one-quarter inch (1 ¼”) or as specified herein. All street crossovers shall have two-inch galvanized rigid steel conduit used as a raceway for underground cable.
- d. Underground cable
All underground cable and conduit shall be buried to a minimum depth of twenty-four inches (24”) below the normal finished grade. 18” burial depth underneath non-pavement areas can be approved on a case-by-case basis by the Village Engineer.
- e. Underground cable location
Underground cable shall be run in a trench two feet (2’) from back edge of curb, except that it shall not be located under a sidewalk.

8.2.6 Street Lighting System Control

New street light systems should have a detailed plan for how the streetlights will be configured and controlled. Streetlights shall not be directly hard-wired into the electrical grid without a controller. Any work to existing hard-wired streetlights shall include installation of a controller.

- a. The minimum control mechanism shall be General Electric (or approved equal) photoelectric cell, mounted in luminaire canopy to control individual lamps or group of lamps (refer to the Village’s “**Residential Street Light**” Standard detail for more details).
- b. Each pole shall have individual fuse protection, sized appropriately per fixture.
- c. All lighting systems shall contain a weatherproof cabinet housing all street light controls. (refer to the Village’s “**Street Lighting Control Box**” Standard detail for more details).
- d. The contractor shall arrange with the local electric power company for electric service and shall bear the expense of any charges by the power company to furnish the service connection.



SECTION 9 – DEVELOPMENT AGREEMENTS

9.1 Development Agreement Requirements and Process

In accordance with Sec 22-105 of the Village Code, Development Agreements shall be formalized between the Village and the Developer for any development project which includes improvements that are intended to be owned or maintained by the Village. This may include, but is not limited to, public utilities, roadways, or sidewalks. The Village can enforce or waive the requirement for a Development Agreement for any proposed development, at its sole discretion.

Each Development Agreement (or “Agreement”) is project-specific. The final requirements of the Agreement can vary but will typically include items summarized within this section.

Should a Development Agreement be required for a development, Village staff will typically provide the applicants with an initial draft of the Agreement for review by the Developer. The Village may, at its discretion, require that the Developer prepare the initial draft of the Agreement for review by the Village.

All Development Agreements will require approval by the Village Board of Trustees by way of Resolution. Development Agreements will be presented to the Board for consideration only after Village staff and the Developer have agreed upon a final draft of the Agreement, and the Agreement is executed by the Developer. Upon approval by the Board, the Development Agreement shall be recorded by the Lake County Recorder of Deeds.

9.2 Resident Engineer

A common requirement of the Development Agreement is that a Resident Engineer (“RE”) is required to be furnished by the Developer to oversee proper installation of any proposed public utilities in accordance with the following standards:

- a. The RE shall be hired directly by the Developer and will not contract with the Village.
- b. The RE shall be required to observe all public utility improvements as specified within the Development Agreement.
- c. The RE shall prepare a Utility Installation Observation Form for each day of construction observation in the field. This form has been attached as Appendix C.
- d. The RE shall email reports to the Village Engineering Division on a weekly basis at a minimum.
- e. It is highly recommended that the RE take regular photographs of the construction activity and include the photos with the daily reports.
- f. The Village retains the right to halt all work for a specific utility, if the RE reports for that utility are not received, or are deemed unsatisfactory upon Village staff review



9.3 Reduction of Performance Security

The Developer is required to provide a financial guarantee to the Village as identified within the Development Agreement.

It is understood that the Developer often requests a reduction in the Performance Security based on partial construction of the permitted improvements. The following items are typical documentation requirement that will need to be completed, submitted, and ultimately approved by Village staff prior to consideration of any reduction requests. The Village may require further documentation in addition to the following typical items:

- a. As-Built Plans shall be provided for any completed improvement, in accordance with [Section 10.1](#) of these Design Standards.
- b. A calculation worksheet shall be provided, which corresponds to the originally approved Cost Estimate used to generate the Performance Security amount. This calculation worksheet shall clearly identify the quantity and unit prices of the completed work, as well as the quantity and unit prices of the outstanding work to remain in the Performance Security.
- c. A letter from the Developer addressed to the Director of Public Works, requesting Village approval, and where appropriate, Village acceptance of specific improvements. This letter should also specify the requested reduction amount, and clearly describe the specific items for which the reduction is being requested.
- d. Final lien waivers for any items for which the reduction is being requested.
- e. Bill of Sale, in a form provided by the Village, for any improvements to be accepted by the Village.
- f. The above documents must be completed and submitted by the owner/developer for each instance in which a reduction of financial guarantee is proposed.
- g. For improvements that have been accepted by the Village, the Developer is required to maintain a Guarantee Surety, in accordance with the terms of the Agreement, for the duration of the Guarantee Period.

9.4 Guarantee Period

The Agreement typically identifies a specific duration of time, known as the “Guarantee Period” in which the Village holds the Guarantee Surety amount. At any time during the Guarantee Period, the Village reserves the right to operate and inspect the improvements to identify any items which require corrective action by the Developer.

At the end of the Guarantee Period, the Developer should submit a written request to the Director of Public Works, requesting the release of the Guarantee Surety.



SECTION 10 – CONSTRUCTION PHASE REQUIREMENTS

10.1 As-Built Record Drawing Requirements

As-Built Record Drawings (referred to as As-Built Plans) shall be provided to confirm that the construction was completed in conformance with the approved engineering plans, in accordance with Section 22-104(h) of the Village Code and these Design Standards. They shall be prepared by a licensed professional land surveyor or civil engineer, after performing an “As-Built Survey” in the field to document the constructed conditions. These constructed conditions are then compared to the approved design plans and presented as the As-Built Plans. Village review and approval of the As-Built Plans is required.

Should the As-Built Plans show that the construction was not in conformance with the approved plans, the Village reserves the right to require additional information and/or modification of the improvements to achieve conformance with the approved plans.

10.1.1 As-Built Plans Format and Standards

- a. As-Built plans shall be prepared by a licensed professional land surveyor or licensed professional engineer in the State of Illinois and shall include the surveyor’s or engineer’s professional seal and signature accordingly.
- b. A Grading Certificate signed and sealed by a licensed professional engineer shall be provided on the plans indicating that: ***“Grades are in substantial compliance with the approved engineering plan, and stormwater management features and detention volumes have been provided in accordance with WDO and Village requirements.”***
- c. As-Built Plans shall be prepared using the latest approved Engineering Plans as a background or base-file. Any deviation from the approved site geometry and utility locations shall clearly be shown on the As-Built Plans. All elevations shall be NAVD 88 , in accordance with the benchmark information on the approved plans.



- d. As-Built Plans shall strike-out all design values on the engineering plans. Next to the crossed-out value, the surveyed value should be displayed in bold. This includes, but is not limited to, the following information:

1. Pavement spot grades and slopes

- ADA routes and parking stalls (all necessary spot shots for verification of longitudinal slopes and cross-slopes)
- Public sidewalks and curb ramps (all necessary spot shots for verification of longitudinal slopes and cross-slopes)
- Public roadways (50' cross-sections & per design plan stationing)
 - Centerline, flowline, and top-of-curb elevations at each section
- Private roads/drives (crest points and sag points)
 - Centerline, flowline, and top-of-curb elevations at each section
- Private parking lots (corners, drainage divides, overflow routes)

2. Finished grade spot grades and slopes

- Swale slopes
- Emergency overflow weirs
- Top of berm grades
- Drainage divides and overflow routes

3. Structural Improvement Grades and Elevations:

- Top-of-Foundation (TF) or Finished Floor (FF) Elevations
- Tops of window wells
- Finished Grade elevations at foundation & window wells (FG)
- Garage Floor Elevations (GF)
- Top of retaining walls (T/Wall) & grade at base of walls (B/Wall)

4. Sanitary and Storm Sewers

- Pipe sizes, slopes, lengths between manhole centers, & material type
- Manhole, Catch Basin, and Inlet rim and invert elevations
- Location of services stubs (distance from nearest manhole)

5. Watermain

- Watermain pipe size, location, and material type
- Watermain structure rim elevations
- Depth to top-of-pipe at Valve Vaults

6. All elevations used in stormwater calculations (not limited to):

- Restrictor size & elevation (to be shown on both plan view and detail)
- Weir size & elevation (to be shown on both plan view and detail)
- Detention storage volumes (required vs. as-built)
- High Water Levels (HWL) & Normal Water Levels (NWL)
- Base Flood Elevations (BFE)



- e. Stormwater management features shall be surveyed with enough detail to confirm that the approved volume/elevation/capacity was achieved. Surface stormwater features (Ponds, Basins, Swales, Overflow Weirs, Rain Gardens) shall be topographically surveyed on a detailed grid to generate As-Built contours.
- f. If applicable, the As-Built Stage Storage Table should be included within the As-Built Plans, to show the actual storage amount constructed.
- g. Only the updated plan sheets should be included in the As-Built Plan Set. These sheets typically include, but are not limited to:
 - 1. Title Sheet and/or Index (omitted sheets are crossed out)
 - 2. Grading Plan
 - 3. ADA Grading details/enlargements (as applicable)
 - 4. Utility Plan
 - 5. Utility Profiles (as applicable)
 - 6. Roadway Plan and Profile (as applicable)
 - 7. Stormwater Management / Detention Plan
 - 8. Applicable Detail Sheets (Permeable Pavers, Restrictor Structure, etc.)

10.1.2 Intermediate As-Built Plans

There is often a benefit/need to perform and submit Intermediate As-Built Plans as the construction process advances. The Village will review Intermediate As-Built Plans as they are received and provide feedback with the potential to prevent costly modifications and/or delays at project close-out. Intermediate As-Built Plans are not a requirement, but are strongly encouraged and supported by Village staff.

Intermediate As-Built Plans can be submitted by the developer at any time. Typical examples include, but are not limited to:

- a. Utilities which will be located underneath pavement (especially if utility design is at or near minimum design criteria for slopes, depth, crossing clearance, etc.)
- b. Elevation (depth) and area of buried aggregate used in stormwater calculations (permeable pavers, underground detention system, drywell, etc)
- c. Final graded stormwater management areas requiring a verification of appropriate volumes prior to final stabilization
- d. Any form of underground detention which will be rendered inaccessible (elevations, footprint, volume provided)



ENGINEERING DESIGN & CONSTRUCTION STANDARDS

Please note that each set of Intermediate As-Built Plans shall follow the same standard format as described in Section 10.1.1. Plan sheets shall not be submitted separately for review. The As-Built Plans shall be submitted as a complete set and should be updated with a revision date for each new submittal.

10.1.3 Final As-Built Plans

Final As-Built plans are required to be submitted for all projects at the discretion of Village staff.

Requirements for Final As-Built Plans are in addition to any Intermediate As-Built Plans described above, and shall follow the As-Built Plan Format and Standards of Section 10.1.1.

Upon completion of the project, the contractor or engineer shall submit two (2) paper copies of as-built engineering plans for review, along with one (1) digital copy in .PDF format. Upon approval by Village staff, two (2) paper copies and digital copies in both PDF and CAD (.dwg) format shall be provided via a flash drive or download link. The final .DWG file must include all as-built information (elevations and linework) and shall be on State Plane (X-Y) coordinates for future incorporation into the Village's GIS system.

10.2 Construction Site Requirements

10.2.1 Construction Site Security and Safety

It is solely the responsibility of the permittee to ensure that the construction site is kept secure and is not a hazard to public health or safety. The Village reserves the right to require any additional safety measures or precautions beyond those identified in the approved construction documents as deemed necessary. Any work in the public Right-of-Way must adhere strictly to all applicable Maintenance of Traffic and safety requirements of the jurisdictional agency. Any public property must be protected in conformance with best practices and all applicable provisions of the Village Code.

10.2.2 Construction Site Hours, Noise, Lighting, and Waste

Please refer to Chapter 6 of the Village Code for regulations regarding construction debris management and dumpsters, sanitary toilet facilities, and construction hours.

The Village reserves the right to impose curfews and/or screening requirements on temporary construction site lighting as deemed necessary.



10.2.3 Water Usage

All water usage on construction sites shall be metered. Where hydrant usage is desired, the contractor shall request a Village-supplied RPZ/meter, contact the Streets & Utilities Department to coordinate (847-362-3434).

10.2.4 Illicit Discharge

The permittee of any active construction site is responsible for the prevention of any illicit discharge for the site, in accordance with Chapter 20.5, Article III of the Village Code. In addition to other hazardous materials, this includes sediment-laden stormwater runoff, regardless of construction site size or if an NPDES permit is required.

Refer to [Section 2.2](#) of these Design Standards (“Soil Erosion and Sediment Control”) for more details. It should be noted that no area can be de-watered directly into a storm sewer without proper filtration device(s), a stabilized construction entrance should be provided, and any mud/dirt/dust leaving the site must be cleaned/addressed immediately.

10.3 Inspections

Engineering Division inspections are required for site improvements or modifications, in accordance with the terms of the approved permit(s) and the general guidelines below. Additional inspections may be required by the permit conditions, or by the terms of a Development Agreement or other agreement. Further, other Village Divisions (Building, Planning, Fire Department, etc.) have separate inspection requirements based on the nature of the work and as specified within the applicable regulations. Permits will not be closed out until all required inspections have been completed and approved by the Village.

10.3.1 Soil Erosion & Sediment Control (SESC) Inspections

SESC inspections are required in accordance with WDO and NPDES regulations. For projects that do not require an NPDES permit, the Village Engineer and/or WDO Enforcement Officer shall have final determination of the minimum SESC inspection requirements.

Any construction site which requires an NPDES permit therefore also requires recurring SESC inspections in accordance with the NPDES and SWPPP guidelines until permanent site stabilization has been achieved. Such inspections shall be recorded in the following manner:

- a. Printed as a hard copy, and added to the SWPPP Binder located on the construction site
- b. Emailed as a PDF to the Village Engineering Division (email addresses to be provided at the pre-construction meeting or upon request)



In addition to the weekly SWPPP inspections, an initial inspection **must be scheduled with the Village after Soil Erosion and Sediment Control measures are installed but prior to any disturbance or grading work**. This initial SWPPP inspection will need to verify that a hard copy of the SWPPP is located on-site and that all SESC measures are properly installed. Please contact the Village Engineering Division (847-918-2100) to schedule this initial SWPPP inspection.

Construction Pause (Winter Weather): Soil Erosion measures and inspection reports must be maintained through any temporary halt in construction (including winter season). However, during such a pause, the frequency of inspections/reports may be reduced from weekly to monthly, at the discretion of the Village Engineer



10.3.2 Storm and Sanitary Utility Inspections

Storm Utility Inspections:

- a. Connection to Storm Sewer Main:** All connections to storm sewer main and any abandonments shall be made available for observation by Engineering Division staff prior to backfill. Call 847-918-2100 to schedule.
- b. Storm Sewer Televising:** Post construction televising of new storm sewer main is required, and the recorded video shall be submitted to Engineering Division for review.
- c. Stormwater Management Systems:** Some stormwater management systems have underground components that cannot be observed or surveyed after construction is complete (e.g. linings, underdrains, specified stone materials, etc.). All such components shall be made available for observation by Engineering Division staff prior to backfill.

Sanitary Utility Inspections

- a. Connection to Sanitary Sewer Main:** All connections to sanitary sewer main shall be made available for observation by Engineering Division staff prior to backfill. Call 847-918-2100 to schedule.
- b. Sanitary Service Abandonment:** All temporary and permanent abandonments must be witnessed by Village Personnel prior to backfill; call 847-918-2100 to schedule. See [Section 4.4](#) for more information on requirements for sanitary service abandonments.
- c. New Sanitary Sewer – Deflection Test:** Mandrel testing provided by the contractor and witnessed by Engineering staff is required for new sanitary sewer to be performed after a minimum of 30-day waiting period from installation back fill. Call 847-918-2100 to schedule.
- d. New Sanitary Sewer – Pressure Test:** Sanitary air testing provided by the contractor witnessed by Engineering staff is required for new sanitary sewer. Call 847-918-2100 to schedule.
- e. Sanitary Sewer Televising:** Post construction televising of new sanitary sewer main is required, and the recorded video shall be submitted to Engineering Division for review.



10.3.3 Water Main Utility Inspections

When working on water main an Illinois Licensed Plumber must be present. Only Village Staff are permitted to open/close valves in the public water system. Any time a connection is made, or any work occurs, affecting to the Village system, designated Village Staff must be present. See below for required inspections regarding water main and water services:

- a. *Water Service Tap to Existing Main (up to 2"):*** Water taps up to 2" shall be performed by Public Works staff. Minimum 24 hours (1 business day) notice is required for tapping of water main; notify Streets & Utilities Division, 847-362-3434. Separate arrangements are required for service installation inspection; call 847-918-2100 or 847-918-2020. Note: The new tap location must be separated by a minimum of 18" from the existing tap location.
- b. *Water Service Tap to Existing Main (larger than 2"):*** Water taps or connections larger than 2" (including pressure connections) will be performed by the contractor. Minimum 24 hours' (1 business day) notice is required for tapping of water main; notify Engineering Division, 847-918-2100. For a cut-in tee connection (when permitted), more advance notice is required to coordinate shutoff of the water main; notify Streets & Utilities Division, 847-362-3434.
- c. *Water Services part of a watermain installation project:*** Water taps that are part of a larger development with multiple new services on a new section of water main, or those included in a Village Watermain Replacement Program, will be performed by the contractor. Minimum 24 hours' (1 business day) notice is required for tapping of new water main; notify Engineering Division, 847-918-2100.
- d. *Water Service Abandonments:*** All temporary and permanent abandonment must be witnessed by Village Personnel prior to backfill; call 847-918-2100 to schedule. See [Section 3.5](#) for more information on requirements for water service abandonments.
- e. *New Water Main Pressure Testing:*** New water main shall be pressure tested by the developer and witnessed by Village Personnel; call 847-918-2100 to schedule. Pressure testing procedures shall be in accordance with State of Illinois standards, and the Village requires that water line shall maintain an average testing pressure of 150 PSIG.
- f. *Water Main Full-Bore Flush:*** A full-bore flush of the water main is required, to be performed by the contractor and witnessed by the Village's Fire Department staff. Call 847-362-5664 prior to beginning installation to verify scheduling requirements.



- g. *Water Main Chlorination:*** Chlorination of the new water main shall be performed by the contractor using a testing company and witnessed by Village water department staff. Notify Streets & Utilities Division, 847-362-3434 at least 48 hours in advance. See additional notes below:
- i. After chlorination, Streets & Utilities Division will take samples on at least two consecutive days from a minimum of 2 (two) source points depending on the length of main being tested.
 - ii. Any source points that utilize a saddle and tap will have to abandon the tap in place by turning off the corporation stop, removing the copper whip, placing a copper wafer in a cap, and screwing cap on to flange.
 - iii. Chlorine shall remain in the water main for 24 hours but shall not remain in any water main over a weekend or holiday. No samples can be collected on the day immediately before, or any day during, a weekend or holiday. Therefore, to allow for completion of the required sampling process, chlorination generally needs to be scheduled for a Monday or Tuesday of a typical work week.
- h. *Valve Exercising and Vault Inspection:*** Final water main inspections for valve turning/exercising and vault inspection to be performed by Village staff by calling 847-918-2100 to schedule.

10.3.4 Other Inspections

The following listed inspections are to be scheduled by calling the Engineering Division at 847-918-2100 at least 24 hours in advance:

- a. *Water service, sanitary service, and/or storm service replacement or repair (prior to backfill):*** Inspection by Engineering Division is generally required for service replacement or repair occurring within a public right-of-way.
- b. *Pot-holing to expose existing underground facilities (prior to all trenchless operations):*** Prior to all trenchless installations (including any dry utility/conduit installation), potholing of all existing Village utilities and/or service laterals is required to determine actual location(s) and depth(s); such potholing shall be made available for Engineering Division inspection. (Refer to the General Notes in Appendix A for more information on requirements for trenchless installations.)
- c. *Public pavement sawcutting inspection:*** Full-depth sawcut of any public pavement is required prior to removal.



- d. Public pavement restoration – Flowable fill, PCC, Asphalt (prior to pour or paving):** Inspections are required to verify that the pavement restoration conforms with the requirements of this manual. For utility excavation patches, the contractor shall restore removed areas to match existing pavement(s) by type and thickness.
- e. Public curb removal or depression:** Full-depth sawcut of any public curb / curb & gutter is required prior to removal. If proposed, curb depression by removing the curb head shall be performed by a qualified contractor with the proper equipment. Contractor shall apply linseed oil to cover the new surface exposed by sawcutting the concrete curb & gutter.
- f. Public Curb Installation or Replacement (prior to pour):** Inspection is required to verify that the curb installation conforms with the requirements of this manual. For curb and gutter patches, the gutter flag shall match the existing width.
- g. Public Sidewalk repair identification inspection (prior to removal):** Inspection is required prior to removal to verify public sidewalk panels needing replacement.
- h. Public Sidewalk installation or replacement (prior to pour):** Inspection is required to verify that the sidewalk installation conforms with the requirements of this manual.
- i. Driveway Apron installation or replacement (prior to pour or paving):** Inspection is required to verify that the driveway apron conforms with the requirements of this manual.
- j. Parkway Tree Planting:** Where the approved plans call for any proposed parkway trees, the contractor shall stake locations for Village review and approval before planting proceeds.
- k. Parkway Restoration:** Where public parkway disturbance has occurred, inspection is required to verify that the parkway has been properly graded and restored with seed/blanket or sod. Established grass growth is required prior to final approval.
- l. Final Inspection:** Final site inspection is required to verify that all site installations have been completed and that site restoration has been completed in accordance with the applicable permits, regulations, and standards



APPENDIX A:

Village of Libertyville General Notes

The General Notes shall be included on all engineering plans for work proposed within the Village of Libertyville municipal limits. Notes should be included in their entirety, and without revisions, unless specifically approved in writing by the Village Engineer.

VILLAGE OF LIBERTYVILLE

GENERAL NOTES

Date: 2-15-2023

1. ALL WORK AND MATERIALS SHALL BE IN CONFORMANCE WITH THE VILLAGE OF LIBERTYVILLE'S REGULATIONS AND "ENGINEERING DESIGN & CONSTRUCTION STANDARDS". IN CASE OF A DISCREPANCY BETWEEN THE PLANS AND THE VILLAGE DESIGN STANDARDS/CODE, THE MORE STRINGENT REQUIREMENT WILL GOVERN, AS DETERMINED BY THE VILLAGE ENGINEER.
2. THE OWNER OR THEIR REPRESENTATIVE IS SOLELY RESPONSIBLE TO OBTAIN ANY AND ALL PERMITS REQUIRED BY APPLICABLE GOVERNMENTAL AGENCIES.
3. THE CONTRACTOR/DEVELOPER ASSUMES ALL RESPONSIBILITY AND LIABILITY FOR ANY ACTION RESULTING FROM THEIR WORK WITHIN THE PUBLIC RIGHT-OF-WAY.
4. THE CONTRACTOR/DEVELOPER SHALL INDEMNIFY AND HOLD HARMLESS THE VILLAGE OF LIBERTYVILLE.
5. ALL CONSTRUCTION MEANS AND METHODS, TECHNIQUES, PROCEDURES, SCHEDULING, SEQUENCING, AND JOB SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR/DEVELOPER.
6. A SET OF PLANS AND SPECIFICATIONS WITH THE LATEST REVISION DATE APPROVED BY THE VILLAGE SHALL BE KEPT ON THE JOB SITE AT ALL TIMES DURING THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL OBTAIN FURTHER VILLAGE AUTHORIZATION PRIOR TO BEGINNING ANY WORK THAT IS NOT INDICATED ON THE APPROVED DOCUMENTS.
7. NO EXCAVATIONS SHALL COMMENCE UNTIL ALL EXISTING PUBLIC AND PRIVATE UTILITIES ARE FIELD LOCATED. CALL JULIE (811 OR 800-892-0123) AT LEAST FORTY-EIGHT (48) HOURS IN ADVANCE.
8. THE SOIL EROSION AND SEDIMENT CONTROL (SESC) MEASURES INDICATED ON THESE PLANS ARE THE MINIMUM REQUIREMENTS, AND THE CONTRACTOR SHALL PROMPTLY ADDRESS ANY SESC ISSUE WITH APPROPRIATE MEASURES. ADDITIONAL SESC MEASURES MAY BE REQUIRED, AS DETERMINED BY THE CONTRACTOR, ENGINEER, SESC INSPECTOR, VILLAGE STAFF, OR WDO ENFORCEMENT OFFICER.
9. PRIOR TO COMMENCEMENT OF SITE DISTURBANCE ACTIVITIES, SEDIMENT/EROSION CONTROL MEASURES MUST BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND MADE AVAILABLE FOR INSPECTION/APPROVAL BY THE VILLAGE. CONTACT THE ENGINEERING DIVISION (847-918-2100) AT LEAST TWENTY-FOUR (24) HOURS IN ADVANCE TO SCHEDULE INSPECTION.
10. THE CONTRACTOR SHALL MAKE ALL SITE MODIFICATIONS AND ALL REQUIRED TESTING AVAILABLE FOR VILLAGE STAFF INSPECTION AND OBSERVATION, IN ACCORDANCE WITH THE APPLICABLE PERMITS, REGULATIONS AND STANDARDS. THE CONTRACTOR SHALL VERIFY ALL APPLICABLE INSPECTION REQUIREMENTS WITH THE VILLAGE BEFORE BEGINNING THE SUBJECT INSTALLATION.

11. SUITABLE TRAFFIC CONTROL MEASURES SHALL BE PROVIDED FOR CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), LATEST EDITION. TRAFFIC CONTROL MUST BE PROVIDED FOR ANY ACTIVITY THAT IMPACTS TRAFFIC FLOW. THIS INCLUDES, BUT IS NOT LIMITED TO, ROAD CLOSURES REQUIRING DETOURS, DAILY LANE CLOSURES, LONG TERM LANE CLOSURES, NARROW LANES, AND CONSTRUCTION VEHICLES ENTERING AND EXITING THE PUBLIC ROADWAY.

NOTE: ROAD CLOSURES AND DETOURS WILL ONLY BE PERMITTED WITH PRIOR REVIEW AND WRITTEN APPROVAL BY THE VILLAGE.

12. ACCESS FOR MAIL DELIVERY, GARBAGE COLLECTION, SCHOOL BUSES, AND EMERGENCY VEHICLES MUST BE MAINTAINED ALONG PUBLIC STREETS AT ALL TIMES.

13. PEDESTRIANS MUST BE PROVIDED WITH A SAFE ALTERNATE ROUTE IF PEDESTRIAN FACILITIES ARE TO BE CLOSED AS A RESULT OF CONSTRUCTION ACTIVITIES. GUIDANCE MUST BE PROVIDED TO PEDESTRIANS SO THAT THEY MAY AVOID THE WORK ZONE.

14. PRIOR TO COMMENCEMENT OF ANY OFF-SITE CONSTRUCTION, THE CONTRACTOR SHALL SECURE WRITTEN AUTHORIZATION THAT ALL OFF-SITE EASEMENTS HAVE BEEN SECURED AND THAT PERMISSION HAS BEEN GRANTED TO ENTER ONTO PRIVATE PROPERTY.

15. ANY USE OF VILLAGE WATER MUST BE REQUESTED THROUGH PUBLIC WORKS, 600 NORTH AVENUE, 847-362-3434, AND METERED AT THE PUBLIC WORKS BUILDING OR, IF AUTHORIZED BY PUBLIC WORKS, WITH A HYDRANT METER.

16. EXCEPT FOR EMERGENCY REPAIRS, NO WORK REQUIRING REMOVAL OF STREET PAVEMENT SHALL BE SCHEDULED WHEN HOT MIX ASPHALT WILL BE UNAVAILABLE FOR PERMANENT PAVEMENT RESTORATION.

17. FULL DEPTH SAWCUT IS REQUIRED FOR PRIOR TO ANY REMOVAL OF EXISTING PUBLIC PAVEMENT OR CURB & GUTTER.

18. UTILITY EXCAVATION AND INSTALLATION AFFECTING THE PUBLIC SYSTEM OR WITHIN THE PUBLIC RIGHT-OF-WAY SHALL OCCUR ONLY ON WEEKDAYS (MONDAY TO FRIDAY, EXCLUDING HOLIDAYS) BETWEEN 7:00 AM AND 3:30 PM. WRITTEN CONSENT FROM THE PUBLIC WORKS DEPARTMENT WOULD BE REQUIRED PRIOR TO ANY SUCH WORK OCCURRING ON SATURDAY, SUNDAY, OR OUTSIDE THE SPECIFIED HOURS. IN THE CASE OF EMERGENCY REPAIR WORK, THE REQUIREMENT FOR WRITTEN CONSENT DOES NOT APPLY; HOWEVER, THE CONTRACTOR SHALL NOTIFY PUBLIC WORKS IMMEDIATELY AND COOPERATE WITH ALL REQUIREMENTS AS DIRECTED.

19. PRIOR TO ALL TRENCHLESS INSTALLATIONS (INCLUDING ANY DRY UTILITY/CONDUIT INSTALLATION BY THE CONTRACTOR, EVEN IF IT IS NOT SHOWN ON THE PLANS), POTHOLING OF ALL EXISTING VILLAGE UTILITIES AND/OR SERVICE LATERALS IS REQUIRED TO DETERMINE ACTUAL LOCATION(S) AND DEPTH(S); SUCH POTHOLING SHALL BE MADE AVAILABLE FOR ENGINEERING DIVISION INSPECTION. FOR TRENCHLESS INSTALLATIONS INSTALLED AT THE APPROXIMATE DEPTH OF EXISTING VILLAGE UTILITIES

AND/OR SERVICE LATERALS, APPLICANT SHALL ARRANGE FOR POST-CONSTRUCTION CLOSED CIRCUIT TELEVISIONING OF THESE EXISTING SANITARY AND STORM SEWER FACILITIES (MAINS AND LATERALS/PRIVATE SERVICES, AS APPLICABLE). THE VIDEO FOOTAGE SHALL BE PROVIDED TO ENGINEERING DIVISION FOR REVIEW. IF A RECORDING CANNOT BE MADE AVAILABLE, THE APPLICANT SHALL PROVIDE AT LEAST 24 HOURS NOTICE SO AN ENGINEERING DIVISION INSPECTOR CAN BE PRESENT FOR THE TELEVISIONING. ANY OBSERVED DAMAGE ATTRIBUTABLE TO THE SUBJECT INSTALLATION SHALL BE PROMPTLY REPAIRED BY THE APPLICANT ACCORDING TO THE APPLICABLE STANDARDS.

20. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN AGAINST DAMAGE TO EXISTING UTILITIES. IN THE EVENT OF A BREAK IN AN EXISTING WATER MAIN, GAS MAIN, SEWER, OR UNDERGROUND CABLE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY A RESPONSIBLE OFFICIAL FROM THE ORGANIZATION OPERATING THE UTILITY INTERRUPTED. THE CONTRACTOR OR DEVELOPER SHALL LEND ALL POSSIBLE ASSISTANCE IN RESTORING SERVICE AND SHALL ASSUME ALL COSTS, CHARGES, OR CLAIMS CONNECTED WITH THE INTERRUPTION AND REPAIR OF SUCH SERVICES. SHOULD REPAIR WORK NEED TO BE PERFORMED BY THE VILLAGE FOR ANY REASON, THE COST OF SUCH REPAIR WORK WILL BE BILLABLE TO THE CONTRACTOR OR DEVELOPER ON A TIME AND MATERIAL BASIS PLUS, FRINGE, OVERHEAD, AND ADMINISTRATIVE COSTS.
21. BURIED SPLICES ARE STRICTLY PROHIBITED. THEREFORE, ANY DAMAGE TO UNDERGROUND ELECTRICAL CONDUIT SHALL RESULT IN A FULL REPLACEMENT OF ELECTRICAL CABLE BY A VILLAGE-APPROVED CONTRACTOR. THE COST OF SUCH REPAIR WORK WILL BE BILLED TO THE CONTRACTOR OR DEVELOPER ON A TIME AND MATERIAL BASIS PLUS, FRINGE, OVERHEAD, AND ADMINISTRATIVE COSTS.
22. HYDRAULIC CEMENT SHALL BE USED IN PLACE OF TRADITIONAL MORTAR FOR SEALING ALL UTILITY STRUCTURES, PIPE CONNECTIONS, OR SIMILAR APPLICATIONS.
23. ANY AREAS AFFECTED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED TO THEIR PRE-CONSTRUCTION CONDITION OR BETTER. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, ALL UTILITIES, PAVEMENTS, CURBS, DRIVEWAYS, TREES, AND PARKWAYS. NEWLY CONSTRUCTED WORK SHALL ALSO BE PROTECTED FROM DAMAGE UNTIL THE PROJECT HAS BEEN COMPLETED.
24. CONTRACTOR SHALL RESTORE ALL DISTURBED PUBLIC PARKWAY AREAS WITH A MINIMUM 4" TOPSOIL, WITH EITHER SEEDING AND BLANKETING OR SOD. INSPECTION IS REQUIRED TO VERIFY THAT THE PARKWAY HAS BEEN PROPERLY GRADED AND RESTORED. ESTABLISHED GRASS GROWTH IS REQUIRED PRIOR TO FINAL APPROVAL.
25. AS-BUILT RECORD DRAWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE VILLAGE OF LIBERTYVILLE, IN ACCORDANCE WITH THE APPROVED PERMIT(S) AND THE APPLICABLE VILLAGE STANDARDS. PLEASE REFER TO THE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR AS-BUILT SUBMITTAL REQUIREMENTS.



APPENDIX B:

Standard Details

Any applicable Standard Details shall be included on all engineering plans for work proposed within the Village of Libertyville municipal limits. Details should be included without revisions, unless specifically approved in writing by the Village Engineer.



APPENDIX B: STANDARD DETAILS

INDEX OF DETAILS

(Page 1 of 2)

General Utilities

- UTIL-01 – Typical Trench Bedding
- UTIL-02 – Frame & Grate/Lid Standards

Watermain

- WM-01 – Valve Vault
- WM-02 – Pressure Connection & Vault
- WM-03 – Thrust Blocking
- WM-04 – Hydrant Assembly
- WM-05 – Valve Box
- WM-06 – Water Service
- WM-07 – Water Main Casing Pipe
- WM-08 – Water Main Polyethylene Encasement

Sanitary

- SAN-01 – Sanitary Manhole
- SAN-02 – Sanitary Manhole Drop Connection
- SAN-03 – Sanitary Service

Storm

- STM-01 – Storm Manhole Standards
- STM-02 – Catch Basin Standards
- STM-03 – Storm Inlet Standards
- STM-04 – Sump Pump Connection
- STM-05 – Residential Dry Well
- STM-06 – Rain Garden



APPENDIX B: STANDARD DETAILS

INDEX OF DETAILS

(Page 2 of 2)

Pavement

- PAV-01 – B6.12 Curb and Gutter
- PAV-02 – B6.18 Curb and Gutter
- PAV-03 – M3.12 Curb and Gutter
- PAV-04 – Type B Barrier Curb
- PAV-05 – P.C.C. Sidewalk
- PAV-06 – Sidewalk Curb Ramp Standards
- PAV-07 – Residential Driveway Apron
- PAV-08 – Commercial Driveway Apron
- PAV-09 – Accessible Parking & Signage
- PAV-10 – Sign Post
- PAV-11 – Utility Trench Pavement Patch
- PAV-12 – Typical Residential Roadway Section
- PAV-13 – Typical Non-Residential Roadway Section

Erosion Control

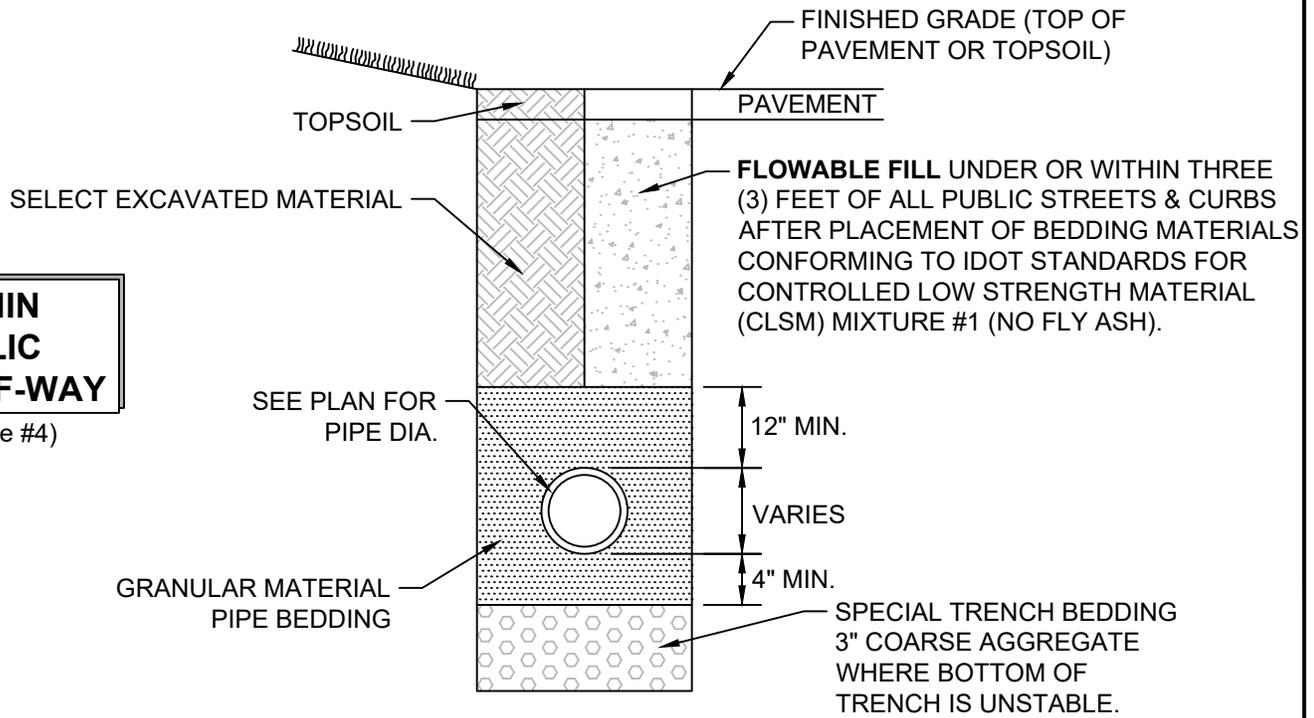
- EROS-01 – Erosion / Sediment Control Standards
- EROS-02 – Concrete Wash Out
- EROS-03 – Temporary Perforated Riser
- EROS-04 – Tree Protection Fencing
- EROS-05 – Tree Root Pruning

Street Lighting

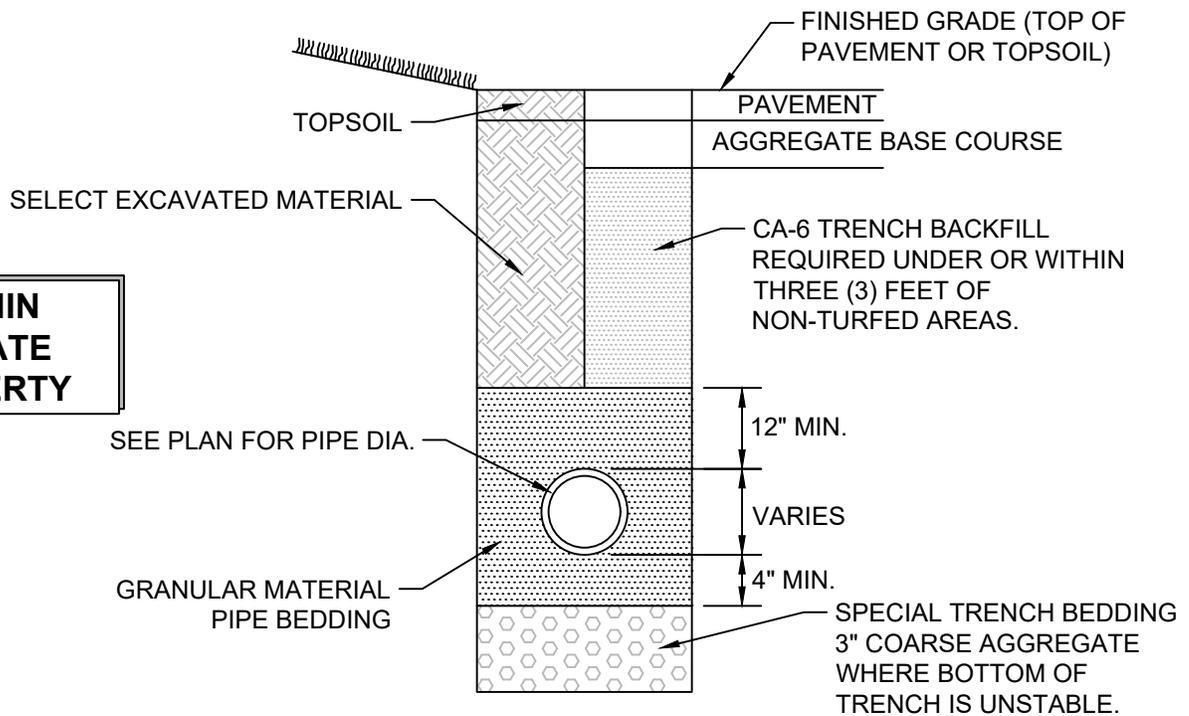
- SL-01 – Residential Street Light
- SL-02 – Primary Street Light
- SL-03 – Primary Street Light Pole Foundation
- SL-04 – Street Lighting Control Box

**WITHIN
PUBLIC
RIGHT-OF-WAY**

(See Note #4)



**WITHIN
PRIVATE
PROPERTY**



NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. SEE "UTILITY TRENCH PAVEMENT PATCH" DETAIL FOR FURTHER REQUIREMENTS ON PAVEMENT RESTORATION.
3. TRENCH WIDTH
 - a.) MAXIMUM WIDTH (TRENCH DEPTH ≤ 5 FT) = 9" + O.D. + 9"
 - b.) MAXIMUM WIDTH (TRENCH DEPTH > 5 FT) = 18" + O.D. + 18"
4. IF EXPRESSLY APPROVED BY THE VILLAGE ENGINEER, AND ON A CASE-BY-CASE BASIS, CA-6 MAY BE USED IN PLACE OF FLOWABLE FILL WITHIN THE PUBLIC RIGHT-OF-WAY

TYPICAL TRENCH & BEDDING



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
UTIL - 01

ITEM	FRAME & GRATE / LID (OR APPROVED EQUAL)	I.D.O.T. TYPE	DESCRIPTION	OPTIONS	APPLICABLE TO CURRENT PROJECT? "X"
WATERMAIN					
VALVE VAULT (MAINTAINED BY VILLAGE) FRAME & CLOSED LID	NEENAH R-1713	1	FLAT, ROUND, CLOSED LID	"VILLAGE OF LIBERTYVILLE" AND "WATER" IMPRINTED ON COVER. LID SHALL HAVE CONCEALED PICKHOLE.	
VALVE VAULT (PRIVATELY MAINTAINED) FRAME & CLOSED LID	NEENAH R-1713	1	FLAT, ROUND, CLOSED LID	ONLY "WATER" IMPRINTED ON COVER. LID SHALL HAVE CONCEALED PICKHOLE.	
SANITARY SEWER					
SANITARY MANHOLE (MAINTAINED BY VILLAGE) FRAME & CLOSED LID	NEENAH R-1713	1	FLAT, ROUND, CLOSED LID	"VILLAGE OF LIBERTYVILLE" AND "SANITARY" IMPRINTED ON COVER. LID SHALL HAVE CONCEALED PICKHOLE.	
SANITARY MANHOLE (PRIVATELY MAINTAINED) FRAME & CLOSED LID	NEENAH R-1713	1	FLAT, ROUND, CLOSED LID	ONLY "SANITARY" IMPRINTED ON COVER. LID SHALL HAVE CONCEALED PICKHOLE.	
STORM SEWER					
STORM MANHOLE (MAINTAINED BY VILLAGE) FRAME & CLOSED LID	NEENAH R-1713	1	FLAT, ROUND, CLOSED LID	"VILLAGE OF LIBERTYVILLE" AND "STORM" IMPRINTED ON COVER. LID SHALL HAVE CONCEALED PICKHOLE.	
STORM MANHOLE (PRIVATELY MAINTAINED) FRAME & CLOSED LID	NEENAH R-1713	1	FLAT, ROUND, CLOSED LID	ONLY "STORM" IMPRINTED ON COVER. LID SHALL HAVE CONCEALED PICKHOLE.	
FLAT, ROUND, OPEN GRATE *	NEENAH R-1713	1	FLAT, ROUND, OPEN TYPE D GRATE		
CURB DRAINAGE STRUCTURE (FOR BARRIER CURB)	NEENAH R-3278-A (IN ROADWAY SAGS)	3	INLET FRAME & CURB BOX FOR BARRIER CURB, RECTANGULAR	STANDARD GRATE	
	NEENAH R-3278-AL (DIRECTIONAL FLOW)	3V		TYPE L VANE GRATE	
CURB DRAINAGE STRUCTURE (FOR ROLL-TYPE CURB)	NEENAH R-3501-P	N/A	INLET FRAME ROLL-TYPE CURB, RECTANGULAR, OPEN GRATE		
BEEHIVE GRATE *	NEENAH R-4340-B	8	BEEHIVE TYPE INLET, ROUND, OPEN GRATE	FOR LAWN AREAS ONLY	

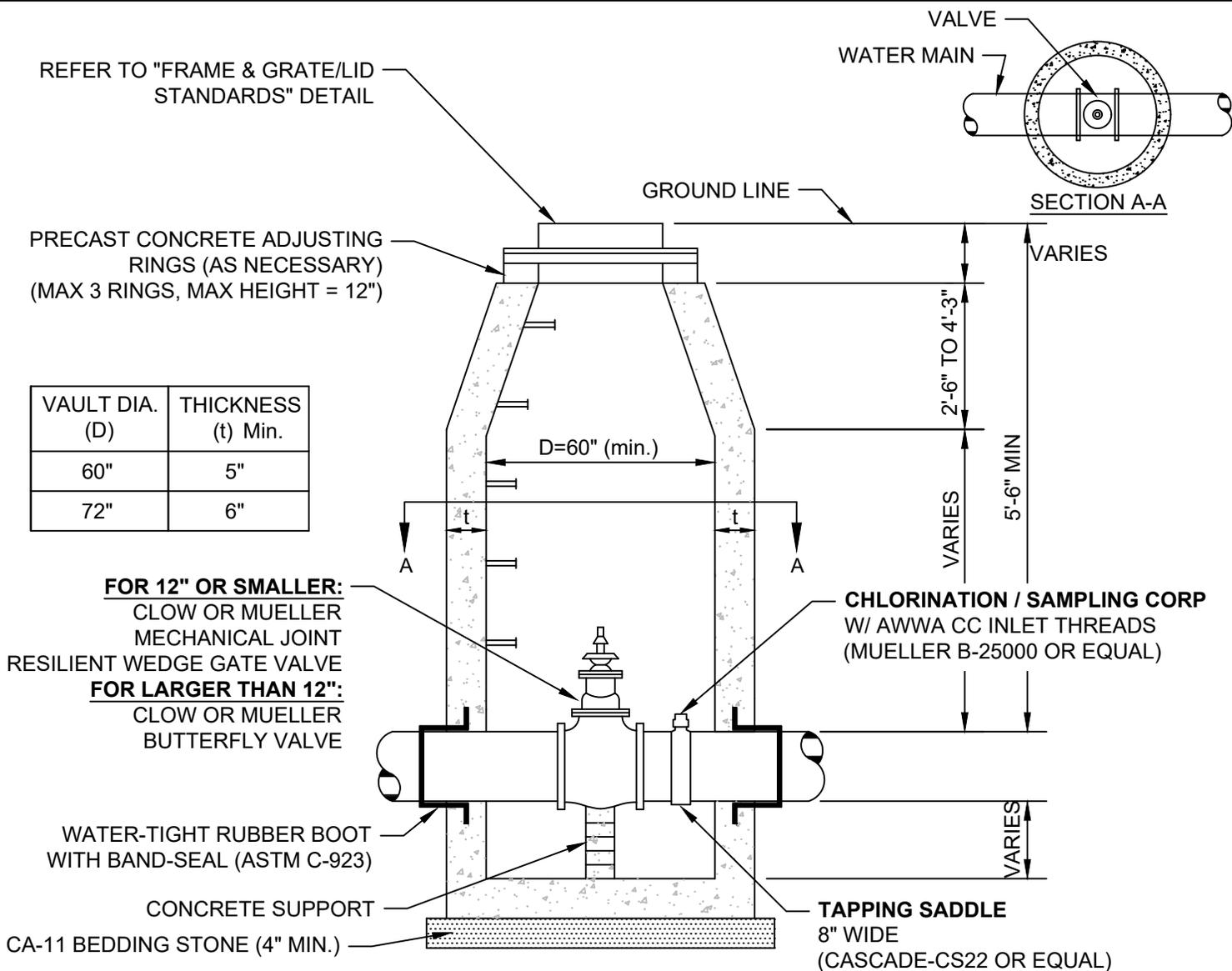
* NOTE: DRAINAGE STRUCTURES SHALL HAVE "NO DUMPING - DRAINS TO RIVER" IMPRINTED ON FRAME/GRATE

FRAME & GRATE / LID STANDARDS



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
UTIL - 02



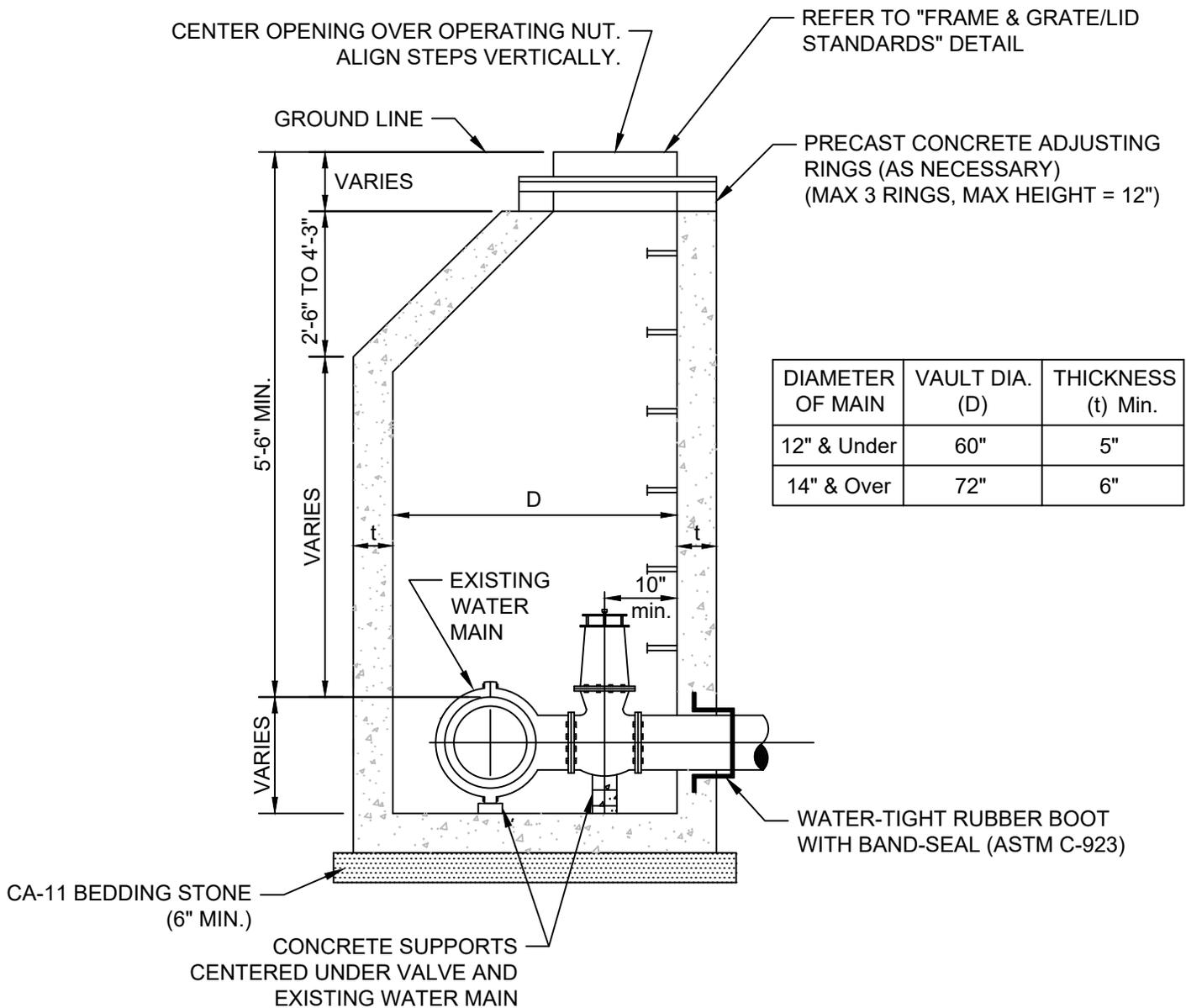
- NOTES:**
1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
 2. DIMENSION "D" SHALL BE 60" MINIMUM FOR ALL VALVE VAULTS.
 3. PRECAST REINFORCED CONCRETE SECTIONS PER ASTM C-478 WITH INTEGRAL PRECAST BOTTOMS.
 4. ALL MANHOLE SECTIONS, ADJUSTING RINGS, AND FRAME SHALL BE SET IN FULL WITH PRE-FORMED BITUMINOUS GASKETS
 5. MASTIC SHALL BE APPLIED OVER EXTERIOR OF JOINTS BETWEEN SECTIONS AND LIFT HOLES.
 6. PIPE OPENINGS SHALL BE PRECAST INTO WALLS.
 7. I.D.O.T #602601 FOR FLAT TOPS.
 8. STEPS TO BE STEEL REINFORCED PLASTIC.
 - A. EMBEDDED 3" INTO STRUCTURE WALL.
 - B. SPACED AT 16" CENTER TO CENTER.
 - C. FIRST STEP LOCATED 8"-12" BELOW FRAME.
 7. ALL BELOW GRADE FASTENERS TO BE STAINLESS STEEL:
 - A. BOLTS & THREADED RODS - GRADE #304
 - B. NUTS & WASHERS - GRADE #316
 8. VALVES 12" OR LARGER MAY REQUIRE OFFSET CONES.
 9. IF VALVE VAULT IS TO BE PRIVATELY OWNED AND/OR MAINTAINED, LID SHALL ONLY READ "WATER" WITH NO REFERENCES TO THE VILLAGE. IF THE UTILITY IS TO BE MAINTAINED BY THE VILLAGE, THE COVER SHALL ALSO INCLUDE "VILLAGE OF LIBERTYVILLE" IMPRINTED AS WELL.

VALVE VAULT



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
WM - 01



NOTES:

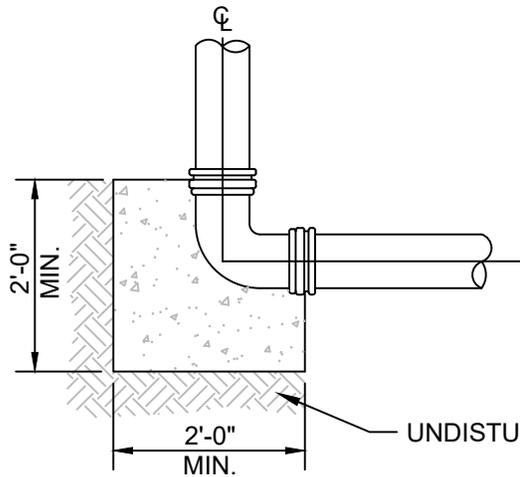
1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. PRECAST REINFORCED CONCRETE SECTIONS PER ASTM C-478 WITH INTEGRAL PRECAST BOTTOMS.
3. ALL MANHOLE SECTIONS, ADJUSTING RINGS, AND FRAME SHALL BE SET IN FULL WITH PRE-FORMED BITUMINOUS GASKETS.
4. MASTIC SHALL BE APPLIED OVER EXTERIOR OF JOINTS BETWEEN SECTIONS AND LIFT HOLES. PIPE OPENINGS SHALL BE PRECAST INTO WALLS.
5. I.D.O.T #602601 FOR FLAT TOPS.
6. STEPS TO BE STEEL REINFORCED PLASTIC.
 - A. IMBEDDED 3" INTO STRUCTURE WALL.
 - B. SPACED AT 16" CENTER TO CENTER.
 - C. FIRST STEP LOCATED 8"-12" BELOW FRAME.
7. ALL BELOW GRADE FASTENERS TO BE STAINLESS STEEL:
 - A. BOLTS & THREADED RODS - GRADE #304
 - B. NUTS & WASHERS - GRADE #316

PRESSURE CONNECTION & VAULT

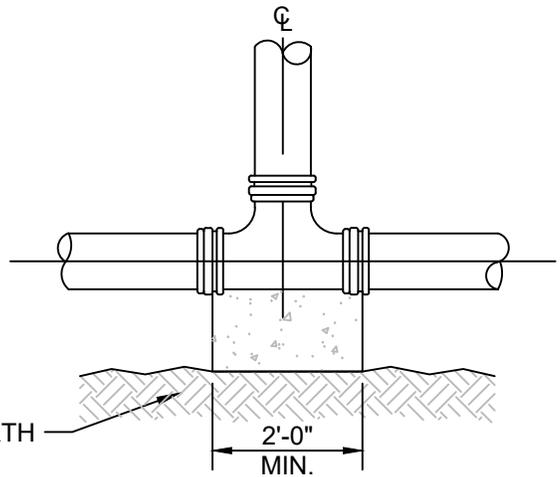


LAST
REVISED:
02/15/2023

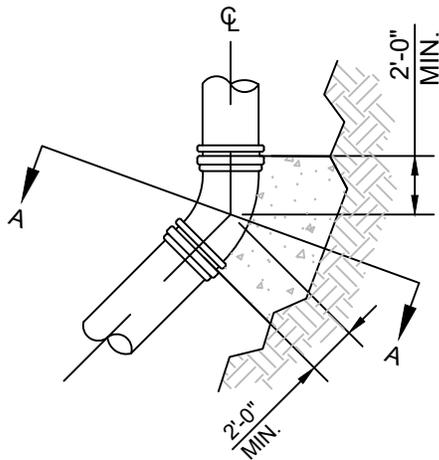
STANDARD DETAIL #
WM - 02



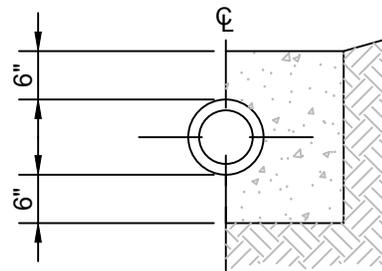
90° ELBOW - PLAN VIEW



TEE - PLAN VIEW



45°, 22.5°, 11.25° BEND - PLAN VIEW



SECTION A-A

NOTES:

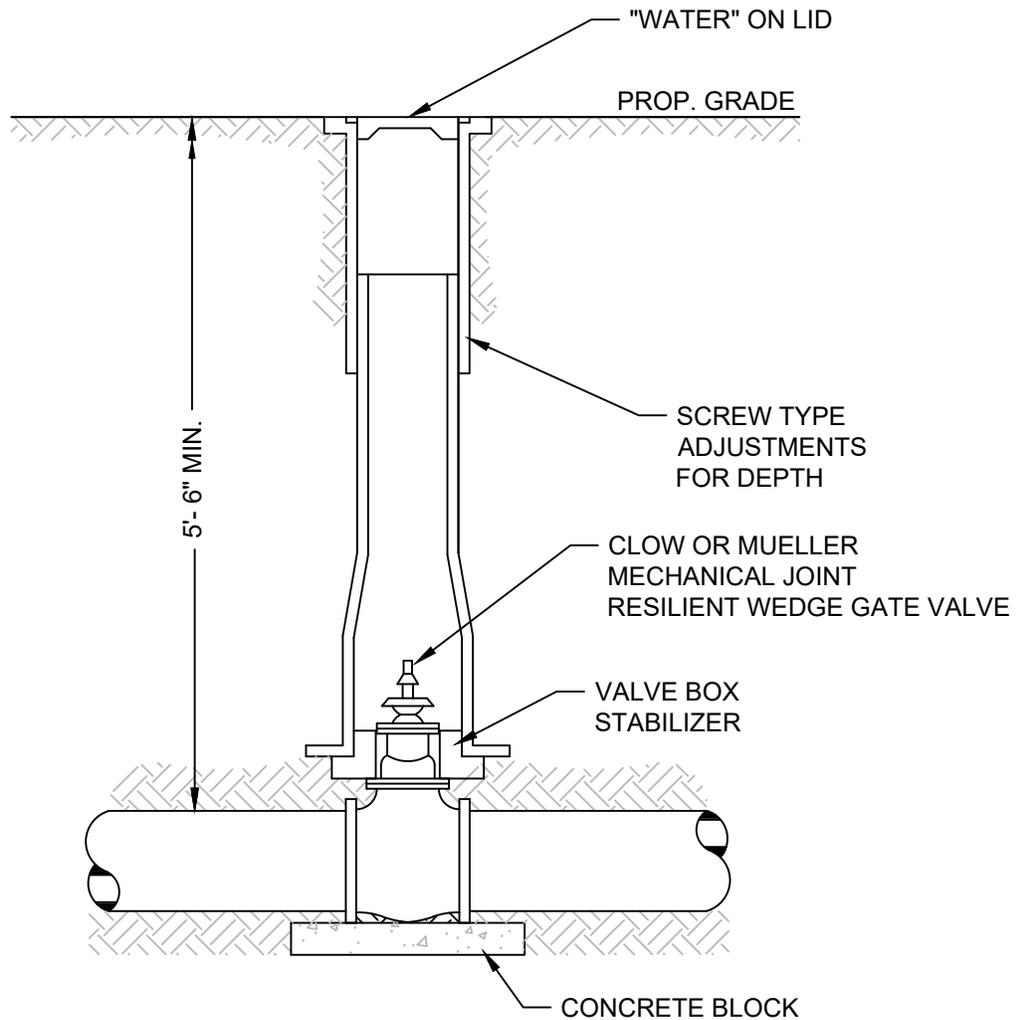
1. CONTRACTOR'S DISCRETION TO INSTALL MONOLITHIC CONCRETE BLOCK OR POURED-IN-PLACE CONCRETE THRUST BLOCKS.
2. ALL THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED EARTH.
3. ALL MONOLITHIC CONCRETE BLOCKS SHALL BE 3000 P.S.I. CONCRETE.
4. ALL POURED-IN-PLACE CONCRETE THRUST BLOCKS SHALL BE IDOT CLASS SI CONCRETE OR APPROVED EQUAL.

THRUST BLOCKING



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
WM - 03



NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. VALVE BOXES SHALL BE TYLER #664, FOUR INCH (4") DIAMETER, SCREW TYPE, OR APPROVED EQUAL.
3. ALL BELOW GRADE FASTENERS TO BE STAINLESS STEEL:
 - A. BOLTS & THREADED RODS - GRADE #304
 - B. NUTS & WASHERS - GRADE #316

VALVE BOX



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
WM - 05

TRACER WIRE ACCESS BOX
(ONLY IF USING PLASTIC PIPE FOR
PRIVATE WATER SERVICE ONLY)
See Note #9

FINISHED GRADE
VARIES
(See Note #3)

TELESCOPING SERVICE BOX
(A.Y. MCDONALD 5615WB CURB BOX)
5 1/2 - 8 FT LENGTH

TRACER WIRE FROM MAIN TO ACCESS BOX,
AND FROM ACCESS BOX TO STRUCTURE
(ONLY IF USING PLASTIC PIPE FOR PRIVATE
WATER SERVICE ONLY)
See Note #9

TAPPING SADDLE
8" WIDE
(CASCADE-CS22
OR EQUAL)

CORPORATION STOP
(A.Y. MCDONALD
NL PLUG STYLE - 74701)

WATER MAIN WITH
SERVICE SADDLE

SERVICE PIPE
COPPER, TYPE K
1" MIN. DIAMETER

CURB STOP
(A.Y. MCDONALD
NL BALL STYLE - 76104)

CONCRETE BLOCK

(CONTINUES TO
STRUCTURE)

5'-6" MIN.

RIGHT OF WAY LINE

NOTES:

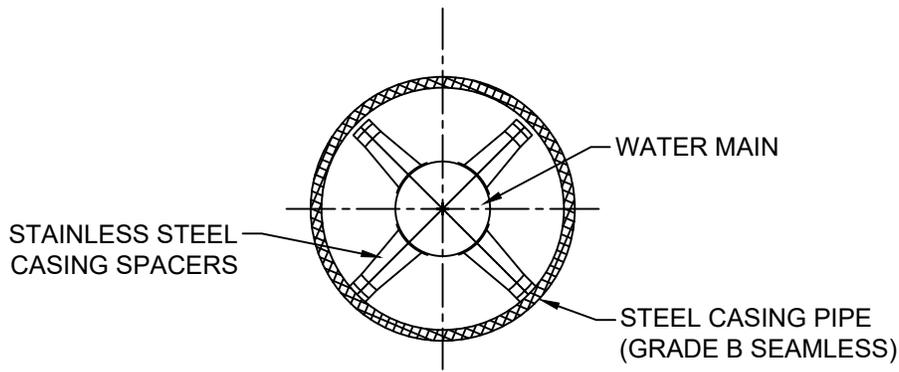
1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. THIS DETAIL APPLIES TO WATER SERVICES 2" IN DIAMETER OR SMALLER. ANY WATER SERVICE WHICH IS 3" OR LARGER SHALL CONFIRM TO VILLAGE WATERMAIN STANDARDS.
3. B-BOX SHALL BE LOCATED IN THE GRASS PARKWAY WITHIN THE PUBLIC RIGHT-OF-WAY (WHENEVER POSSIBLE) AND A MINIMUM OF 4 FEET BEHIND THE BACK-OF-CURB.
4. SERVICE PIPE TO BE WEAVED IN TRENCH TO ALLOW AT LEAST ONE (1) FOOT EXTRA LENGTH IN ITS LENGTH.
5. UPON COMPLETION OF WATER SERVICE CONSTRUCTION, ALL BOXES ARE TO BE FULLY EXTENDED AND LEFT PROTRUDING ABOVE THE FINISHED GRADE. FINAL ADJUSTMENT TO BE MADE DURING FINISHED GRADING OF PARKWAY.
6. COMPACTED GRANULAR TRENCH BACKFILL IS REQUIRED WHERE ANY PORTION OF THE EXCAVATION ACTIVITY IS WITHIN THREE (3) FEET HORIZONTALLY OF EXISTING OR PROPOSED PAVEMENTS, DRIVEWAYS, OR SIDEWALKS.
7. TAPS SHALL BE AT THE 10 O'CLOCK POSITION ON THE WATER MAIN AT LEAST 18" FROM ANY EXISTING TAP AND AT LEAST 12" FROM ANY BELL.
8. IF A NEW SERVICE CONNECTION OF 2" OR SMALLER IS BEING MADE TO AN EXISTING WATER MAIN THAT IS OWNED AND MAINTAINED BY THE VILLAGE, THE SERVICE TAP SHALL BE PERFORMED BY THE VILLAGE'S PUBLIC WORKS DEPARTMENT. THE VILLAGE SHALL BE CONTACTED ACCORDINGLY TO SCHEDULE THE REQUIRED TAP (CALL UTILITIES DIVISION AT 847-362-3434).
9. IF PLASTIC PIPE IS PROPOSED FROM THE B-BOX TO THE METER (I.E. THE "PRIVATE SERVICE"), TRACER WIRE IS REQUIRED AND SHALL COMPLY WITH THIS DETAIL. PLEASE NOTE: FROM THE B-BOX TO THE MAIN, THE SERVICE MATERIAL SHALL BE TYPE K COPPER.

WATER SERVICE



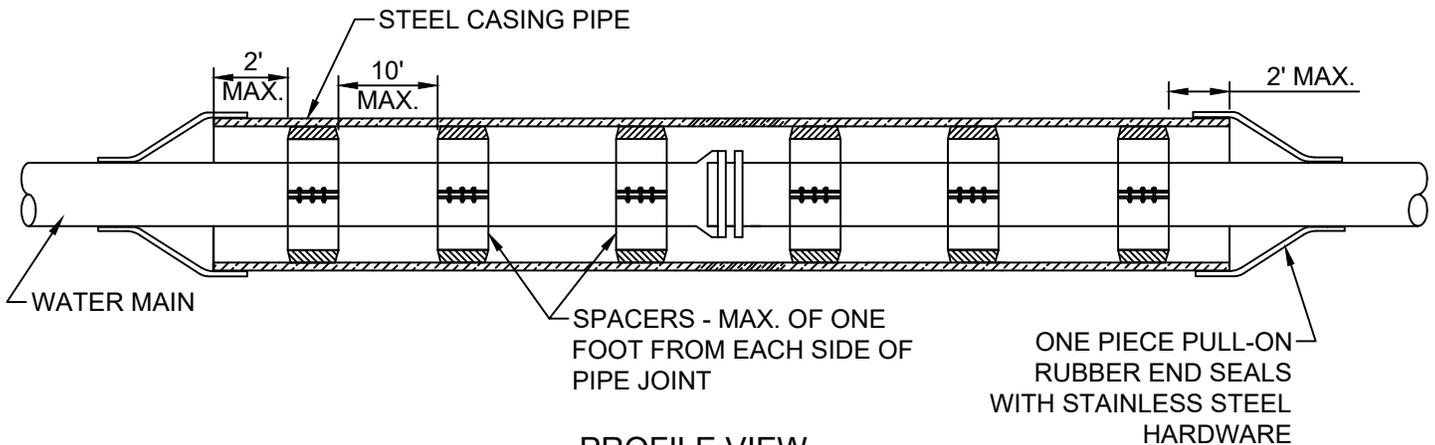
LAST
REVISED:
02/15/2023

STANDARD DETAIL #
WM - 06



CROSS-SECTION VIEW

WATERMAIN DIA.	MIN. CASING PIPE DIA.
6"	16"
8"	16"
10"	20"
12"	24"
16"	30"
24"	36"
30"	42"



PROFILE VIEW

NOTES:

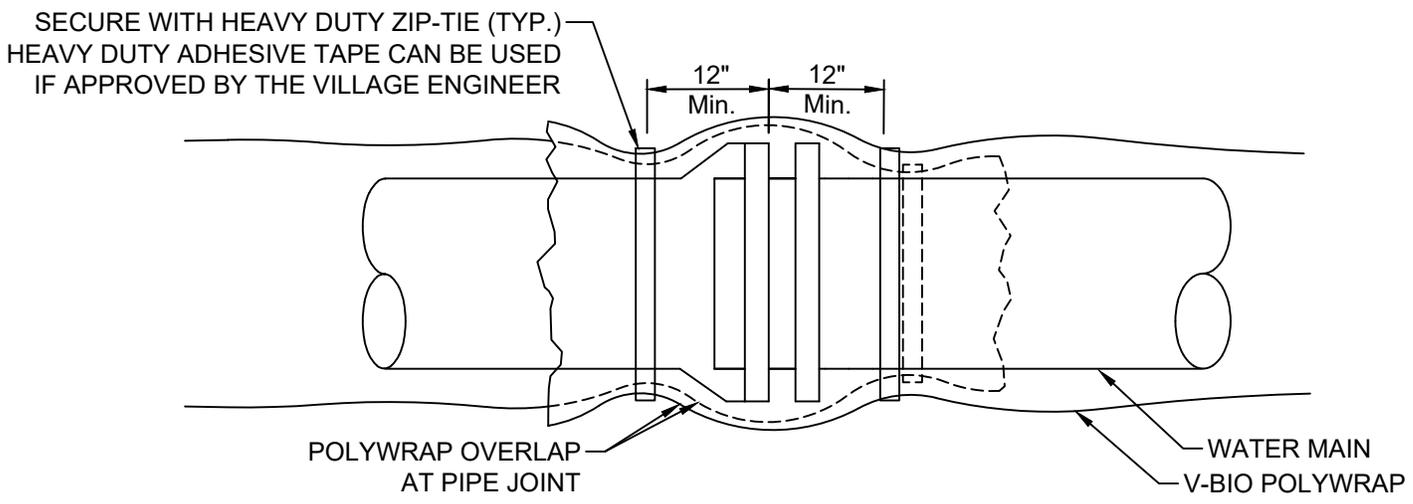
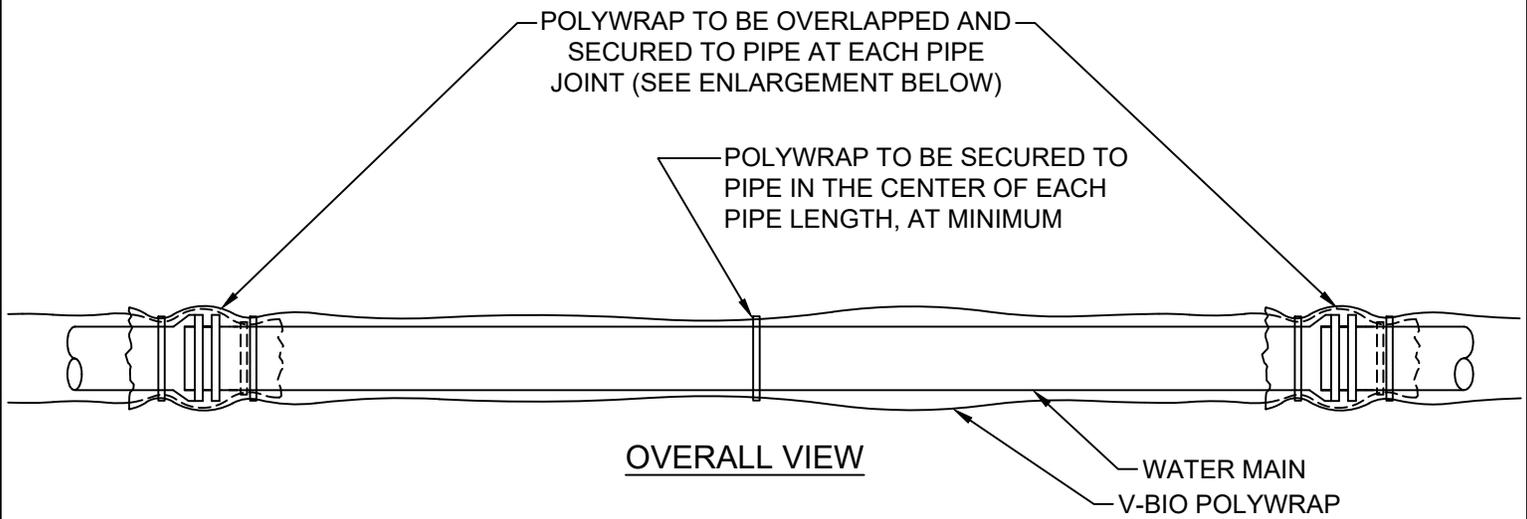
1. CASING PIPE TO BE BITUMINOUS COATED STEEL PER IDOT WALL THICKNESS GUIDE OR AS SPECIFIED ON THE PLANS.
2. CASING SPACERS SHALL BE STAINLESS STEEL BY CASCADE OR APPROVED EQUAL.
3. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, CASING SPACERS MUST BE CENTERED AND RESTRAINED.
4. JOINTS LOCATED INSIDE OF CASING PIPE MUST BE RESTRAINED SO TAHT JOINT PRESSURE LIMIT IS NO LESS THAN 350 PSI FOR PIPE LESS THAN OR EQUAL TO 24" DIAMETER AND NO LESS THAN 250 PSI FOR PIPE LARGER THAN 24" DIAMETER. NO FIELD CUT JOINTS WILL BE ALLOWED WITHOUT CONSENT OF ENGINEER.
5. ALL DUCTILE IRON WATER MAIN LOCATED INSIDE OF CASING PIPE MUST BE POLYETHYLENE ENCASED IN ACCORDANCE WITH THE VILLAGE STANDARDS.
6. CASING ENDS TO BE SEALED WITH ONE PIECE PULL-ON RUBBER END SEALS WITH STAINLESS STEEL HARDWARE, MODEL ESC BY CCI PIPELINE SYSTEMS OR APPROVED EQUAL.

WATER MAIN CASING PIPE



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
WM - 07



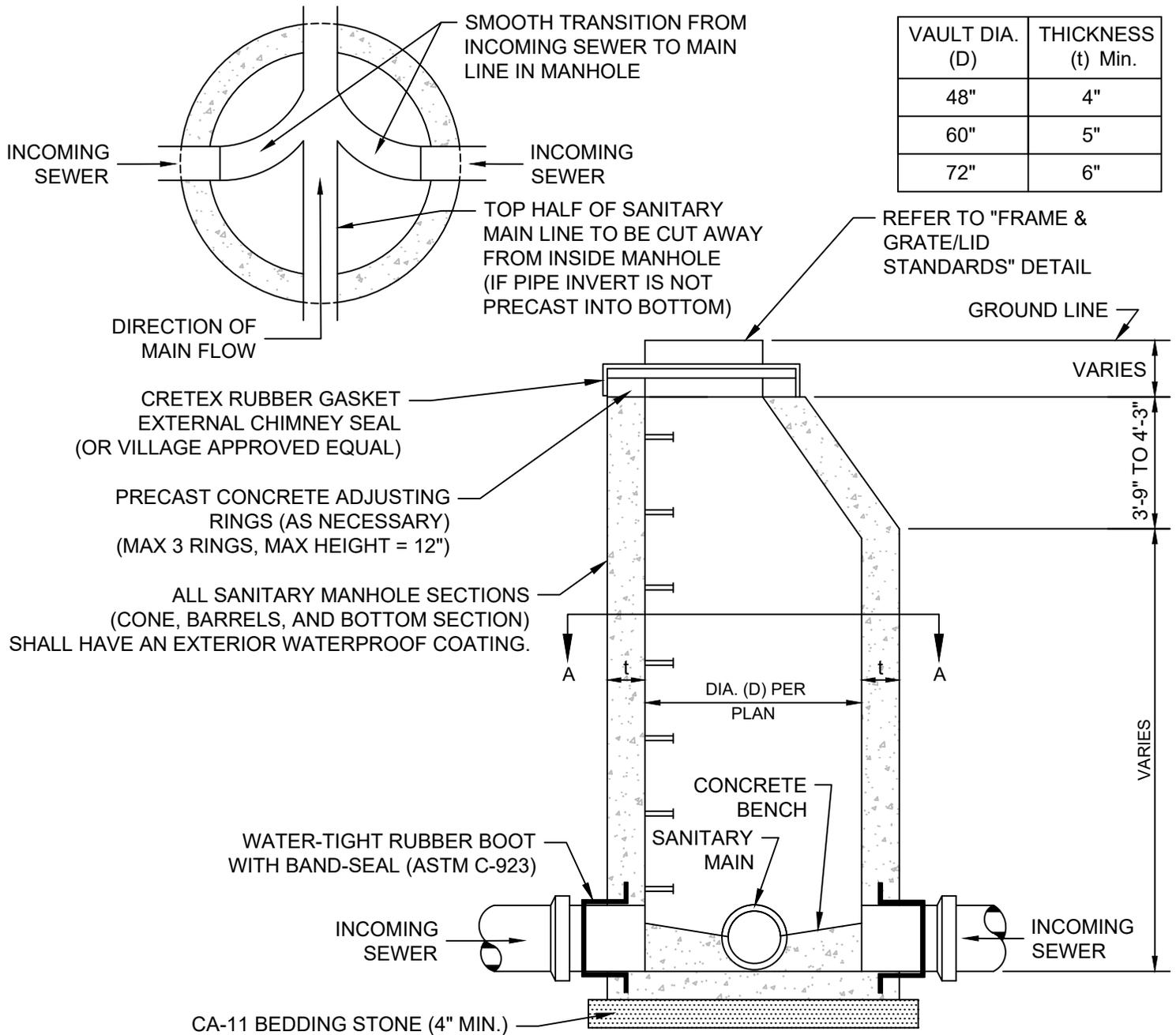
PIPE JOINT ENLARGEMENT VIEW

NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. ALL DIP WATER MAINS SHALL BE ENCASED IN AN 8-MIL V-BIO POLYWRAP, OR APPROVED EQUAL.
3. THE POLYWRAP IS TO BE SECURED TO THE PIPE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. MATERIAL AND INSTALLATION SHALL ADHERE TO APPLICABLE AWWA AND ANSI STANDARDS.
4. FOR INSTALLATION IN AREAS OF UNSUITABLE OR CORROSIVE SOILS, THE VILLAGE MAY REQUIRE WATER MAIN TO BE WRAPPED IN TWO LAYERS OF POLYETHYLENE ENCASEMENT (POLYWRAP).

**WATER MAIN
POLYETHYLENE ENCASEMENT**

	
LAST REVISED: 02/15/2023	STANDARD DETAIL # WM - 08



NOTES:

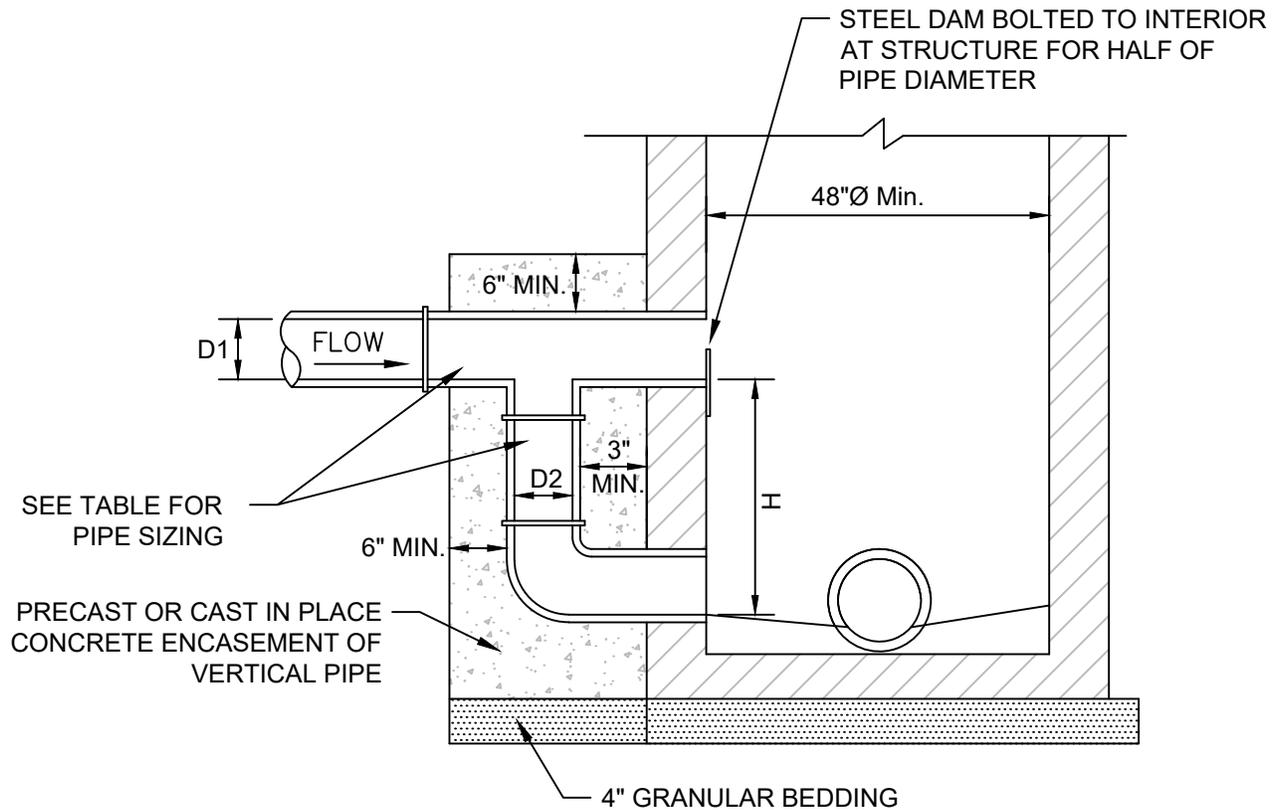
1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. EXTERIOR NEOPRENE CHIMNEY SEAL STAINLESS STEEL TRIM PER ASTM C-923.
3. PIPE OPENINGS SHALL BE PRECAST INTO WALLS.
4. PRECAST REINFORCED CONCRETE SECTIONS PER ASTM C-478 WITH INTEGRAL PRECAST BOTTOMS.
5. ALL MANHOLE SECTIONS, ADJUSTING RINGS, AND FRAME SHALL BE SET IN FULL WITH PRE-FORMED BITUMINOUS GASKETS.
6. STEPS TO BE STEEL REINFORCED PLASTIC.
 - A. EMBEDDED 3" INTO STRUCTURE WALL.
 - B. SPACED AT 16" CENTER TO CENTER.
 - C. FIRST STEP LOCATED 8"-12" BELOW FRAME.
7. PRECAST PCC BENCH SHALL EXTEND TO CROWN AND SLOPE TO OUTSIDE WALL, SMOOTH FINISH.

SANITARY MANHOLE



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
SAN - 01



INCOMING SEWER	DROP SEWER
D1	D2
6"	8"
8"	8"
10"	8"
12"	8"
15"	10"
18"	12"
21"	15"
24"	18"

NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. REFER TO 'SANITARY MANHOLE' DETAIL FOR MANHOLE SPECIFICATIONS.
3. IF H > 12 INCHES, A DROP PIPE TO SANITARY MAIN IS REQUIRED.
3. CONCRETE FOR ENCASEMENT SHALL BE 4,000 PSI @ 28 DAYS.
4. FORCEMAIN NOT ALLOWED AS INCOMING SEWER.
5. VILLAGE RESERVES THE RIGHT TO REQUIRE AN INTERNAL DROP CONNECTION BASED ON FIELD CONDITIONS OR OTHER CONSIDERATIONS.

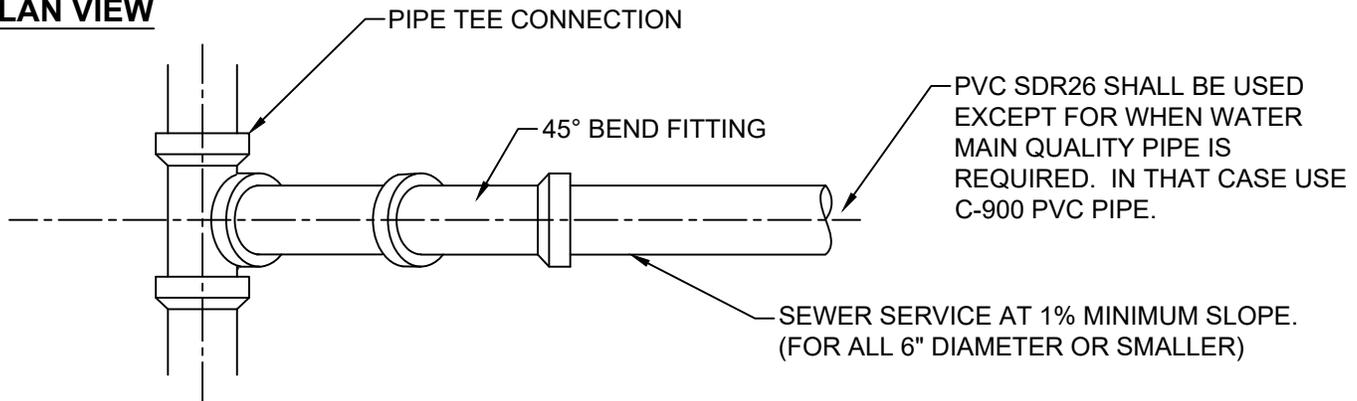
SANITARY MANHOLE DROP CONNECTION



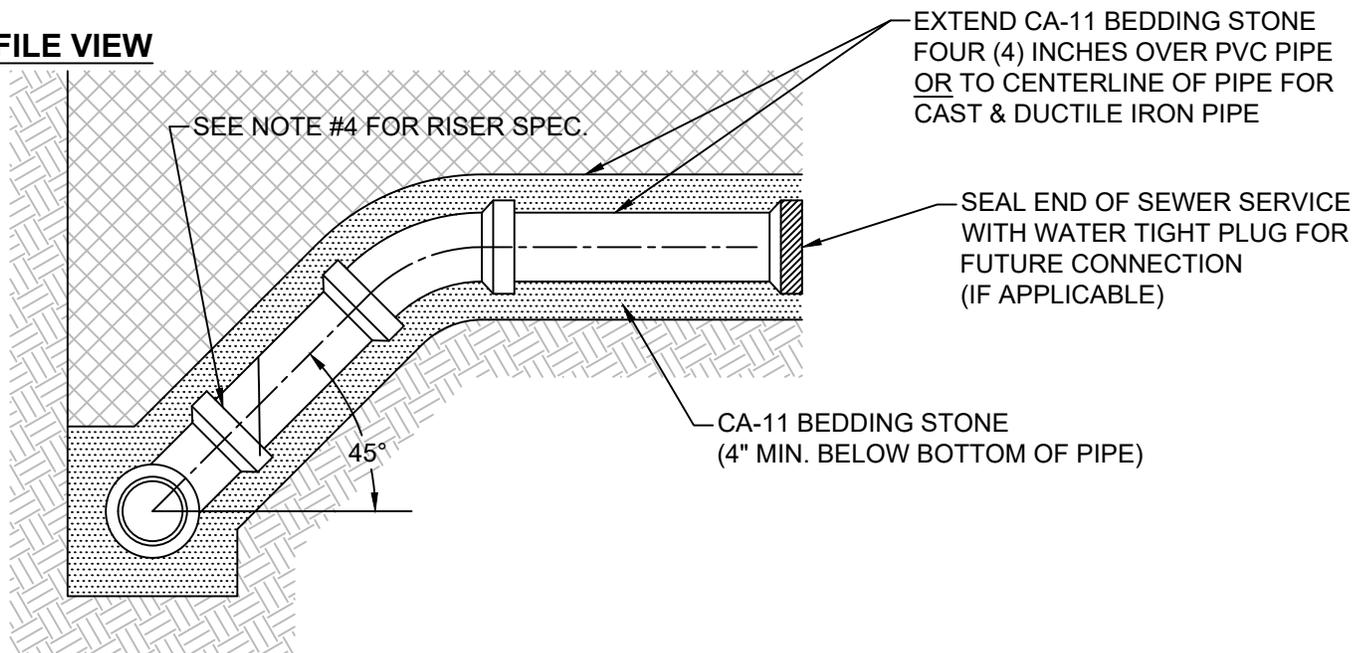
LAST
REVISED:
02/15/2023

STANDARD DETAIL #
SAN - 02

PLAN VIEW



PROFILE VIEW



NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. TRENCH BACKFILL FOR PAVED AREAS SHALL BE CA-6 CRUSHED LIMESTONE OR APPROVED EQUAL.
3. TRENCH BACKFILL FOR NON-PAVED AREAS SHALL BE FINELY DIVIDED EXCAVATED MATERIAL FREE OF ROCKS AND DEBRIS.
4. RISER REQUIRED WHEN SEWER DEPTH EXCEEDS NINE (9) FEET. MAXIMUM SLOPE OF 1:1 ON RISERS.
5. FOR DEVELOPMENTS WITH NEW MAIN CONSTRUCTION, A TEE OR WYE CONNECTION SHALL BE PROVIDED.
6. FOR PROPERTIES WITH NO EXISTING SERVICE LINE THAT ARE CONNECTING TO AN EXISTING MAIN, THE CONNECTION SHALL BE MADE VIA A ROMAC CB OR FORD FSS SEWER SADDLE.

FOR PROPERTIES WITH AN EXISTING SERVICE:

1. IF EXISTING SERVICE IS CLAY, THE EXISTING WYE OR TEE CONNECTION AT THE MAIN MUST BE REMOVED AND REPLACED ENTIRELY.
2. IF EXISTING SERVICE IS PVC OR IRON, SEWER TELEVISIONING VIDEOS OF THE ENTIRE SERVICE CAN BE PROVIDED TO THE VILLAGE FOR REVIEW AND DETERMINATION OF POSSIBLE RE-USE.
3. IF NEW SERVICE IS PROPOSED, THE CONNECTION TO THE EXISTING MAIN SHALL BE ONE OF THE FOLLOWING:
 - 3.1. NEW PVC WYE OR TEE CONNECTION INSTALLED ALONG EXISTING MAIN; OR
 - 3.2. ROMAC CB OR FORD FSS SEWER SADDLE ON EXISTING MAIN (IF PROPOSED AT DIFFERENT LOCATION THAN EXISTING CONNECTION); OR
 - 3.3. LMT STYLE SADDLE SYSTEM INSTALLATION (OR APPROVED EQUAL) WHEN TAPPING A LINED SANITARY MAIN.

SANITARY SERVICE



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
SAN - 03

ILLINOIS DEPARTMENT OF TRANSPORTATION (I.D.O.T.) STANDARDS TO BE UTILIZED FOR ALL STORM MANHOLES.

PLEASE "X" ANY STANDARDS LISTED BELOW THAT ARE APPLICABLE TO THIS PROJECT, AND INCLUDE THE CORRESPONDING I.D.O.T. STANDARD DETAIL ON THE PLANS.

STANDARD	DESCRIPTION	APPLICABLE TO CURRENT PROJECT? "X"
602401	MANHOLE TYPE A, 4' DIAMETER	
602402	MANHOLE TYPE A, 5' DIAMETER	
602406	MANHOLE TYPE A, 6' DIAMETER	
602411	MANHOLE TYPE A, 7' DIAMETER	
602416	MANHOLE TYPE A, 8' DIAMETER	
602421	MANHOLE TYPE A, 9' DIAMETER	
602426	MANHOLE TYPE A, 10' DIAMETER	
602601	PRECAST REINFORCED CONCRETE FLAT SLAB TOP	

NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. USE LATEST REVISION OF STANDARDS.

STORM MANHOLE STANDARDS



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
STM - 01

ILLINOIS DEPARTMENT OF TRANSPORTATION (I.D.O.T.) STANDARDS TO BE UTILIZED FOR ALL STORM CATCH BASINS.

PLEASE "X" ANY STANDARDS LISTED BELOW THAT ARE APPLICABLE TO THIS PROJECT, AND INCLUDE THE CORRESPONDING I.D.O.T. STANDARD DETAIL ON THE PLANS.

STANDARD	DESCRIPTION	APPLICABLE TO CURRENT PROJECT? "X"
602001	CATCH BASIN, TYPE A	
602011	CATCH BASIN, TYPE C	
602601	PRECAST REINFORCED CONCRETE FLAT SLAB TOP	

NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. USE LATEST REVISION OF STANDARDS.

CATCH BASIN STANDARDS



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
STM - 02

ILLINOIS DEPARTMENT OF TRANSPORTATION (I.D.O.T.) STANDARDS TO BE UTILIZED FOR ALL STORM INLETS.

PLEASE "X" ANY STANDARDS LISTED BELOW THAT ARE APPLICABLE TO THIS PROJECT, AND INCLUDE THE CORRESPONDING I.D.O.T. STANDARD DETAIL ON THE PLANS.

STANDARD	DESCRIPTION	APPLICABLE TO CURRENT PROJECT? "X"
602001	INLET, TYPE A	
602601	PRECAST REINFORCED CONCRETE FLAT SLAB TOP	

NOTES:

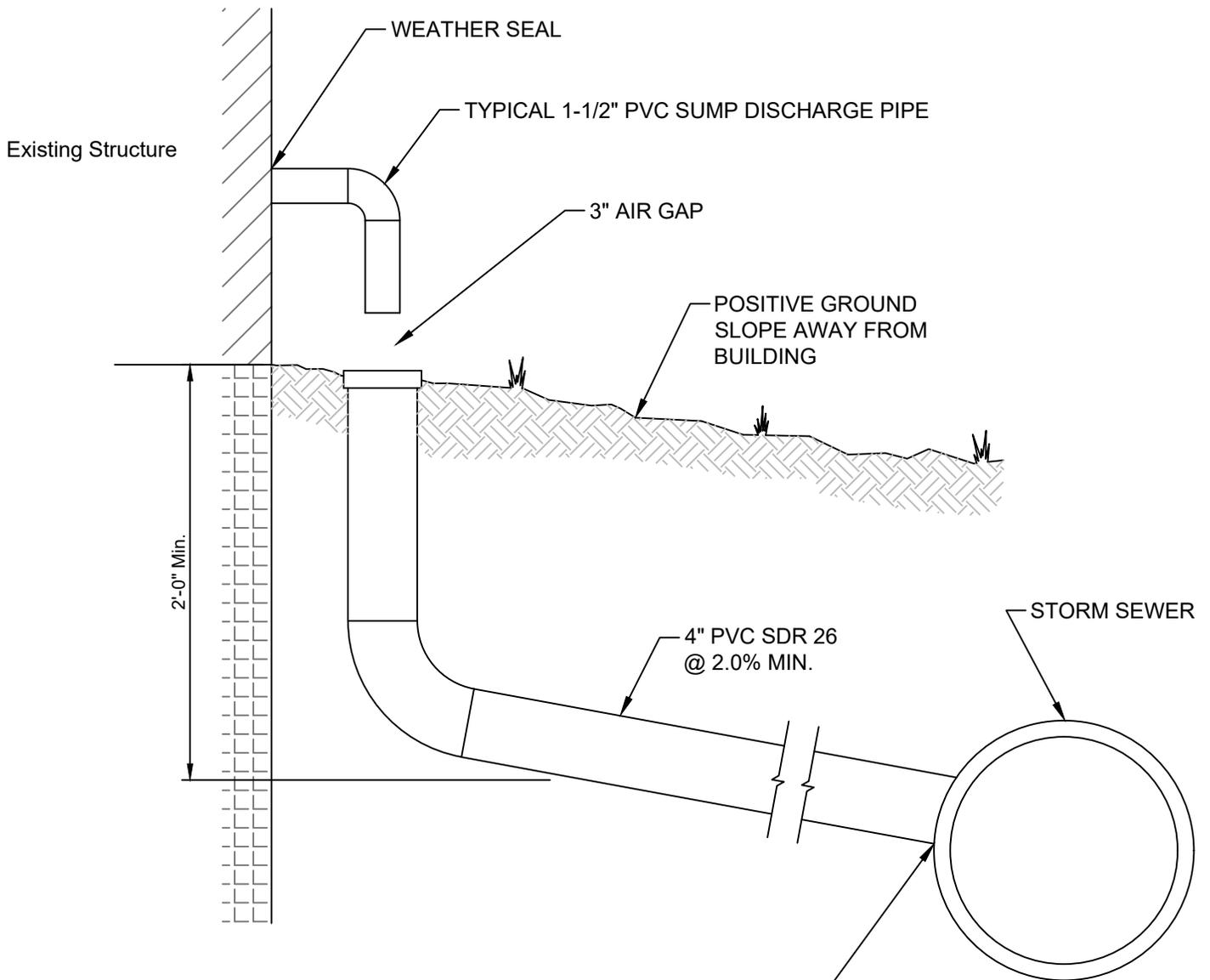
1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. USE LATEST REVISION OF STANDARDS.

STORM INLET STANDARDS



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
STM - 03



- CONNECTION TO STORM SEWER AS FOLLOWS:**
1. EXISTING "WYE" FITTING
 2. PRE-CORED HOLE & SADDLE DEVICE
 3. MACHINE CORE HOLE & SADDLE DEVICE
 4. DIRECT TAP TO STORM STRUCTURE IS PREFERRED

NOTES:

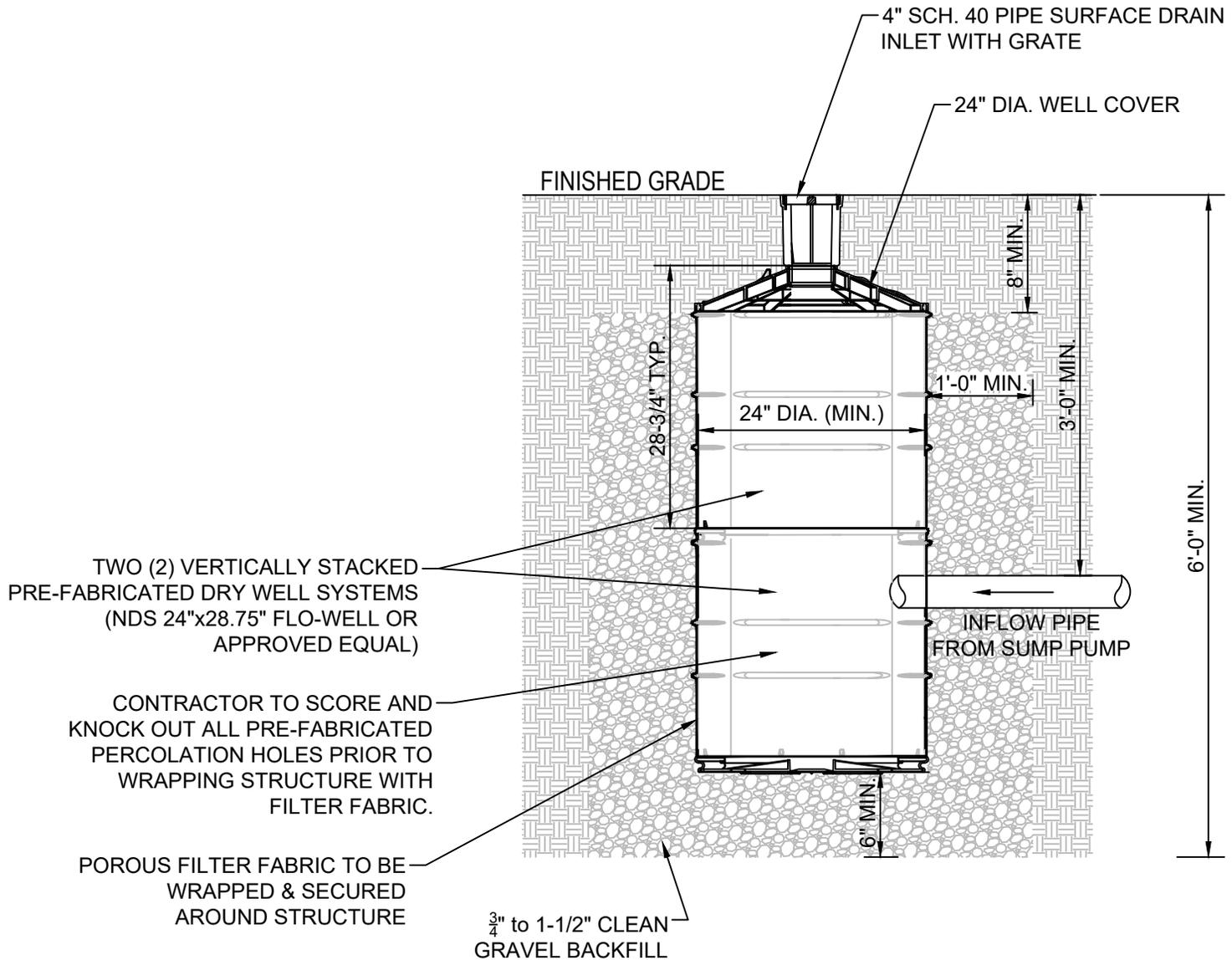
1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS
2. CONTRACTOR ASSUMES FULL RESPONSIBILITY AND LIABILITY FOR ANY DAMAGE TO UTILITIES.
3. IN NO EVENT SHALL THE SUMP PUMP DISCHARGE INTO THE SANITARY SEWER SYSTEM.

SUMP PUMP CONNECTION



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
STM - 04



FOR PROPERTIES WITH AN EXISTING SERVICE:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS FOR SELECTED PRODUCT.
2. VILLAGE INSPECTION REQUIRED BY THE ENGINEERING DIVISION UPON EXCAVATION OF HOLE AND PRIOR TO INSTALLATION OF DRY WELL STRUCTURES AND STONE IN ORDER TO VERIFY SIZE AND DEPTH OF EXCAVATION. PLEASE CALL (847) 918-2020 TO SCHEDULE INSPECTIONS ACCORDINGLY.

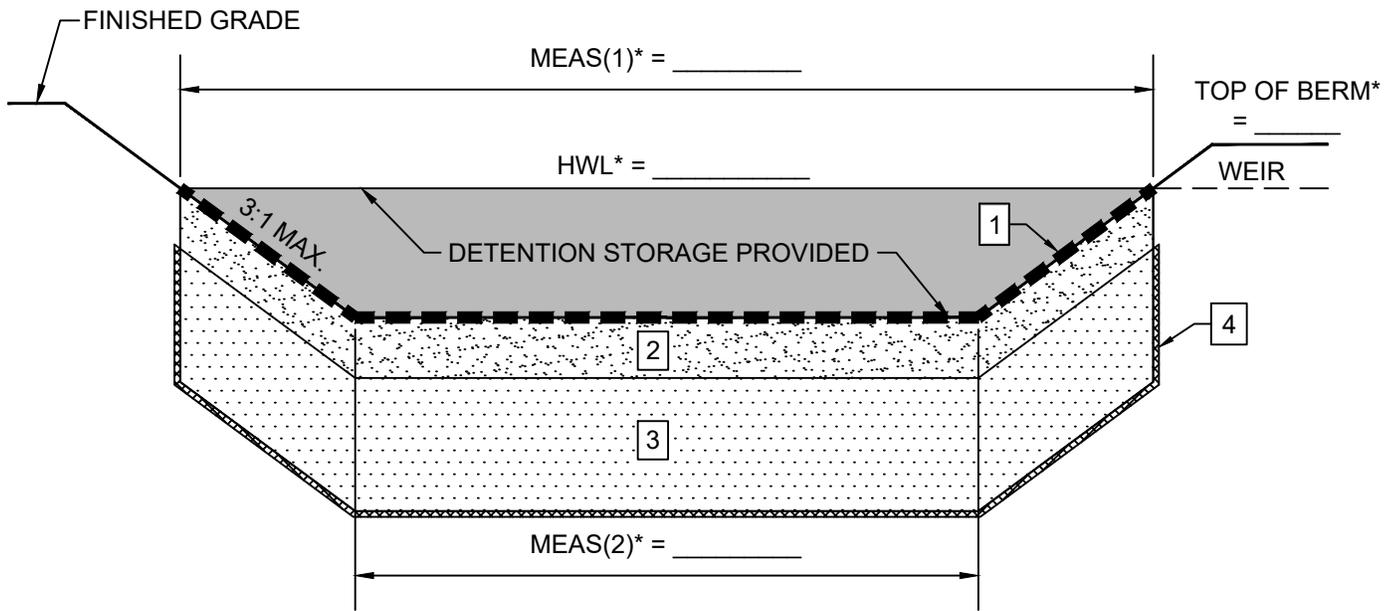
RESIDENTIAL DRY WELL



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
STM - 05

*** INFORMATION TO BE PROVIDED BY DESIGN ENGINEER**



- 1 NATIVE PLANTINGS - INSTALLED AT 1 PLANT PER SQUARE FOOT (MIN.)
 - PLANTINGS TO BE INSTALLED ALONG ENTIRE BOTTOM OF RAIN GARDEN AND EXTENDING UP TO DESIGN HWL.
 - PLANTING TYPES TO BE IDENTIFIED BY DESIGN ENGINEER IN TABLE BELOW.
- 2 3" TOPSOIL WITH POWDERED GYPSUM (2000 LBS/AC)
- 3 9" PEAT FILTER - 50% SPHAGNUM PEAT & 50% SAND
- 4 GEOTEXTILE FABRIC TO BE EXTENDED ALONG SIDES AND BOTTOM OF PEAT FILTER LAYER.

RAIN GARDEN SPECIES PLANTS TO BE USED*:

NOTES:

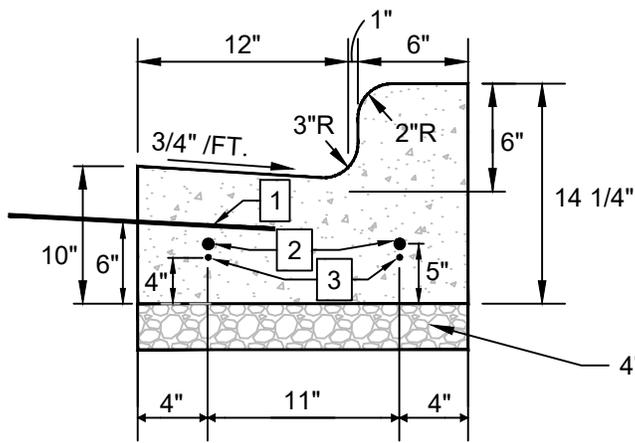
1. VILLAGE INSPECTION REQUIRED BY THE ENGINEERING DIVISION UPON EXCAVATION OF RAIN GARDEN, PRIOR TO INSTALLATION OF PEAT FILTER LAYER AFTER PLACEMENT OF GEOTEXTILE FABRIC. PLEASE CALL (847) 918-2020 TO SCHEDULE INSPECTIONS ACCORDINGLY.
2. A FINAL AS-BUILT SURVEY WILL BE REQUIRED TO VERIFY PROVIDED DETENTION VOLUME (SURFACE ONLY).
3. CONFIRMATION OF INSTALLED PLANTING TYPES (I.E. SEED MIX, PLANT TYPE, ETC.) WILL BE REQUIRED BY CONTRACTOR UPON COMPLETION AND PRIOR TO PERMIT CLOSE-OUT.

RAIN GARDEN

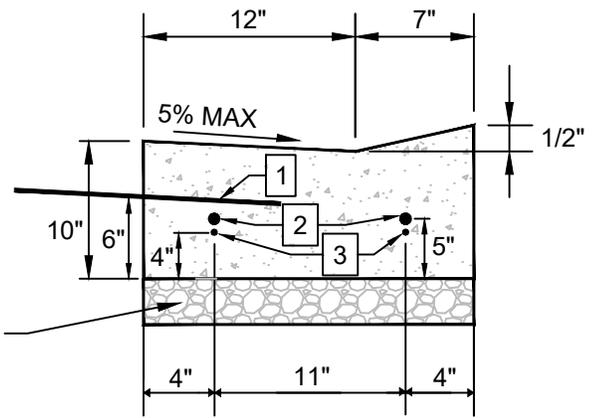


LAST REVISED:
02/15/2023

STANDARD DETAIL #
STM - 06

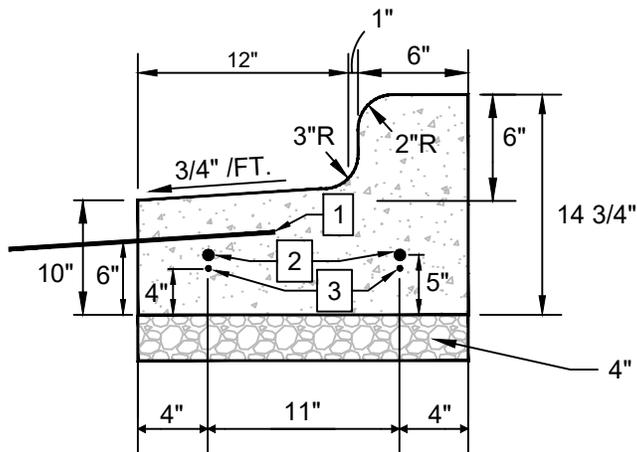


REGULAR SECTION

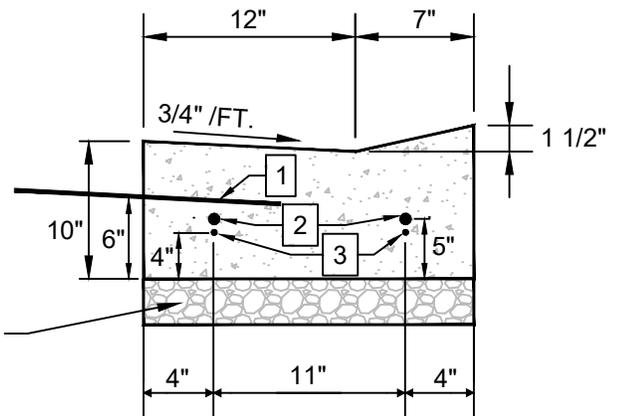


ADA DEPRESSED SECTION

- 1 24" LONG #6 ($\frac{3}{8}$ ") EPOXY-COATED, DEFORMED TIE BARS, GRADE 60 INSTALLED 24" ON-CENTER, EMBEDDED 8" AND EPOXIED IN PLACE (FOR P.C.C. PAVEMENT ONLY).
- 2 TWO (2) - #8 EPOXY COATED SMOOTH DOWEL BARS WITH GREASED CAPS TO BE INSTALLED AT ALL EXPANSION JOINTS
- 3 TWO (2) - #4 ($\frac{1}{2}$ ") EPOXY COATED DEFORMED CONTINUOUS STEEL REINFORCEMENT BARS ARE TO BE INSTALLED ALONG THE ENTIRE LENGTH OF THE CURB ONLY TO BE INTERRUPTED AT EXPANSION JOINTS. SUPPORT BARS WITH CHAIRS EVERY FIVE (5) FEET, MINIMUM OF TWO (2) CHAIRS.



REVERSE PITCH SECTION



REGULAR DEPRESSED SECTION

NOTES:

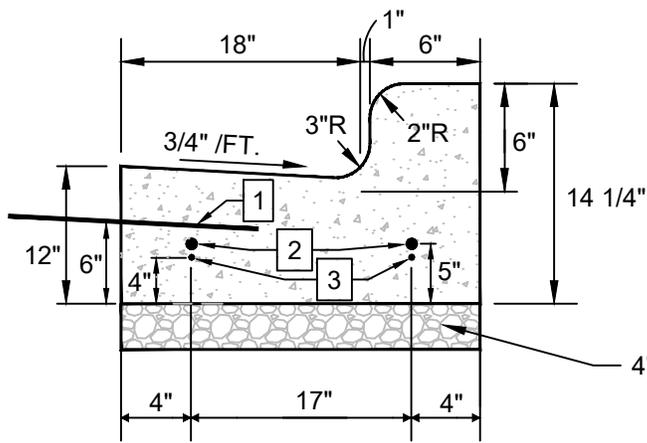
1. EXPANSION JOINTS TO BE SET AT ALL PC'S, PT'S, FIVE (5) FEET ON EITHER SIDE OF ANY FRAMES, AND AT 45' MAX. INTERVALS. ADDITIONAL LOCATIONS MAY BE SPECIFIED BY THE ENGINEER.
2. CONTRACTION JOINTS ARE TO BE CONSTRUCTED AT 15' MAX. INTERVALS AND AT ADDITIONAL LOCATIONS AS MAY BE SPECIFIED BY ENGINEER.
3. ANY CONTINUOUS CURB REMOVALS OF TEN (10) FEET OR GREATER IN LENGTH SHALL HAVE CONTINUOUS STEEL REINFORCEMENT BARS PER [3] ABOVE. REMOVALS LESS THAN TEN (10) FEET IN LENGTH SHALL ONLY HAVE DOWEL BARS INSTALLED AT ENDS PER [2] ABOVE.

B6.12 CURB & GUTTER

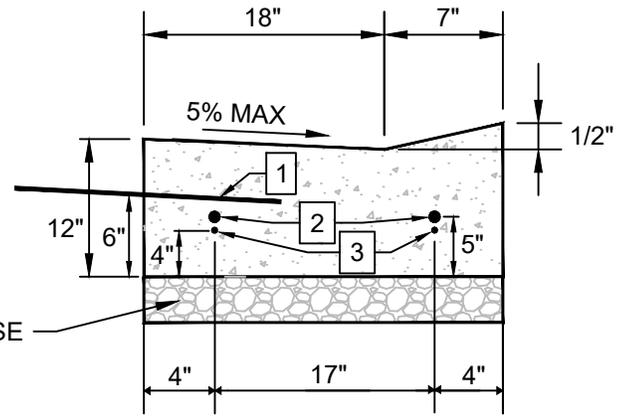


LAST
REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 01

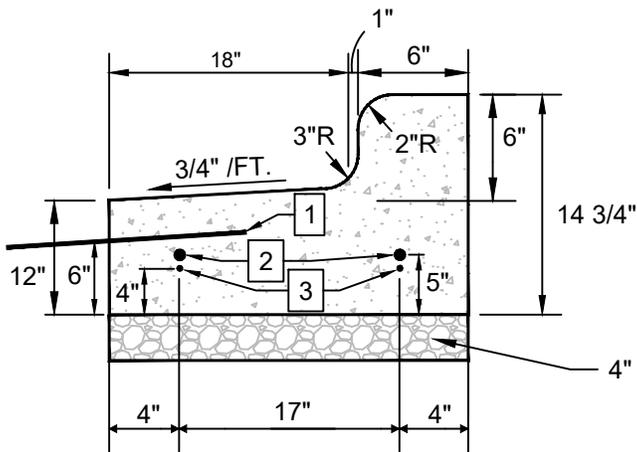


REGULAR SECTION

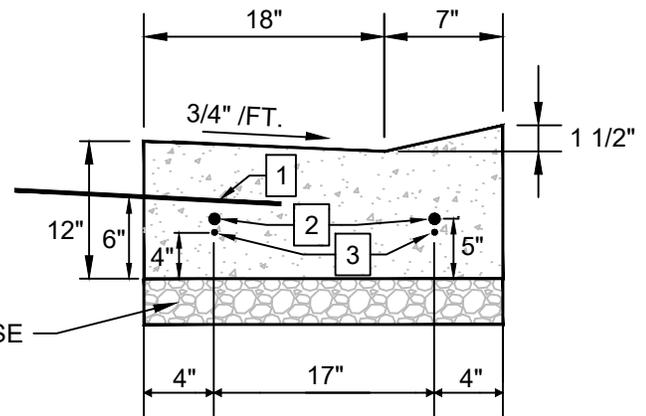


ADA DEPRESSED SECTION

- 1 24" LONG #6 ($\frac{3}{8}$ ") EPOXY-COATED, DEFORMED TIE BARS, GRADE 60 INSTALLED 24" ON-CENTER, EMBEDDED 8" AND EPOXIED IN PLACE (FOR P.C.C. PAVEMENT ONLY).
- 2 TWO (2) - #8 EPOXY COATED SMOOTH DOWEL BARS WITH GREASED CAPS TO BE INSTALLED AT ALL EXPANSION JOINTS
- 3 TWO (2) - #4 ($\frac{1}{2}$ ") EPOXY COATED DEFORMED CONTINUOUS STEEL REINFORCEMENT BARS ARE TO BE INSTALLED ALONG THE ENTIRE LENGTH OF THE CURB ONLY TO BE INTERRUPTED AT EXPANSION JOINTS. SUPPORT BARS WITH CHAIRS EVERY FIVE (5) FEET, MINIMUM OF TWO (2) CHAIRS.



REVERSE PITCH SECTION



REGULAR DEPRESSED SECTION

NOTES:

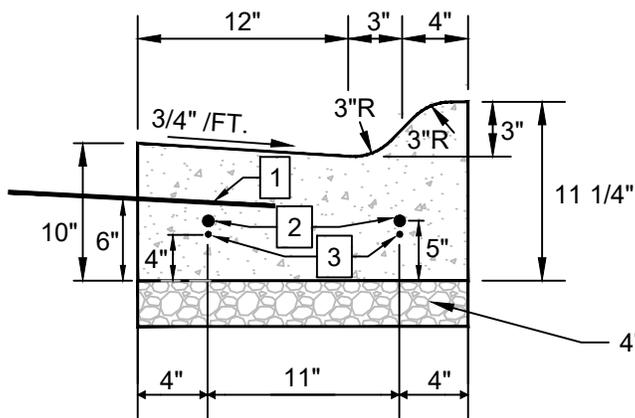
1. EXPANSION JOINTS TO BE SET AT ALL PC'S, PT'S, FIVE (5) FEET ON EITHER SIDE OF ANY FRAMES, AND AT 45' MAX. INTERVALS. ADDITIONAL LOCATIONS MAY BE SPECIFIED BY THE ENGINEER.
2. CONTRACTION JOINTS ARE TO BE CONSTRUCTED AT 15' MAX. INTERVALS AND AT ADDITIONAL LOCATIONS AS MAY BE SPECIFIED BY ENGINEER.
3. ANY CONTINUOUS CURB REMOVALS OF TEN (10) FEET OR GREATER IN LENGTH SHALL HAVE CONTINUOUS STEEL REINFORCEMENT BARS PER [3] ABOVE. REMOVALS LESS THAN TEN (10) FEET IN LENGTH SHALL ONLY HAVE DOWEL BARS INSTALLED AT ENDS PER [2] ABOVE.
4. CURB THICKNESS CAN BE MODIFIED TO MATCH PAVEMENT SECTION IF APPROVED BY VILLAGE ENGINEER

B6.18 CURB & GUTTER

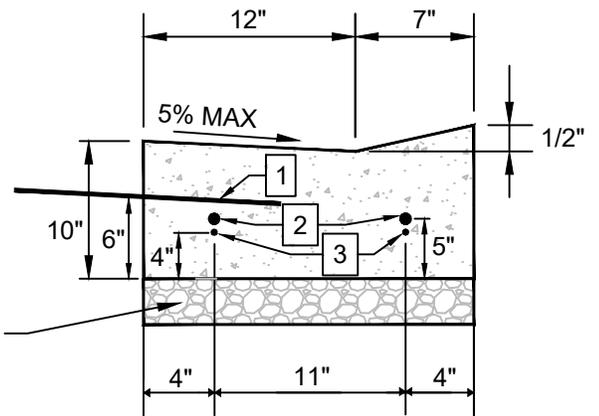


LAST
REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 02

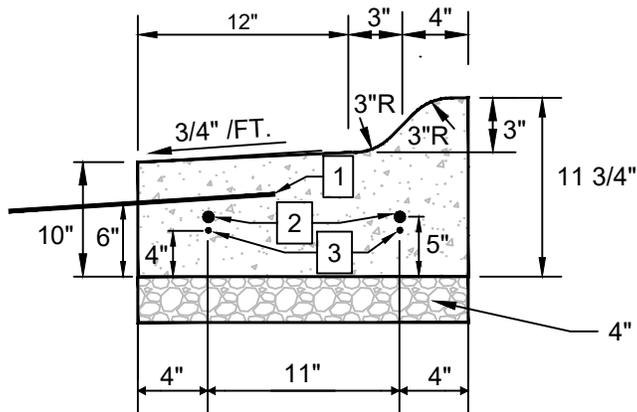


REGULAR SECTION

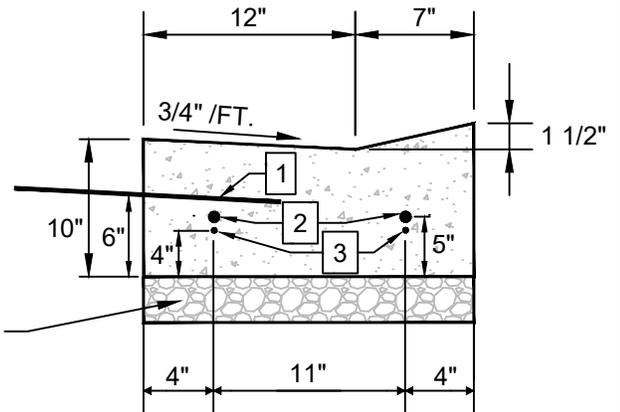


ADA DEPRESSED SECTION

- | | |
|---|--|
| 1 | 24" LONG #6 ($\frac{3}{8}$ ") EPOXY-COATED, DEFORMED TIE BARS, GRADE 60 INSTALLED 24" ON-CENTER, EMBEDDED 8" AND EPOXIED IN PLACE (FOR P.C.C. PAVEMENT ONLY). |
| 2 | TWO (2) - #8 EPOXY COATED SMOOTH DOWEL BARS WITH GREASED CAPS TO BE INSTALLED AT ALL EXPANSION JOINTS |
| 3 | TWO (2) - #4 ($\frac{1}{2}$ ") EPOXY COATED DEFORMED CONTINUOUS STEEL REINFORCEMENT BARS ARE TO BE INSTALLED ALONG THE ENTIRE LENGTH OF THE CURB ONLY TO BE INTERRUPTED AT EXPANSION JOINTS. SUPPORT BARS WITH CHAIRS EVERY FIVE (5) FEET, MINIMUM OF TWO (2) CHAIRS. |



REVERSE PITCH SECTION



REGULAR DEPRESSED SECTION

NOTES:

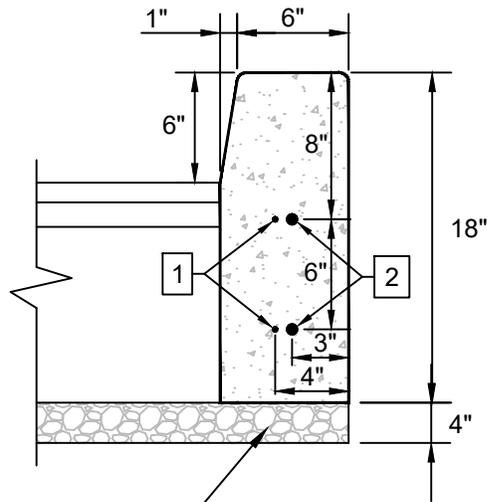
- EXPANSION JOINTS TO BE SET AT ALL PC'S, PT'S, FIVE (5) FEET ON EITHER SIDE OF ANY FRAMES, AND AT 45' MAX. INTERVALS. ADDITIONAL LOCATIONS MAY BE SPECIFIED BY THE ENGINEER.
- CONTRACTION JOINTS ARE TO BE CONSTRUCTED AT 15' MAX. INTERVALS AND AT ADDITIONAL LOCATIONS AS MAY BE SPECIFIED BY ENGINEER.
- ANY CONTINUOUS CURB REMOVALS OF TEN (10) FEET OR GREATER IN LENGTH SHALL HAVE CONTINUOUS STEEL REINFORCEMENT BARS PER [3] ABOVE. REMOVALS LESS THAN TEN (10) FEET IN LENGTH SHALL ONLY HAVE DOWEL BARS INSTALLED AT ENDS PER [2] ABOVE.

M3.12 CURB & GUTTER



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 03



4" CA-6 STONE BASE
MECHANICALLY
COMPACTED

- 1 TWO (2) - #4 ($\frac{1}{2}$ ") EPOXY COATED DEFORMED CONTINUOUS STEEL REINFORCEMENT BARS ARE TO BE INSTALLED ALONG THE ENTIRE LENGTH OF THE CURB ONLY TO BE INTERRUPTED AT EXPANSION JOINTS. SUPPORT BARS WITH CHAIRS EVERY FIVE (5) FEET, MINIMUM OF TWO (2) CHAIRS.
- 2 TWO (2) - #8 EPOXY COATED SMOOTH DOWEL BARS WITH GREASED CAPS TO BE INSTALLED AT ALL EXPANSION JOINTS

NOTES:

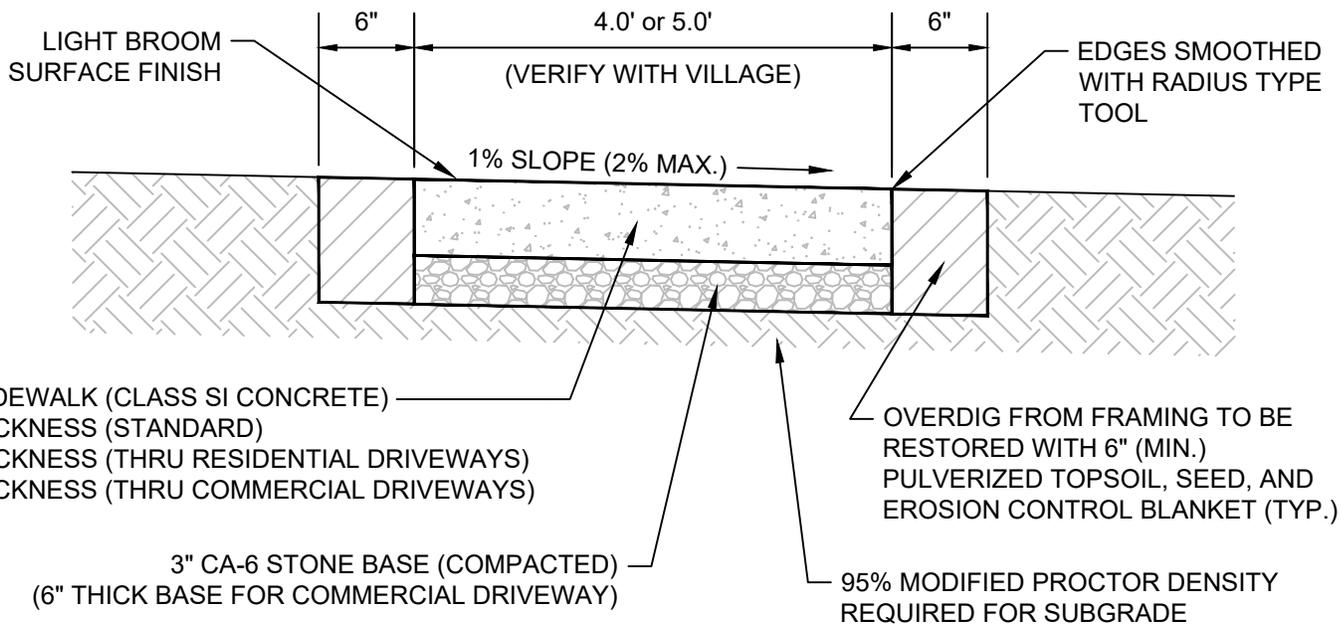
1. EXPANSION JOINTS TO BE SET AT ALL PC'S, PT'S, FIVE (5) FEET ON EITHER SIDE OF ANY FRAMES, AND AT 45' MAX. INTERVALS. ADDITIONAL LOCATIONS MAY BE SPECIFIED BY THE ENGINEER.
2. CONTRACTION JOINTS ARE TO BE CONSTRUCTED AT 15' MAX. INTERVALS AND AT ADDITIONAL LOCATIONS AS MAY BE SPECIFIED BY ENGINEER.
3. ANY CONTINUOUS CURB REMOVALS OF TEN (10) FEET OR GREATER IN LENGTH SHALL HAVE CONTINUOUS STEEL REINFORCEMENT BARS PER 1 ABOVE. REMOVALS LESS THAN TEN (10) FEET IN LENGTH SHALL ONLY HAVE DOWEL BARS INSTALLED AT ENDS PER 2 ABOVE.

TYPE B BARRIER CURB



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 04



- P.C.C. SIDEWALK (CLASS SI CONCRETE)
- 5" THICKNESS (STANDARD)
 - 6" THICKNESS (THRU RESIDENTIAL DRIVEWAYS)
 - 8" THICKNESS (THRU COMMERCIAL DRIVEWAYS)

3" CA-6 STONE BASE (COMPACTED)
(6" THICK BASE FOR COMMERCIAL DRIVEWAY)

OVERDIG FROM FRAMING TO BE RESTORED WITH 6" (MIN.) PULVERIZED TOPSOIL, SEED, AND EROSION CONTROL BLANKET (TYP.)

95% MODIFIED PROCTOR DENSITY REQUIRED FOR SUBGRADE

NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. PROVIDE $\frac{1}{2}$ " THICK FIBER EXPANSION JOINTS AT POINTS ABUTTING CURB OR PAVEMENT AND AT 50-FOOT MAXIMUM INTERVALS.
3. CONTROL JOINTS SHALL BE $\frac{1}{8}$ " TO $\frac{1}{4}$ " WIDE AND 1/4 OF THE SIDEWALK THICKNESS DEEP. THE EDGE OF THE CONTROL JOINTS SHALL BE GIVEN A $\frac{1}{4}$ " RADIUS.
4. CONTROL JOINTS TO BE PROVIDED AT 5' ON-CENTER SPACING. SPACING CAN BE INCREASED FOR SIDEWALKS IN EXCESS OF 5-FOOT IN WIDTH AS DIRECTED BY THE ENGINEER.
5. PLACING, FINISHING, AND CURING OF P.C.C. SIDEWALK SHALL MEET THE REQUIREMENTS OF SECTION 424 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

P.C.C. SIDEWALK



LAST REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 05

ILLINOIS DEPARTMENT OF TRANSPORTATION (I.D.O.T.) STANDARDS TO BE UTILIZED FOR ALL CURB RAMPS.

PLEASE "X" ANY STANDARDS LISTED BELOW THAT ARE APPLICABLE TO THIS PROJECT, AND INCLUDE THE CORRESPONDING I.D.O.T. STANDARD DETAIL ON THE PLANS.

STANDARD	DESCRIPTION	APPLICABLE TO CURRENT PROJECT? "X"
424001	PERPENDICULAR RAMPS FOR SIDEWALKS	
424006	DIAGONAL CURB RAMPS FOR SIDEWALKS	
424011	CORNER PARALLEL CURB RAMPS FOR SIDEWALKS	
424016	MID-BLOCK CURB RAMPS FOR SIDEWALKS	
424021	DEPRESSED CORNER FOR SIDEWALKS	
424026	ENTRANCE / ALLEY PEDESTRIAN CROSSINGS	
424031	MEDIAN PEDESTRIAN CROSSINGS	

NOTES:

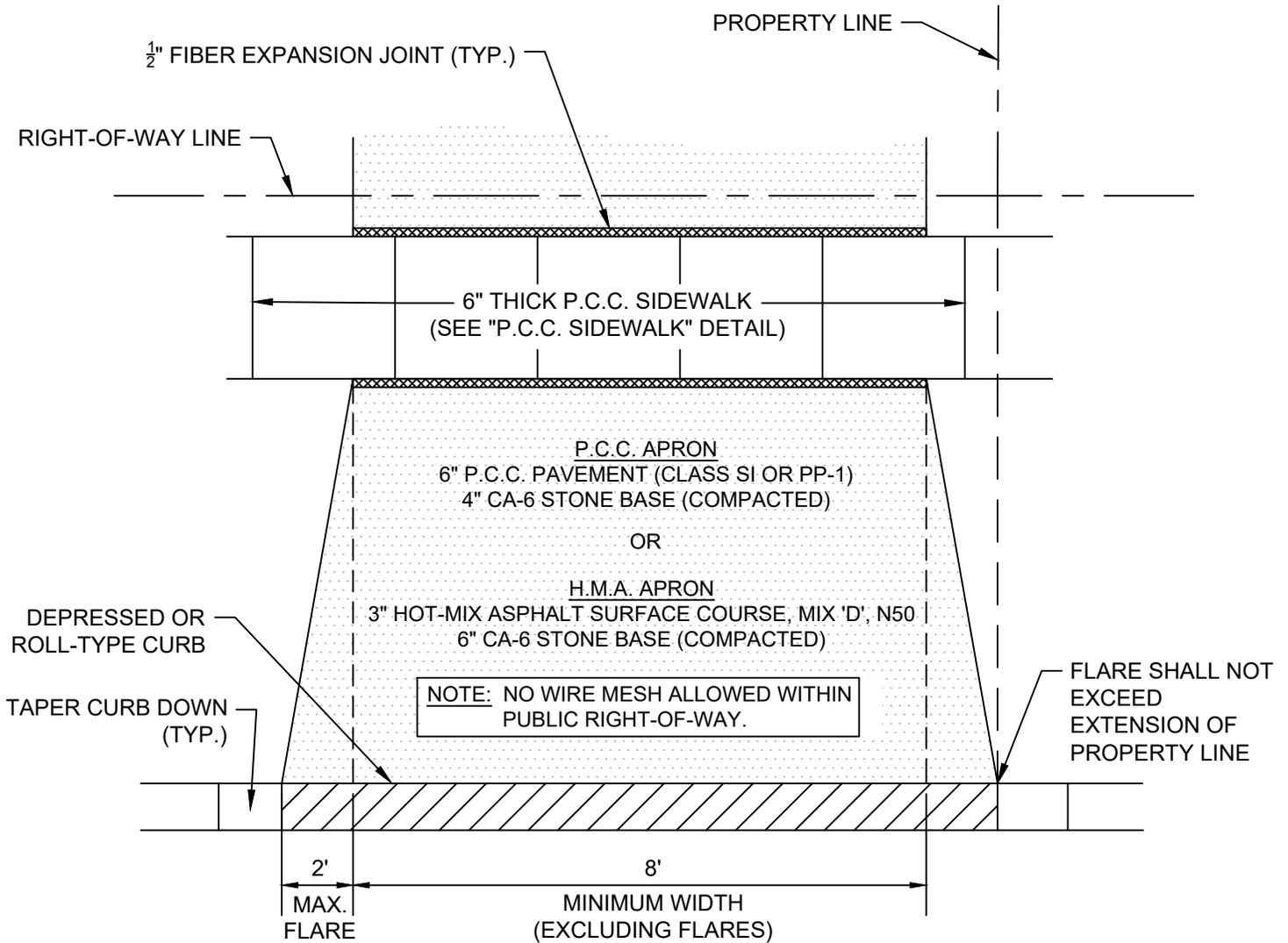
1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. ALL DETECTABLE WARNINGS ON PUBLIC SIDEWALK SHALL BE ARMOR TILE "CAST IN PLACE" POLYMER COMPOSITE, "BRICK RED" COLOR, OR APPROVED EQUAL
3. USE LATEST REVISION OF STANDARDS.

SIDEWALK CURB RAMP STANDARDS



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 06



NOTES:

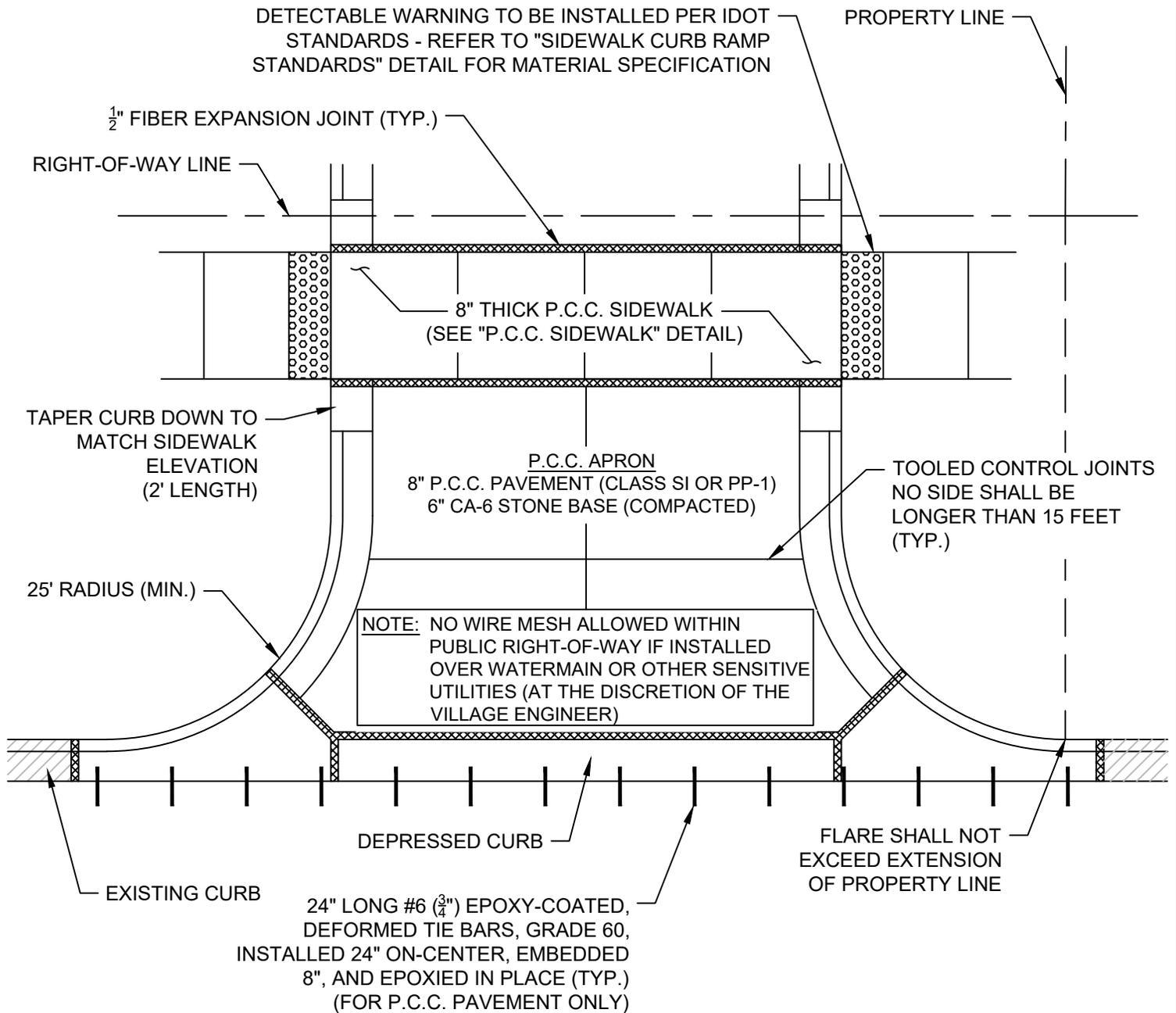
1. ALL EXISTING ABUTTING EXPANSION JOINT MATERIAL SHALL BE REMOVED AND REPLACED.
2. WHITE CURING COMPOUND, PER IDOT SECTION 1022.01(C), SHALL BE APPLIED TO THE CONCRETE IMMEDIATELY AFTER IT HAS BEEN FINISHED OR PER MANUFACTURER'S RECOMMENDATION.
3. DRIVEWAY FLARE SHALL BE A MAXIMUM OF 2-FEET WIDE AS MEASURED FROM THE SIDEWALK TO THE BACK-OF-CURB. IF NO SIDEWALK EXISTS, THE WIDTH OF THE FLARE SHALL BE MEASURED FROM A POINT 6-FEET BEHIND THE BACK-OF-CURB TO THE BACK-OF-CURB.
4. PRE-POUR INSPECTION REQUIRED BY THE ENGINEERING DIVISION PRIOR TO PLACEMENT OF PAVEMENT AFTER FORMING IS IN PLACE. PLEASE CALL (847) 918-2020 TO SCHEDULE INSPECTIONS.

RESIDENTIAL DRIVEWAY APRON



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 07



NOTES:

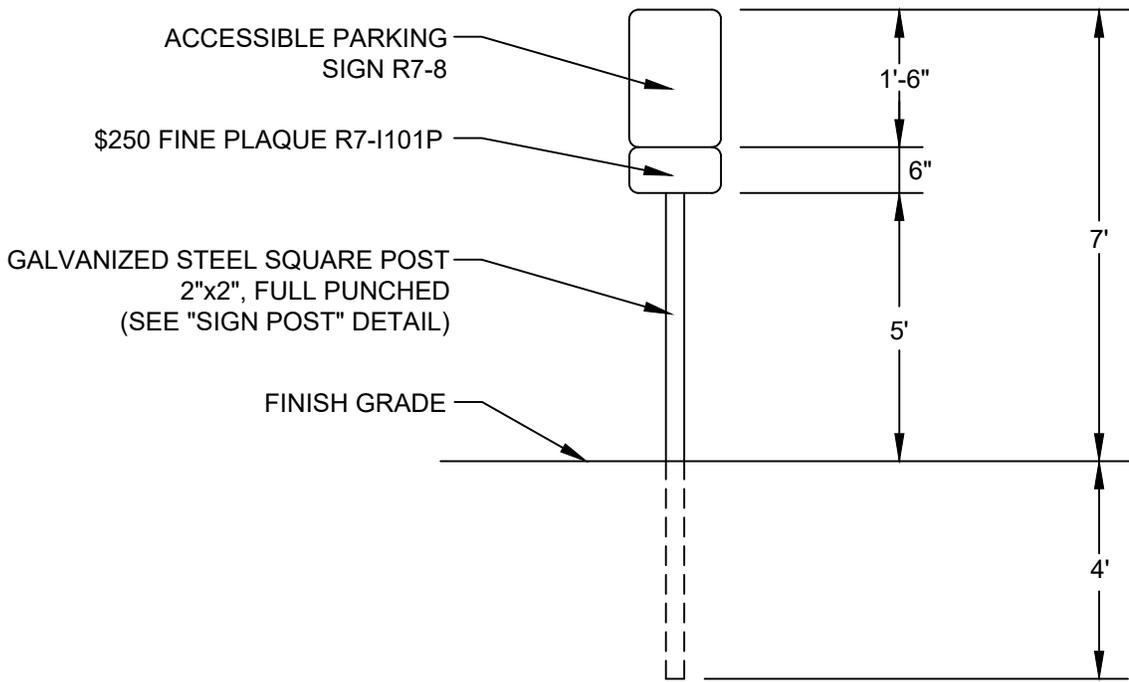
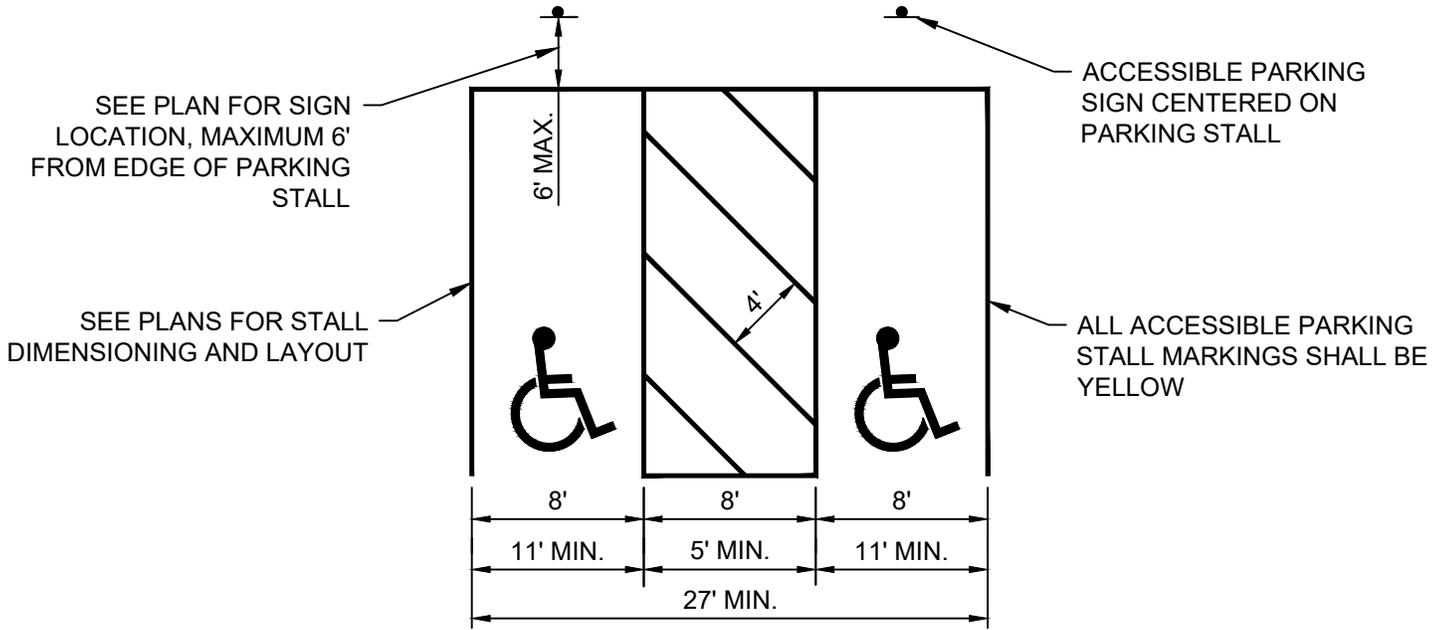
1. ALL EXISTING ABUTTING EXPANSION JOINT MATERIAL SHALL BE REMOVED AND REPLACED.
2. WHITE CURING COMPOUND, PER IDOT SECTION 1022.01(C), SHALL BE APPLIED TO THE CONCRETE IMMEDIATELY AFTER IT HAS BEEN FINISHED OR PER MANUFACTURER'S RECOMMENDATION.
3. DRIVEWAY FLARE SHALL BE A MAXIMUM OF 2-FEET WIDE AS MEASURED FROM THE SIDEWALK TO THE BACK-OF-CURB. IF NO SIDEWALK EXISTS, THE WIDTH OF THE FLARE SHALL BE MEASURED FROM A POINT 6-FEET BEHIND THE BACK-OF-CURB TO THE BACK-OF-CURB.
4. PRE-POUR INSPECTION REQUIRED BY THE ENGINEERING DIVISION PRIOR TO PLACEMENT OF PAVEMENT AFTER FORMING IS IN PLACE. PLEASE CALL (847) 918-2020 TO SCHEDULE INSPECTIONS.

COMMERCIAL DRIVEWAY APRON



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 08



NOTES:

1. ALL ACCESSIBLE PARKING PAVEMENT MARKINGS TO BE 'YELLOW' IN COLOR.
2. THE SIGN MUST BE SUPPLEMENTED WITH A "VAN ACCESSIBLE" SIGN AS APPLICABLE.
3. THE ACCESS AISLE MAY BE ON EITHER SIDE OF THE PARKING STALL, EXCEPT FOR ANGLED PARKING SPACES WHICH SHALL HAVE THE ACCESS AISLE LOCATED ON THE PASSENGER SIDE OF THE PARKING STALL.

ACCESSIBLE PARKING & SIGNAGE

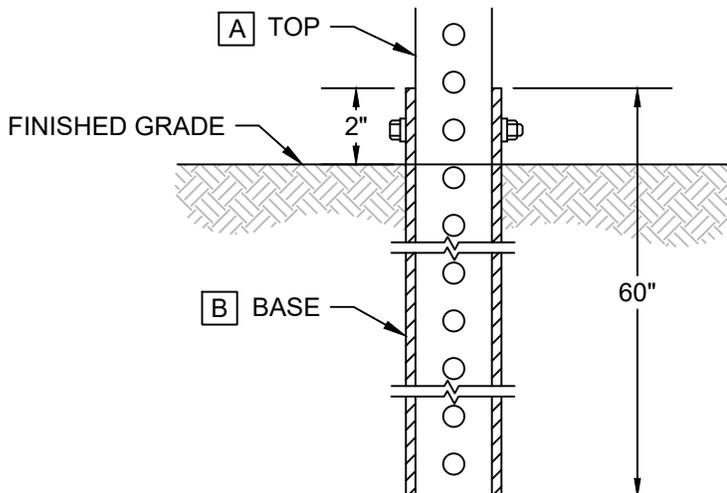


LAST
REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 09

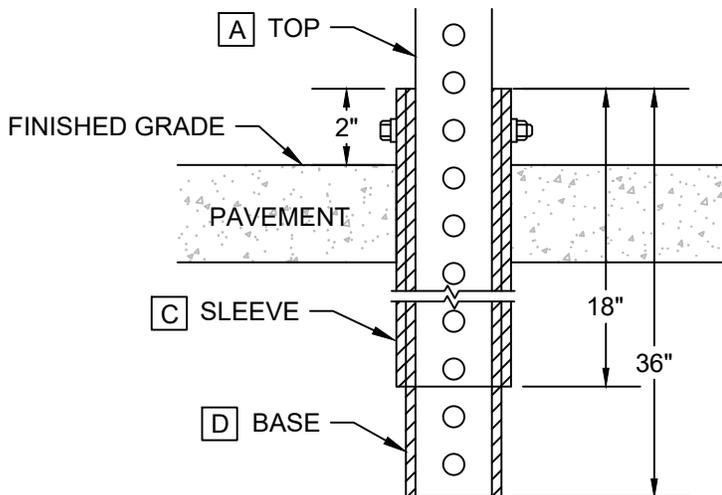
ALL SIGN POSTS TO BE GALVANIZED STEEL SQUARE POSTS, 2"x2", FULL PUNCHED.

GROUND MOUNT DETAIL



- A** TOP - 2" x 2" x VARIABLE LENGTH
- B** BASE FOR GROUND MOUNT - 2" x 2" x 60"
- C** SLEEVE FOR PAVEMENT MOUNT - 2-1/2" x 2-1/2" x 18"
- D** BASE FOR PAVEMENT MOUNT - 2-1/4" x 2-1/4" x 36"

PAVEMENT MOUNT DETAIL



NOTES:

1. INSTALLATION HEIGHTS OF ALL SIGNAGE SHALL BE IN ACCORDANCE STATE OR OTHER APPLICABLE REGULATIONS.
2. ALL BOLTS AND OTHER ASSEMBLY MATERIAL SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. IF A SURFACE ANCHOR BOLT MOUNT IS REQUIRED, INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

SIGN POST

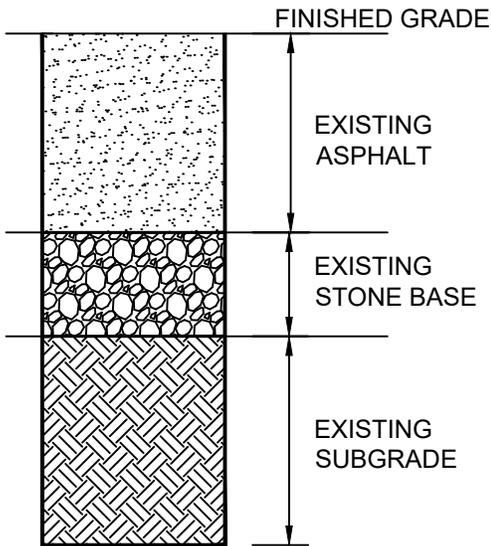


LAST
REVISED:
02/15/2023

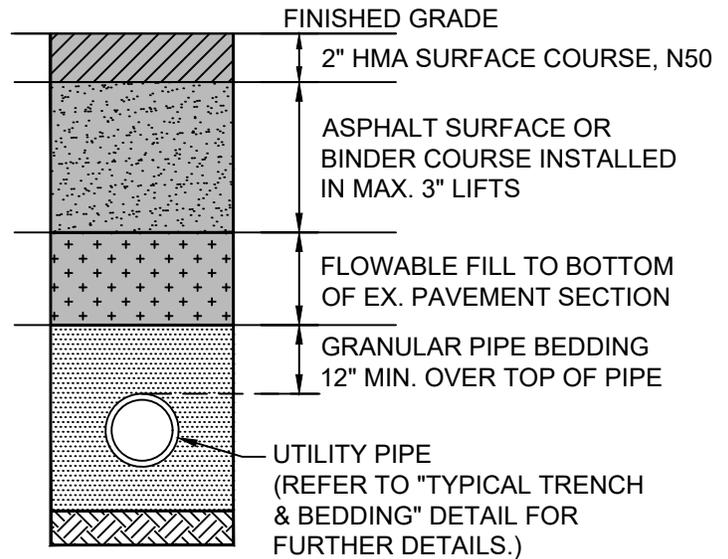
STANDARD DETAIL #
PAV - 10

ROADWAYS WITH FULL-DEPTH ASPHALT

EXISTING

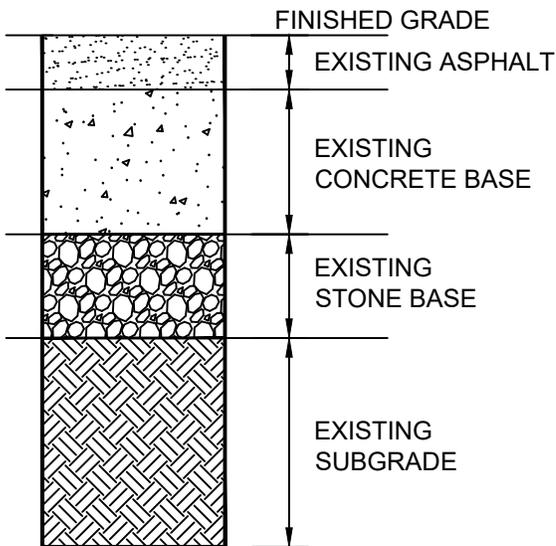


PROPOSED

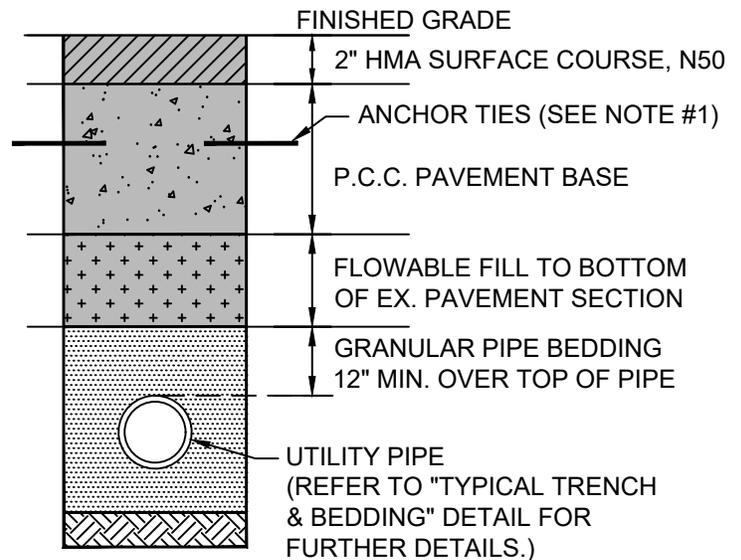


ROADWAYS WITH CONCRETE BASE

EXISTING



PROPOSED



NOTES:

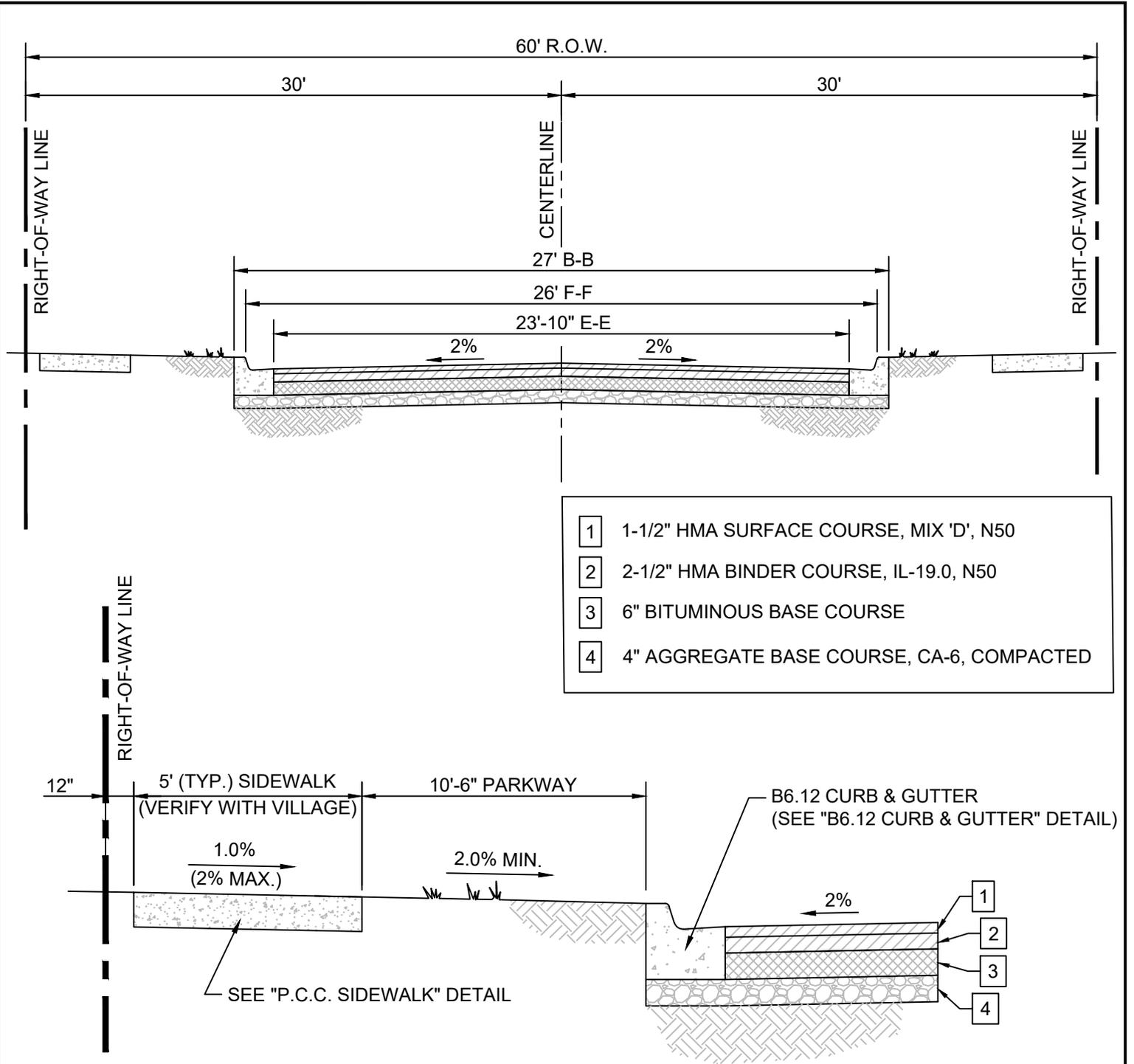
1. 1/2" EPOXY-COATED THREADED BARS TO BE EMBEDDED 12" AND SPACED AT 36" MAX. ON-CENTER TO BE PROVIDED BETWEEN NEW CONCRETE AND EXISTING CONCRETE BASES (FOR CONCRETE BASE ROADS ONLY).
2. INSPECTIONS ARE REQUIRED BY THE ENGINEERING DIVISION FOR EACH LAYER OF PAVEMENT RESTORATION. PLEASE CONTACT (847) 918-2020 TO SCHEDULE INSPECTIONS ACCORDINGLY.
3. REFER TO "TYPICAL TRENCH & BEDDING" DETAIL FOR FURTHER INFORMATION ON SEWER INSTALLATIONS.

UTILITY TRENCH PAVEMENT PATCH



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 11



NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. SIDEWALK WIDTHS & CURB TYPES SHALL BE CONSISTENT WITH ADJACENT AREAS AND MUST BE COORDINATED WITH THE VILLAGE OF LIBERTYVILLE DURING INITIAL DESIGN STAGES.

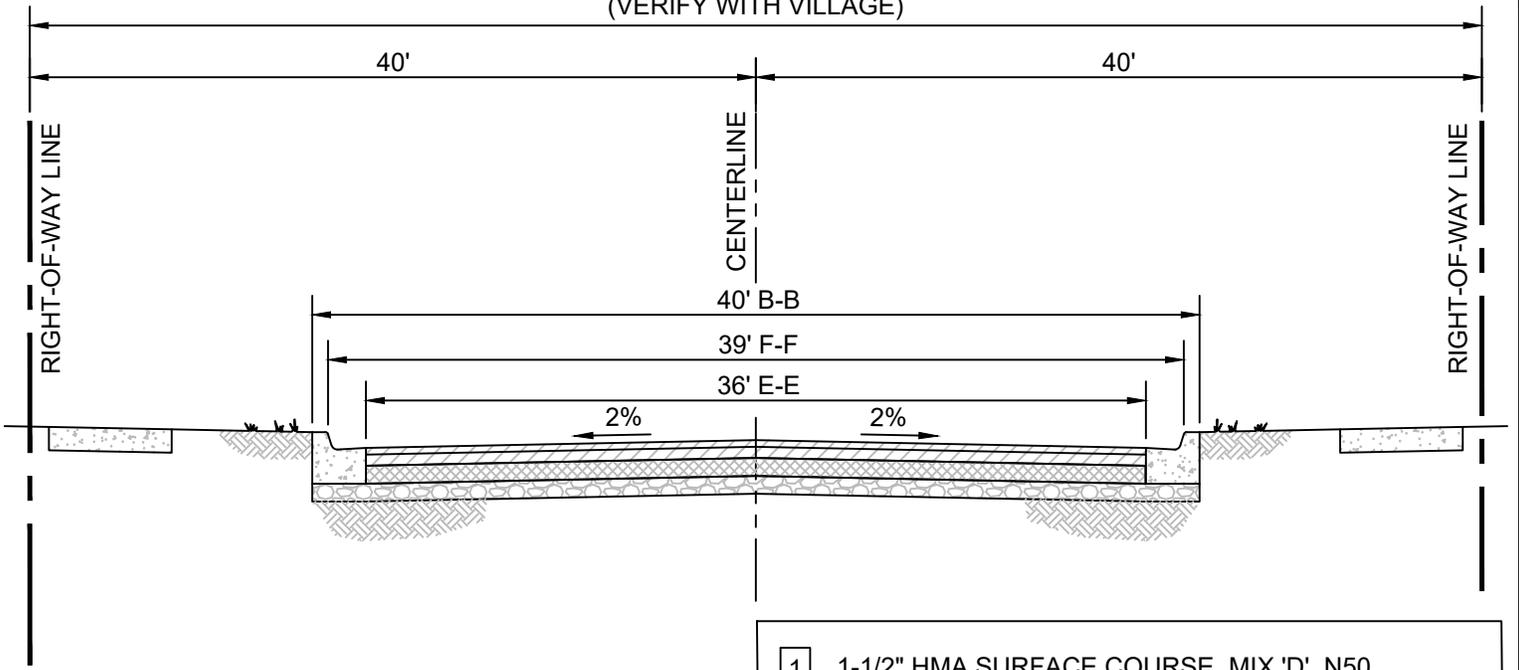
TYPICAL RESIDENTIAL ROADWAY SECTION



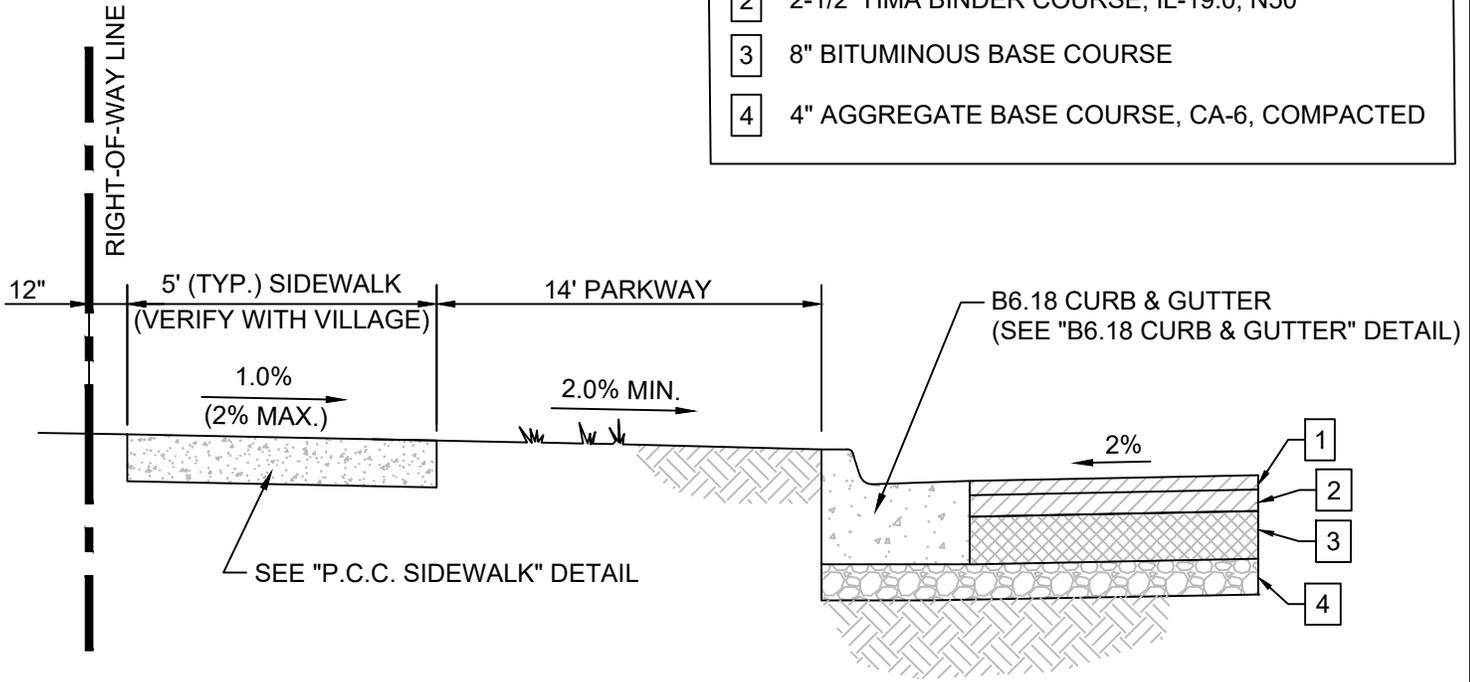
LAST REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 12

80' (TYP.) R.O.W.
(VERIFY WITH VILLAGE)



- 1 1-1/2" HMA SURFACE COURSE, MIX 'D', N50
- 2 2-1/2" HMA BINDER COURSE, IL-19.0, N50
- 3 8" BITUMINOUS BASE COURSE
- 4 4" AGGREGATE BASE COURSE, CA-6, COMPACTED



NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. SIDEWALK WIDTHS & CURB TYPES SHALL BE CONSISTENT WITH ADJACENT AREAS AND MUST BE COORDINATED WITH THE VILLAGE OF LIBERTYVILLE DURING INITIAL DESIGN STAGES.

TYPICAL NON-RESIDENTIAL ROADWAY SECTION



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
PAV - 13

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION (LCSMC), NATIONAL RESOURCES CONSERVATION SERVICE (NRCS) & ILLINOIS URBAN MANUAL (IUM) STANDARDS TO BE UTILIZED FOR EROSION & SEDIMENT CONTROL MEASURES.

PLEASE "X" ANY STANDARDS LISTED BELOW THAT ARE APPLICABLE TO THIS PROJECT, AND INCLUDE THE CORRESPONDING STANDARD DETAIL ON THE PLANS.

DESCRIPTION	PROVIDED BY:	DETAIL #	APPLICABLE TO CURRENT PROJECT? "X"
LCSMC SOIL EROSION AND SEDIMENT CONTROL CONSTRUCTION NOTES	LCSMC	N/A	
SILT FENCE DETAIL	LCSMC	N/A	
DITCH CHECK (MANUFACTURED) - ROLLED	IUM	IUM-514	
EROSION CONTROL BLANKET	IUM	IUM-530	
INLET PROTECTION - PAVED AREAS DROP-IN PROTECTION	IUM	IUM-561D	
ROCK CHECK DAM - RIPRAP	NRCS / IUM	IL-605R	
SEDIMENT BASIN DEWATERING DEVICE	NRCS / IUM	IL-615	
SOIL STOCKPILE	IUM	IL-627	
STABILIZED CONSTRUCTION ENTRANCE PLAN (2 PAGES)	NRCS / IUM	IL-630	
TEMPORARY CONCRETE WASHOUT FACILITY - BARRIER WALL	IUM	IL-654BW	

NOTES:

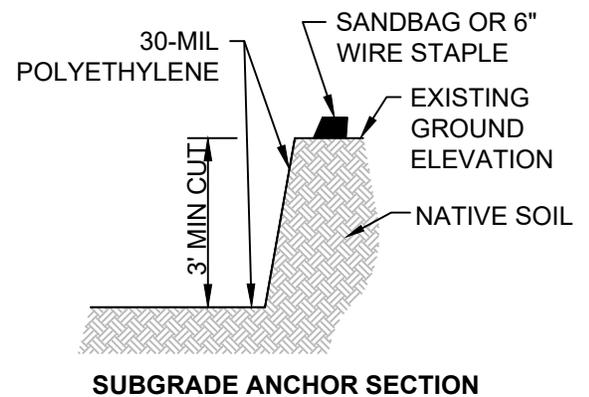
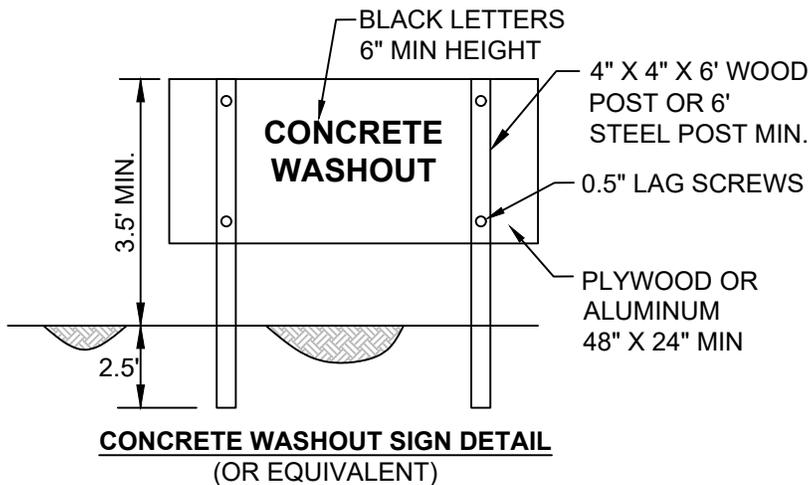
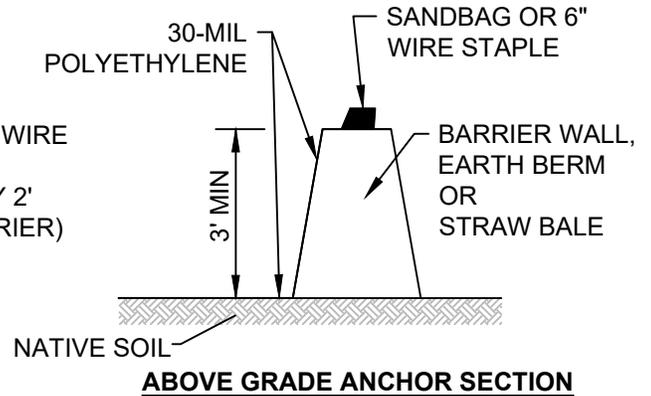
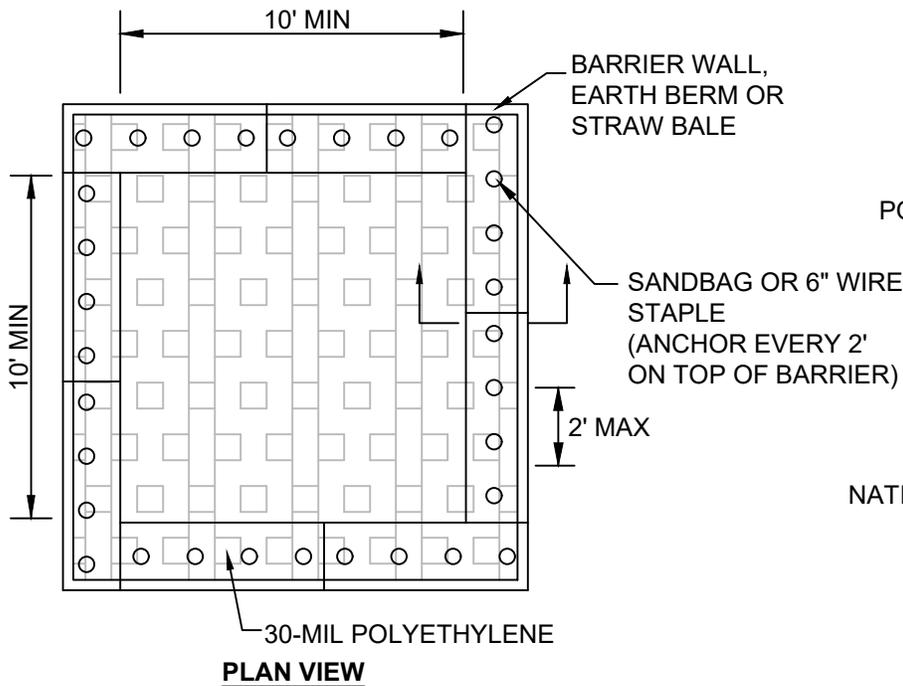
1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. ADDITIONAL MEASURES MAY BE REQUIRED BEYOND THOSE LISTED ABOVE. DESIGN ENGINEER SHALL IDENTIFY AND INCORPORATE ANY ADDITIONAL MEASURES AND STANDARD DETAILS AS REQUIRED FOR THE PROJECT.
3. USE LATEST REVISION OF STANDARDS.

EROSION / SEDIMENT CONTROL STANDARDS



LAST REVISED:
02/15/2023

STANDARD DETAIL #
EROS - 01



MAINTENANCE:

1. DRIED CONCRETE WASTE SHALL BE PICKED UP AND DISPOSED OF PROPERLY WHEN 75% OF CAPACITY IS REACHED.
2. HARDENED CONCRETE CAN BE PROPERLY RECYCLED AND REUSED ONSITE OR HAULED OFF-SITE TO AN APPROPRIATE FACILITY.

NOTES:

1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. CONCRETE WASHOUT SHOULD NOT BE ALLOWED IN STREET OR TO REACH A STORM WATER DRAINAGE SYSTEM OR WATERCOURSE.
4. CONCRETE WASHOUT AREA TO BE LOCATED AT LEAST 10' BEHIND CURB IF ADJACENT TO A PAVED ROAD.
5. IF USING STRAW BALES, STAKE IN PLACE USING (2) 2"X2"X4' WOODEN STAKES.
6. STRAW BALES SHALL BE TRENCHED IN 3".
7. CONCRETE WASHOUT DUMPSTER MAY BE USED IN LIEU OF CONSTRUCTION ONE AS DETAILED.

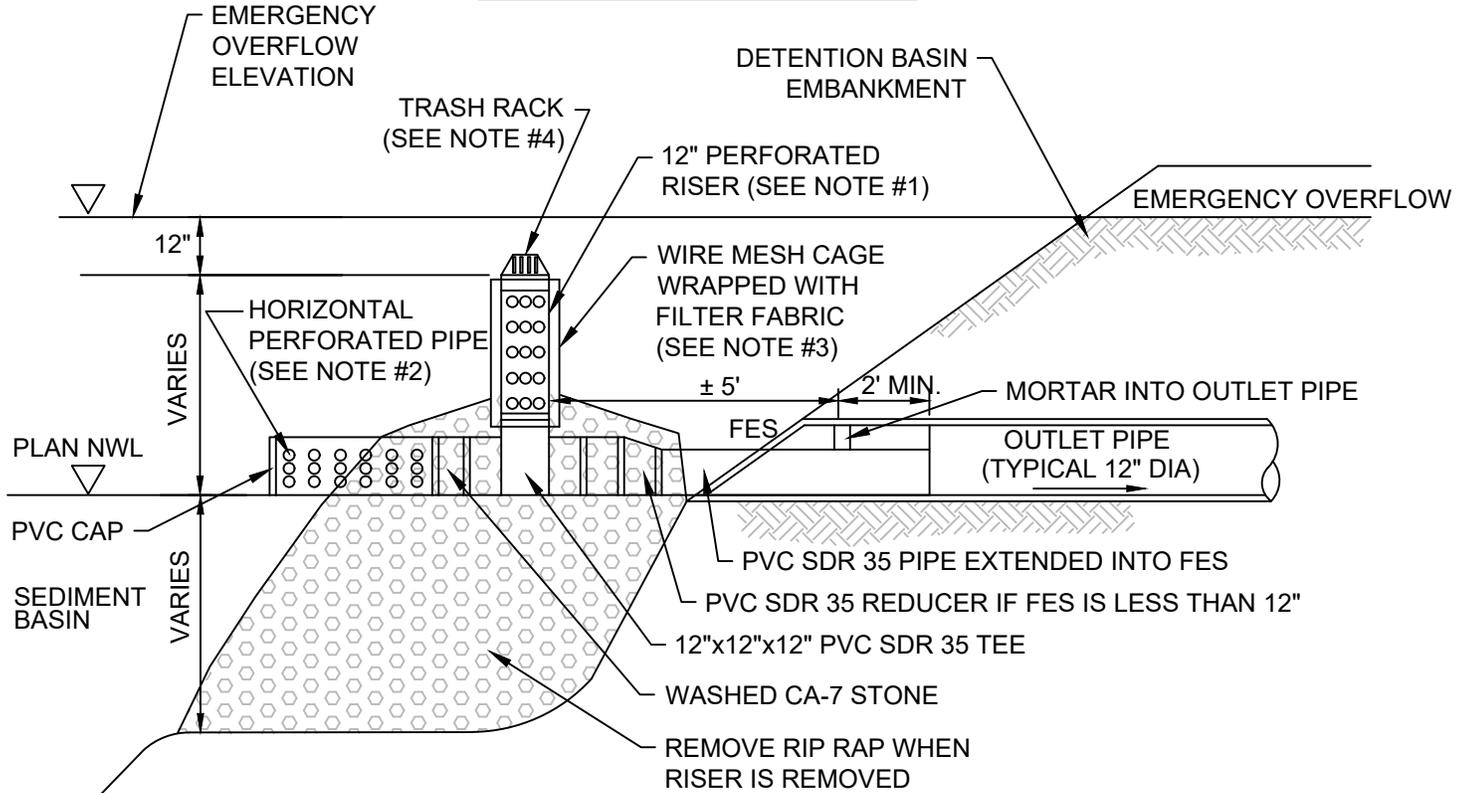
CONCRETE WASHOUT



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
EROS - 02

SECTION ON CENTERLINE OF PIPE



MAINTENANCE:

1. REPLACE FILTER FABRIC.
2. CLEAN OR REPLACE STONE.
3. REMOVE TRASH.
4. CLEAN OUTFALL.

NOTES:

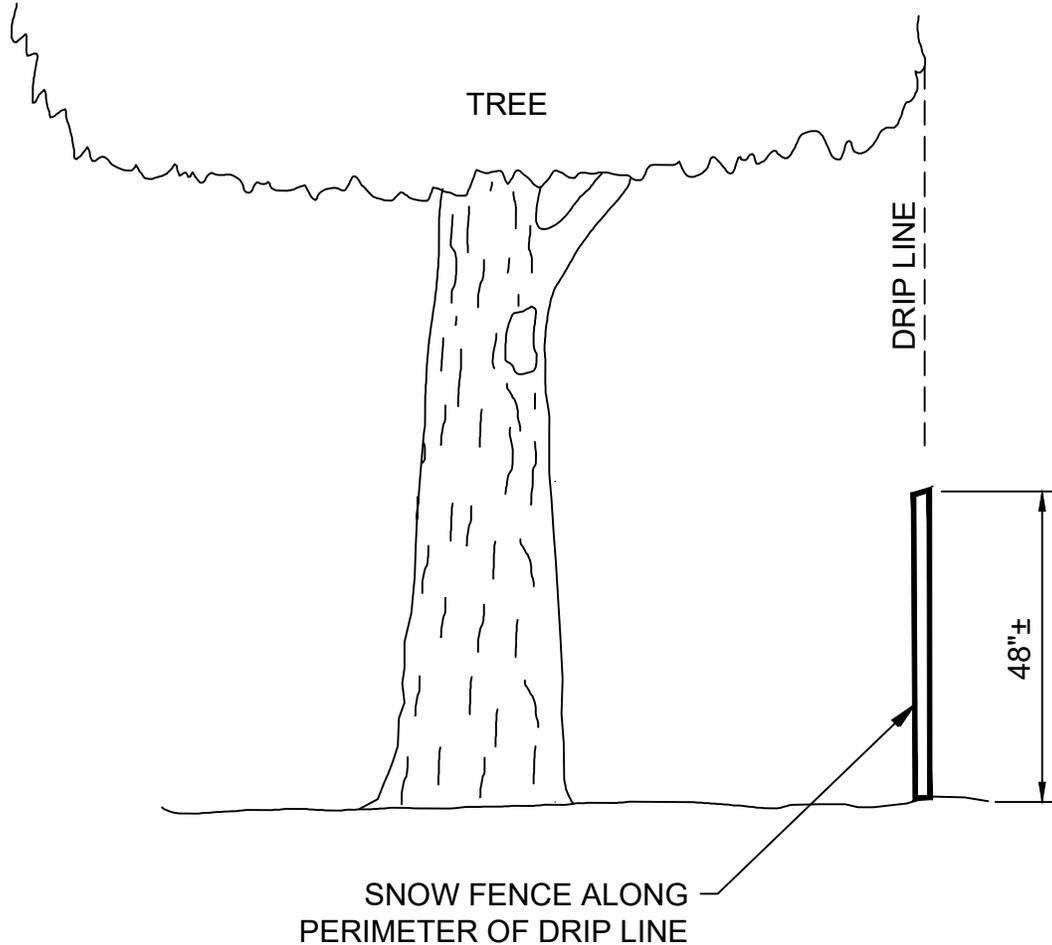
1. 12" DIAMETER PERFORATED RISER SHALL CONSIST OF THIRTY 1" DIAMETER HOLES (\pm 24 SQ INCHES) PER LINEAR FOOT OF PIPE. USE OF 1"x4" SLOTS ARE PERMITTED. TOP OF PERFORATED RISER TO BE SET 12" BELOW EMERGENCY OVERFLOW ELEVATION. (ADS HICKENBOTTOM 1"/SLOTTED HOLE MODEL OR APPROVED EQUAL)
2. PROVIDE 4 LINEAR FEET OF HORIZONTAL PERFORATED PIPE. CHICKEN COOP WIRE SHALL BE WRAPPED DIRECTLY AROUND HORIZONTAL PERFORATED PIPE A MINIMUM OF THREE TIMES AND FASTENED WITH WIRE OR PLASTIC TIES. THEN CHICKEN COOP WIRE SHALL BE WRAPPED A MINIMUM OF TWO TIMES WITH WEVTEX 403 FABRIC OR APPROVED EQUAL. FABRIC SHALL BE FASTENED TO EACH END OF PVC PIPE AND AT 12" SPACING USING PLASTIC TIES.
3. 15"-18" DIAMETER WIRE MESH CAGE WRAPPED A MINIMUM OF TWO TIMES WITH WEVTEX 403 WOVEN FABRIC OR APPROVED EQUAL. FABRIC SHALL BE FASTENED TO WIRE MESH CAGE ONLY WITH WIRE OR PLASTIC TIES. WIRE CAGE TO BE SET INTO WASHED CA-7 STONE AND SIZED TO MATCH TOP OF PERFORATED RISER. WIRE CAGE MAY BE CONSTRUCTED USING FOUR LAYERS OF CHICKEN COOP WIRE FASTENED TO ITSELF OR AN 18" DIAMETER REBAR LIGHT STANDARD CAGE WRAPPED TWICE WITH CHICKEN COOP WIRE.
4. METAL TRASH RACK SHALL FIT FIRMLY AND CONSIST OF 12" ADS BAR GUARD. (NEENAH R-4351-B OR APPROVED EQUAL)
5. ALL PIPE AND FITTINGS MAY BE CONSTRUCTED OF STANDARD PVC SDR 35 PIPE. LOCAL SUPPLIERS ARE ADVANCED DRAINAGE SYSTEMS, INC (ADS) AND ERO-TEX.
6. CONTRACTOR TO MAINTAIN RISER SUCH THAT THE POND CAN RETURN TO NWL.

TEMPORARY PERFORATED RISER



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
EROS - 03



NOTES:

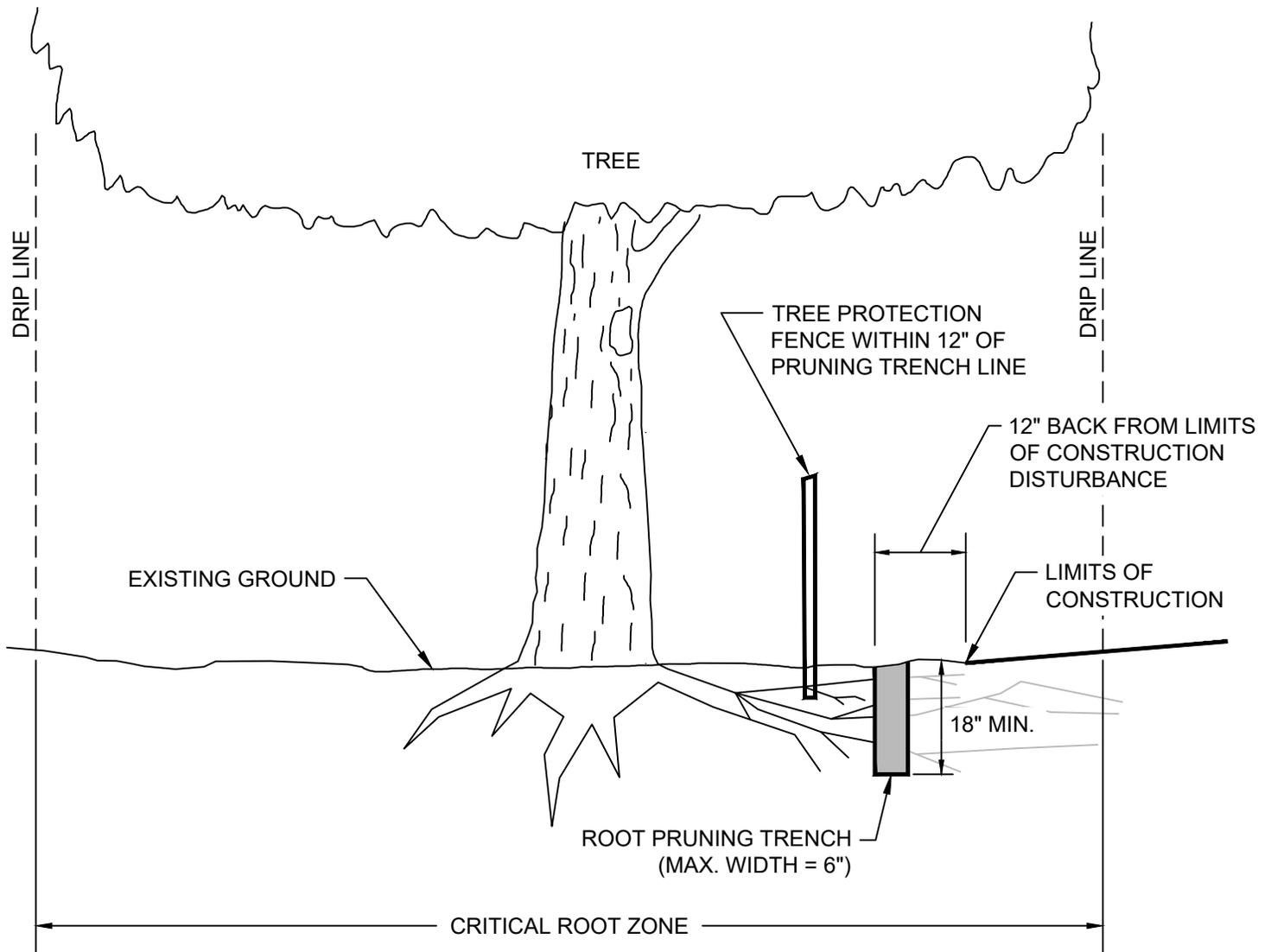
1. EXISTING TREES TO BE PROTECTED SHALL HAVE SNOW FENCE INSTALLED AT THE DRIP LINE OF THE TREE TO PREVENT THE STOCKPILING OF EXCAVATED OR CONSTRUCTION MATERIALS UNDER THE TREE, AND PROHIBIT VEHICULAR TRAFFIC OR EXCESSIVE FOOT TRAFFIC WITHIN THE DRIP LINE.
2. SNOW FENCE SHALL BE WEBBED HDPE CONSTRUCTION FENCING, COLORED ORANGE AND SUPPORTED WITH STEEL "TEE" POSTS SET AT MAX. 15' INTERVALS, OR AS REQUIRED TO MAINTAIN THE FENCE IN AN UPRIGHT POSITION THROUGHOUT THE TERM OF CONSTRUCTION.
3. TREES THAT MAY BE DAMAGED BY CONSTRUCTION OPERATIONS SHALL BE REPAIRED OR REPLACED IN A MANNER ACCEPTABLE TO THE VILLAGE.

TREE PROTECTION FENCING



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
EROS - 04



NOTES:

1. EXACT LOCATION OF ROOT PRUNING TO BE AS SPECIFIED BY ENGINEER OR APPOINTED REPRESENTATIVE OF THE VILLAGE OF LIBERTYVILLE PARKS DIVISION.
2. ROOT PRUNING TRENCH SHALL BE BACKFILLED IMMEDIATELY FOLLOWING COMPLETION OF PRUNING ACTIVITIES. TRENCH SHALL BE COVERED WITH A MINIMUM OF 3" MULCH.
3. ROOT PRUNING ACTIVITIES AND THE PLACEMENT OF PROTECTIVE FENCING SHALL BE COORDINATED SO THAT BOTH SHALL BE COMPLETED AT EACH LOCATION WITHIN A 48-HOUR PERIOD.
4. UNDER NO CIRCUMSTANCES SHALL CONSTRUCTION PROCEED PRIOR TO THE COMPLETION OF ROOT PRUNING AND THE PLACEMENT OF PROTECTIVE FENCING, NOR SHALL FENCING BE REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE ENGINEER OR PARKS DIVISION REPRESENTATIVE.

TREE ROOT PRUNING



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
EROS - 05

PHOTOCELL (G.E. OR APPROVED EQUAL) ON FIRST POLE (SERVICE POLE ONLY) OF EACH CIRCUIT. INSTALL SHORTING CAPS ON REMAINING LUMINARIES.

TRADITIONAL-STYLE POST TOP

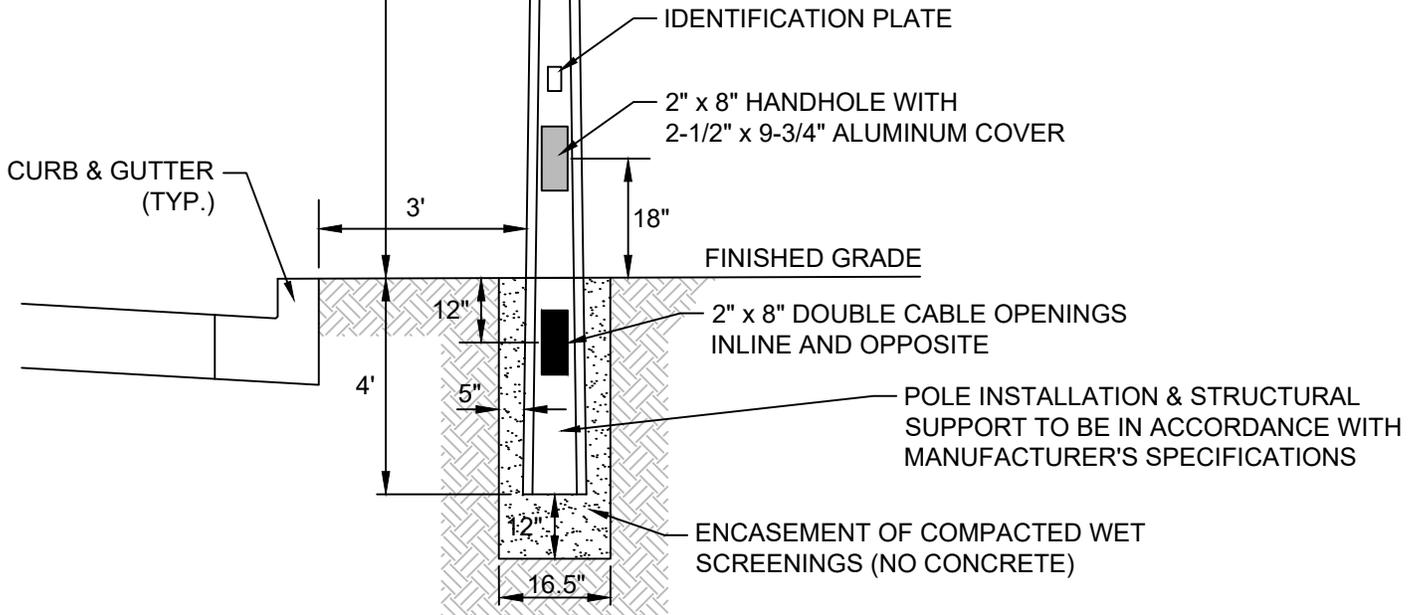
GE EVOLVE LED TOWN & COUNTRY TRADITIONAL POST TOP (OR APPROVED EQUAL) PER THE FOLLOWING:

- TYPE = "EPTT" (EVOLVE, POST TOP, TOWN & COUNTY)
- GENERATION = "01"
- VOLTAGE = "0" (120 - 277V)
- LUMEN OUTPUT = "03"
- REFRACTOR = "A" (ACRYLIC)
- LED COLOR TEMP = "27" (2700K)
- DISTRIBUTION CODE = "D" (ASYMMETRIC HO)
- CONTROLS = "A" (ANSIC136.41 7-PIN DIMMING PE SOCKET)
- MOUNTING ARM = "P" (POLE MOUNTED)
- COLOR = "BLK" (BLACK)

CODE = "EPTT01_03DA27_120-277V.ies"

PRESTRESSED, SPUN CONCRETE OCTAGONAL POLE

- TRADITIONAL CONCRETE, INC. 400 SERIES (OR APPROVED EQUAL)
- 12' ABOVE-GROUND HEIGHT
- 'SKY GRAY' COLOR



NOTES:

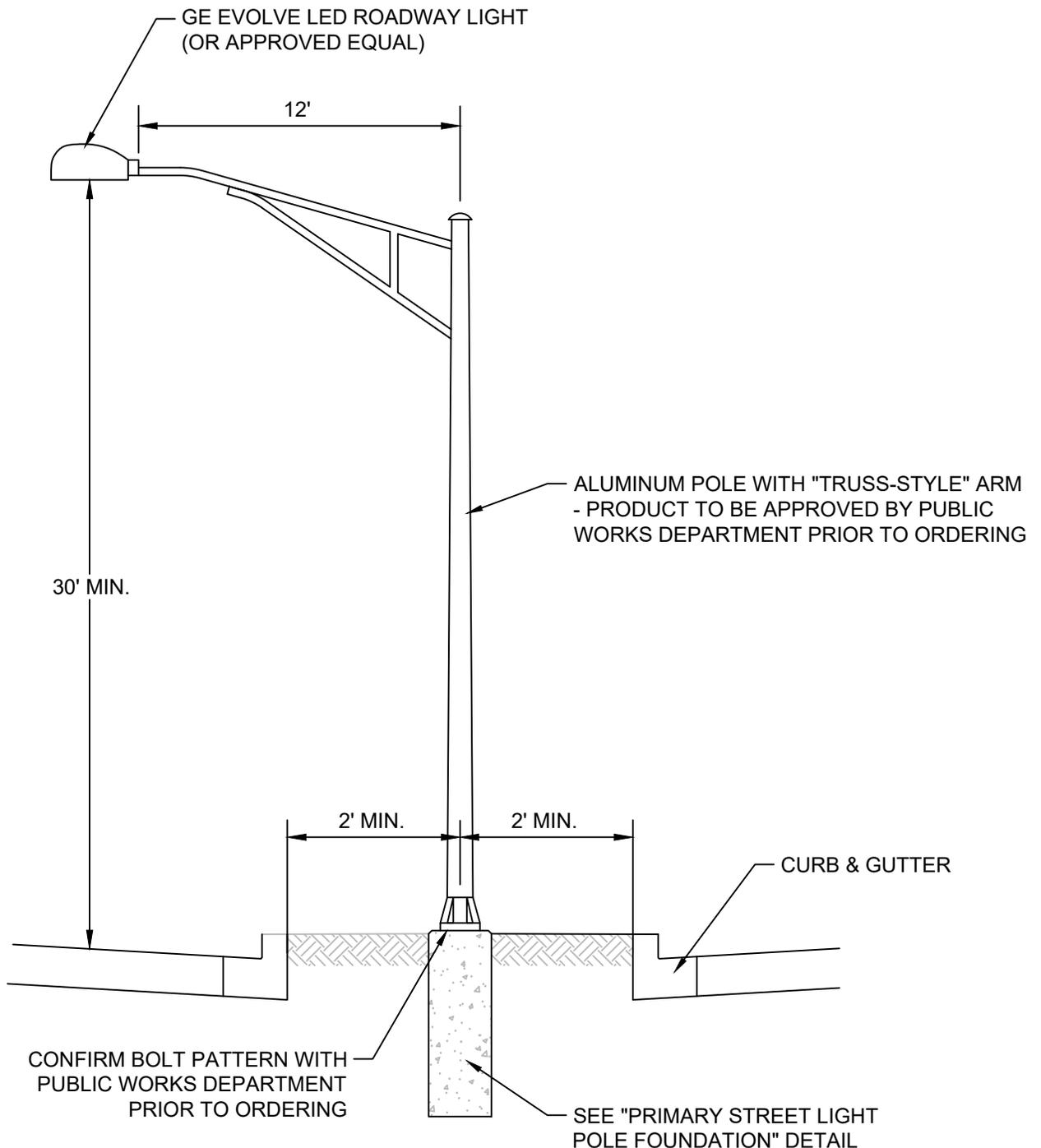
1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. 1" DIAMETER UNIDUCT TO BE INSTALLED PARALLEL TO CURB LINE WITH TWO NO. 6 AWG STANDARD CONDUCTOR COPPER CABLES, NEOPRENE JACKETED U.S.E. TYPE HAZARD STYLE RR HAZASHEATH, 600 VOLT CABLE IN 1-1/4" I.D. UNIDUCT BURIED 4' BEHIND CURB, 24" DEEP.
3. 2" DIA. GALVANIZED RIGID STEEL CONDUIT SLEEVE SHALL BE PLACED 30" DEEP UNDER PAVEMENT AND EXTENDED 18" PAST LIMITS OF DRIVEWAYS, PAVEMENT, SIDEWALKS, ETC.
4. VERIFY FIXTURE AND POLE SPECIFICATIONS WITH THE VILLAGE PRIOR TO ORDERING.
5. SETBACK SHALL BE 3' FROM BACK-OF-CURB IF CURB IS PRESENT. SETBACK SHALL BE 4' FROM EDGE-OF-PAVEMENT IF THERE IS NO CURB.
6. EACH POLE SHALL HAVE INDIVIDUAL FUSE PROTECTION, SIZED APPROPRIATELY FOR THE FIXTURE
7. EACH STREETLIGHT CIRCUIT MUST HAVE A STREET LIGHT CONTROL BOX BEFORE IT CONNECTS TO THE COMED POWER SOURCE. REFER TO THE VILLAGE'S "STREET LIGHTING CONTROL BOX" DETAIL.

RESIDENTIAL STREET LIGHT



LAST REVISED:
02/15/2023

STANDARD DETAIL #
SL - 01



NOTES:

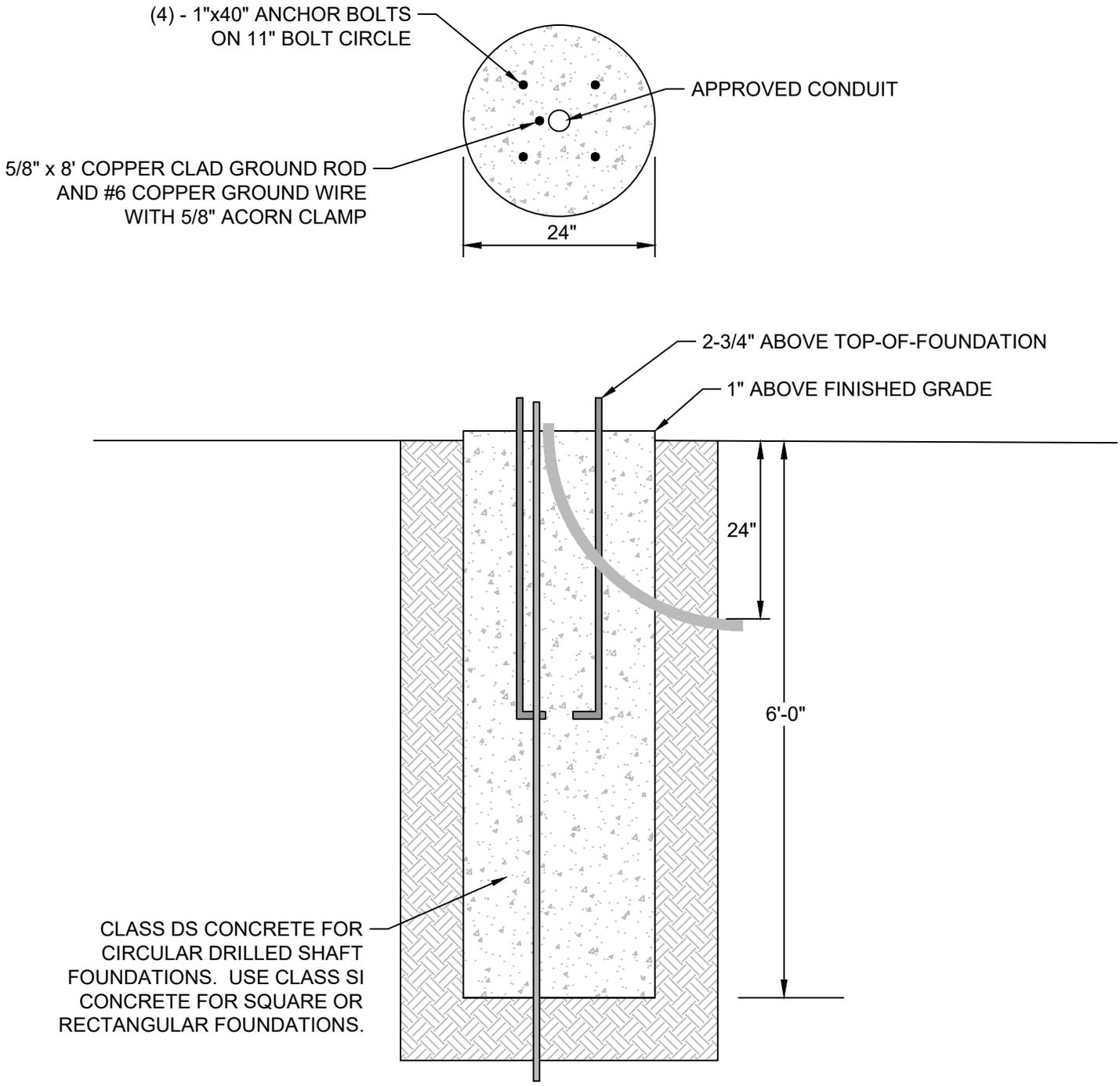
1. VERIFY FIXTURE & POLE SPECIFICATION WITH THE VILLAGE PRIOR TO ORDERING.
2. SETBACK SHALL BE 2' FROM BACK-OF-CURB IF CURB IS PRESENT OR 4' FROM EDGE-OF-PAVEMENT IF NO CURB IS PRESENT.
3. AT ROADWAY INTERSECTIONS WITH SIGNS, LIGHT POLES SHALL BE SET BACK AS TO NOT OBSTRUCT STOP SIGNS, ETC.
4. EACH POLE SHALL HAVE INDIVIDUAL FUSE PROTECTION, SIZED APPROPRIATELY FOR THE FIXTURE
5. EACH STREETLIGHT CIRCUIT MUST HAVE A STREET LIGHT CONTROL BOX BEFORE IT CONNECTS TO THE COMED POWER SOURCE. REFER TO THE VILLAGE'S "STREET LIGHTING CONTROL BOX" DETAIL.

PRIMARY STREET LIGHT



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
SL - 02



NOTE:

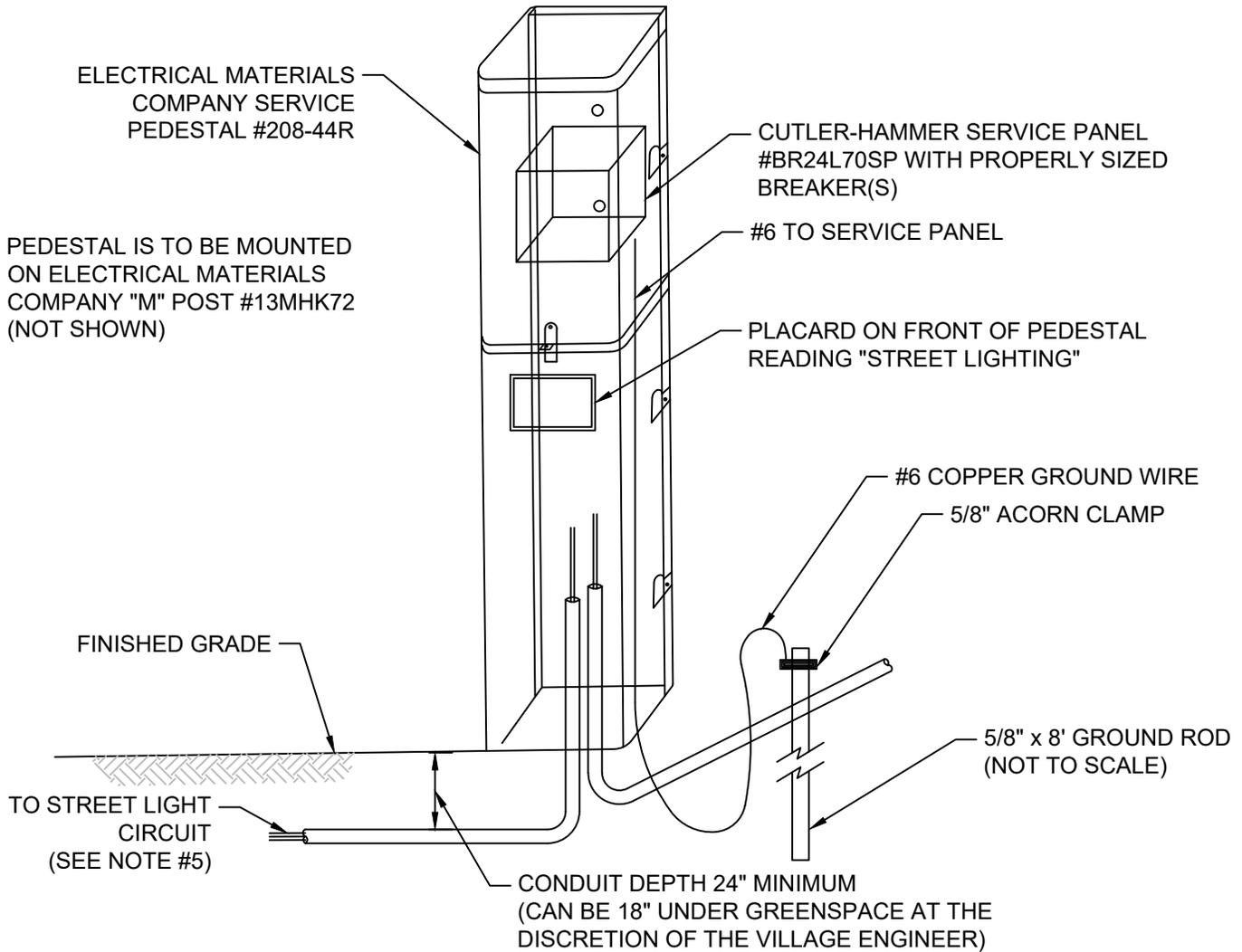
1. REFER TO "PRIMARY STREET LIGHT" DETAIL FOR FURTHER INFORMATION ON POLE AND LIGHT FIXTURE.

PRIMARY STREET LIGHT POLE FOUNDATION



LAST
REVISED:
02/15/2023

STANDARD DETAIL #
SL - 03



NOTES:

1. REFER TO THE VILLAGE "ENGINEERING DESIGN & CONSTRUCTION STANDARDS" FOR FURTHER REQUIREMENTS.
2. NO DIRECT CONNECTION OF PUBLIC STREET LIGHT CABLING TO A COMED POWER SOURCE SHALL BE PERMITTED
3. A FULLY RATED SERVICE PANEL WITH 70 AMP BUS AND MAIN BONDING JUMPER SHALL BE PROVIDED WITHIN THE ELECTRICAL MATERIALS CO. SERVICE PEDESTAL. AN "M" POST SHALL BE PROVIDED FOR MOUNTING THE PEDESTAL. ANY OF THE PRODUCTS LISTED ABOVE MAY BE SUBSTITUTED WITH APPROVED EQUALS AT THE DISCRETION OF THE VILLAGE ENGINEER
4. THE PEDESTAL SHALL BE GROUNDED WITH A 5/8" x 8' COPPER CLAD GROUND ROD AND #6 COPPER GROUND WIRE WITH 5/8" ACORN CLAMP.
5. STREET LIGHTING CIRCUIT MUST BE RUN IN AN APPROVED CONDUIT, INCLUDING A PROPER EQUIPMENT GROUNDING CONDUCTOR.

STREET LIGHTING CONTROL BOX

	Libertyville
<small>LAST REVISED: 02/15/2023</small>	STANDARD DETAIL # SL - 04



APPENDIX C:

Utility Installation Observation Form

The following form shall be used to document utility installation observations and shall be submitted to Engineering Division Staff for records. Please refer to [Section 9.2](#) for more information on requirements of a Resident Engineer, and how this form applies to their role.

UTILITY INSTALLATION OBSERVATION REPORT

General Site Information		
Project Name		Date:
Owner / Developer		Project No.:
Site Location / Address		
Contractor		
Observer's Name & Title		
Weather / Site Conditions		
Construction Work Information		
Location/Type of Work		
Work in Progress		
Work Completed		
Notes		
Attachments <input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Photos <input type="checkbox"/> Sketches <input type="checkbox"/> Other (Describe)	

Note: Any installation of public utilities shall be clearly described, and photos and/or sketches of the installation shall be provided along with this report.

Print Name & Title: _____

Signature: _____ Date: _____