CITY OF

DELPHI, INDIANA

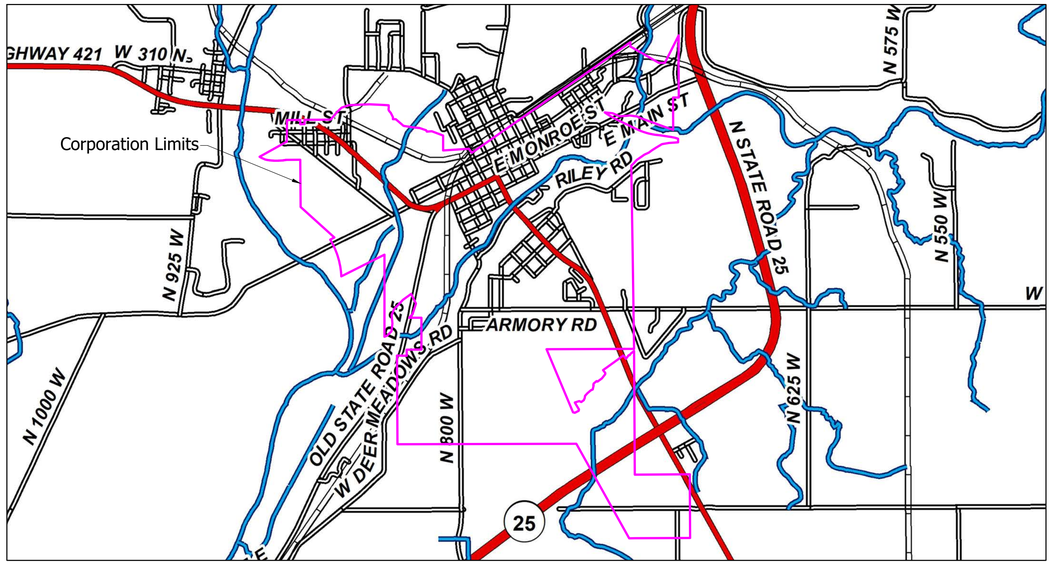
CITY DEVELOPMENT STANDARDS

BOARD OF PUBLIC WORKS AND SAFETY

Kamron Gates
MAYOR KAMRON GATES — PRESIDENT

SpencerKingery
SPENCER KINGERY — MEMBER

Breanna Maxwell
BREANNA MAXWELL — MEMBER



VICINITY MAP
CARROLL COUNTY

SCALE: NONE

PROJECT LOCATION SHOWN BY

Approx. 40°35'12.8"N Lat. & 86°40'26.8"W. Long.

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REVISIONS		
Rev. No.	Description	Date
1	Updated BOW Personnel	02/14/2024

CHRISTOPHER M. MAC — REGISTERED — No. PE11800287 — STATE OF INDIANA — PROFESSIONAL ENGINEER

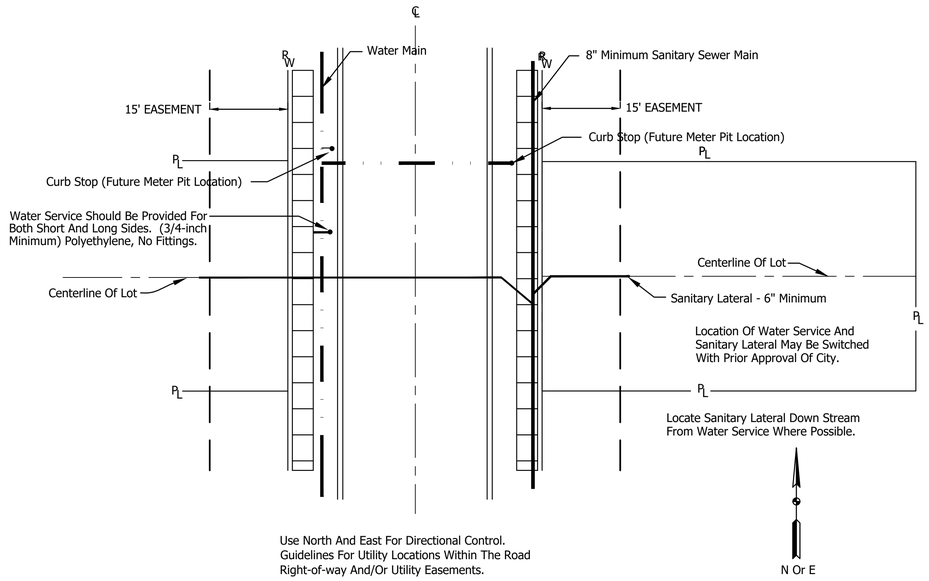
RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — 12/12/2023 DATE

APPROVED: Kamron Gates — CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — 01/15/2024 DATE

CITY OF DELPHI

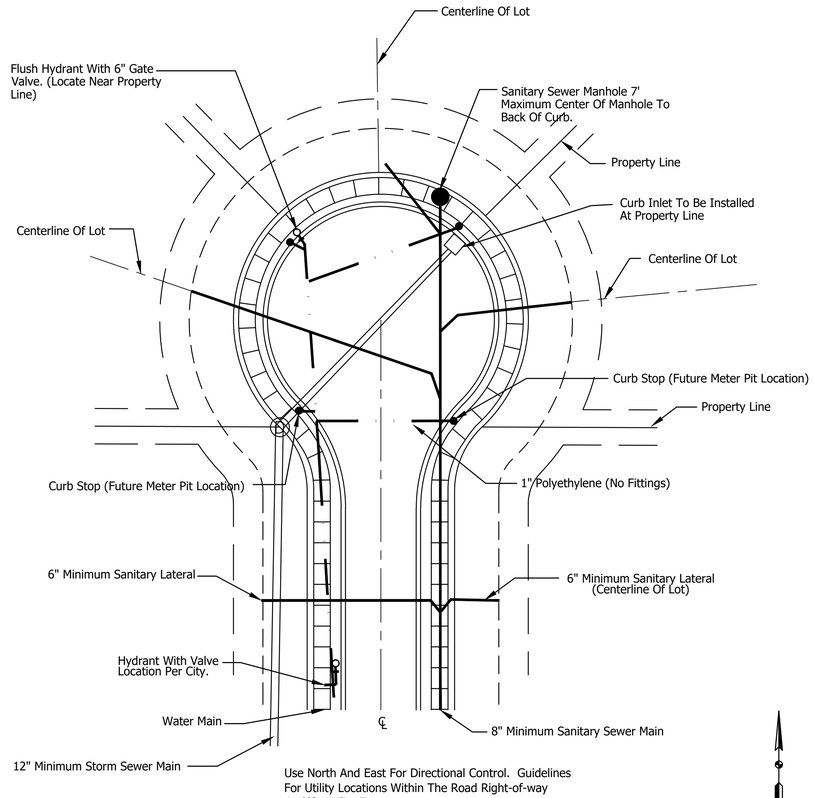
VICINITY MAP & INDEX

SHEET 01 OF 20



UTILITY LOCATIONS

Not To Scale



UTILITY LOCATIONS

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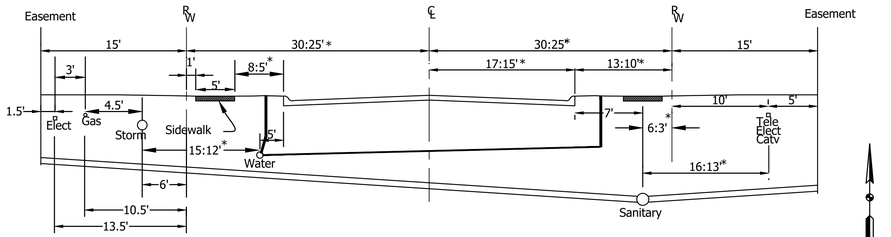

LOCAL CROSS-SECTION

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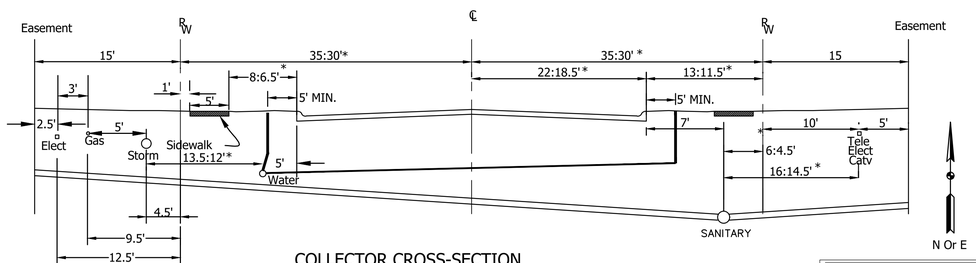

COLLECTOR CROSS-SECTION

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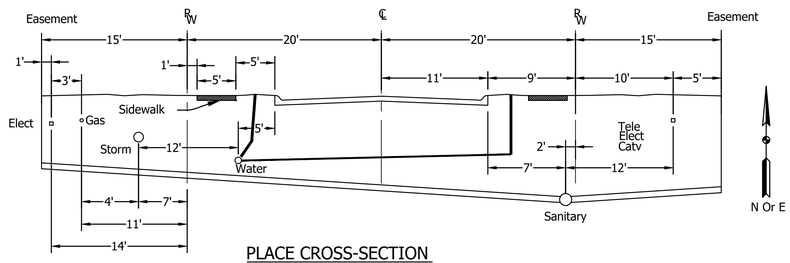


PLACE CROSS-SECTION

Not To Scale

Use North And East For Directional Control. Guidelines For Utility Locations Within The Road Right-of-way And/Or Utility Easements.

* = Nonresidential Requirement:Residential Requirement

GENERAL NOTES

1. Contractor Shall Verify The Exact Location Of All Underground Utilities At Least 24 Hours Prior To Any Construction Or Excavation. During Construction, All Utilities Shall Be Adequately Supported To Minimize Damage.
2. All Permits And Easements Will Be Obtained By The Owner With Any Required Insurance Or Bonds To Be Provided By The Contractor Prior To The Start Of Work On The Project.
3. All Vertical Control Shall Be On North American Vertical Datum (NAVD 1988). Horizontal Control Shall Be On Nad State Plane Coordinates.
4. Wherever Proprietary Equipment Is Specified, "Or Approved Equal" Is Implied All Proposals For Substitution Shall Be Submitted To The City In Writing For Their Approval.
5. All Areas Disturbed By The Construction Process Shall Be Fertilized And Seeded. Adequate Mulching Shall Be Placed After Seeding And Fertilizing. It Shall Be The Contractor's Responsibility To See That Adequate Growth Is Established. Sodding Will Be Required As Shown On The Plans.
6. Trenches Under Paved Areas (Excluding Sidewalks) Shall Be Backfilled With Granular Material Per Indiana Department Of Transportation "Standard Specifications", Latest Edition, Section 211, And Compacted In Lifts. Granular Material To Extend Five Feet Beyond The Limits Of The Paved Area With A 1:1 Slope To The Bottom Of The Trench. Flowable Mortar Per Section 213 Of Indiana Department Of Transportation "Standard Specifications", Latest Edition, May Be Used In Lieu Of Granular Material. With Prior Approval Of The City's Consulting Engineer Office.
7. Installation Of Or Provisions For The Installation Of All Underground Utilities Including Service Laterals To Be Placed Under The Pavements Shall Be Established Prior To The Construction Of The Pavements
8. Contractor Shall Contact The City If Any Damage To City Utilities Occurs. Damage To Delphi Water Main Or City's Sewers By Contractors Will Be Be Repaired By City's Utility Dept. With All Costs Of Repair To Be Paid By The Contractor Unless Otherwise Directed By The City. Other Damaged Utilities Shall Be Repaired In Accordance With The Affected Utility's Repair Policy.
9. 18" Vertical Separation And 10'- 0" Horizontal Separation Is To Be Maintained Between Water Mains, Hydrants And Sewers (Storm And Sanitary).
10. The Contractor Is Responsible For Maintaining A Safe Construction Site And For Keeping Surrounding Streets Neat And Clean. The Contractor Will Provide All Traffic Control Required On Public Ways Near The Project.
11. The Construction Work Shall Conform To The Requirements Of All Agencies Having Jurisdiction Over The Project.
12. The Contractor Will Notify The Appropriate Governmental Agencies At Least 48 Hours Prior To Starting Or Resuming Work On A Project.
13. The Contractor Will Provide Safe Access To The Construction Site For All Inspectors And Will Provide Material Samples For Testing.
14. Information Required For Preparing "As-Built" Drawings Must Be Recorded Prior To The Backfilling Of The Underground Facility.
15. Top Of Manhole Frames To Be Set At Proposed Yard Or Sidewalk Grade When Located In Front Yard Area Of Lot Or Right-of-Way.
16. All Sign, Markings And Other Traffic Control Devices Shall Comply With INDOT Standards And IMUTCD.
17. Utility Placement For Other Than Single Family Residences, Contact City's Consulting Engineer's Office For Requirements.
18. Sidewalk Width Shall Be In Accordance With The Current Subdivision Ordinance
19. Sidewalk Placement Shall Be Referenced From The Right Of Way
20. The Last Lateral On A Sanitary Line Shall Be Connected Into The Main Line With A Tee-Wye. No Sanitary Laterals Shall Be Directly Connected To A Manhole.

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. LIMING REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

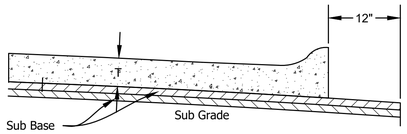
RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — DATE 12/12/2023

APPROVED: Ramon Yates, CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — DATE 01/15/2024

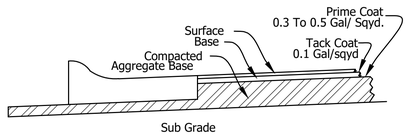
CITY OF DELPHI

GENERAL NOTES & GUIDELINES FOR UTILITY LOCATIONS

SHEET 02 OF 20



Concrete Rigid Pavement Section
Not To Scale



Asphalt Pavement Section
Not To Scale

Base To Be Constructed Prior To Construction Of Curb And Gutter

Class Of Street [1]	Curb [2]	Sub Grade Thickness	Concrete Pavement [4]		Asphalt Pavement [3]		
			T (Pvt. Thickness)	Transverse Joint Spacing	9.5mm (HMA Surface)	25mm (Base)	#53 (Agg. Base)
Primary Arterial	Type III	To Be Determined By City	8"	--	(To Be Determined By The City)		
Secondary Arterial	Type III	To Be Determined By City	8"	--	(To Be Determined By The City)		
Collector	Type I (Residential) Type III (Nonresidential)	6"	6"	14'	1.5"	4.5"	12" Compacted (2 Lifts)
Local And Place	Type I (Residential) Type III (Nonresidential)	6"	6"	14'	1.5"	4.5"	12" Compacted (2 Lifts)

Item	Material Type	INDOT Specifications Section
Sub Grade	Earth	207
Sub Base		302
Curb	Combined Curb And Gutter	605.04-A,B,C,F,G,H,I
Base (Aggregate)	Compacted Aggregate	301
Base (Asphalt)	Asphaltic Concrete	304
Intermediate	Asphaltic Concrete	401,402
Surface	Asphaltic Concrete	401,402
Prime Coat	MC-70, AE-P	405
Tack Coat	AE-T	406
Pavement (Concrete)	Portland Cement Concrete	305,501
Sidewalks, Ramps, Etc.	Portland Cement Concrete	604
Joint Sealant	Sealant	906

Notes:

(1) As Defined By The Unified Development Ordinance.

(2) See Sheet 11 For Curb Inlet Details. Perimeter Drain Shall Extend 50 Ft. Each Direction From The Curb Inlet.

(3) 8" Of Lime Treated Subbase Can Be Substituted For 6" Of #53 Aggregate Base Under Asphalt. Lime Treatment Can Be Used In Areas Of New Construction Only And With Prior Written Approval Of The City's Consulting Engineer Office.

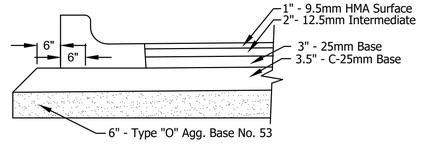
(4) Sub Base Shall Be 6" Of #53's.

(5) Sub Base For Concrete Pavement Where Underdrains Are Required Shall Be 3" Of #8's Or #43's For Drainage And 4" Of #53's For Separation.

(6) Alternate Pavement Designs May Be Submitted To City's Consulting Engineer Office. Designs Must Be Approved By The City's Consulting Engineer.

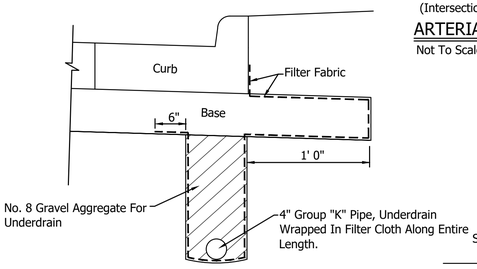
Pavement Construction Notes

1. Installation Of Or Provisions For The Installation Of All Underground Utilities, Including Service Laterals, To Be Placed Under The Pavements Shall Be Established Prior To The Construction Of The Pavements.
2. All Pavement, Curbs, Sidewalks, Ramps, Etc. Shall Be Constructed In Accordance With The Specifications And In Close Conformance With The Lines, Grades, Thickness' And Typical Cross Sections Shown On The Plans. Materials And Workmanship Shall Be In Accordance With Designated Sections Of The Indiana Department Of Transportation "Standard Specifications", Latest Edition.
3. Subbase And Sub Grade Fill Material Shall Be Compacted To A Minimum 95% Of The Maximum Dry Density In Accordance With ASTM D698.
4. All Portland Cement Concrete Pavement Streets Shall Have Joint Maintenance Conducted Before The City Accepts Ownership Of Street (i.e. Crack Seal Or Other Approved Measure) Within The Three Year Maintenance Period.
5. Wherever Rigid Pavement Is To Be Used The Contractor Shall Submit A Detailed Paving Plan To The City's Consulting Engineer. The Paving Plan Shall Show The Location And Type Of Jointing To Be Used In The Construction. The Location And Type Of Jointing Shall Be In Accordance With The City Standards And Guidelines.
6. Whenever Sub Grade Stabilization Is To Be Used The Contractor Shall Submit A Written Plan Detailing The Application Method. The Plan Must Comply With The State Of Indiana Environmental Regulations And Standards And Be Approved By The City's Consulting Engineer Office.
7. Recycled Concrete May Be Used As # 53 Agg. Base On A Case By Case Basis Upon Prior Written Approval Of The City.
8. Wherever Proprietary Equipment Is Specified, "Or Approved Equal" Is Implied. All Proposals For Substitution Shall Be Submitted To The City In Writing For Their Approval.



(Intersection Of Local, Place Or Collector With Arterial)

ARTERIAL APPROACH PAVEMENT SECTION
Not To Scale



Underdrain Shall Be Constructed As Directed By City's Consulting Engineer's Office

UNDERDRAIN DETAIL
Not To Scale

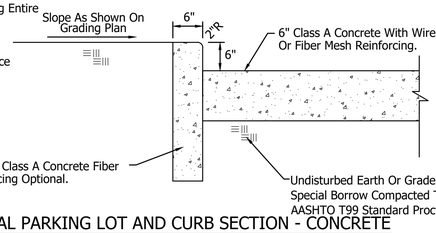
Quality Control Requirements

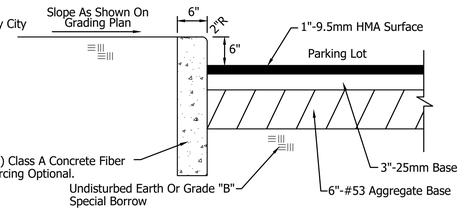
1. All Testing Shall Be In Accordance With The Latest INDOT Standard Specifications. All Tests Where Practicable Shall Be Witnessed By The City. Contractor Shall Coordinate Testing Schedule With The City's Consulting Engineer Office. All Test Results Shall Be Submitted To The City's Consulting Engineer Office Within 48 Hours Of The Completion Of Each Test And Prior To Placing Any Material On The Subbase/Subgrade. The Frequency Of Testing Where Shown Is A Minimum. Additional Testing May Be Required At The Direction Of The Public Works Inspector.

2. The Developer/Contractor Shall Retain An Independent Testing Firm (Unless Otherwise Noted) To Perform The Following Testing:
   A. Subgrade:
      1. Compaction (Fill Sections): 1 Test Per Lift Per 500 LF Of Single Lane Width.
      2. Adequacy Of Subgrades Shall Be Determined Solely By The Public Works Inspector. A Proofroll Shall Be Performed On All Street Sub Grade Prior To Placing Stone And Installing Curb. Subgrade Shall Meet INDOT Specification Section 207, Except That Only The Top 6" Of Subgrade Shall Be Tested For 100% Standard Compaction. Proofrolling That Complies With INDOT Specification 203.26 Is Also Required, Except That Proofrolling May Also Be Accomplished Using A Fully Loaded Tandem Or Tri-Axle Dump Truck In Lieu Of The Specified Rubber Tire Roller. Roller Marks Less Than 1/2" Are Acceptable, As Are Deflections Less Than 1/2" Over The Length Of The Roller Or Truck. If The Subgrade Does Not Pass These Specifications, Then Subgrade Treatments, Including Chemical Modification Performed According To INDOT Specifications 207 And 215 May Be Done In Lieu Of The Above Density And Proofroll Specifications.

      Tandem Dump Truck - Gross Weight 48,000 #
      Tri-axle Dump Truck - Gross Weight 68,000 #

   B. Aggregate Subbase:
      1. Graduation - 1 Test Per 1000 Tons Or 1 Per Week
      2. Compaction - 1 Test Per 500 Lf Of Single Lane Width
   C. Bituminous Material (Base, Intermediate And Surface):
      1. Asphalt Extraction - 1 Test Per Each Type Of Material Used Per Job Test To Include Gradation, Asphalt Content, Crushed Particle Determination And Deleterious Determination. Test Shall Be Certified Per INDOT Certification Requirements.
      2. Density- The Target Density Shall Be Determined From A Test Strip Constructed Per INDOT Specifications. The Target Density Shall Not Be Less Than 96% Of The Unit Weight At The Optimum Binder Content NDES As Determined By The Mix Design. The Density Of Each Sublot Will Be The Average Of Five Tests. A Sublot Shall Be 1000 LF Of Single Lane Width. Breakdown Roller Shall Be Minimum 10 Ton Or Approved Vibratory.
   D. Concrete For Curbing And Driveways:
      1. Air And Slump - 1 Test Per Day For Pours Over 20 CY Or Minimum 1 Per Week.
      2. Compressive Strength Tests - An Adequate Number Of Concrete Test Cylinders Should Be Taken To Ensure That Psi Requirements Of The Concrete Section Are Met. A Minimum Of One Set Of Test Cylinders Per Week Shall Pass These Requirements.
      3. Concrete Strength Shall Be A Minimum 4000 PSI Before Open To Traffic.
   E. Concrete For Pavement - Frequency Of Tests Shall Be In Accordance With The INDOT Frequency Testing Manual As Set Out In The Section Titled "Concrete Pavement And Structure Material".





TYPICAL PARKING LOT AND CURB SECTION - CONCRETE
NOT TO SCALE

TYPICAL PARKING LOT AND CURB SECTION - ASPHALT
Not To Scale

TYPICAL PAVEMENT SECTIONS AND NOTES
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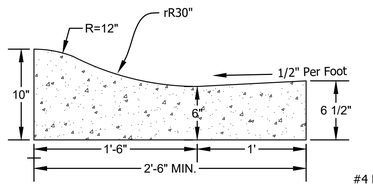
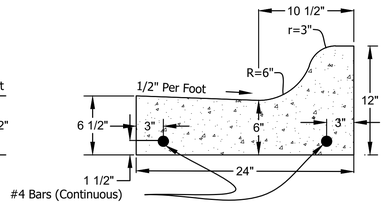
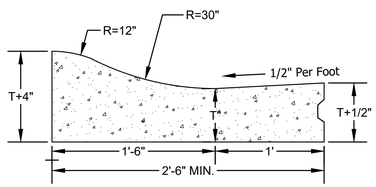


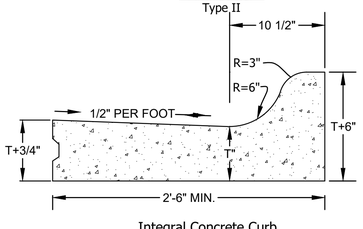
Combined Concrete Curb And Gutter
Type I



Combined Concrete Curb And Gutter
Type II



Integral Concrete Curb
Type I



Integral Concrete Curb
Type II

Notes:

(1) City Has Final Determination For Curb Widths For Selected Applications.

CURB SECTIONS
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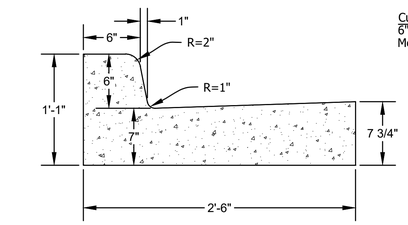
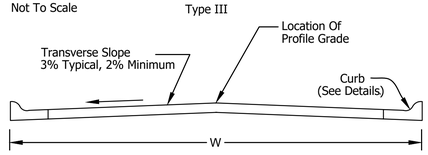


COMBINED CONCRETE CURB AND GUTTER
Not To Scale Type III



STANDARD STREET CROSS-SECTION
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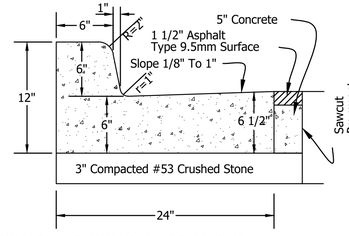
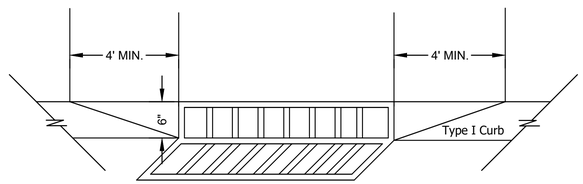


COMBINED CONC. CURB AND GUTTER
Not To Scale For Reconstruction In Existing Neighborhoods



CURB TRANSITION DETAIL
Not To Scale

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. LIMING REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — 12/12/2023 DATE

APPROVED: Kamron Gates, CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — 01/15/2024 DATE

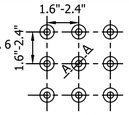
CITY OF DELPHI

PAVEMENT & CURB TYPICAL SECTIONS AND NOTES

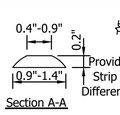
SHEET 03 OF 20

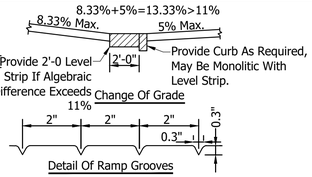
GENERAL NOTES

1. These Dimensions Are Based On A 6 in. Curb Height. They Shall Be Proportionally Adjusted For Other Curb Heights.
2. Where Site Infeasibility Precludes Construction To The Width Shown, Such Width May Be Decreased To A Minimum Of 3'-0".
3. The Bottom Edge Of The Curb Ramp Shall Be Flush With The Edge Of Adjacent Pavement And Gutter Line.
4. Landing Areas At The Top Of Curb Ramps Shall Have Maximum Cross Slope Of 50:1 In Any Direction. When Site Infeasibility Precludes A Landing Slope Of 50:1 In Any Direction, The Slope Perpendicular To The Curb Face Shall Not Exceed 50:1.
5. If Site Infeasibility Precludes Construction To The Width Shown, The Landing Width May Be Decreased To 3'-0 Min. The Running Slope Of The Curb Ramp May Be Steepended To A Max Of 10:1 For a Max 6 in. Rise.
6. Drainage Inlets Should Be Located Uphill From Curb Ramps To Prevent Puddles At The Path Of Travel.
7. Algebraic Difference In Grade Between The Base Of Curb Ramp And The Gutter Shall Be Limited To Less Than 11%. If It Is Not Practical, A 2'-0 Wide Level Strip Shall Be Provided. See Detail Sketch.
8. Min. Recommended Width Of Curb Ramp Is 5'-0.
9. Detectable Warning Surfaces Shall Be Cast Iron Plates With Black Epoxy Coating.

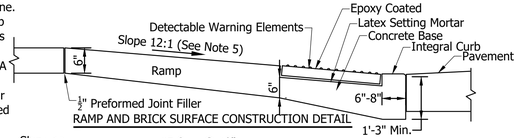


TRUNCATED DOMES USED IN DETECTABLE WARNINGS

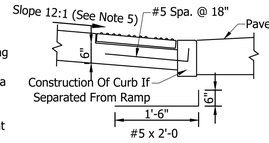




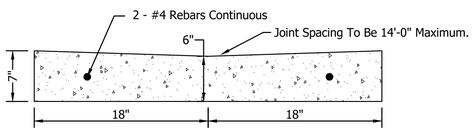
Detail Of Ramp Grooves



RAMP AND BRICK SURFACE CONSTRUCTION DETAIL

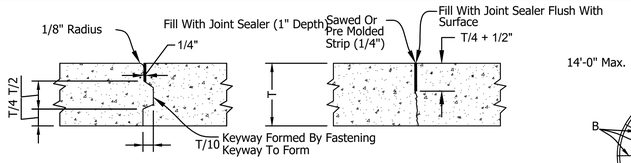


ALTERNATE CURB CONSTRUCTION



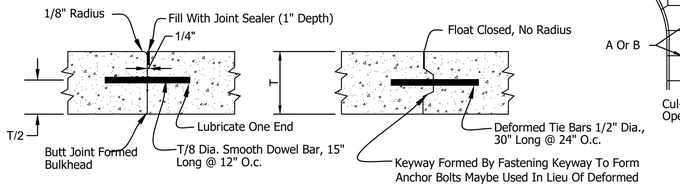
CONCRETE GUTTER - STREET

Not To Scale



Type A
Longitudinal Construction Joint

Type B
Sawed Or Pre Molded Strip, Longitudinal Or Transverse Contraction Joint



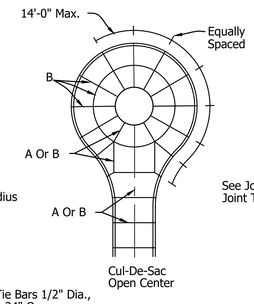
Type C
Transverse Construction Joint

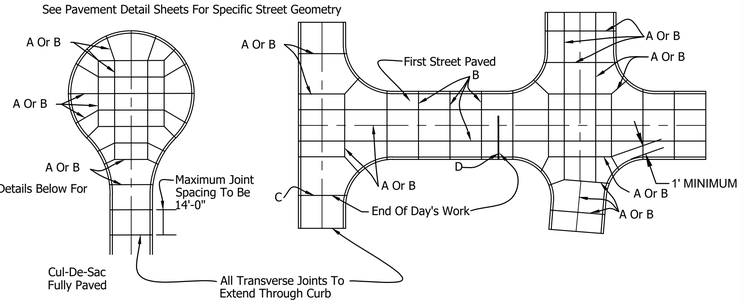
Type D
Tied Transverse Construction Joint

Note:
Joint Sealing Compound To Be Sealtight Hi-Spec (W.R. Meadows, Inc.) Hot-applied, Single Component, Polymeric Joint Sealing Compound (ASTM D 3405), Or Approved Equal.

NEW CONSTRUCTION - CONCRETE JOINT DETAILS

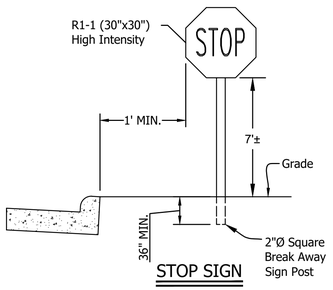
Not To Scale



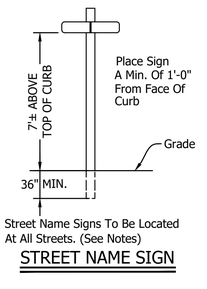


CONCRETE JOINT LAYOUT

Not To Scale



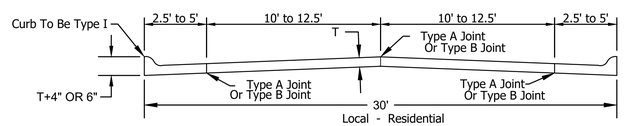
STOP SIGN

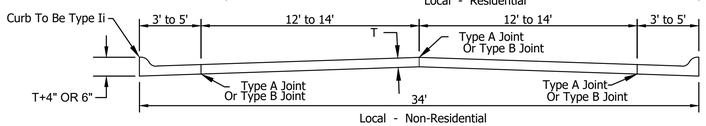


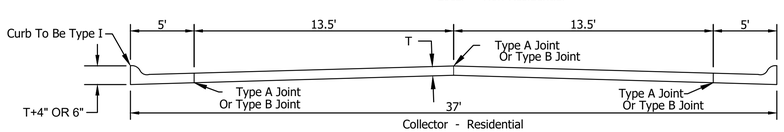
STREET NAME SIGN

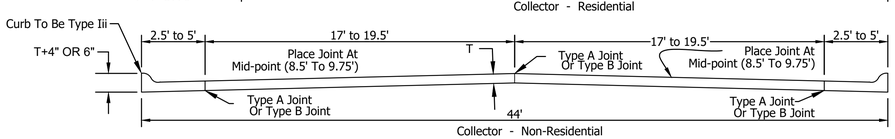
TRAFFIC CONTROL AND SIGN NOTES

1. The Contractor/Developer Shall Provide And Install All Street Name And Road Signs Per Current INDOT Standards And City Of Delphi Guidelines And Details. All Traffic Control Devices Shall Comply With The Current IMUTCD.
2. Materials Shall Be Free Of Burrs, Pits And Blemishes And Shall Present A Smooth Clean Surface.
3. Sign Blanks Shall Meet INDOT Specifications Unless Otherwise Specified.
4. All Street Signs Shall Have Green Background With White Letters/Numbers On Extruded Aluminum Blades.
5. The Street Name Letters To Be High Intensity Grade: 9" Blades With 6" Letters/Numbers On All Streets.
6. Stop Signs Shall Be 30" High Intensity.
7. Sign Bolts To Be Per INDOT Standard Specifications. Bolts Are To Be Theft Proof.
8. Speed Limit Signs Shall Be 24" X 30" High Intensity Grade.
9. Sign Post Shall Be Driven Into The Ground. No Excavation Shall Be Done To Place Signs.



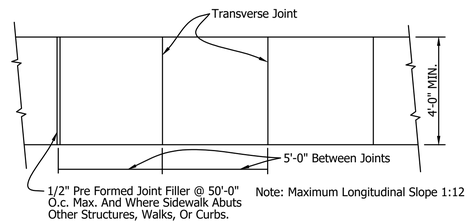






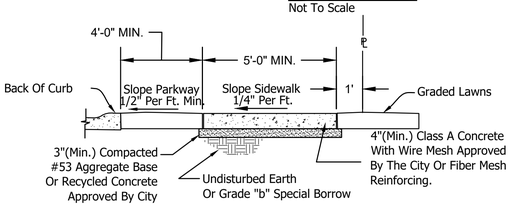
RIGID PAVEMENT STREET CROSS SECTIONS

Not To Scale



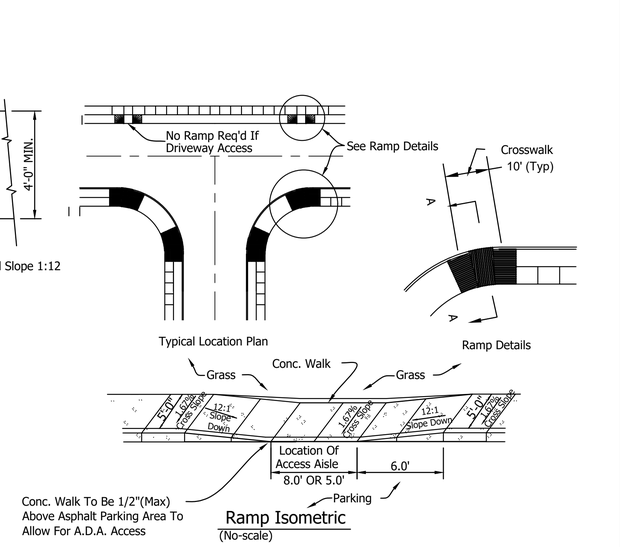
SIDEWALK PLAN

Not To Scale



SIDEWALK SECTION

Not To Scale



Ramp Isometric
(No-scale)

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. INMAN REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

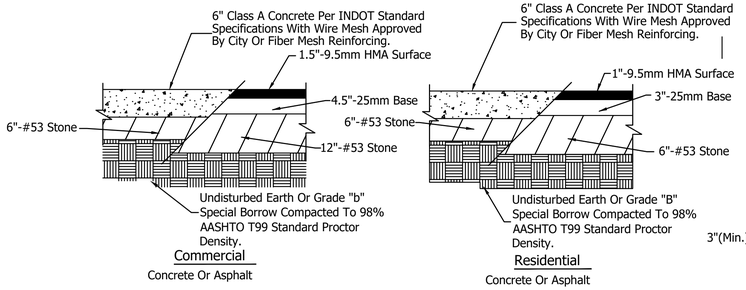
RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — 12/12/2023 DATE

APPROVED: CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — Kamron Yates — 01/15/2024 DATE

CITY OF DELPHI

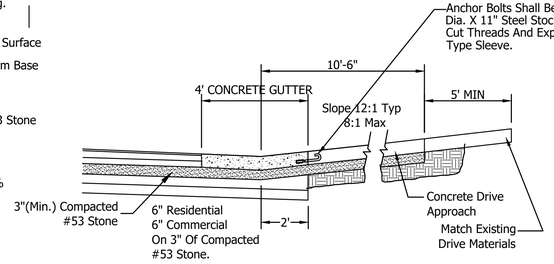
CONCRETE PAVEMENT, SIDEWALK, DRIVEWAY TYPICAL SECTIONS AND NOTES

SHEET 04 OF 20



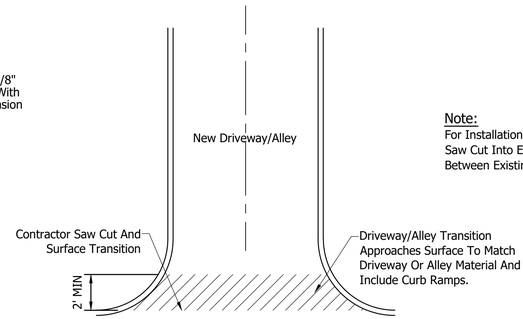
MINIMUM REQUIRED APPROACH SECTION FOR PRIVATE DRIVES

Not To Scale Within Right Of Way



TYPICAL DRIVEWAY SECTION DETAIL

(Type II Or Type III Curbs)
Not To Scale



DRIVEWAY/ALLEY TRANSITION DETAIL

Not To Scale

Note:
For Installation Of Private Driveways, Contractor Shall Saw Cut Into Existing Roadway And Ensure A Clean Joint Between Existing Road And New Driveway Approach

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. LIMING REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

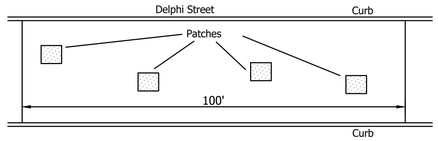
RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — DATE 12/12/2023

APPROVED: CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — DATE 01/15/2024

CITY OF DELPHI

TYPICAL DETAILS FOR DRIVES IN RIGHT OF WAY

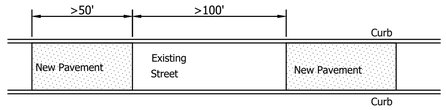
SHEET 05 OF 20



Multiple Cuts Shall Be Defined As City Street Or Alley, Asphalt Or Concrete, That Have The Following Conditions:

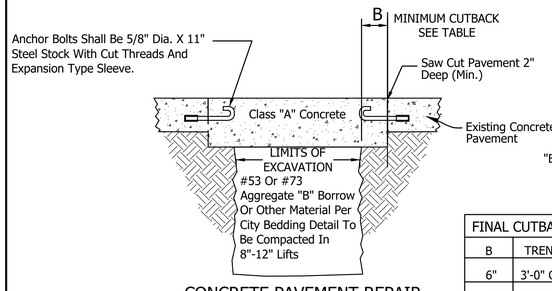
1. Four (4) Or More Patches Per 100 Lineal Feet Of Roadway Within A One (1) Year Period Of Time, And
2. Area Cut Is Greater Than 64 S.F. In 100 Lineal Feet Of Roadway Within A One (1) Year Period Of Time.

Multiple Cuts To Be Restored As Follows:



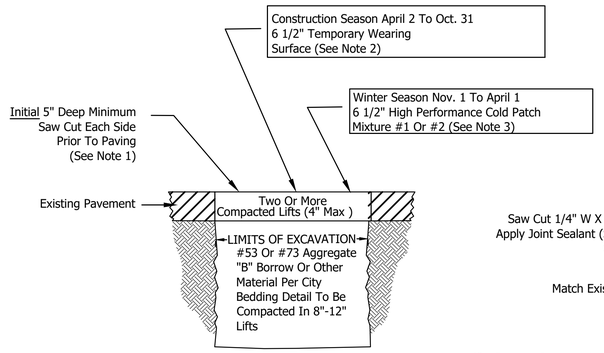
1. New Pavement Areas Shall Not Have Gaps Of Less Than 100 Feet. Minimum Length Of New Pavement Shall Be 50 Feet.
2. The City's Consulting Engineer Shall Have The Authority To Negotiate A Payment From The Utility Company In Lieu Of Resurfacing. The Payment Shall Be Based Upon The Unit Price For Asphalt From The City's Most Recent Resurface Contract And The Area That Would Have To Be Resurfaced According To This Standard. The Payment Shall Be Prorated According To The City's Resurfacing Schedule At A Rate Of 10% Per Year. For Example, If The Street Is Scheduled To Be Resurfaced In One Year, Only 10% Will Be Charged, In 2 Years Only 20%, Etc. This Payment Option Shall Not Apply To Recently Resurfaced Streets.

CITY OF DELPHI
METHOD FOR REPLACING MULTIPLE CUTS

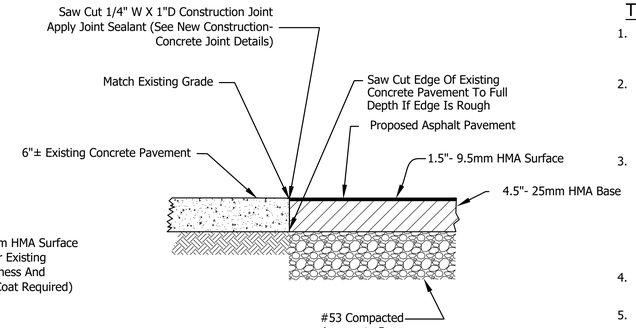


CONCRETE PAVEMENT REPAIR

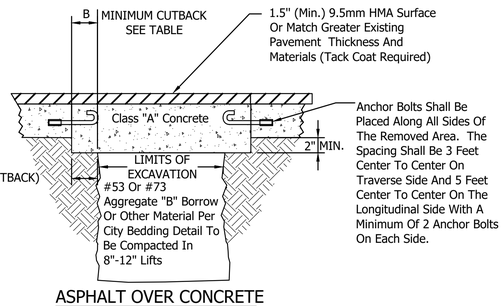
FINAL CUTBACK TABLE	
B	TRENCH WIDTH
6"	3'-0" Or Less
9"	3'-1" To 5'-0"
12"	5'-1" Or Greater



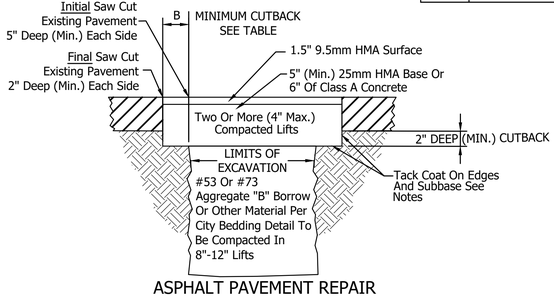
TEMPORARY ASPHALT REPAIR
Not To Scale



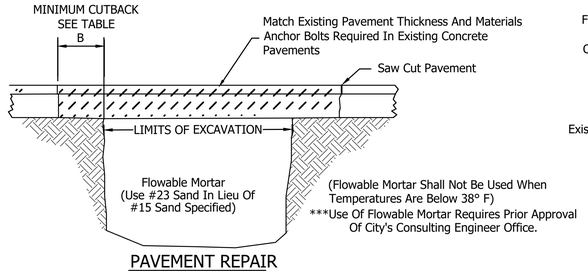
BUTT JOINT DETAIL
Not To Scale



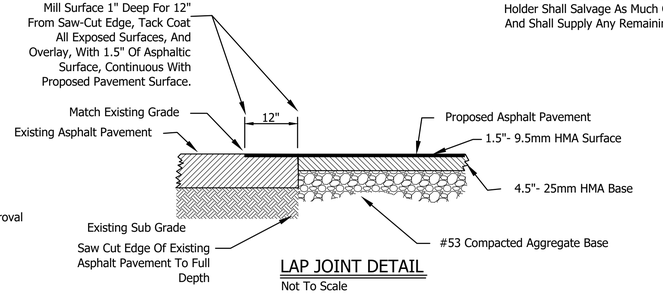
ASPHALT OVER CONCRETE
PAVEMENT REPAIR



ASPHALT PAVEMENT REPAIR



PAVEMENT REPAIR
WITH FLOWABLE MORTAR BACKFILL



LAP JOINT DETAIL
Not To Scale

PERMANENT PAVEMENT RESTORATION
Not To Scale

PAVEMENT RESTORATION NOTES

GENERAL:

1. Maintenance Of Any Street Restoration Or Repair Shall Be The Responsibility Of The Individual Utility Or Developer Authorized To Make Such Repair Until The Street Has Been Resurfaced.

PERMANENT PAVEMENT RESTORATION:

1. Permanent Restoration Shall Commence Immediately Upon Completion Of Utility Work And Be Complete Within (10) Working Days Unless The City's Consulting Engineer Office Grants A Longer Period. Request For Extension Shall Be In Written Form And Accompanied With A Repair Schedule, Inventory Of Existing Temporary Restorations, And Statement Indicating The Reason(s) For The Extension.
2. Existing Pavement Saw Cuts Shall Be In Straight Lines And Are Perpendicular To The Curb (Where Possible). Edges Of Broken Pavement Shall Be Squared Off To Provide Neat Edge For Paving.
3. Asphalt Shall Be Placed Using Professional Means To Establish A Hard, Smooth, Even Graded Surface. Compaction Shall Center. All Rolling And Tamping Operations Shall Be Completed Prior To Asphalt Cooling To Below 180°F. With The Roller Traveling Parallel To The Centerline Of The Pavement Beginning At Each Edge And Working Toward The Hand With Mechanical Compaction Equipment Upon Prior Approval Of The City. All Courses Shall Be Initially Rolled Be Done Thoroughly And Uniformly By A Machine Roller. Areas Too Small For Machine Rolling Shall Be Compacted By Hand With Mechanical Compacting Equipment Upon Prior Approval Of The City.
4. Prior To Tack Coating Subbase And Edges, The Existing Surface Shall Be Free Of Irregularities To Provide A Reasonably Smooth And Uniform Surface To Receive Treatment. The Edges Of Existing Pavement Shall Be Cleaned To Permit Adhesion. Tack Coat Shall Not Be Applied To Wet Surfaces Or When The Air Temperature Is Below 45°F. Tack Coat May Be Rolled, Brushed Or Mopped. All Excess Tack Coat Shall Be Squeegeed From The Surface.
5. All Pavement Restoration Materials To Be Per INDOT "Standard Specifications", Latest Edition.

TEMPORARY PAVEMENT REPAIR:

1. Existing Pavement Initial Saw Cut To Be 5" Minimum Depth To Obtain Straight Lines Perpendicular From The Curb Edge And Neat Edge For Paving. Edges Of Broken Pavement Shall Be Squared Off And Trimmed To Neat Straight Lines.
2. Temporary Pavement Material Is To Be 6 1/2 Inches Thick Hot Mix Asphalt. Asphalt Cold Patch, Bag Asphalt And Crush Stone Are Unacceptable For Use. The Use Of Steel Street Plates Must Be Requested In Written Form And Accompanied With A Repair Schedule, Inventory Of Existing Temporary Restorations, And Statement Indicating The Reason(s) For Use Of Plates.
3. During Winter Season When The Permanent Patch Cannot Be Completed Within 10 Working Days (November 1 Thru April 14), If Hot Mix Asphalt Is Not Available, Use INDOT Approved "High Performance Cold Patch" Or Equal INDOT Approved Material.
   High Performance Cold Patch Mixture #1 (UPM), Is For Use In Wet And Cold Conditions And Workable At Temperatures As Low As -15°F.
   High Performance Cold Patch Mixture #2 (CM300), Is For Use In Wet And Cold Conditions And Workable At Temperatures As Low As 32°F.
4. All Materials Are To Be Compacted To Form A Firm And Smooth Transition Between Old And New Surface Grade. Do Not Apply Hot Mix Asphalt On A Wet Surface.
5. Upon Completion Of Backfilling, Temporary Pavement On Streets Shall Be Place By The End Of Work Day.
6. Temporary Street Restoration Is Intended To Be An Interim Measure Until Conditions Allow For Permanent Restoration Of The Street. The City Realizes That At Times, Temporary Restoration Is Necessary, Such As, During The Winter Season When The Asphalt Plants Are Closed And When Freezing Temperatures Make Permanent Restoration Not Feasible Or When Permit Work Precedes City Street Reconstruction Or Rehabilitation Permit Holders Are To Minimize The Use Of Temporary Restorations When Possible. Any Work Undertaken Before November 1 Shall Be Permanently Restored Before The Fall Asphalt Plant Closings. Only Work Undertaken On Or After November 1 May Be Carried Over To Permanent Restoration In The Following Spring Season All Temporary Restoration Placed During The Winter Season Must Be Permanently Restored Within Four (4) Weeks Of Spring Asphalt Plant Openings, But No Later Than May 15th. The City's Consulting Engineer Office May Grant Extensions Beyond May 15th For Permanent Restorations When Requested In Writing And Accompanied With A Repair Schedule, Inventory Of Existing Temporary Restorations, And Statement Indicating The Reason(s) For The Extension

SPECIAL SURFACE STREETS:

1. Any Special Surfaces Shall Be Restored In-kind. For Example. Brick Surface Streets Require All Pavement Cuts To Be Restored With Brick. Cobblestone Surface Streets Must Be Restored With Cobblestone. Permit Holder Shall Salvage As Much Of The Existing Brick Or Cobblestone As Possible For Reuse In The Restoration And Shall Supply Any Remaining Material Required For The Restoration.

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. LIMING REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — DATE 12/12/2023

APPROVED: Ramon Yates, CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — DATE 01/15/2024

CITY OF DELPHI

PAVEMENT REPAIR & RESTORATION
TYPICAL SECTIONS AND NOTES

SHEET 06 OF 20

WATER MAIN MATERIALS

1.) All Pipe Provided For Use In The City Of Delphi Water System Shall Be Of U.S. Production Manufactured By American, U.S. Pipe, Or City Approved Equal. All Fittings Provided For Use In The City Of Delphi Water System Shall Be Of U.S. Production Manufactured By Clow, Tyler, American, Or As Approved By Delphi DPW. Tracer Wire Is Required On All Water Lines.

2.) All Watermain Pipe 8" And Larger Shall Be Ductile Iron. Water Main Pipe 6" And Smaller May Be C900 Material. City Will Review Requests For Alternate Materials On A Case By Case Basis.

3.) Ductile Iron Pipe For Water Mains Shall Be Centrifugally Cast And Shall Conform To The Latest Revision Of ANSI A21.5 And AWWA C151. Ductile Iron Pipe With Push-On Or Mechanical Joints Shall Be Special Thickness Class 50. The Pipe Shall Be Provided With A Minimum Laying Length Of 18 Feet.

4.) Ductile Iron Fittings 3 Inches Through 48 Inches Shall Conform To The Latest Revision Of ANSI A21.10 And AWWA C110. Ductile Iron Compact Fittings 3 Inches Through 16 Inches Shall Conform To The Latest Revision Of ANSI A21.53 And AWWA C153. Fittings In, And Within 2 Feet Of, Structures Shall Be Flanged. All Other Fittings Shall Be Mechanical Joint Type.

5.) Ductile Iron Pipe Coatings Shall Conform To The Latest Revision Of ANSI A21.51, AWWA C151, ANSI A21.4, And AWWA C104. Interior Pipe Lining Shall Be Cementious Mortar With Asphaltic Seal Coat. Exterior Pipe Coating Shall Be Standard Asphaltic Coating, Except Exposed Piping Within Structures Shall Receive Shop Priming Compatible With Finish Coat.

6.) Mechanical Joints And Accessories Shall Conform To The Latest Revision Of ANSI A21.10 And AWWA C110. Rubber Gaskets Shall Be Vulcanized Synthetic Rubber And Shall Conform To The Latest Revision Of ANSI A21.11 And AWWA C111.

7.) Flanged Joints Shall Conform To The Latest Revision Of ANSI A21.15 And AWWA C115. Rubber Gaskets Shall Be Either Ring Or Full Face And Shall Be 1/8" Thick. Bolts And Nuts Shall Conform To ANSI B18.2.1 And ANSI B18.2.2.

8.) Push-On Joints Shall Conform To The Latest Revision Of ANSI A21.11 And AWWA C111. Rubber Gaskets Shall Be Vulcanized Synthetic Rubber And Shall Conform To The Latest Revision Of ANSI A21.11 And AWWA C111.

9.) Service Tubing To Customer Shall Be Polyethylene Pipe With Tracer Wire For 3/4" Through 2" For Underground Service, Conforming To ASTM B88, ASTM B251, And AWWA C800. Pipe Shall Be Marked With The Manufacturer's Name Or Trademark And Mark Indicative Of The Type Of Pipe. Outside Diameter Of The Pipe And Minimum Weight Per Foot Of Pipe Shall Not Be Less Than Listed In ASTM B251, Table II.

10.) Gate Valves Shall Be In Accordance With AWWA C515 Having Fused Epoxy Coating Inside And Outside Assembled With S.S. Bolts And Shall Be American Flow Control Series 2500. Consult Delphi DPW For Valves Larger Than 16 Inches. Valves Shall Pass A 250 PSI Factory Test. Valve Boxes Shall Be Furnished With Posi-Caps To Align Box Over Stem.

WATER MAIN PRESSURE AND LEAKAGE TESTING

1.) The City Of Delphi Shall Be Given 24 Hour Written Notice Of The Required Pressure And Leakage Test To Be Performed By The Contractor. The Pressure And Leakage Test Shall Be Performed In Accordance With The Basic Provisions Of AWWA C600. The Testing Procedure Shall Assume A 100 PSIG Working Pressure. The Test Pressure Shall Not Be Less Than 1.25 Times The Working Pressure At The Highest Point Along The Test Section But Not Less Than 1.5 Times The Assumed Working Pressure At The Point Of Testing. Test Pressure Shall Not Exceed Pipe Or Thrust Restraint Design Pressures Or Rated Pressure Of The Valves. The Test Pressure Shall Not Vary By More Than +5 PSI For The 2 Hour Test Duration.

2.) Valves Shall Not Be Operated In Either Direction At Differential Pressures Exceeding The Rated Valve Working Pressure.

3.) The Pressure And Leakage Test Shall Be Performed Following The General Form Of The Following:

A. Record Time And Line Pressure Prior To Start Of Test.

B. Pump Water Into New Main Until Pressure Reaches 150 PSIG, Stop Pumping When Pressure Reaches 150 PSIG, Record Time And Line Pressure.

C. Contractor Shall Remain At Site For One Hour. The Test Shall Be Voided If Any Adjustments Are Made To The Main, Test Equipment, Or Appurtenances. Tightening Of Fittings On Test Equipment Is Allowed. Following The One Hour Period, Record Time And Line Pressure.

D. Pump Water Into New Main From A Calibrated Container Of Water Until Pressure Reaches 150 PSIG, Stop Pumping When Pressure Reaches 150 PSIG, Record Time, Line Pressure, And Amount Of Water Pumped To The Nearest 1/100 Gallon. The Calibrated Container Shall Have Markings At 1/10 Gallon Increments.

E. Repeat Steps C And D One Additional Time.

4.) A Test Section Of Water Main Is Considered Satisfactory If It Meets The Following:

Main Size (Inches)	Allowable Leakage (Gal./Hr./1000 Ft.)
6	0.50
8	0.66
10	0.83
12	0.99
16	1.32

5.) If The Leakage From A Test Section Is Greater Than Permitted Under These Specifications, The Contractor Shall Locate And Repair The Defective Joints, Mains, And Appurtenances. The Pressure And Leakage Test Shall Then Be Repeated Until Satisfactory Results Are Obtained. All Labor And Materials Required To Meet The Requirements Of The Pressure And Leakage Test Shall Be At The Expense Of The Contractor.

WATER MAIN GENERAL NOTES AND AS-BUILT DRAWINGS

1.) Provide A Valve On All Runs And Branches Per The Connection Details On Sheet 12 Of The Delphi Standards Even When Such Runs Or Branches Are Stubs For Future Extension.

2.) Storm Pipe Conflicts Require Special Attention In That Proposed Water Mains Shall Pass Over Proposed Mainline Storm Pipe. Such Situations May Require Upsizing Of Downstream Storm Pipes To Enable Flatter Slopes To The Point Of Conflict Such That 30 Inch Minimum Cover Is Maintained Over The Water Main. Vertical Water Main Fittings Shall Not Be Used. All Water Main Crossings Of Storm Pipe Shall Be Shown On Storm Sewer Profiles. When It Is Necessary To Decrease Water Main Cover To Less Than 54 Inches, Inlet Pipes That May Conflict With The Water Main Shall Be Laid At Such Slope To Pass Below The Water Main.

3.) Water Mains Shall Follow The Alignment Of The Road ℄ And Shall Remain 3½ Feet Behind The Back Of Curb On One Side Of The Street Without Alternating From Such Side.

4.) All Water Pipe Shall Be Installed In Accordance With AWWA C600 And With A Minimum Depth Of Cover Of 54 Inches, Except As Provided By General Note No. 2.

5.) Terminate Dead End Mains With A Mainline Valve Followed By A Fire Hydrant Assembly. For Cul-De-Sacs, Eliminate Hydrant Assembly Tee And Terminate With 6" Valve And Fire Hydrant. As Directed Or Approved By The Delphi DPW, Terminate Temporary Dead End Mains With A #2 Eclipse Post Hydrant With Tamper-Proof Options And Provide #492 Tamper-Proof Wrench With A Brass Street Elbow, Brass Nipple, Mueller B20283 Ball Curb Valve With Box, And A Brass Nipple Tapped Into Restrained Cap. See Development Standard DS-W05.

6.) Unless Unavoidable As Determined By Delphi Water, Double Tees Shall Not Be Permitted. Utilize A Cross At Intersection Of Four Water Mains With Cross Sized To Match The Largest Pipe.

7.) See Development Standard DS-W01 For Water Main Abandonment Procedure.

8.) As-Built Drawings Shall Be Submitted To Delphi Water. GPS Collected Coordinates Shall Depict Actual Horizontal And Vertical Locations Of Utility Assets Such As: System Valves, Hydrants, Blow-Offs, Air Release Valves, And Master Meters.

WATER MAIN DISINFECTION, BACTERIOLOGICAL TESTING

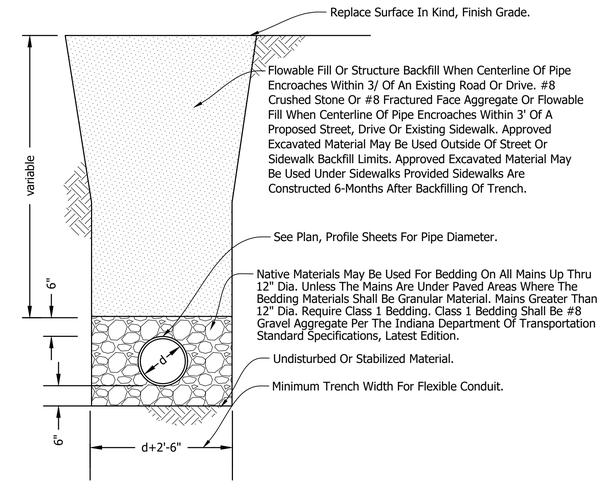
1.) The City Of Delphi Shall Be Given 24 Hour Written Notice Of The Required Disinfection, Flushing And Testing Procedures To Be Performed By The Contractor. All Newly Installed Water Mains Shall Be Disinfected In Accordance With ANSI/AWWA C-651. Liquid Chlorine, High-Test Calcium Hypochlorite (70 Percent Chlorine), Or High-Test Sodium Hypochlorite (14.7 Percent Chlorine) May Be Used To Provide An Initial Minimum Concentration Of 25 mg/L Of Free Chlorine In All Newly Installed Mains.

2.) A Minimum Concentration Of 10 mg/L Of Free Chlorine Shall Be Maintained In All Parts Of The Newly Installed Mains For 24 Hours Of Contact Time.

3.) Following The Initial 24 Hour Contact Time But Prior To 48 Hours Of Contact Time, All Treated Water Shall Be Properly Dechlorinated And Thoroughly Flushed From The Newly Laid Pipe At Its Extremity Until The Replacement Water Has A Chlorine Residual Of Less Than 1 mg/L.

4.) After Flushing, Water Samples Collected On Two Successive Days From The Treated Piping System, As Directed By The City Of Delphi, Shall Show Satisfactory Bacteriological Tests. Following Satisfactory Bacteriological Tests, Contractor Shall Submit 2 Copies Of The Results To Delphi DPW And To IDEM Drinking Water Branch.

5.) The Taking Of Samples And The Testing Of Chlorine Residual Shall Be Carried Out By The Contractor At The Direction Of The City Of Delphi.

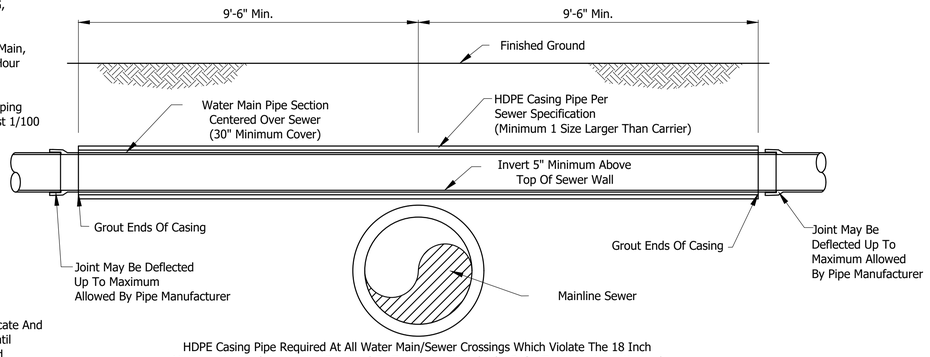


D.I. PIPE BEDDING TABLE		
Pipe Size (in)	Bedding Depth Below Barrel (in)	Cubic Yards Of Bedding Per Foot Of Pipe (cys/ft)
4	4	0.038
6	4	0.053
8	4	0.070
10	4	0.088
12	4	0.108
14	4	0.131
16	5	0.164
18	5	0.191
20	6	0.230
24	7	0.306
30	8	0.432

Note:
Bedding Is Still Required Where Pipe Requires Structural Backfill (Flowable Fill, Coarse Aggregate No. 8, Etc.)

DI PIPE BEDDING DETAIL

Scale: None



HDPE Casing Pipe Required At All Water Main/Sewer Crossings Which Violate The 18 Inch Minimum Vertical Separation Required By Ten States Standards. Refer To Water Main General Notes.

SPECIAL SEWER CONFLICT TREATMENT

Scale: None

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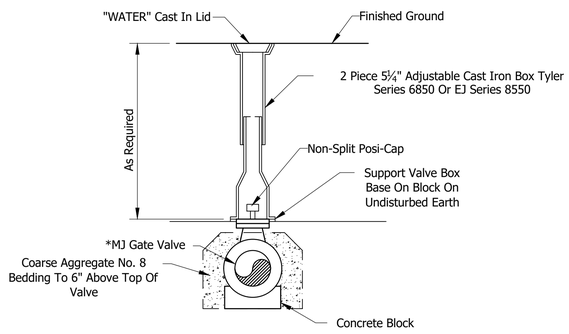
APPROVED: Kamron Gates, CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — 01/15/2024 DATE

CITY OF DELPHI & DELPHI REDEVELOPMENT COMMISSION

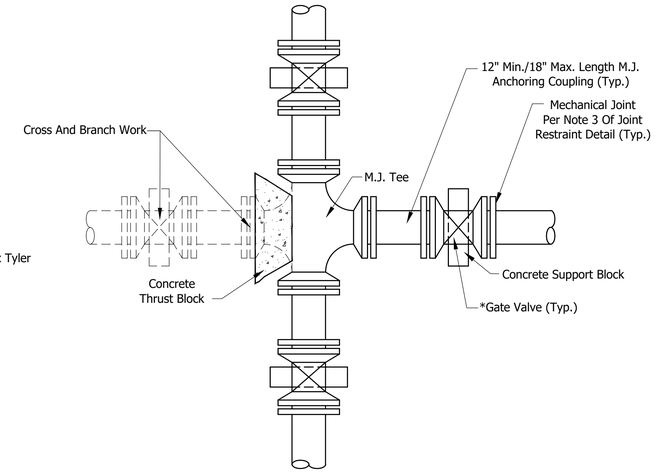
WATER MAIN BEDDING DETAILS AND NOTES

SHEET 07 OF 20



TYPICAL VALVE INSTALLATION DETAIL

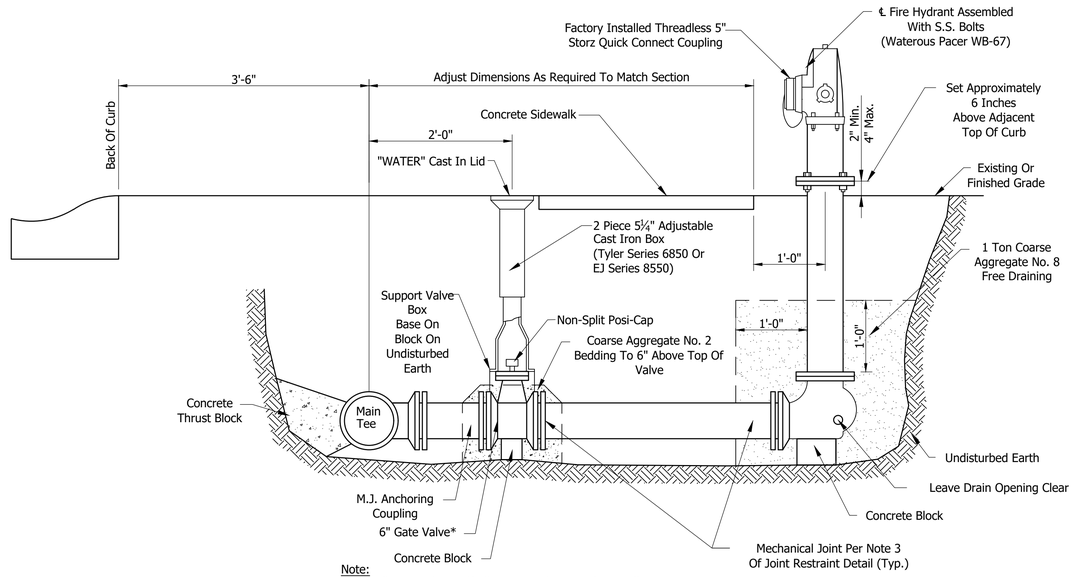
Scale: None



See Reference For Tapping Sleeve And Valve Connection, Cutting-In Sleeve And Tee Connection, And Procedures For Abandonment Of Water Mains.

STANDARD NEW WORK BRANCH CONNECTION

Scale: None

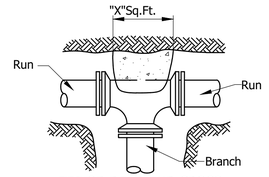


Note:
1. All Fire Hydrants Shall Be Painted Fire Hydrant Yellow.
2. A Minimum 5-Foot Clear Zone Radius Around Hydrants Shall Be Maintained. No Permanent Above Grade Improvements Shall Be Permitted Within The Clear Zone. Improvements Include, But are Not Limited To, Structures, Fences, Posts, Signs, Mailboxes, Trees And Landscaping Features.

TYPICAL HYDRANT INSTALLATION DETAIL

Scale: None

* All Gate Valves Shall Be American Flow Control Series 2500 Assembled With Factory Installed Stainless Steel Bolts & With Coarse Aggregate No. 8 Bedding To 6" Above Top Of Valve.



TEE OR DEAD-END CROSS

MINIMUM LENGTH OF RESTRAINED JOINT D.I. PIPE (WITHOUT POLY WRAP) EACH SIDE OF FITTING (FEET)				
PIPE SIZE	6"	8"	12"	16"
Tee Including Thrust Block (See Note 4)	15	20	28	36
Horizontal 90° OR Vertical 45° Down	15	20	28	36
Horizontal 45° OR Vertical 22½° Down	6	8	11	15
Horizontal 22½° Or Vertical 11¼° Down	3	4	6	7
Horizontal 11¼°	2	2	3	3
Dead End	27	35	50	65

NOTES:

1.) Length Of Restraint Measured From Centerline Of Fitting Requiring Restraint. Length Of Restraint For Vertical Bends Up Are Equal To That For Horizontal Bends.

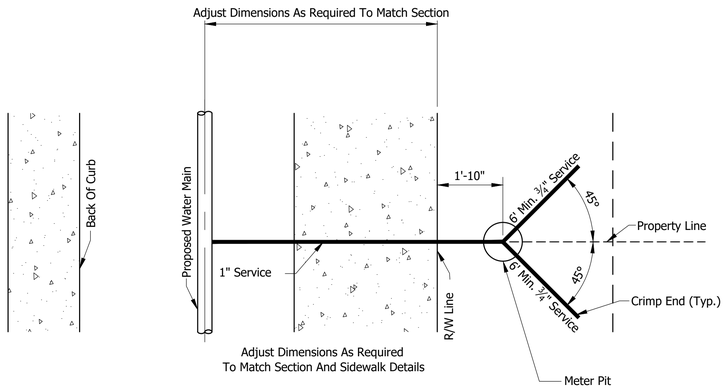
2.) Length Of Restraint Based Upon 4'-6" Cover, 150 PSI Pressure, And ASTM D2487 Soil Types CL, ML, SC, SM, SP, SW, GC, GM, GP, & GW. For Less Cover, Higher Pressure, Or ASTM D2487 Soil Types PT, OH, CH, MH, & OL, Consult Delphi DPW.

3.) Restraint To Be Accomplished With Field-Lok Gasket As Manufactured By U.S. Pipe Or Fast-Grip Gaskets As Manufactured By American For Push-On Joints, Anchoring Coupling For Valves And Adjacent Tees, Romac Grip Ring For All Mechanical Joints, Or As Approved By Delphi Water. Romac Grip Ring May Be Deleted On The Runs Of Hydrant Tees Unless A Mainline Valve Is Within 18 Feet Of The Hydrant Tee Or Unless Hydrant Tee Is Within Another Fitting's Restraint Length. All Restraints Shall Be Of U.S. Production.

4.) Tees And Dead-End Crosses Require Concrete Thrust Blocks In Addition To Branch Restraint Length, "X" Area For Concrete Thrust Blocks Per Detail Shall Be As Follows; 2, 4, 6, And 10 Square Feet For 6, 8, 12, And 16 Inch Pipe, Respectively. Other Than Restraint Of MJ Fittings Adjacent To Tee, No Run Restraint Length Is Required.

JOINT RESTRAINT DETAIL

Scale: None



TYPICAL DUAL METER SETTING DETAIL

Scale: None

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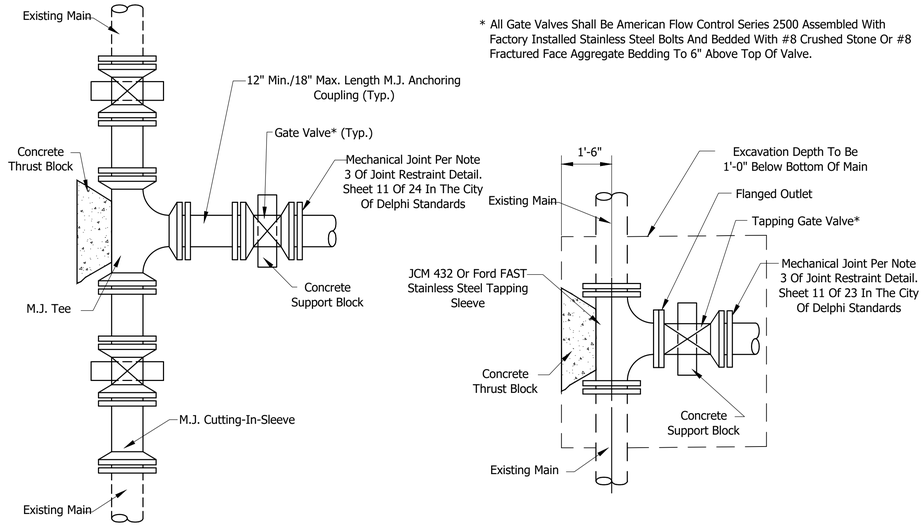
APPROVED: CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT Kamron Gates — DATE 01/15/2024

CITY OF DELPHI & DELPHI REDEVELOPMENT COMMISSION

WATER MAIN DETAILS AND NOTES

SHEET 08 OF 20

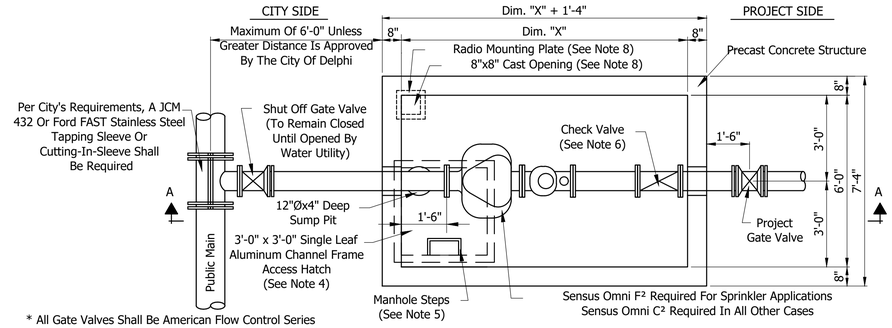


CUTTING-IN-SLEEVE AND TEE CONNECTION

Not To Scale

TAPPING SLEEVE AND VALVE CONNECTION

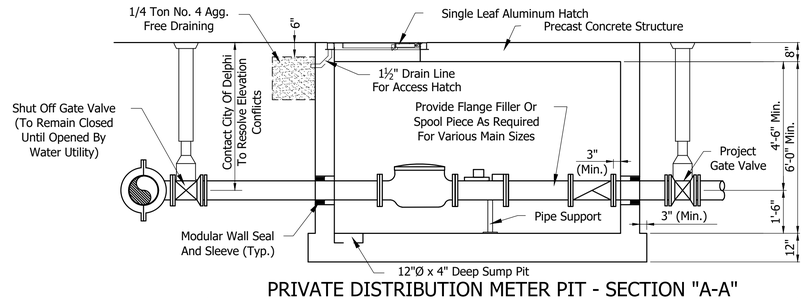
Not To Scale



* All Gate Valves Shall Be American Flow Control Series 2500 Assembled With Factory Installed Stainless Steel Bolts.

PRIVATE DISTRIBUTION METER PIT - PLAN

Not To Scale



PRIVATE DISTRIBUTION METER PIT - SECTION "A-A"

Not To Scale

	4" COMPOUND	6" COMPOUND	8" COMPOUND
Dim. "X"	8'-0"	8'-0"	10'-0"

1.) Provide Minimum #4 Rebars On 12" Centers, Each Way In Top, Bottom, And All Sides.
2.) All Labor And Materials To Be Provided By The Developer.
3.) Piping, Valves, Double Detector Check Valve Assembly, And Meter Shall Be Same Size Throughout. Other Than Dim. "X", Meter Pit Dimensions Shall Be Maintained For 4", 6", and 8" Mains.
4.) Access Hatch Shall Be On Meter Side Of Pit And Shall Be Bilco Model J-4AL With Drain Coupling Or As Approved By City Of Delphi.
5.) Manhole Steps Shall Be Neenah R-1981-J, M.A. Industries PS-1-PF, Or As Approved By City Of Delphi.
6.) Check Valve Shall Be Bronze Seated And Shall Be Provided With Bolted Covers For Easy Access To The Discs. Valve Shall Be Outside Adjustable Weight And Lever As Mueller A-2600-6-01, Kennedy/Clow 1106LW, Or As Approved By The City Of Delphi.
7.) Piping In And Within 2 Feet Of Meter Pit Shall Be Class 53 Flanged Ductile Iron Pipe. Transition To Class 50 At A Mechanical Joint.
8.) Provide 1/4"x12"x12" Steel Plate, Paint Plate With 5 Mils DFT Tnemec 74-ANSI No. 61 Gray Over 3 Mils DFT Tnemec 90-97 Primer. Center Plate Over 8"x8" Opening. Secure Plate With Four 1/4"Ø 304 S.S. Anchor Bolts, Nuts, And Washers.

WATER MAIN MATERIALS

1.) All Pipe Provided For Use In The City Of Delphi Water System Shall Be Manufactured By American, Griffith, U.S. Pipe, Or As Approved By City Of Delphi. All Fittings Provided For Use In The City Of Delphi Water System Shall Be Manufactured By Clow, Tyler, American, Or As Approved By City Of Delphi.

2.) Service Tubing To Customer Shall Be Copper Water Tube, Type K, Soft Temper For 3/4" Thru 2" For Underground Service, Conforming To ASTM B88, ASTM B251, And AWWA C800. Pipe Shall Be Marked With The Manufacturer's Name Or Trademark And Mark Indicative Of The Type Of Pipe. Outside Diameter Of The Pipe And Minimum Weight Per Foot Of Pipe Shall Not Be Less Than Listed In ASTM B251, Table II.

WATER MAIN ABANDONMENT PROCEDURES

1.) In Cases Where An Existing Main Line Is To Be Abandoned, The Abandonment Shall Include The Complete Removal Of The Tee & Replacement With Sleeve And Pipe As Required.

2.) In Cases Where An Existing Service Line Is To Be Abandoned, The Abandonment Shall Include The Complete Removal Of The Service Line To Corporation Stop & Placement Of A Brass Cap At The Stop.

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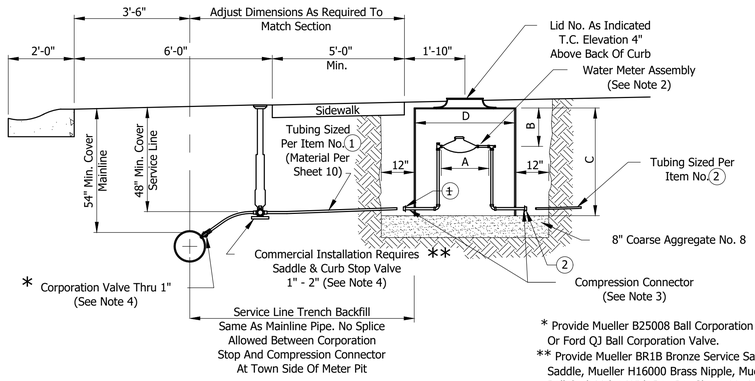
CITY OF DELPHI & DELPHI REDEVELOPMENT COMMISSION

WATER (W) DEVELOPMENT STANDARDS

SHEET 09 OF 20



* Provide Mueller B25008 Ball Corporation Valve Or Ford QJ Ball Corporation Valve.

** Provide Mueller BR1B Bronze Service Saddle, Ford Saddle, Mueller H16000 Brass Nipple, Mueller B20283 Ball Curb Valve With Box Per Sheet 11, And Mueller H15428 Straight Coupling. (Level Tap)

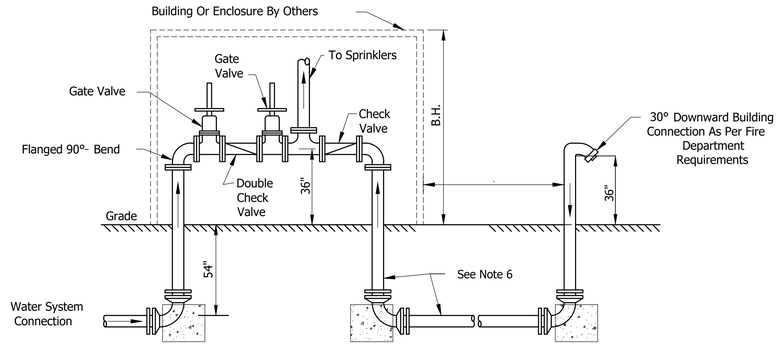
TYPICAL METER SETTING DETAIL

Not To Scale

	RESIDENTIAL		COMMERCIAL		
	SINGLE 5/8"x3/4"	DUAL 5/8"x3/4"	SINGLE 1"x1"	SINGLE 1½"x1½"	SINGLE 2"x2"
Mueller Part No.	203RS1846FSBS000688N	203RD2146FSBS000688N	--	--	--
Ford Part No.	PSBHH-244-95509-002-NL	PDSBHH-244-95512-002-NL	PSBHH-444-95513-001-NL	PFBHH-688-95455-124-NL	PFBHH-788-95455-009-NL
Dim A	7.5"	7.5"	10.75"	17.25"	17.25"
Dim B	10"	10"	10"	10"	10"
Dim C	36"	36"	36"	36"	36"
Dim D	20"	20"	20"	20"	20"
Ford Lid No.	A32-C-REC463-T	A4-C-REC463-T	A4-C-REC463-T	MC-36-T	MC-36-T
Vestal Lid No.	32-389	32-434	32-434	32-256/049	32-256/049
(1)	¾" Compression	1" Compression	1" Compression	2" Compression (See Note 4)	2" Compression
(2)	¾" Compression	¾" Compression	1" Compression	2" Compression (See Note 4)	2" Compression

METER SETTING NOTES:

1.) Residential Construction Requires The Use Of Dual Meter Installations Whenever Possible. The Meter Box Shall Not Be Installed In A Driveway.
2.) Water Meter Assembly Shall Consist Of Sensus 5/8" Meter, Yoke Valve On The Supply Side Of The Meter, And Ames LF2000B Double Check Assembly On The Customer Side Of The Meter. Meters For Residential Use Provided By The City, All Other Meters, Regardless Of Use, Provided By User.
3.) The Contractor Shall Make All Tubing Connections Utilizing Mueller Or Ford Quick Compression Connectors.
4.) Tubing May Be Used 1½" Or 2" For Such 1½" Meter. Provide Reducing Fittings As Required.
5.) Residential Meters Require A Radio Read System. Commercial Meters And Radios Are Not Provided By The City.
6.) See Development Standards For Private Distribution Meter Pit And Procedures For Abandonment Of Service Lines.
7.) Meter Lid Adjustment Shall Be Accomplished With Adjusting Rings Manufactured by Ford. The Maximum Adjustment Shall Be 4 Inches.



TYPICAL FREE STANDING SPRINKLER CONNECTION

Not To Scale

NOTES:

1.) The Connection Shall Be Within 150', As Measured On A Paved Roadway, Of A Fire Hydrant Supplied By The Public Water Main. The Connection And Hydrant Location Shall Be Such That From The Hydrant To A Fire Department Pumper, And From The Pumper To The Free Standing Sprinkler Connection, Access To Premises Will Not Be Blocked.
2.) Underground Pipe Shall Be Designed And Constructed As Required For An Underground Fire Main Using NFPA 24. Design Shall Allow For Water To Drain After Use.
3.) The Free Standing Sprinkler Connection Shall Be A Double 2½" Siamese Connection With Female End Coupler And Integral Gate Valve.
4.) The Free Standing Sprinkler Connection Shall Be Painted Red, And Labeled "SPRINKLER CONNECTION" Or "STANDPIPE CONNECTION" With The Address Served Displayed.
5.) Where The Connection Is Subject To Vehicular Damage, The Connection Shall Be Protected. Protection Components Shall Not Be Closer Than 36" To The Connection And Shall Not Interfere With The Operation Of The Connection.
6.) Fire Department Connection (FDC) Pipe Diameter Shall Not Be Reduced At Any Point In The FDC Line From The Point Of Connection At The Base Of The Sprinkler/Standpipe Riser (BOR) To The Point Of Attachment Of The Double 2½" Siamese Connection Ports.

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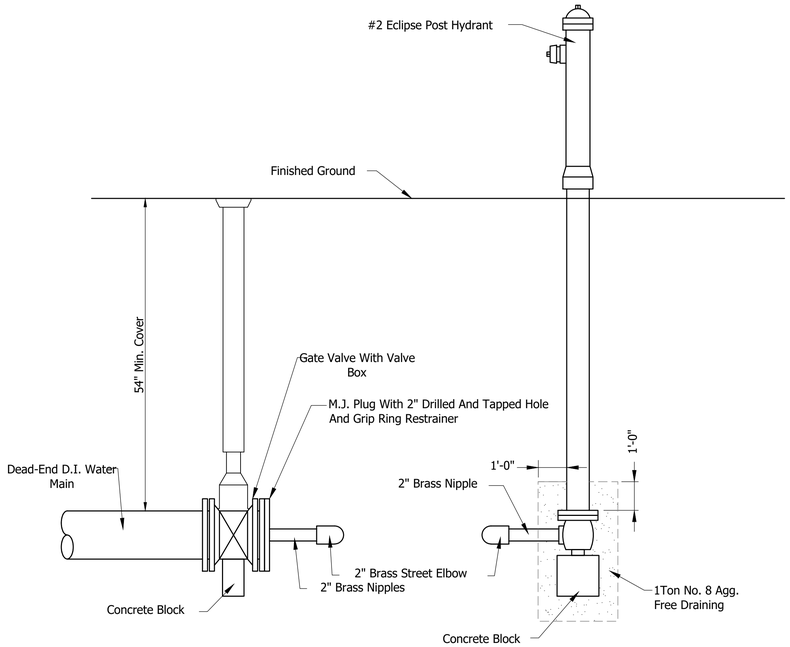
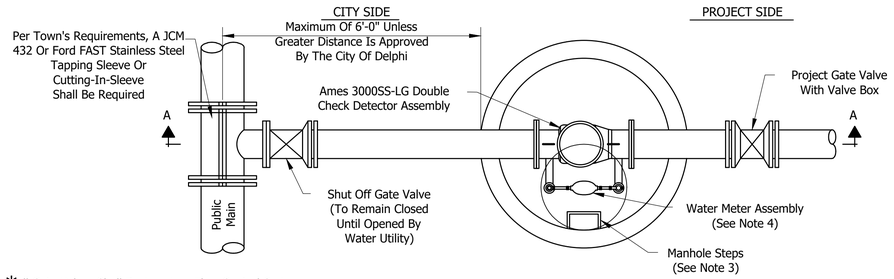
CITY OF DELPHI & DELPHI REDEVELOPMENT COMMISSION

WATER (W) DEVELOPMENT STANDARDS



TEMPORARY DEAD-END WATER MAIN TERMINATION DETAIL

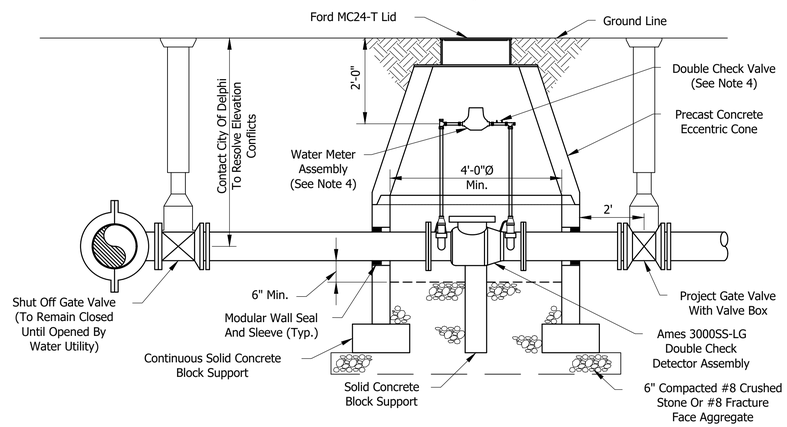
Not To Scale



*All Gate Valves Shall Be American Flow Control Series 2500 Assembled With Factory Installed Stainless Steel Bolts.

FIRE PROTECTION METER VAULT - PLAN

Scale: $\frac{3}{8}$" =1'-0"



FIRE PROTECTION METER VAULT - SECTION "A-A"

Not To Scale

1.) All Labor And Materials including Meters And Radios To Be Provided By The Developer.
2.) Piping, Valves, Double Detector Check Valve Assembly, And Meter Shall Be Same Size Throughout. Meter Pit Dimensions Shall Be Maintained For 4", 6", And 8" Mains.
3.) Manhole Steps Shall Be Neenah R-1981-J, M.A. Industries PS-1-PF, Or As Approved By City Of Delphi.
4.) Water Meter Assembly Shall Consist Of Sensus IPERL 5/8" Meter, Yoke Valve On The Supply Side Of The Meter And Ames LF 2000B Double Check Assembly On The Customer Side Of The Meter.
5.) Piping In And Within 2 Feet Of Meter Pit Shall Be Class 53 Flanged Ductile Iron Pipe. Transition To Class 50 At A Mechanical Joint.
6.) Meter Lid Adjustment Shall Be Accomplished With Adjusting Rings Manufactured by Ford. The Maximum Adjustment Shall Be 4 Inches.
7.) All New Meters Are To Be Placed On The Exterior Of Structures At The Property Line Unless Otherwise Approved By The City.

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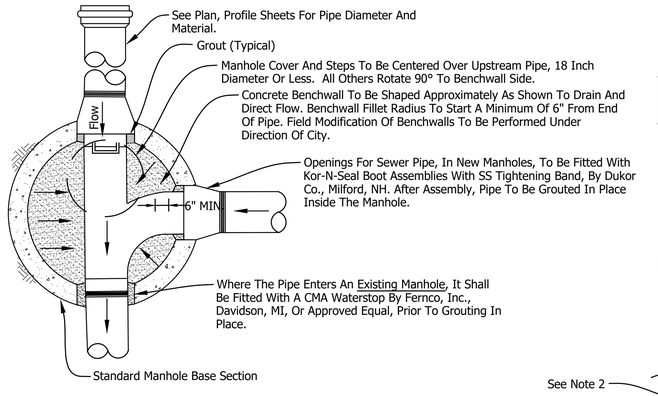
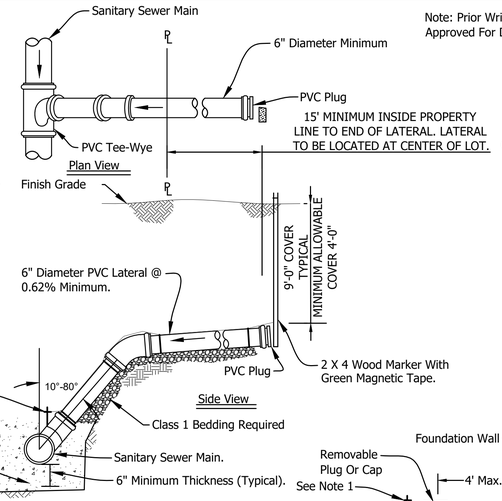
WATER (W) DEVELOPMENT STANDARDS



STANDARD SANITARY MANHOLE PLAN

Not To Scale

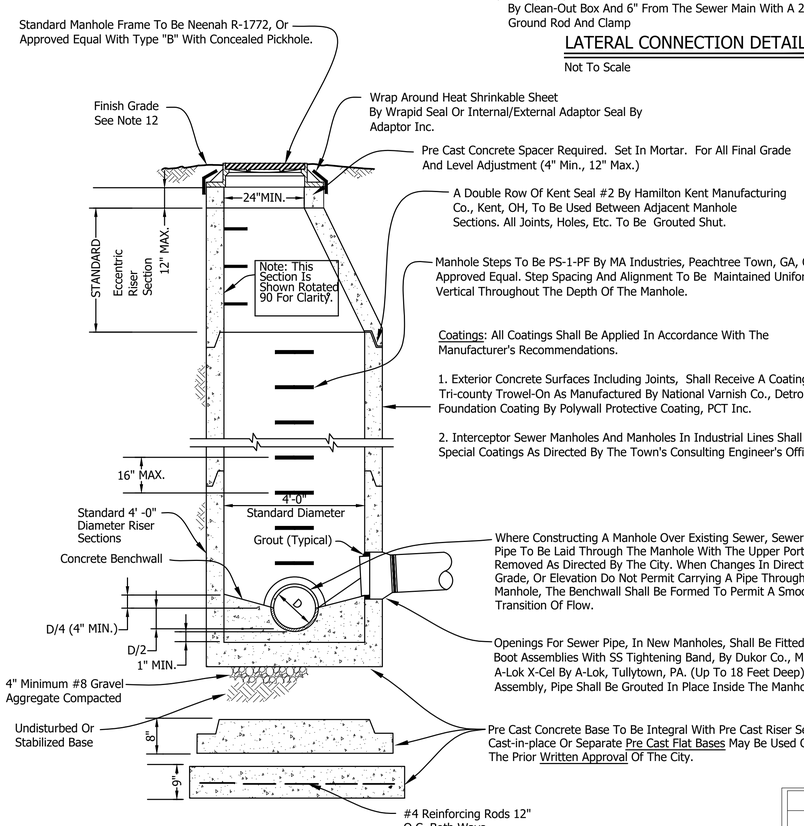


Notes:

1) Not To Be Used For Commercial Or Industrial Sanitary Lateral Connections
2) #10 (AWG) Tracer Wire Shall Be Attached To Pipe And Shall Terminate By Clean-Out Box And 6" From The Sewer Main With A 24" Long, 5/8" Ground Rod And Clamp

LATERAL CONNECTION DETAIL

Not To Scale



STANDARD SANITARY MANHOLE DETAIL

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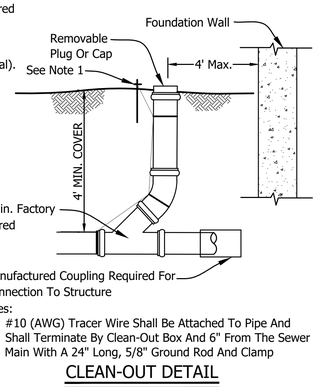


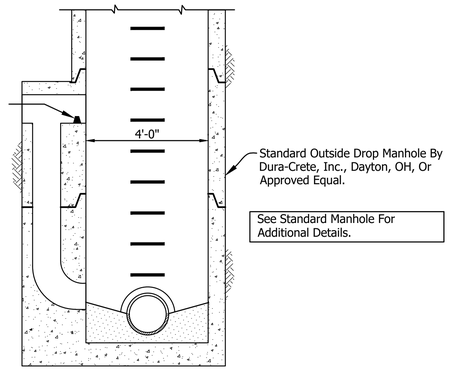
Notes:

1) #10 (AWG) Tracer Wire Shall Be Attached To Pipe And Shall Terminate By Clean-Out Box And 6" From The Sewer Main With A 24" Long, 5/8" Ground Rod And Clamp

CLEAN-OUT DETAIL

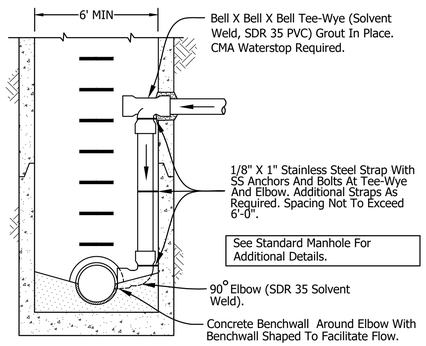
Not To Scale

Note: Prior Written Approval Of The City Is Required For Use Of A Drop Manhole. Drop Manholes Are Generally Not Approved For Drops Less Than 8 Feet.



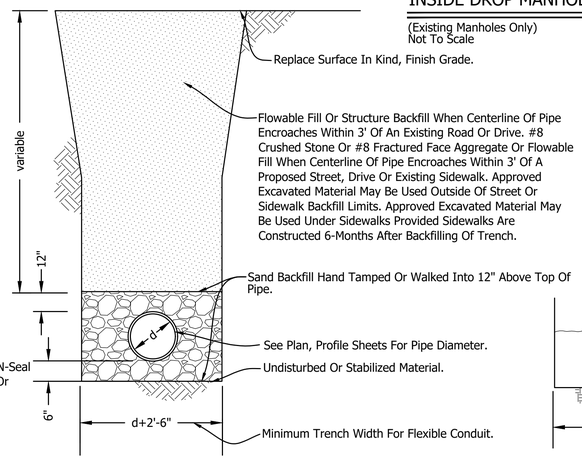
PRE CAST OUTSIDE DROP MANHOLE

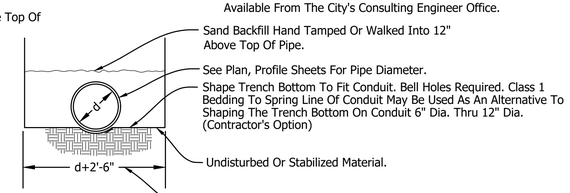
Not To Scale



INSIDE DROP MANHOLE DETAIL

(Existing Manholes Only)
Not To Scale





STANDARD BEDDING DETAIL

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SANITARY SEWER NOTES

1. Sanitary Sewers To Be Polyvinyl Chloride (PVC) SDR 35 Pipe And Shall Meet Or Exceed ASTM D-3034 Or ASTM 679 As Applicable. Joints Shall Be Gasketed, Bell And Spigot Type With The Bell Made Integral With The Pipe. See Plan, Profile Sheets For Sizes. Sanitary Sewers To Be SDR 26 Pipe For Depth 16' Or Greater.
2. Sanitary Sewer Laterals For House Connections Shall Be 6" Diameter PVC SDR 26 Conforming To ASTM D-3034, Laid At A Minimum Slope Of 0.62%. Ends To Be Plugged. Joints Shall Be Gasketed Bell And Spigot Type With The Bell Made Integral. Pipe Laterals Longer Than 150' Require A Cleanout.
3. Sanitary Laterals For Commercial, Industrial, Or Institutional Users Shall Be Made At Either An Existing Or New Manhole And Shall Utilize An Inside Drop Manhole Connection. For New Manholes, Include A 1' Sump To The Outgoing Sewer Line Pipe.
4. Lateral Connections To An Existing Sewer Shall Be Made With A Boot-N-Saddle With Stainless Steel Straps And Appropriate Rubber Fitting.
5. The Completed Sanitary Sewer Shall Be High Pressure Water Jet Cleaned And Subjected To An Air Test Conforming To ASTM F1417-92. A Deflection Test Shall Be Performed With A "Go-No-Go" Mandrell (95%) According To IDEM Standards. Cleaning, Televising And Testing Shall Be Performed A Minimum Of 45 Days After Installation And Witnessed By The City. All Costs Of Cleaning And Testing Are To Be Borne By The Contractor. Televised Inspection Of The System Shall Be Required (A Digital Copy Shall Be Retained By The City). All Costs Of Televising Are To Be Borne By The Contractor.
6. Manholes Shall Be Air Tested In Accordance With ASTM C1244-93, Standard Test Method For Concrete Sewer Manholes By The Negative Air Pressure (Vacuum) Test.
7. 18" Vertical Separation And 10'-0" Horizontal Separation To Be Maintained Between Water Mains Hydrants And Sewers (Sanitary And Storm).
8. Trenches Under Paved Areas (Excluding Sidewalks) Shall Be Backfilled With Granular Material Per Indiana Department Of Transportation "Standard Specifications", Latest Edition, And Compacted In Lifts. Granular Material To Extend 5 Feet Beyond The Limits Of The Paved Area With A 1:1 Slope To The Bottom Of The Trench.
9. Connections To Existing Manholes To Be Made Using A CMA Waterstop Grouted In Place Using Preco Plug By Preco Industries.
10. All Sewer Lines Shall Have A 0.1 Ft. Drop Through The Manhole. Where Sewer Lines Change Direction The Manhole Invert Elevation Shall Drop 0.25 Feet (Typical) Through The Manhole.
11. Sewer Permit And City Inspection Required For All Connections To Storm And Sanitary Sewer Systems. Sewer Permit Required On Site During Any Sewer Construction.
12. Top Of Manhole Frames To Be Set At Proposed Yard Or Sidewalk Grade When Located In Front Yard Area Of Lot Or Right-of-way. When Manhole Is In A Traveled Way, The Top Of The Lid Shall Be Flush With The Final Surface, And Backfill Shall Be Granular To Surface. In All Other Areas The Top Of The Frame Shall Be One Foot Above The Surrounding Grade, Sloping Away From The Manhole For A Distance Of 6'-0" In All Directions.
13. Where Proprietary Equipment Is Specified, "Or Approved Equal" Is Implied. All Proposals For Substitution Shall Be Submitted To The City In Writing For Their Approval.
14. Mark The Locations Of The Sanitary Sewer Laterals By Stamping Or Cutting "SS" In The Curb. Similarly, Stamp Or Cut MH In The Curb To Mark The Locations Of Manholes.
15. Contractors And Developers Shall Provide The City With At Least Seventy-Two (72) Hours Notice Prior To The Commencement Of Any Testing.
16. Sanitary Sewers To Be Air Tested In Accordance With ASTM F1417 Within 15 Days Of Installation. Test Shall Be Witnessed By City Utility Representative
17. A Mandrel Deflection Test Shall Be Conducted 45+ Days From Construction. Test Shall Be Witnessed By City Utility Representative
18. Manholes To Be Vacuum Tested In Accordance With ASTM C1244. Test Shall Be Witnessed By City Utility Representative.
19. Force Mains To Be Pressure Tested In Accordance With ASTM E103. Test Shall Be Witnessed By City Utility Representative.
20. Tracer Wire To Be Installed On All New Sanitary Sewers And Laterals

TELEVISION INSPECTION CRITERIA

SANITARY SEWERS

Sewers Shall Be Cleaned And Flushed Before Television Inspection. The Image Shall Be Clear Enough To Enable The City Representative And Others Viewing The Monitor To Easily Evaluate The Interior Condition Of The Pipe.

All Unacceptable Conditions Found During Television Inspection Must Be Corrected By The Contractor And Retelevised.

Unacceptable Conditions Are Conditions That Adversely Effect The Ability Of The System To Function As Designed Or To Be Properly Maintained And May Include, But Are Not Limited To, The Following:

A. Protruding Taps
B. Cracked Or Faulty Pipe
C. Misaligned Or Deformed Pipe
D. Debris In Line
E. Infiltration/Exfiltration
F. Excessive Gaps At Joints
G. Bellies Or Sags With A Depth Greater Than Or Equal To 10% (Or A Maximum Of 1 1/2") Of Pipe Diameter And/Or A Length Greater Than 25 Feet

Details As To Required Television Equipment And Required Television Inspection Report Are Available From The City's Consulting Engineer Office.

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. LINAK REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

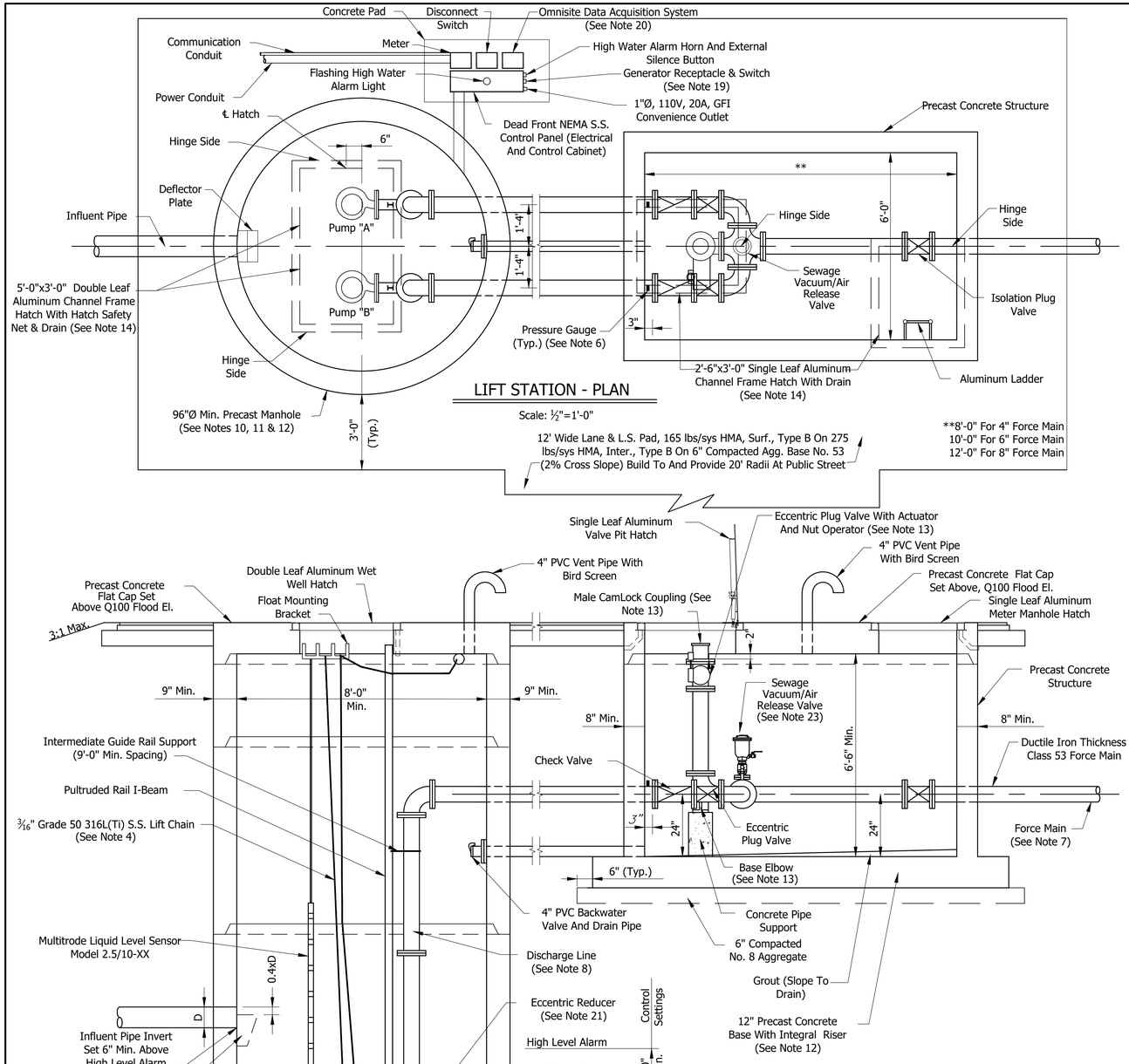
RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — DATE 12/12/2023

APPROVED: CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — DATE 01/15/2024

CITY OF DELPHI

SANITARY SEWER TYPICAL DETAILS AND NOTES

SHEET 12 OF 20



GENERAL NOTES:

1.) Actual Lift Station Dimensions, Control Settings, And Pump Selection To Be As Indicated By The Design Engineer's Certification Sheet.

Final Orientation And Location Of Hatches And Control Panel Are To Be Field Verified.

2.) Pumps "A" And "B" Shall Be Identical, Centrifugal, Submersible, Solids Handling, Non-Clog Design Capable Of Handling 3 Inch Sphere Solids, Fibrous Material, Sludge, And Material Found In Typical Raw Sewage. Fit Replaceable Bronze Wear Ring To Volute. Pumps Shall Be Hydromatic, Flygt, Or City Of Delphi Approved Equal. Manufacturer Shall Warrant The Pumps For One Year After Installation.

All Mating Surfaces Intended To Be Watertight Shall Be Machined And Fitted With Nitrile Rubber O-Rings With Sealing Complete When Metal To Metal Contact Is Made, Resulting In Controlled Compression Of O-Rings Without Specific Torque Limit. Fasteners Shall Be 316 S.S.

Mechanical Shaft Seal System Running In An Oil Reservoir Shall Have Separate, Constantly Lubricated Lapped Seal Faces. The Lower Seal Unit Between Media And Oil Reservoir Shall Consist Of One Stationary Seat And One Rotating Ring Held In Place By Its Own Spring. The Rotating Seat Ring And The Stationary Seat Ring Shall Be Made Of Tungsten-Carbide. The Lower Seal Shall Be Removable Without Disassembling The Seal Chamber. The Upper Seal Between Seal Chamber And Motor Shall Be Of The Same Design With Its Own Spring. Seals Shall Be Maintenance Free, But Shall Be Easily Inspectable.

Lower Seal Failure Alarm Shall Be Engaged By Seal Failure Sensor Provided In The Seal Chamber Which Senses Water Intrusion Through Lower Seal.

Over Temperature Alarm, And Pump Shut Down, Shall Be Engaged By Heat Sensor Attached To The Motor Windings. Motor Winding And Stator Lead Insulation Shall Be Class F With Maximum Temperature Capability Of 155°C Or Better. Housing Shall Be Filled With High Dielectric Oil. Air Filled Housing May Be Acceptable When Approved By City Of Delphi. Pump And Motor Shall Be Designed To Operate Partially Or Fully Submerged In Pumped Media Without The Use Of Cooling Jackets.

Rail System Shall Enable The Easy Removal Of The Pump Without The Need For A Person To Enter The Wet Well. A Non-Corrosive FRP I-Beam Shall Be Provided For Each Pump. The Guide Rail Shall Be Supported At The Bottom By The Discharge Elbow, Aligned Perfectly Plumb And Securely Affixed To Access Frame. One Intermediate Guide Rail Support Is Required For Each 9' Of Guide Rail Length. Schedule 40 S.S. Guide Rails May Be Acceptable If Pump Is Approved By City Of Delphi.

3.) Check Valve Shall Be Bronze Seated And Shall Be Provided With Bolted Covers For Easy Access To The Discs. Valve Shall Be Outside Adjustable Weight And Lever As Mueller A-2600-6-01, Kennedy/Clow 1106LW, Or As Approved By City Of Delphi. The Valve Shall Be Furnished With Fusion Bonded Epoxy Coating Inside And Out In Accordance With AWWA C550.

4.) Provide Sufficient Lift Chain, Float Mounting Cable, And Pump Power And Sensor Cable To Enable Non-Spliced Field Adjustment. Lift Chain Shall Have A Minimum Work Load Limit Of 1100 Pounds. Float Mounting Cable Shall Be Held In Place By Weight, Floats Shall Be Fastened To Cable With S.S. Clamps Near Each Float Location. Pump Power And Sensor Cable Shall Be Suitable For Submersible Pump Applications And This Shall Be So Indicated By A Code/Legend Permanently Embossed On The Cable.

5.) Plug Valve Shall Be An Eccentric Buna-N Rubber Faced Plug With Hand Lever Operation In-Line And Gear Operation On Bypass. Valve Shall Be Valmatic F-5800-R, Kennedy/Clow F-5412, Or As Approved By City Of Delphi. The Valve Shall Be Furnished With Fusion Bonded Epoxy Coating Inside And Out In Accordance With AWWA C550.

6.) Pressure Gauge Shall Be Trerice Model 450 LFB Or City Of Delphi Approved Equal. Drill And Tap Run Of Pipe To Install Pressure Gauge.

7.) Piping Not Within 2 Feet Of Wet Well And Valve Pit Shall Be DI AWWA C151, HDPE AWWA C906, PVC ASTM D2241, PVC AWWA C900, Or City Of Delphi Approved Equal. See Design Engineer's Certification Sheet For Pipe Class.

8.) Piping In And Within 2 Feet Of Wet Well And Valve Pit Shall Be Class 53 Flanged Ductile Iron Pipe And Shall Be Manufactured By Griffith, U.S. Pipe, Or As Approved By City Of Delphi. All Fasteners Within Wet Well And Valve Vault Shall Be 316 S.S.

9.) Piping And Fittings In Wet Well And Valve Pit Shall Be Factory Primed Tnemec Series Purple Prime To A Dry Film Thickness Of 5.0 To 11.0 Mils And Shall Be Field Painted With Tnemec Series 69-Color To A Dry Film Thickness Of 5.0 To 6.0 Mils. Fittings Shall Be Manufactured By Clow, Tyler, Mueller, Or As Approved By City Of Delphi.

10.) Damp Proof All Exterior Vertical Surfaces Which Are Backfilled Against With Bituminous Coating, Masterseal 614.

11.) Lift Station Manhole And Valve Pit Structures Shall Be Precast Concrete In Accordance With ASTM C478, With Rubber Gaskets Equal To Gasket Material Or City Of Delphi Approved Equal. See Sanitary Sewer Details And Notes Sheet For Manhole Steps.

12.) Horizontal Projections From Precast Integral Base And Riser May Be Required To Enable The Weight Of The Vertical Soil Ring Above The Projection To Resist Buoyancy Forces. See Design Engineer's Certification Sheet.

13.) CamLock Coupling And Eccentric Plug Valve On Bypass Line Shall Be 4 Inch Diameter With Transition To Force Main Size Occurring With Concentric Reducer Placed On Top Of Base Elbow. Fix Operating Nut For Eccentric Plug In Vertical Position To Enable Wrench Operation From Surface. Layout Of All Valve Vault Fittings And Equipment To Be Based Upon Bypass Line Being Close To Hatch Opening, As Shown.

14.) Aluminum Hatches Shall Be Channel Frame Type Flygt Safe-Hatch. Leaf Shall Be ½ Inch Aluminum Diamond Plate Live Load Rated To 300 PSF. Channel Frame Shall Be ½ Inch Extruded Aluminum With A Mill Finish And Bituminous Coating On Exterior Surfaces. Hatch Shall Be Provided With Type 316 S.S. Hardware Throughout, Automatic Hold-Open Arm With Release Handle, Slam Lock With Removable Handle, 1-½ Inch Drain Coupling, Padlock Hasp, And USF Fabrication Fall-Through Protection Hatch Safety Net.

15.) Sewer Connection To Wet Well Shall Be KOR-N-SEAL, A-LOK, Press-Seal, Or City Of Delphi Approved Equal.

16.) Force Main Penetrations Of Wet Well And Valve Pit Shall Be Made Watertight Through The Use Of Portland Cement Grout.

17.) Automatic Pump Control Panel Shall Include All Necessary Items And Appurtenances Which Might Normally Be Considered A Part Of A Complete System, Including But Not Limited To: Condensate Heater; Push To Test Button (External); Push To Silence Button (External); Alternator Selector Switch For Manual Designation Of Lead Pump; Time Delay Relay For Lag Pump Start; And Pump Run Time Hour Meters. System Shall Be Supplied By One Manufacturer, Shall Be Factory Assembled, Wired, Tested, And Shall Be Per Complete Electrical Drawings And Instructions. Major Components And Sub-Assemblies Shall Be Identified By Their Function With Laminated, Engraved, Bakelite Nameplates. System Shall Be Built In A Minimum 60"x36"x12" NEMA 4X S.S. Enclosure Suited For The Specified Horsepower And Voltage Of The Pumps. The Outer Door Of The Panel Shall Be A Hinged Dead Front With Provisions For Padlocking. Inside Shall Be A Separate Hinged Panel To Protect All Electrical Components, H-O-A Switches, Run Lights, Circuit Breakers, Etc., Mounted Such That Only The Faces Protrude Through Said Panel With No Wiring Fixed To Said Panel. The Manufacturer Shall Warrant The Control Center For One Year After Installation Covering 100% Parts And Labor.

Provide The Services Of A Factory Trained, Qualified Representative To Inspect, Adjust, Place The System In Trouble Free Operation, And Instruct Operating Personnel In The Proper Operation And Care Of The System.

All Major Components Of Control Center Shall Be American-Made And Available From Local Sources. Pump Manufacturer Shall Accept The Control Center In Writing To Ensure Unit Responsibility And Warranty.

Provide A Manual Transfer Type Disconnect Switch Housed In A Separate NEMA 4X S.S. Enclosure With External Operation Handle Capable Of Being Locked In The "ON" Normal Position Or The "ON" Secondary Position With A Middle "OFF" Position.

A Lightning Arrestor Shall Be Provided At The Phase Relay Block And Connected To Each Line Of The Incoming Side Of The Power Input Terminals. A Single Main Fusible/Breaker Disconnect Switch Of Adequate Size To Provide Power For Control, Operation, And Appurtenant Components Shall Be Provided. Provide A Circuit Breaker And Magnetic Starter With Each Leg Manual Reset Overload Protected For Each Pump. Starters Shall Have Auxiliary Contacts On 3Ø Applications To Operate Both Pumps Simultaneously. Provide A Phase Monitor With Phase Fail Relay. Provide A Circuit Breaker And Transformer To Power The Control Panel With 1Ø, 115 Volt Service For All Control Functions Including OMNISITE Data Acquisition System, Radio and Flowmeter. Provide A Green "Run" Light, And H-O-A Switch To Enable Field Connections.

Materials And Installation Of The Required Equipment Grounding Shall Be In Accordance With NEC Section 250-83(c). All Wiring Shall Have Not Less Than 600 Volt Insulation. Wiring And Buss Shall Be In Accordance With NEC, State, Local, And NEMA Standards. All Wiring Shall Be Color Coded. Minimum 4 Inch Diameter, Schedule 40 Conduit Shall Be Provided From Wet Well To Control Panel Enabling Pump Power And Sensor Cables, And Float Switch Cables To Be Easily Pulled. Seal Conduit At Control Panel To Prevent Sewer Gases From Entering. All Conduits, Fittings, Or Connections Shall Enter From The Bottom Of Enclosures.

Sump Level Rise To Lead Pump Run Float Causes Lead Pump To Operate. Lead Pump Operating And Sump Level Falling To Pumps Off Float Causes Lead Pump To Shut Off. Lead Pump Operating And Sump Level Rising To Lag Pump Run Float Causes Lag Pump To Operate. Lag Pump Operating And Sump Level Falling To Pumps Off Float Causes Both Pumps To Shut Off. Sump Level Rise To High Level Alarm Causes High Level Alarm To Operate. Sump Level Fall To Low Level Alarm Causes Low Level Alarm To Operate. An Alternating Relay Shall Be Provided To Cause Pumps To Alternate Whenever Pumps Off Float Is De-Energized. If One Pump Fails For Any Reason, The Remaining Pump Shall Operate Upon Sump Level Rise To Lag Pump Run Float. An Hour Meter Shall Be Provided For Each Pump To Record The Elapsed Operating Time Of Each Pump.

18.) Four Manuals Shall Be Presented To The Owner Which Shall Include The Following Minimum Information:1) Operation Instructions;2) Maintenance Instructions;3) Recommended Spare Parts List;4) Lubrication Schedule;5) Structural Diagrams;6) As-Built Wiring Diagrams; And 7) Bill Of Materials.

19.) Generator Receptacles To Be Crouse-Hinds Arktite AR1042 100amp Receptacle Or Crouse-Hinds Arktite AR2041 200amp Receptacle With Factory Sealed Switch For Receipt Of The City Of Delphi's Portable Generator Set.

20.) Provide OMNISITE XR 50 Data Acquisition System For Duplex Pump Stations And OMNISITE Crystal Ball Data Acquisition System For Triplex Pump Stations That Incorporates; 1 Spare Input/Output, 1 Input For Flowmeter, 5 Outputs To Control Being Lead Remote On, Lead Remote Off, Lag Remote On, Lag Remote Off, Remote Alarm Acknowledge, 10 Inputs From Control Being Hatch(es) Open Alarm, Panel(s) Open Alarm, Pump "A" On, Pump "B" On, Pump "A" Fail, Pump "B" Fail, Phase Fail Alarm, Power Fail Alarm, High Water Alarm, And Pump(s) Seal Failure. Remote Lead Pump Override And Remote Lag Pump Override.

21.) Eccentric Reducer To Be Installed As Required For Force Main Size. Consult City Of Delphi If Force Main Piping Is Greater Than 6 Inch Diameter.

22.) ¼" Stainless Steel Deflector Plate Required On All Influent Pipes. As Supplied by Mooresville Welding or DPW Approved Equal.

23.) Air/Vacuum Release Valve Shall Be An ARI D-025P Combination Air Valve For Wastewater And Shall Be Sized By The Design Engineer According To The Volume Of Main And Maximum Force Main Operating Pressure. The Pipe Nipples And Gate Valve For The Air/Vacuum Release Valve Shall Be Stainless Steel.

NOTICE:

CERTIFICATION IS LIMITED TO THOSE STANDARDS AND GUIDELINES PER THIS SHEET. CONSTRUCTION IS SUBJECT TO CONSTRUCTION DRAWINGS, SHOP DRAWINGS, AND DESIGN ENGINEER'S CERTIFICATION SHEET.

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. INMAN REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — DATE 12/12/2023

APPROVED: CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — DATE 01/15/2024

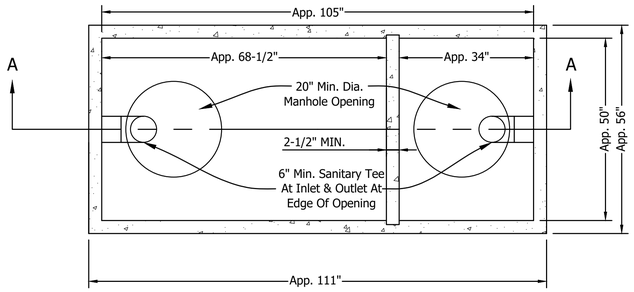
CITY OF DELPHI

SANITARY SEWER
LIFT STATION STANDARDS AND GUIDLINES

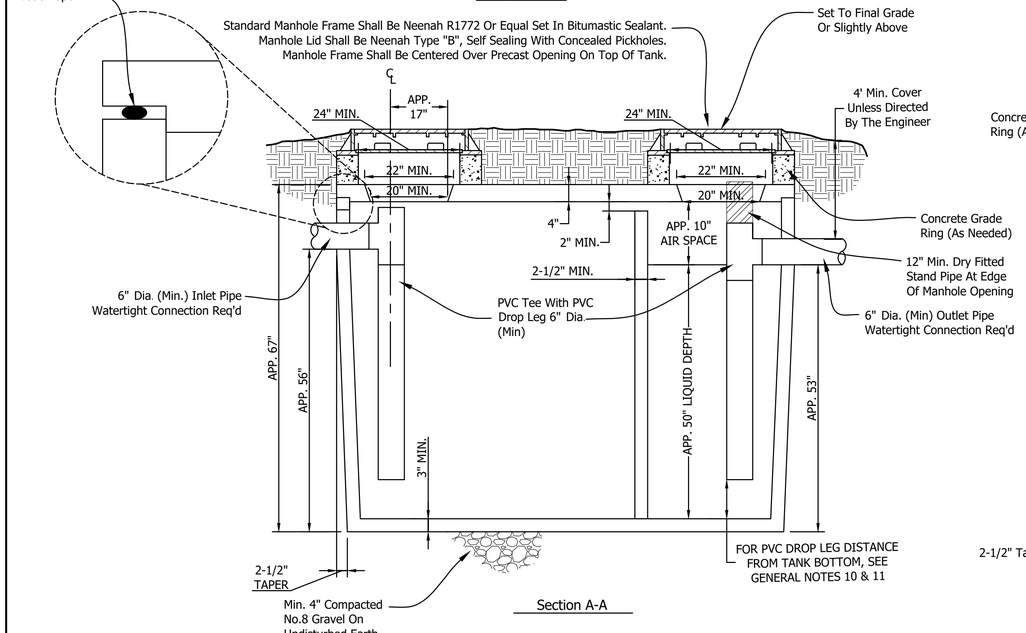
SHEET 13 OF 20

GENERAL NOTES

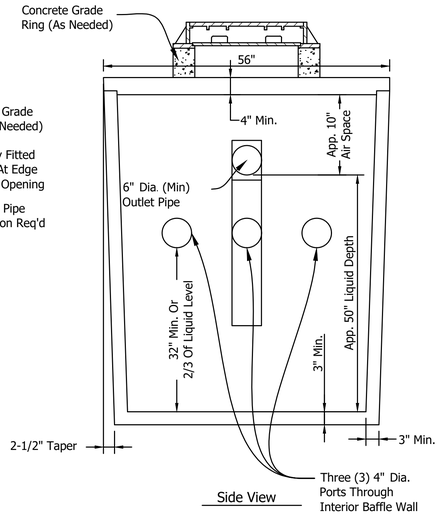
1. All Proposals With Flow Calculations Shall Be Submitted To The City In Writing For Their Approval.
2. Grease Interceptor/Oil & Grit Separator Size Shall Be 1000 Gal. Minimum.
3. Detail Shows General Schematic Requirement.
4. Adequate Structural Strength Should Be Provided To Accommodate Vehicular Traffic.
5. Whenever Proprietary Equipment Is Specified, "Or Approved Equal" Is Implied.
6. Ratio Of L x W x D Is Approximately 2:1:1.
7. Interior Baffle Wall Either Precast Or Blocked.
8. Any Grease Interceptor/Oil & Grit Separator Over 10 Feet Long Needs Third Manway Added.
9. Six Inch (6") Min. Clean Out On Inlet 4' From Foundation And 6" Min. Clean Out On Outlet End Of Interceptor/Separator
10. For A Grease Interceptor The Distance Form The Tank Bottom To The PVC Drop Leg Is 12 Inches Maximum.
11. For An Oil & Grit Separator The Distance From The Tank Bottom To The PVC Drop Leg Is 24 Inches Maximum Or As Approved.
12. Ports Through Interior Baffle Wall Can Be Round (Shown), Rectangular, Or As Approved.



Top View



Section A-A



Side View

GREASE INTERCEPTOR/OIL AND GRIT SEPARATOR (COMMERCIAL)

Not To Scale

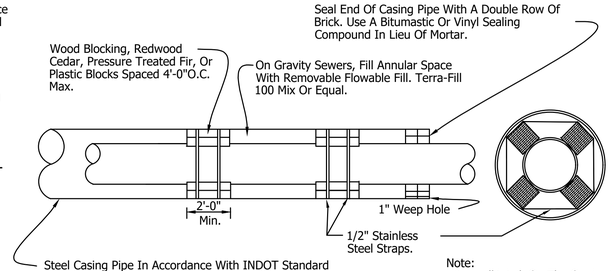
The Casing Pipe Shall Be Welded Steel Pipe, New And Unused Material, In Accordance With Current ASTM Specification A-139, Grade B For "Electric Fusion Of Welded Steel Pipe", With A Minimum Yield Of 35,000 PSI.

The Inside Diameter Of The Casing Pipe Shall Be At Least Six (6) Inches Greater Than The Largest Diameter Of The Pipeline Joint.

The Minimum Wall Thickness Of The Casing Pipe Shall Be As Listed In The Following Table Or As Shown On The Applicable Drawings:

Diameter Of Casing	Wall Thickness (in.) Under Highway	Under Railroad
16" Or Smaller	0.250	0.312
18"	0.250	0.312
20"	0.312	0.344
24"	0.375	0.438
30" Through 42"	0.500	0.563
48"	0.625	0.625
54"	0.875	0.875
66"	1.00	1.00

CASING SPECIFICATION



Note:
1. All Work On The Carrier Pipe Supports Shall Be Performed Per The City's Field Instructions.
2. Locate Bore Pits As Required For State Or Federal Highway Or Railroad, As Applicable.

PIPE CASING DETAIL

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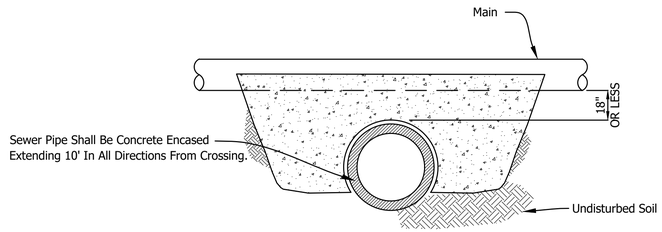

Note: This Detail To Be Used When A Main, Sewer Or Water, Crosses Within 18" Of Of Another Pipe Or Conduit.

PIPE CROSSING DETAIL

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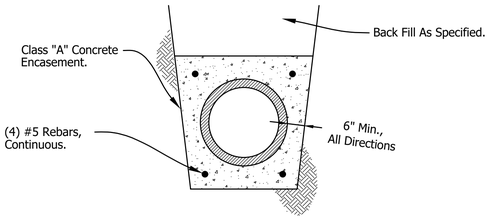

PIPE ENCASEMENT DETAIL

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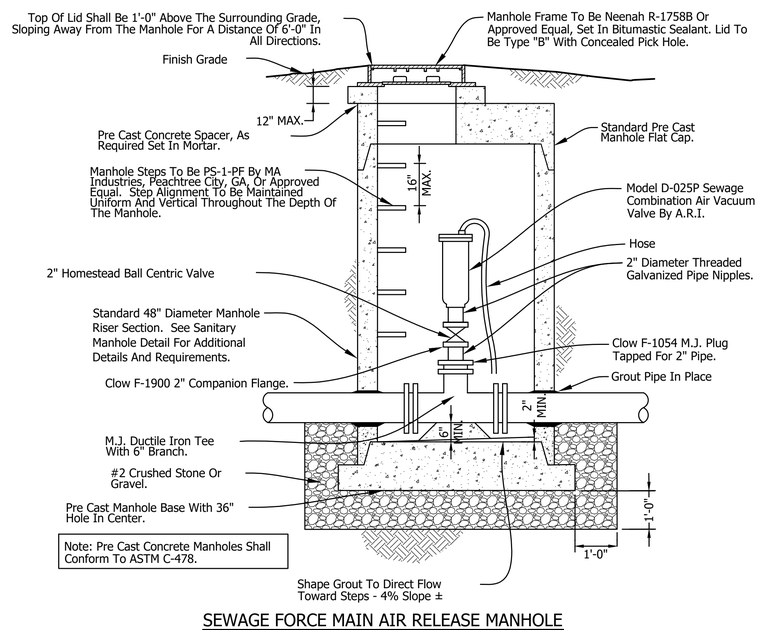


SEWAGE FORCE MAIN AIR RELEASE MANHOLE

Not To Scale (Force Mains 4" Dia. To 12" Dia.)

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. INFALT REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — DATE 12/12/2023

APPROVED: CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — DATE 01/15/2024

CITY OF DELPHI

MISCELLANEOUS UTILITY TYPICAL DETAILS AND NOTES

SHEET 14 OF 20

STORM SEWER NOTES

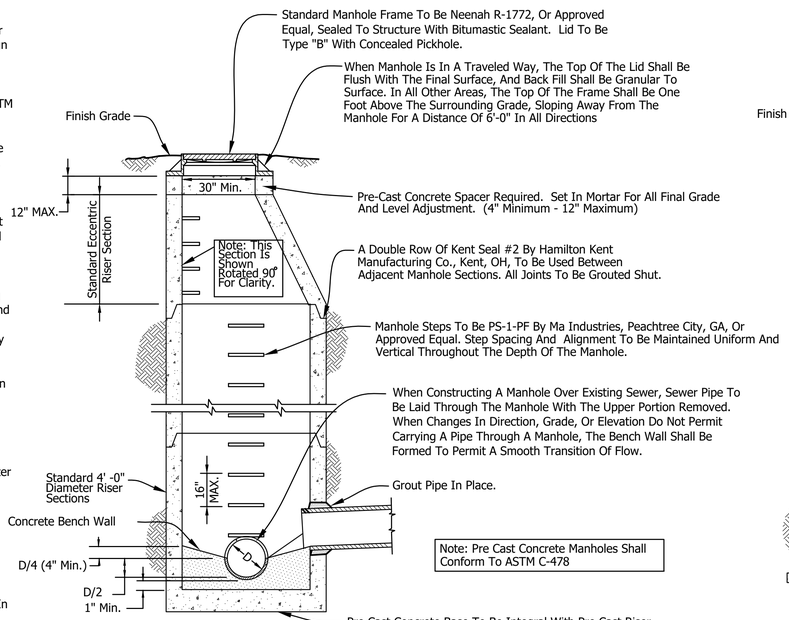
1. Storm Sewer Pipe And Appurtenances Shall Conform To City Of Delphi Specifications For Design And Quality Of Construction, And The Unified Development Ordinance, For Design And Materials.
2. Construction Procedures And Materials Shall Comply With Applicable Sections Of The Indiana Department Of Transportation Standard Specifications Latest Edition
3. Pipe And Fittings Used In Storm Sewer Construction Shall Be PVC Pipe (4"-24" Only; ASTM 3034-SDR 35, ASTM F-679, Or ASTM F-794). Hobas Pipe (24" And Larger Only; ASTM D3262, D4161, D2412, Fiberglass Sleeve Couplings Using Elastomeric Sealing Gaskets Made Of EPDM Compound Per ASTM D 4161), ADS N-12 (42"-48" Only) Dual Wall Single Mold HDPE Pipe With Water Tight Integral Bell Couplers (AASHTO M-294, ASTM F-667). Other Pipe And Fittings Not Specified Herein May Be Used Only When Specifically Authorized In Writing By The City.
4. All Storm Sewers Shall Be High Pressure Water Jet Cleaned. Mainline Storm Sewers (manhole To Manhole) Shall Be Televised. Lateral Storm Sewers (Manhole To Inlet, Inlet To Inlet) In Excess Of 40 Ft. Shall Also Be Televised. Mainline Storm Sewers And Lateral Storm Sewers That Are 36" Diameter Or Less Shall Be Subjected To A Deflection Test Using A Go-No-Go Mandrel (95% Diameter) When Constructed Using Flexible Pipe Conduit Materials. Mainline Storm Sewers And Lateral Storm Sewers That Are Greater Than 36" Diameter Require Third Party Testing And Certification (Daily) Of The Bedding Installation When Constructed Using Flexible Pipe Conduit Material. Cleaning, Testing And Televising Shall Be Performed A Minimum Of 30 Days After Installation, And Shall Be Witnessed By The City. All Costs Of Cleaning, Testing And Televising Are To Be Borne By The Contractor. A Digital Copy Shall Be Retained By The City.
5. Trenches Under Paved Areas (Excluding Sidewalks) Shall Be Back Filled With Granular Material Per Indiana Department Of Transportation Standard Specifications Latest Edition Section 211 And Compacted In Lifts. Granular Material To Extend Five Feet Beyond The Limits Of The Paved Area With A 1:1 Slope To The Bottom Of The Trench.
6. Configuration Of Inlets In Private Parking Or Driving Areas May Be Varied To Accommodate The Dimensions Of The Castings. Prior Written Approval Of The City Is Required.
7. 18" Vertical Separation And 10'-0" Horizontal Separation To Be Maintained Between Water Mains, Hydrants And Sewers (Sanitary And Storm).
8. Sewer Permit And City Inspection Required For All Connections To Storm Or Sanitary Sewer Systems Sewer Permit Required On Site During Any Sewer Construction
9. All Taps To Concrete Pipe Shall Be Made With Boot And Saddle Connectors
10. All Inlets Shall Be Depressed 0.1 Ft. Below Plan Grade.
11. All Sewer Lines Shall Have 0.1 Ft. Drop Through Manholes.
12. Castings Shall Be Centered On Opening In Structures.
13. Minimum 4" Opening Required On Back Of Curb Inlet Casting.
14. Top Of Manhole Frames To Be Set At Proposed Yard Or Sidewalk Grade When Located In Front Area Of Lot Or Right Of Way.
15. Bicycle Safe Grates Required In Paved Areas Excluding, Paved Flow Lines In Swales Or Detention Areas
16. Animal Guards Shall Be Permanently Installed On All Pipe End Sections 18" Or Larger In Diameter. Guards Shall Have A Maximum Clear Opening Of 4" And Be Removable.
17. If Any Existing Field Tile Systems Are Encountered During The Construction Process The Contractor Shall Be Responsible For Reconstructing The Tile To Its Original Conditions Or Connect It Into The Proposed Storm Drainage System
18. Whenever Proprietary Equipment Is Specified Or Approved Equal Is Implied All, Proposals For Substitution Shall Be Submitted To The City In Writing For Their Approval.
19. Contractors And Developers Shall Provide The City With At Least Seventy-Two (72) Hours Notice Prior To The Commencement Of Any Testing
20. Mandrel Deflection Test Shall Be Conducted And Witnessed By City Utility Representative.
21. All Storm Pipes Shall Be Installed With Tracer Wire.
22. The Use Of Doghouse Manholes For Connection To Existing Infrastructure To Be Reviewed On a Case By Case Basis.

TELEVISION INSPECTION CRITERIA
STORM SEWERS

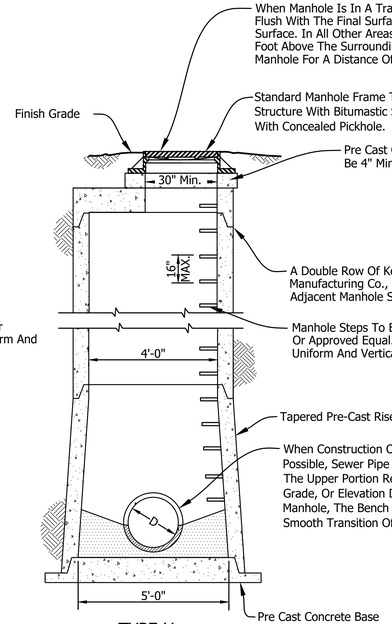
Sewers Shall Be "Flooded" Before Television Inspection. The Image Shall Be Clear Enough To Enable The City Representative And Others Viewing The Monitor To Easily Evaluate The Interior Condition Of The Pipe. All Unacceptable Conditions Found During Television Inspection Must Be Corrected By The Contractor And Retelevised. Unacceptable Conditions Are Conditions That Adversely Effect The Ability Of The System To Function As Designed Or To Be Properly Maintained And May Include, But Are Not Limited To, The Following:

A. Protruding Taps
B. Cracked Or Faulty Pipe
C. Misaligned Or Deformed Pipe
D. Debris In Line
E. Infiltration/Exfiltration
F. Excessive Gaps At Joints
G. Bellies Or Sags With A Depth Greater Than Or Equal To 10% (Or A Maximum Of 3") Of Pipe Diameter And/Or A Length Greater Than 25 Feet

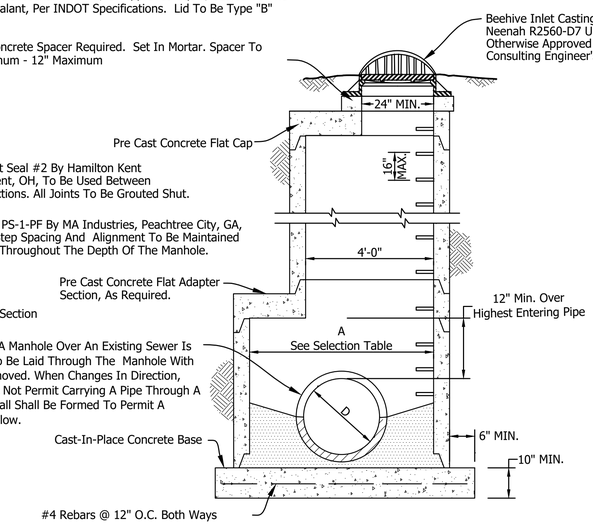
Details As To Required Television Equipment And Required Television Inspection Report Are Available From The City's Consulting Engineer Office.



STANDARD



TYPE H



TYPE D, E, F, G, J, K, L, M, N

MANHOLE SELECTION TABLE - CIRCULAR

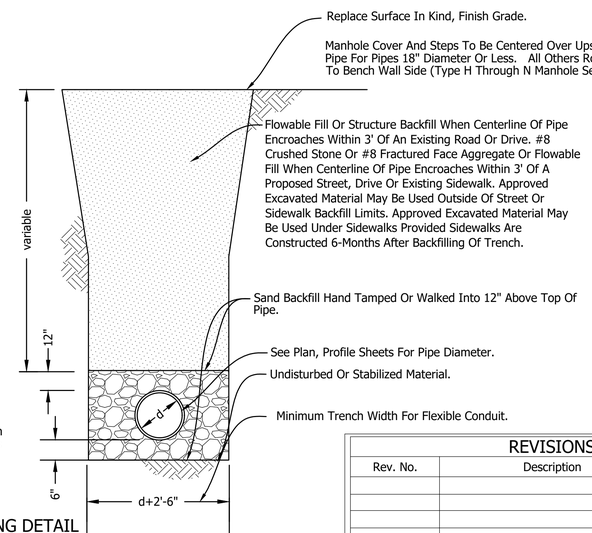
TYPE	PIPE DIAMETER D	RISER DIAMETER A	MAXIMUM PIPE SIZE FOR MAIN LINE	MAXIMUM PIPE SIZE 90 °TO MAIN LINE
STANDARD	UP TO 24"	48"	24"	24"
H	24"-36"	–	36"	30"
J	24"-36"	60"	36"	30"
K	36"-48"	72"	48"	36"
L	48"-54"	96"	54"	48"
M	54"-72"	102"	72"	66"
N	72"-84"	108"	84"	72"

STORM SEWER MANHOLE SECTIONS

Not To Scale

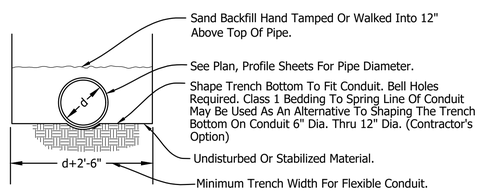
MANHOLE SELECTION TABLE RECTANGULAR

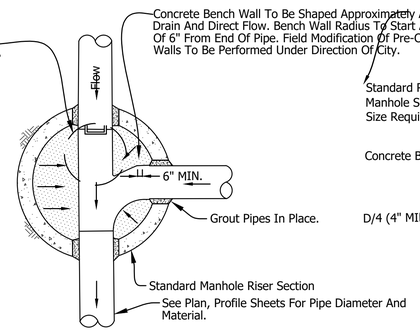
TYPE	PIPE DIAMETER D	WIDTH (MIN) A
STANDARD	UP TO 24"	48"
D	27"-42"	60"
E	48"-60"	78"
F	66"-84"	108"
G	90"-108"	132"



STANDARD BEDDING DETAIL

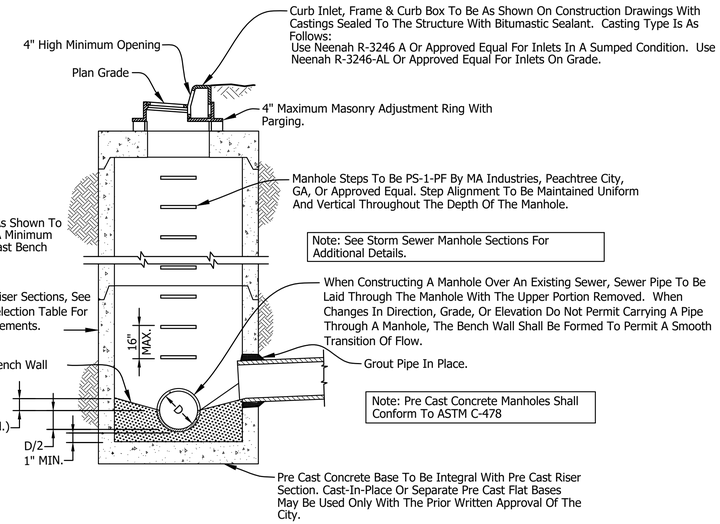
Not To Scale





STORM SEWER MANHOLE PLAN

Not To Scale



STORM SEWER MANHOLE - INLET

Not To Scale

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. LIMAS REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

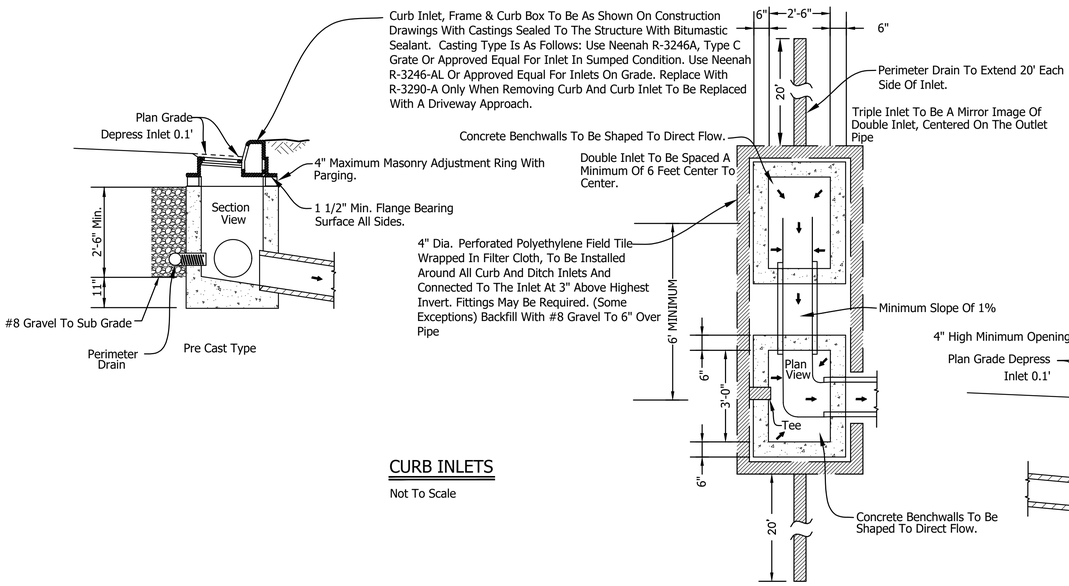
RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — DATE 12/12/2023

APPROVED: CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — DATE 01/15/2024

CITY OF DELPHI

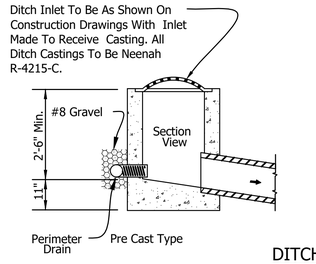
STORM SEWER TYPICAL DETAILS AND NOTES

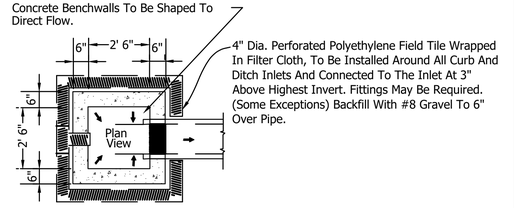
SHEET 15 OF 20



CURB INLETS

Not To Scale





DITCH INLETS

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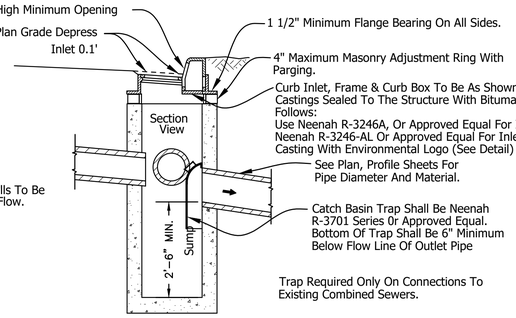

CATCH BASIN

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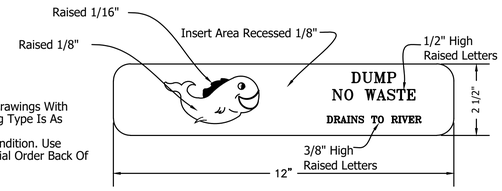
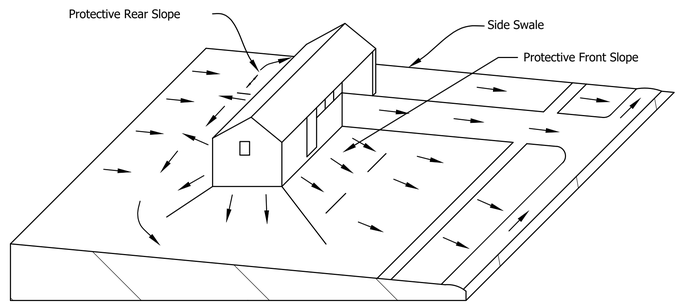
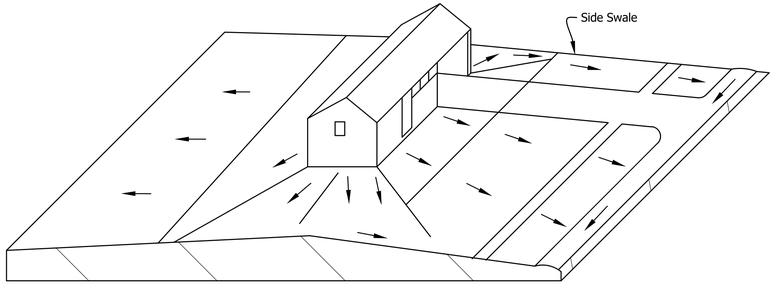


LOGO DETAIL (TOP OF BOX)

Not To Scale



Grading Method For Lot Where Slope Is From Rear To Front Lot. Drainage Swales Are Located At Rear And Sides Of Dwelling.



Grading Method For Lot Where Dwelling Is Located On A Ridge. Drainage Swales Are Located At Side Yards In The Area Of Positive Slopes.

LOT DRAINAGE DETAIL (TYPICAL)

Not To Scale

REVISIONS		
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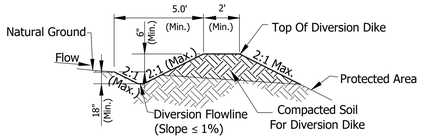
CITY OF DELPHI

STORM SEWER STRUCTURES, DRAINAGE & EROSION CONTROL TYPICAL DETAILS AND NOTES

SHEET 16 OF 20



Notes:

Installation:

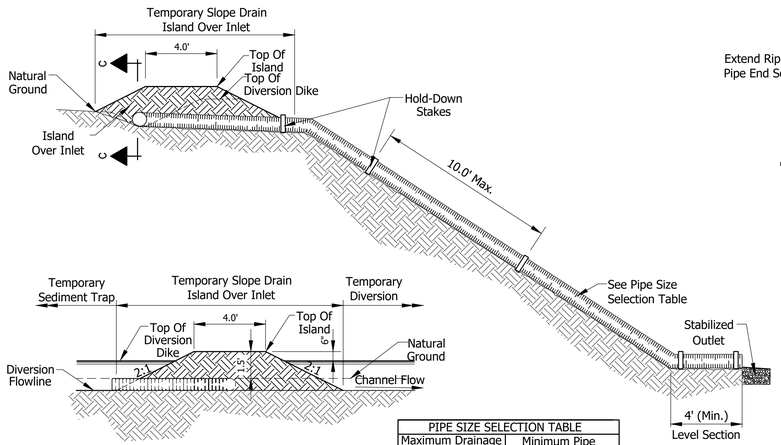
1. Lay Out The Diversion By Setting Grade And Alignment To Fit Site Needs And Topography, Maintaining A Stable, Positive Channel Grade Towards The Outlet.
2. Remove And Properly Dispose Of Brush, Trees, And Other Debris From The Foundation Area.
3. Construct The Diversion To Dimensions And Grades Shown In The Construction Plans.
4. Construct The Diversion Ridge In Six To Eight-Inch Lifts. Compact Each Lift By Driving Wheels Of Construction 5. Equipment Along The Ridge. Overfill And Compact The Ridge To Design Height Plus 10 Percent To Allow For Settlement.
5. Stabilize Outlets Prior To Or During Construction Of The Diversion, Diverting Sediment-Laden Storm Water Flow To A Temporary Sediment Trap Or A Temporary Dry Sediment Basin.

Maintenance:

1. Inspect Within 24 Hours Of Each Rain Event And At Least Once Every Seven Calendar Days.
2. Remove Sediment From Channel To Maintain Positive Grade.
3. Check Outlets And Make Necessary Repairs Immediately.
4. Adjust Ridge Height To Prevent Overtopping.

TEMPORARY DIVERSION

Not To Scale



SECTION C-C

PIPE SIZE SELECTION TABLE	
Maximum Drainage Area Per Pipe	Minimum Pipe Diameter
0.50 acre	8 In.
0.75 acre	10 In.
1.00 acre	12 In.
>1.00 acre	Individually Designed

NOTES:

Installation:

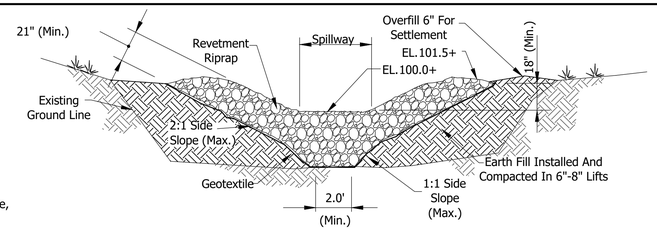
1. Place Temporary Slope Drains On Undisturbed Soil Or Well Compacted Fill. Set The Slope Drain Inlet At The Bottom Of The Diversion Channels. Connect The Pipe To The Inlet Section.
2. Construct The Diversion Ridge By Placing Fill Over The Pipe In 6 Inch Lifts. Compact Each Lift By Hand Tamping Under And Around The Inlet, And Along The Pipe.
3. Make The Top Of The Fill 6 Inches Higher Than The Adjoining Diversion.
4. Make All Pipe Connections Watertight And Secure So That Joints Will Not Separate In Use.
5. Anchor The Pipe To The Face Of The Slope With Stakes Spaced No More Than 10 Feet Apart. Extend The Pipe Beyond The Toe Of Slope To A Stable Grade. Protect The Outlet From Erosion.
6. Grade The Diversion Channel At The Top Of The Slope Toward The Temporary Slope Drain (Slope <2%).
7. Stabilize All Disturbed Areas Following Installation.

Maintenance:

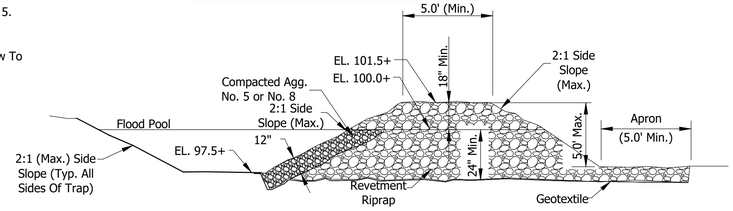
1. Inspect Weekly And Following Each Storm Event. (Remove Sediment From The Channel And Reinforce The Ridge As Needed.)
2. Check The Inlet For Sediment Or Trash Accumulation.
3. Check The Fill Over The Pipe For Settlement, Cracking, Or Piping Holes; Repair Immediately.
4. Check For Holes Where The Pipe Emerges Form The Dike; Repair Immediately.
5. Check The Conduit For Evidence Of Leaks Or Inadequate Anchoring; Repair Immediately.
6. Check The Outlet For Erosion Or Sedimentation; Clean & Repair Or Extend If Necessary.

TEMPORARY SLOPE DRAIN

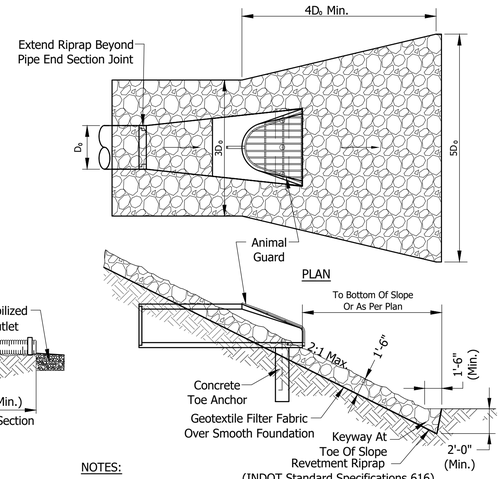
Not To Scale



EARTH EMBANKMENT AND STONE OUTLET SECTION



CROSS SECTION VIEW OF THE STONE OUTLET SECTION



SECTION

NOTES:

Installation:

1. Excavate Only Deep Enough For Both Filter And Riprap. Compact Any Fill Material to The Density Of The Surrounding Undisturbed Soil.
2. Cut A Keyway In Stable Material At The Base Of The Slope to Reinforce The Toe; Keyway Depth Should Be 1~8 Times The Design Thickness Of The Riprap And Should Extend A Horizontal Distance Equal To The Design Thickness.
3. Place Geotextile Fabric On The Smoothed Foundation, Overlapping The Edges 12 Inches Min. Secure With Anchor Pins Spaced Every 3 Feet Along The Overlap.
4. Immediately After Installing The Filter, Add The Riprap To Full Thickness In One Operation. Do Not Dump Through Chutes Or Use Any Method That Causes Segregation Of Rock Sizes Or That Will Dislodge Or Damage The Underlying Filter Material.
5. If Fabric Is Damaged, Remove The Riprap And Repair By Adding Another Layer Of Fabric, Overlapping The Damaged Area By 12 Inches.
6. Place Smaller Rock In Voids To Form A Dense, Uniform, Well Graded Mass. Blend The Rock Surface Smoothly With The Surrounding Area To Eliminate Protrusions Or Over-Falls.
7. Inspect Periodically For Displaced Rock Material, Slumping, And Erosion At Edges, Especially Downstream Or Downslope.

Maintenance:

1. Inspect Periodically For Displaced rock Material, Slumping And Erosion At Edges, Especially Downstream Or Downslope.

PRECAST CONCRETE END SECTION W/ RIP RAP

Not To Scale

Notes:

1. The Spillway Width Varies With The Drainage Area Contributing To The Temporary Sediment Trap:

Drainage Area (acres)	Width (ft.)
1	4
2	6
3	8
4	10
5	12

The Length And Width Of The Basin Are As Shown On The Erosion Control Plan (Maximum Drainage Area Is 5 Acres).
See The Indiana Storm Water Quality Manual For Additional Information.

Installation:

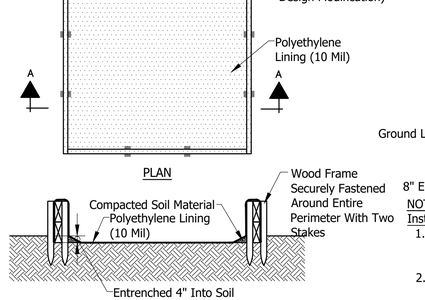
1. Clear, Grub, And Strip All Vegetation And Root Mat From The Embankment Area.
2. Create Embankment Using Material Free Of Roots, Rocks, Brush, And Debris. Overfill The Embankment 6 Inches To Allow For Settling.
3. Excavate A Trapezoidal Stone Outlet Section From The Compacted Embankment (Section A-A).
4. Install Geotextile And Place Specified Stone To The Lines And Grades Shown.
5. Stabilize The Embankment And Other Disturbed Areas With Seed And Mulch Or Another Suitable Erosion Resistant Cover

Maintenance:

1. Inspect Traps Weekly And Following Each Storm Event And Immediately Repair. Check Embankment For Any Erosion And Piping Holes And Repair.
2. Remove Sediment When It Has Accumulated To One Half The Design Depth. Check Pool Area Side Slopes For Erosion And Repair.
3. Replace Spillway Gravel Facing If Clogged.
4. Inspect Vegetation And Reseed Again, If Necessary.
5. Check The Spillway Depth Periodically To Ensure A Minimum 18 Inch Depth From The Lowest Point Of The Settled Embankment To Highest Point Of The Spillway Crest. Fill Any Low Areas To Maintain The Design Elevation.

TEMPORARY SEDIMENT TRAP

Not To Scale



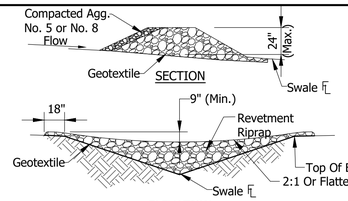
SECTION A-A

NOTES:

1. Prefabricated Washout Containers Or Roll-Off Dumpsters Are Preferred. Self-Installed Concrete Washouts WIth A Concrete Block Or Wood Frame Are Acceptable. Signage Should Be Installed Identifying Washout Areas.
2. Washouts Shall Not Be Used For Trash. Concrete Washouts Shall Be Located Away From Inlets, Open Drainage Facilities, Watercourses And Construction Traffic.
3. Concrete Washouts Shall Be Of Sufficient Volume And Quantity To Contain All Liquid And Concrete Waste Generated By Washout Operations.
4. Once Concrete Wastes Are Washed Into The Designated Area And Allowed To Harden, The Concrete Should Be Broken Up, Removed, And Disposed Of Offsite. Washouts Shall Be Monitored Daily. Arrange For Clean-out When 1/2 Full, Potential For Heavy Rainfall, Or Prior To A Large Pour.
5. Plastic Lining Material Should Be A Minimum Of 10 Mil. Polyethylene Sheeting And Should Be Free Of Holes, Tears, Or Other Defects That Compromise The Impermeability Of The Material

CONCRETE WASHOUT

Not To Scale



ELEVATION

NOTES:

Installation:

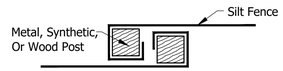
1. Excavate A Cutoff Trench Into The Swale Banks And Extend It A Minimum Of 18 Inches Beyond The Top Of Bank. Place The Rock In The Cutoff Trench And Channel to The Limits And Dimensions Shown.
2. Extend The Rock At Least 18 Inches Beyond The Top Of Bank To Keep Overflow Water From Undercutting The Dam As It Re-Enters The Channel.
3. Space Dams So That The Upstream Dam Toe Elevation And The Overflow Weir Of The Downstream Dam Top Elevation Are The Same. (A 1% Swale Slope Would Equal 200' Spacing)
4. Stabilize The Channel Above The Uppermost Dam. Erosion Resistant Lining Shall Extend At Least 6" Below Lowest Dam.

Maintenance:

1. Inspect Check Dams And The Channel After Each Storm Event, And Repair Any Damage Immediately. If Significant Erosion Occurs Between Dams, Install A Riprap Liner In That Portion Of The Channel.
2. Remove Sediment Accumulated Behind Each Dam As Needed To Maintain Channel Capacity, To Allow Drainage Through The Dam, And To Prevent Large Flows From Displacing Sediment.
3. Add Aggregate To The Dams As Needed To Maintain Design Height And Cross Section. When The Dams Are No Longer Needed, Remove The Aggregate And Stabilize Channel Using An Erosion Resistant Lining, If Necessary.

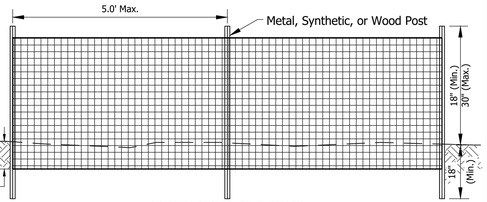
ROCK CHECK DAM

Not To Scale



SILT FENCE JOINT DETAIL

Not To Scale

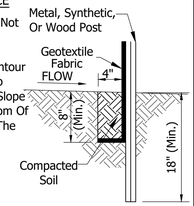


UNSUPPORTED SILT FENCE

NOTES:

Installation:

1. Silt Fence Is Not Recommended For Use As A Diversion And Should Not Be Used Across A Stream, Channel, Ditch, Swale, Or Anywhere That Concentrated Flow Is Anticipated.
2. Lay Out The Location Of The Fence So That It Is Parallel To The Contour Of The Slope And At Least 10 Feet Beyond The Toe Of The Slope To Provide A Sediment Storage Area. Turn The Ends Of The Fence Up Slope Such That The Point Of Contact Between The Ground And The Bottom Of The Fence End Terminates At A Higher Elevation Than The Top Of The Fence At Its Lowest Point
3. Along The Entire Fence Line, Dig An 8 Inch Deep Flat Bottomed Or V-Shaped Trench. Place Fence According To Manufacturer's Recommendations.



TRENCH DETAIL

Maintenance:

1. Inspect The Silt Fence Weekly And After Each Storm Event.
2. If Fence Fabric Tears, Starts To Decompose, Or In Any Way Becomes Ineffective, Replace The Affected Portion Immediately.
3. Remove Deposited Sediment When It Reaches Half The Height Of The Fence At Its Lowest Point Or Is Causing The Fabric To Bulge. Take Care To Avoid Undermining The Fence During Clean Out.
4. After The Contributing Drainage Area Has Been Stabilized, Remove The Fence And Sediment Deposits, Bring The Disturbed Area To Grade, And Stabilize.

SILT FENCE (SEDIMENT FENCE)

Not To Scale

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. LIMPAC
REGISTERED
No. PE11800287
STATE OF INDIANA
PROFESSIONAL ENGINEER

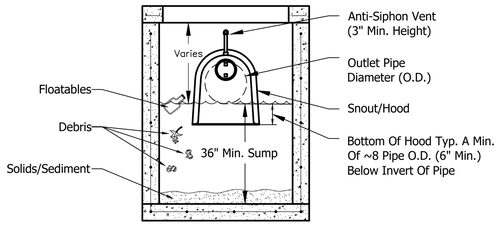
RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — 12/12/2023 DATE

APPROVED: Kamron Yates — CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — 01/15/2024 DATE

CITY OF DELPHI

EROSION CONTROL TYPICAL DETAILS AND NOTES

SHEET 17 OF 20

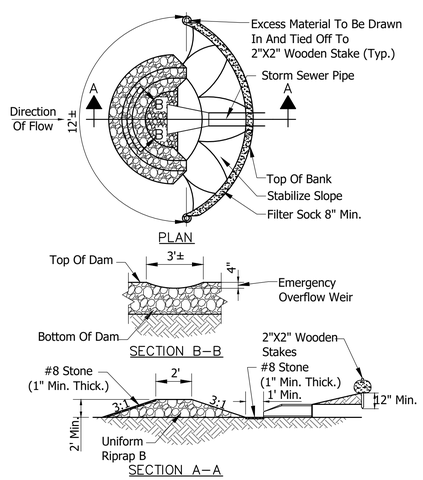


NOTES:

Installation:
1. Snout/Hood Is Installed Over The Outlet Pipe Of A Catch Basin Or Stormwater Structure To Reduce Floatable Trash And Debris, Free Oils, And Other Solids From Stormwater Discharges.
2. Snout/Hood Shall Be Centered And Anchored Over The Outlet Pipe And Must Cover The Pipe O.D. To Ensure Proper Installation.
3. Structure Shall Be Sumped To Manufacture's Recommended Depth. Minimum Sump Depth Is Typically 2.5 To 3 Times The I.D. Of The Outlet Pipe Size (Minimum Of 36").
4. Snout/Hood Shall Be Equipped With An Anti-Siphon Vent.
5. Maximum Flow And Velocity Shall NOT Exceed Manufacture's Recommendation.

Maintenance:
1. Sediment Depth And Surface Pollutants In The Sump Shall Be Measured Monthly And After Each Rain Event Of ~8" or More.
2. The Sump Shall Be Emptied At Least Yearly And When The Sump Is Half Full, Or Six Inches Of Floatable Pollutants Accumulate On The Surface.
3. The Snout/Hood Shall Be Inspected Yearly And The Anti-Siphon Vent Shall Be Flushed To Ensure It Is Clear.

SNOUT/HOOD OIL WATER DEBRIS SEPERATOR
Not To Scale

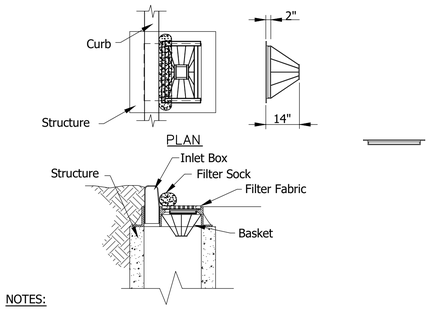


NOTES:

Installation:
1. Around the Outer Permimeter Of The Excavated Area, Lay A Ring of INDOT Uniform B Riprap To A Height Of 12 to 24 Inches Above The Top Of The Storm Drain. Foundation Shall Be Laid On Geotextile Fabric.

Maintenance:
1. Inspect The Structure Weekly And After Each Rainfall Event. After The Contributing Drainage Area Has Been Stabilized, Remove And Properly Dispose Of Any Unstable Sediment And Construction Material, And Stabilize.

ROCK DONUT
Not To Scale

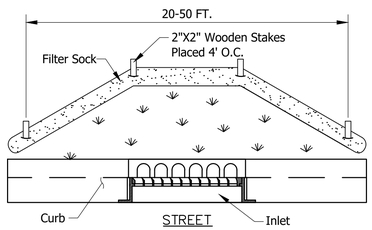


NOTES:

Installation:
1. Install Basket Curb Inlet Protection As Soon As Inlet Boxes Are Installed (New Development) Or Prior To Land Disturbing Activities (Existing Development).
2. If Necessary, Adapt Coir Mat Dimensions To Fit Inlet Box Dimensions.
3. Cut And Install MAT Fabric According To The Manufacturer's Recommendations. Install Filter Sock Across Inlet Box Opening.

Maintenance:
1. Inspect Daily And After Each Storm And Remove Sediment. Replace Or Clean Geotextile Fabric And Filter Sock As Needed. Remove Tracked On Sediment From The Street (But Not By Flushing With Water) To Reduce The Sediment Load On This Curb Inlet Practice.

BASKET CURB INLET PROTECTION
Not To Scale

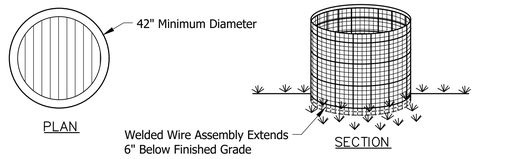


NOTES:

Installation:
1. Filter Sock Is Not Recommended For Use As A Diversion And Should Not Be Used Across A Stream, Channel, Ditch, Swale, Or Anywhere That Concentrated Flow Is Anticipated.
2. Filter Sock Should Maintain Solid Contact With The Soil And Be Installed In A Manner That Minimizes Gaps Between The Bottom Of The Sock And The Underlying Substrate.

Maintenance:
1. Inspect The Silt Fence Weekly And After Each ½" Rainfall Event.
2. If Fence Fabric Tears, Starts To Decompose, Or In Any Way Becomes Ineffective, Replace The Affected Portion Immediately.
3. Inspect The Structure Weekly And After Each Rainfall Event. Damaged Socks Shall Be Repaired According To The Manufacturer's Specifications Or Replaced Within 24 Hours Of Inspection.
4. Remove Deposited Sediment When It Reaches Half The Height Of The Filter Sock At Its Lowest Point. Take Care To Avoid Undermining The Filter Sock During Clean Out.
5. After The Contributing Drainage Area Has Been Stabilized, Remove And Properly Dispose Of Any Unstable Sediment And Construction Material, And Stabilize.

FILTER SOCK BEHIND CURB
Not To Scale

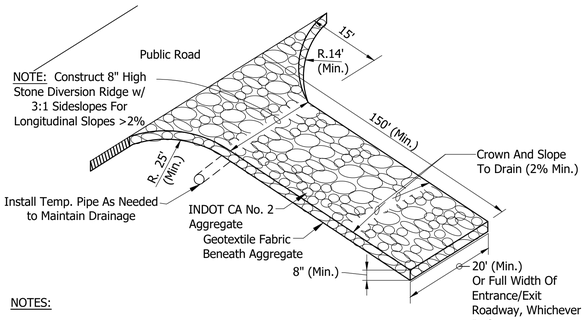


NOTES:

Installation:
1. 6" x 6" Welded Wire Mesh Shall Be Formed Of 10Ga. Steel Conforming To ASTM A-185.
2. Geotextile Shall Be Wrapped Three Inches Over The Top Member Of The 6" x 6" Welded Wire Mesh And Shall Be Secured With Fastening Rings Through Both Geotextile Layers And Close Around A Steel Member At Six Inches On Center. Fastening Rings Shall Be Constructed Of Wire Conforming To ASTM A-641, A-809, A-370, And A-938.
3. Geotextile Shall Be Secured To The Sides Of Welded Wire Mesh With Fastening Rings At A Spacing Of One Per Square Foot Except For The Bottom 2-Inches Which Shall Extend Past The Welded Wire And Be Left Unsecured For Entrenchment.
4. Welded Wire Assembly Shall Be Formed Into A Minimum 42" Diameter Circle With a 3" Minimum Overlap On The Ends Secured By Wire Or Zip Ties.
5. Welded Wire Assembly Shall Then Be Placed In A 6" Deep Trench And Backfilled And Compacted Over The Geotextile Flap.

Maintenance:
1. Inspect The Welded Wire Inlet Protector Weekly And After Each Rainfall Event.
2. If Geotextile Tears, Start To Decompose, Or In Any Way Becomes Ineffective, Replace The Affected Portion Immediately.
3. Remove The Deposited Sediment When It Reaches Half The Height Of The Structure At Its Lowest Point Or Is Causing The Structure To Shift. Take Care To Avoid Undermining The Structure During Clean Out.
4. After The Contributing Drainage Area Has Been Stabilized, Remove The Structure And Sediment Deposits, Bring The Disturbed Area To Grade, And Stabilize.

WELDED WIRE INLET PROTECTION
Not To Scale

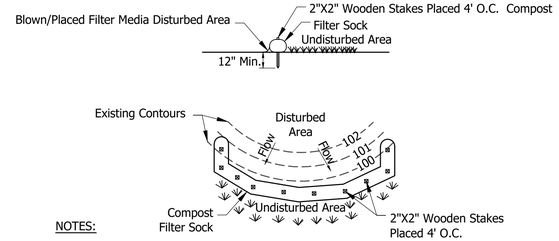


NOTES:

Installation:
1. A Stable Construction Entrance Must Be Provided At All Points Of Construction Traffic Ingress And Egress To The Project Site. Avoid Locating On Steep Slopes Or At Curves In Public Roads.
2. Remove All Vegetation And Other Objectionable Material From The Foundation Area, And Grade The Foundation And Crown For Positive Drainage.
3. If Longitudinal Slope Is In Excess Of 2%, Construct A Water Bar (Ridge) About 15 Feet From The Entrance To Divert Runoff Away Form The Road (See Detail Above).
4. Install Pipe Under The Pad (If Needed) To Maintain Proper Public Road Drainage.
5. Place Geotextile Fabric On The Graded Foundation To Improve Stability.
6. Place Aggregate To Dimensions And Grade Shown On The Erosion Control Plan, Leaving The Surface Smooth And Sloped For Drainage.
7. Divert All Surface Runoff And Drainage From The Stone Pad To A Sediment Trap Or Basin.

Maintenance:
1. Inspect Daily And After Each Storm Event Or Heavy Use.
2. Reshape Pad And Topdress As Needed For Drainage And Runoff Control.
3. Immediately Remove Mud And Sediment Tracked Or Washed Onto Public Roads By Brushing Or Sweeping. Flushing Should Only Be Used If The Water Is Conveyed Into A Sediment Trap Or Basin.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE
Not To Scale

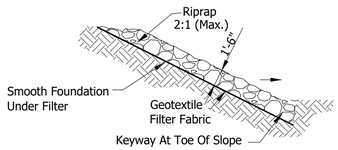


NOTES:

Installation:
1. Filter Sock Should Maintain Solid Contact With The Soil And Be Installed In A Manner That Minimizes Gaps Between The Bottom Of The Sock And The Underlying Substrate.
2. Filter Socks Should Be Installed Parallel To The Contour With Both Ends Of The Sock Extended Upslope At A 45 Degree Angle To The Rest Of The Sock.
3. Socks Placed On Earthen Slopes Should Be Staked In The Center Of The Sock Or Immediately Downslope Of The Sock At The Interval Recommended By The Manufacturer. Socks Installed On Paved Surfaces Shall Have Concrete Blocks Placed Immediately Downslope Of The Sock At An Interval Recommended By The Manufacturer.

Maintenance:
1. Traffic Shall Not Be Permitted To Cross Filter Socks.
2. Inspect The Structure Weekly And After Each Rainfall Event. Damaged Socks Shall Be Repaired According To The Manufacturer's Specifications Or Replaced Within 24 Hours Of Inspection.
3. Remove Deposited Sediment When It Reaches Half The Height Of The Filter Sock At Its Lowest Point.
4. Take Care To Avoid Undermining The Filter Sock During Clean Out.
5. After The Contributing Drainage Area Has Been Stabilized, Remove And Properly Dispose Of Any Unstable Sediment And Construction Material, And Stabilize.

FILTER SOCK
Not To Scale



NOTES:

Installation:
1. Excavate Only Deep Enough For Both Filter And Riprap. Compact Any Fill Material To The Density Of The Surrounding Undisturbed Soil.
2. Cut A Keyway In Stable Material At The Base Of The Slope To Reinforce The Toe. Keyway Depth Should Be 1 ½ Times The Design Thickness Of The Riprap, And Should Extend A Horizontal Distance Equal To The Design Thickness.
3. Place Geotextile Fabric On The Smoothed Foundation, Overlapping The Edges 12 Inches Minimum. Secure With Anchor Pins Spaced Every 3 Feet Along The Overlap.
4. Immediately After Installing The Filter, Add The Riprap To Full Thickness In One Operation. Do Not Dump Through Chutes Or Use Any Method That Causes Segregation Of Rock Sizes, Or That Will Dislodge Or Damage The Underlying Filter Material.
5. If Fabric Is Damaged, Remove The Riprap And Repair By Adding Another Layer Of Fabric, Overlapping The Damaged Area By 12 Inches.
6. Place Smaller Aggregate In Voids To Form A Dense, Uniform, Well Graded Mass. Blend The Riprap Surface Smoothly With The Surrounding Area To Eliminate Protrusions Or Over Falls.

Maintenance:
1. Inspect Periodically For Displaced Aggregate Material, Slumping And Erosion At Edges, Especially Downstream Or Downslope.

RIPRAP
Not To Scale

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. LIMING REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

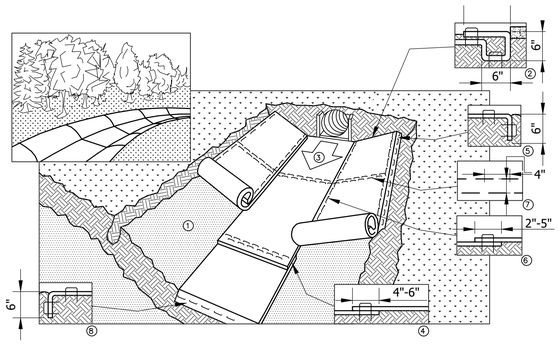
RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — DATE 12/12/2023

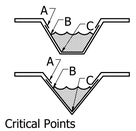
APPROVED: CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — DATE 01/15/2024

CITY OF DELPHI

EROSION CONTROL TYPICAL DETAILS AND NOTES

SHEET 18 OF 20





Critical Points
A. Overlaps And Seams
B. Projected Water Line
C. Channel Bottom/Side Slope Vertices

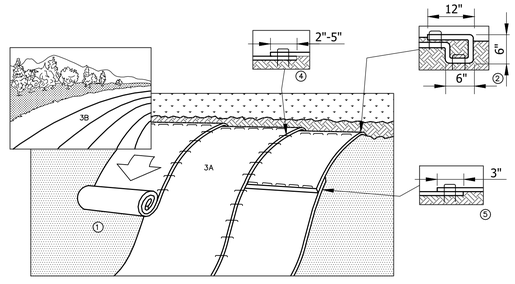
1. Prepare Soil Before Installing Blankets, Including Any Necessary Application Of Lime, Fertilizer, Or Seed.
2. Begin At The Top Of The Channel By Anchoring The Blanket In A 6 Inch Deep By 6 Inch Wide Trench With Approximately 12 Inches Of Blanket Extended Beyond The Upslope Portion Of The Trench. Anchor The Blanket With A Row Of Staples/Stakes Approximately 12 Inches Apart In The Bottom Of The Trench. Backfill And Compact The Trench After Stapling. Apply Seed To Compacted Soil And Fold Remaining 12 Inch Portion Of Blanket Back Over Seed And Compacted Soil. Secure Blanket Over Compacted Soil With A Row Of Staples/Stakes Spaced Approximately 12 Inches Apart Across The Width Of The Blanket.
3. Roll Center Blanket In Direction Of Water Flow In Bottom Of Channel. Blankets Will Unroll With Appropriate Side Against The Soil Surface. All Blankets Must Be Securely Fastened To Soil Surface By Placing Staples/Stakes In Appropriate Locations As Shown In The Staple Pattern Guide. When Using Optional Dot System, Staples/Stakes Should Be Placed Through Each Of The Colored Dots Corresponding To The Appropriate Staple Pattern.
4. Place Consecutive Blankets End Over End (Shingle Style) With A 4-6 Inch Overlap. Use A Double Row Of Staples Staggered 4 Inches Apart And 4 Inches On Center To Secure Blankets.

1. Full Length Edge Of Blankets At Top Of Side Slopes Must Be Anchored With A Row Of Staples/Stakes Approximately 12 Inches Apart In A 6 Inch Deep By 6 Inch Wide Trench. Backfill And Compact The Trench After Stapling.
2. Adjacent Blankets Must Be Overlapped Approximately 2-5 Inches, (Depending On Blanket Type) And Stapled. To Ensure Proper Seam Alignment, Place The Edge Of The Overlapping Blanket (Blanket Being Installed On Top) Even With The Colored Seam Stitch On The Blanket Being Overlapped.
3. In High Flow Channel Applications, A Staple Check Slot Is Recommended At 30-40 Foot Intervals. Use A Double Row Of Staples Staggered 4 Inches Apart And 4 Inches On Center Over Entire Width Of The Channel.
4. The Terminal End Of The Blankets Must Be Anchored With A Row Of Staples/Stakes Approximately 12 Inches Apart In A 6 Inch Deep By 6 Inch Wide Trench. Backfill And Compact The Trench After Stapling.

NOTE:
* Horizontal Staple Spacing Should Be Altered If Necessary To Allow Staples To Secure The Critical Points Along The Channel Surface.
** In Loose Soil Conditions, The Use Of Staple Or Stake Lengths Greater Than 6 Inches May Be Necessary To Properly Anchor The Blankets.

EROSION CONTROL BLANKET - FLOWLINE APPLICATION

Not To Scale

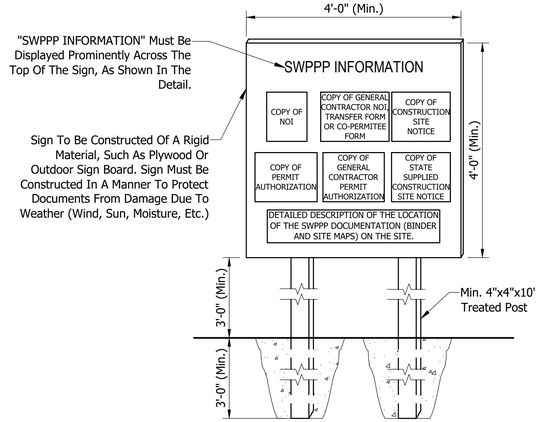


1. Prepare Soil Before Installing Blankets, Including Any Necessary Application Of Lime, Fertilizer, And Seed.
2. Begin At The Top Of The Slope By Anchoring The Blanket In A 6 Inch Deep By 6 Inch Wide Trench With Approximately 12 Inches Of Blanket Extended Beyond The Upslope Portion Of The Trench. Anchor The Blanket With A Row Of Staples/Stakes Approximately 12 Inches Apart In The Bottom Of The Trench. Backfill And Compact The Trench After Stapling. Apply Seed To Compacted Soil And Fold Remaining 12 Inch Portion Of Blanket Back Over Seed And Compacted Soil. Secure Blanket Over Compacted Soil With A Row Of Staples/Stakes Spaced Approximately 12 Inches Apart Across The Width Of The Blanket.
3. Roll The Blankets (A.) Down Or (B.) Horizontally Across The Slope. Blankets Will Unroll With Appropriate Side Against The Soil Surface. All Blankets Must Be Securely Fastened To Soil Surface By Placing Staples/Stakes In Appropriate Locations As Shown In The Staple Pattern Guide. When Using Optional Dot System, Staples/Stakes Should Be Placed Through Each Of The Colored Dots Corresponding To The Appropriate Staple Pattern.
4. The Edges Of Parallel Blankets Must Be Stapled With Approximately 2-5 Inches Overlap Depending On Blanket Type. To Ensure Proper Seam Alignment, Place The Edge Of The Overlapping Blanket (Blanket Being Installed On Top) Even With The Colored Seam Stitch On The Previously Installed Blanket.
5. Consecutive Blankets Spliced Down The Slope Must Be Placed End Over End (Shingle Style) With An Approximate 3 Inch Overlap. Staple Through Overlapped Area, Approximately 12 Inches Apart Across Entire Blanket Width.
   Overlap The Blankets With The Direction Of The Flow Of The Water

NOTE:
* In Loose Soil Conditions, The Use Of Staple Or Stake Lengths Greater Than 6 Inches May Be Necessary To Properly Secure The Blankets.

EROSION CONTROL BLANKET - SLOPE APPLICATION

Not To Scale



NOTES:
1. The SWPPP Information Sign Must Be Located Near The Construction Entrance Of This Site, Such That It Is Accessible And Viewable By The General Public, But Not Obstructing Views As To Cause A Safety Hazard.
2. All Posted Documents Must Be Maintained In A Clearly Readable Condition At All Times Throughout Construction And Until The Notice-Of-Termination (NOT) Is Filed For The Permit.
3. Contractor Shall Post Other Storm Water And/Or Erosion And Sediment Control Related Permits On The Sign As Required.
4. Sign Shall Be Located Outside Of Public Right-Of-Way And Easements Unless Approved By The Local MS4 Operator.

SWPPP INFORMATION SIGN

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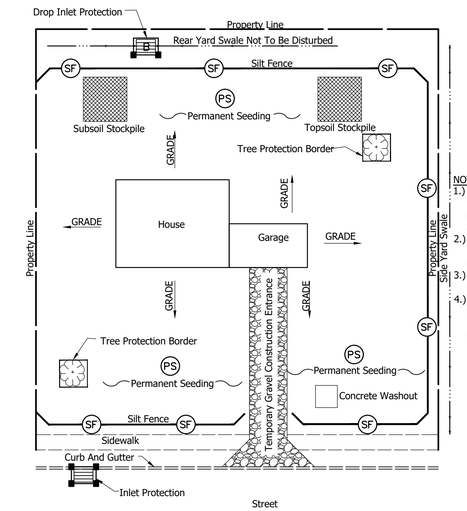


NOTES:
1.) It Is The Responsibility Of The Property Owner And Contractor To Comply With State Laws And Local And County Ordinances Regarding Construction Site Erosion And Sediment Control.
2.) This Plan Is Only A Sample Plan And Is Not Intended To Be All Inclusive Or Address Every Situation, Additional Or Modified Practices May Be Required On Some Sites.
3.) Erosion Or Sediment Control Measures Must Be Functional And Maintained Throughout Construction.
4.) Maintain Positive Drainage Away From The Structure(s).
5.) If Permanent Drive Having Prohibited Access Is Constructed Provide Separate Temporary Gravel Entrance For Access.

SAMPLE EROSION CONTROL SITE PLAN

Not To Scale
(For Construction Of Typical Single Family Dwellings.)

SEEDING:
The Following Table Is For General Seeding Information Only. Consult The Indiana Storm Water Quality Manual For Recommendations Relating To Steep Banks And Cuts, High Maintenance Areas, And Channels And Areas Of Concentrated Flow.

SEEDS:

40 Percent Kentucky Bluegrass
40 Percent Creeping Red Fescue
20 Percent Annual Rye Grass

FERTILIZER:
Commercial Fertilizer (12-12-12)

STRAW:
Clean And Free Of Weed Seeds

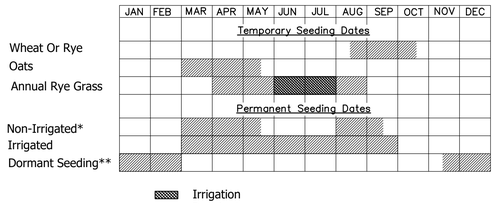
Spread Fertilizer Uniformly Over Finish Graded Surfaces At A Rate Of 20 Pounds Per 1,000 Square Feet. Thoroughly Disk, Harrow, Or Rake Fertilizer Into Soil To Depth Not Less Than 2 Inches.

Distribute Seed Mix Same Day As Fertilizer Is Applied. Spread Evenly At A Rate Of 3 Pounds Per 1,000 Square Feet. Rake Lightly And Compact Areas With 100 Pound Roller.

Cover Areas With Straw Evenly Spread At A Rate Of 2 Tons Per Acre Immediately After Seeding. Water Areas With Fine Spray. Do Not Flood Or Create Washes. Protect Seeded Areas From Erosion.

Continue Watering Of These Areas On A Daily Basis For The Remainder Of The Construction Period.

Hold Sloped Areas Steeper Than 2 (Horizontal) To 1 (Vertical) With Wire Mesh Or Stakes And Wire.

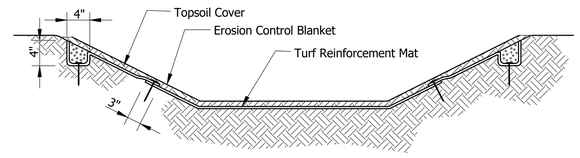


Irrigation Required
* Seeding Dates May Be Extended 5 Days If Mulch Applied And Planted Late Summer
** Increase Seeding Rate By 50%

NOTES:

If Construction Activities Take Place During The Months Of November Through February, Use Dormant Seeding Practices In Place Of Temporary And Permanent Seeding Practices.

See Chapter 7 Of The Indiana Storm Water Quality Manual, For Additional Seeding Recommendations.



Extend Turf Reinforcement Mat To Accommodate Maximum Designed Flow Depth

NOTES:

Installation:
1. Select The Type Of Mat Recommended For The Site Conditions (Slope, Channel, Flow Velocity) And Problem To Be Addressed.
2. Install Any Practices Needed To Control Erosion And Runoff, Such As Temporary Or Permanent Diversions, Slope Drains, Sediment Basins/Traps, Silt Fence Or Straw Bale Dams.
3. Grade The Site As Specified.
4. Install The Mat According To Manufacturer's Specifications.
5. Backfill Topsoil To A Depth Equal To The Thickness Of The Mat.
6. Seed The Area After The Mat Has Been Installed And Backfilled With Soil.
7. Mulch The Area, Or Use Erosion Control Blankets To Stabilize The Surface.

Maintenance:
1. Until The Surface Is Stabilized, Inspect Weekly And After Each Storm Event For Erosion Exposing The Mat.
2. If A Specific Area Shows Erosion, Add Soil And Restabilize.

TURF REINFORCEMENT MAT

Not To Scale

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. LIMING REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — DATE 12/12/2023

APPROVED: CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — DATE 01/15/2024

CITY OF DELPHI

EROSION CONTROL TYPICAL DETAILS AND NOTES

SHEET 19 OF 20

EROSION CONTROL NOTES

GENERAL:

1. Take Measures To Control Erosion And Sedimentation By Storm/Wind Events To Assure That Sediment Is Not Transported From The Site By Storm Events. Practices Such As Silt Traps Or Filters Shall Be Installed Prior To Land Disturbing Activities. New Drainage Swales Shall Be Seeded And/Or Sodded, Or Other Protective Practices Applied, Immediately Following Construction. All Practices Shall Be Maintained To Remove Sediment From Runoff Leaving The Site As Long As Unstabilized Soil Conditions Exist.
2. After Land Disturbing Activities Cease And The Soil Is Stabilized, Temporary Erosion Control Measures May Be Eliminated If Their Purpose Has Been Fulfilled. Any Disturbed Soil Resulting From Removal Of Such Practices Shall Be Stabilized By Approved Methods.
3. Dispose Properly All Waste And Unused Building Materials Including, But Not Limited To, Garbage, Debris, Cleaning Wastes, Water, Toxic Materials, And Hazardous Substances. Do Not Allow Substances To Be Carried By Runoff Into A Receiving Channel Or Storm Sewer System.
4. Clean Public Or Private Roadways Daily And After Major Storms Using Acceptable Methods Such as Sweeping To Remove Any Accumulated Sediment. The Developer's Contractors Are Responsible For Supervision Of The Construction Activity Within The Development And Shall Take All Necessary Actions To Remove Sediment From The Streets.
5. For Construction Sequence, Maintenance, And Other Soil Erosion Requirements, See Specifications For Site Clearing, Slope Protection, Erosion Control, Landscaping, And Seeding.
6. Erosion And Sediment Control Practices Must Adhere To, Or Exceed Those Shown On The Erosion Control Plan, And Shall Be In Accordance With The Construction Stormwater General Permit, And Indiana Storm Water Quality Manual, Indiana Department Of Environmental Management.

SURFACE STABILIZATION:

1. Cut Slopes Which Are To Be Topsoiled Should Be Scarified To A Minimum Depth Of 4 Inches Prior To Placement Of Topsoil. Install Erosion Control Blankets On All Slopes Of 3 (Horizontal) To 1 (Vertical).
2. Stabilize All Disturbed Ground Within Fifteen Days Of Being Left Inactive By Seeding, Sodding, Mulching, Or By Other Equivalent Erosion Control Practices. Immediate Stabilization Shall Be Planned To Aid In Surface Runoff And Stabilization Shall Follow A Linear Progression As The Site Is Developed.
3. Un-Vegetated Areas That Are Left Idle Or Scheduled To Be Left Inactive Must Be Temporarily Or Permanently Stabilized With Measures Appropriate For The Season To Minimize Erosion Potential. To Meet This Requirement, The Following Apply:
   A. Stabilization Must Be Initiated By The End Of The Seventh Day The Area Is Left Idle. The Stabilization Activity Must Be Completed With Fourteen Days After Initiation. Initiation Of Stabilization Includes, But Is Not Limited To, The Seeding And/Or Planting Of The Exposed Area And Applying Mulch Or Other Temporary Surface Stabilization Methods Where Appropriate. Areas That Are Not Accessible Due To An Unexpected And Disruptive Event That Prevents Construction Activities Are Not Considered Idle.
   B. Areas That Have Been Compacted May Be Excluded From The Stabilization Requirement When The Areas Are Intended To Be Impervious Surfaces Associated With The Final Land Use, Provided Run-off From The Area Is Directed To Appropriate Sediment Control Measures.
4. See The Landscape Plan For Permanent Ground Cover Requirements Adjacent To The Building And Parking Areas.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT PAD:

1. Construct The Temporary Gravel Drive Using 6 Inches INDOT No. 2 Stone Over A Stable Foundation. Geotextile Fabric Shall Be Used Under All Drives Including Individual Lots. Grade For Positive Drainage.
2. Inspect The Entrance Pad Area Weekly And After Storm Events Or Heavy Use. Reshape The Pad As Needed For Drainage And Runoff Control. Top Dress Pad With Clean Stone.

SODDING:

1. Do Not Install Sod On Hot, Dry Soil, Frozen Soil, Compacted Clay, Loose Sand Or Gravel, Or Pesticide Treated Soil. Ideal Sodding Time Is May 1-June 1, Or September 1-October 20, Although It Can Be Installed As Early As March 15, If Available And Temperatures Are Above 32°F, Or June 1-September 1 If Irrigated.
2. Install Sod After Other Erosion Control Practices Have Been Completed. Break Up Compacted Soils Sufficiently To Create A Favorable Rooting Depth Of 6-8 Inches, Using A Chisel Plow, Disk, Harrow, Or Rake.
3. Soil Compaction Is To Be Minimized, Especially In Areas Where Permanent Vegetation Will Be Established. Topsoil Must Be Preserved, Unless Infeasible.
4. Apply Topsoil If The Site Is Otherwise Unsuitable For Establishing Vegetation. Shape, Smooth, And Firm The Soil Surface.
5. Have The Soil In The Sod Bed Tested To Determine Its pH And Nutrient Level. If The pH Is Too Acidic For The Grass Sod To Be Installed, Apply Lime According To Test Results Or At The Rate Recommended By The Sod Supplier.
6. Fertilize As Recommended By The Soil Test. If Testing Was Not Done, Consider Applying 400-600 Lbs./Acre Of 12-12-12 Analysis Fertilizer, Or Equivalent Fertilizer, As Recommended By The Soil Test. Work The Fertilizer Into The Soil To 2-4 Inches Deep.
7. Apply Fertilizer At An Appropriate Time Of year For The Project Location, Taking Into Consideration Proximity To A Waterbody, And Preferably Timed To Coincide With The Period Of Maximum Vegetative Uptake And Growth.
8. Avoid Applying Fertilizer Immediately Prior To Precipitation Events That Are Anticipated To Result In Stormwater Run-Off From The Application Area.

TREE CONSERVATION/PROTECTION:

1. Protect Trees From Construction Equipment By Fencing Off An Area Equivalent To The Tree's Crown With Temporary Construction Safety Fence. If A Fence Cannot Be Erected, Cushion The Rooting Area With 6 Inches Of Wood Chips, Or Wood Or Brick Paths.
2. Create Traffic Patterns Such As To Keep Soil Compaction To A Minimum. Store Supplies And Equipment Away From Protected Tree Areas. Aerate Soil Where Compaction Has Been Excessive.
3. When Clearing Areas Adjacent To Protected Trees, Use Equipment Such As A Brush Cutter Or Rotary Ax, Or Cut By Hand. Where Root Areas Must Be Graded, Cut Large Roots Instead Of Tearing Them With Equipment.
4. Minimize Changes In The Drainage Pattern. Avoid Putting Fill Over The Root System.
5. Prune Low Hanging Limbs That Could Otherwise Be Broken Off By Equipment.

EROSION CONTROL NOTES CONT'D

EROSION CONTROL BLANKETS:

1. Erosion Control Blankets Shall Be Selected Based Upon Application And Shear Strength.
2. Use Machine Produced Mat Of Straw Fiber Matrix Or Curled Wood Excelsior Of 80 Percent, 6 Inch Or Longer Fiber Length.
3. Evenly Distribute Fibers Over Entire Area Of Blanket To Provide Consistent Thickness.
4. Provide Blanket With Top Side Covered With Biodegradable Extruded Plastic Mesh.
5. Treat Blankets To Impart Smolder Resistance Without Use Of Chemical Additives.
6. Provide "Curlex Blankets" By American Excelsior Company, Or "S150" By North American Green, Or Accepted Substitute.

EROSION CONTROL BLANKET STAPLES:

1. Use Minimum 0.091 Inch Diameter Steel Wire "U" Shape With Legs 6 Inches In Length With 1 Inch Crown.

CONCRETE AND CEMENTITIOUS WASHWATER:

1. Cementitious Washwater Results From The Cleaning Of Tools And Equipment Used In The Delivery, Mixing, Handling, And Working Of Cementitious Materials Often Associated With Concrete, Mortar, Plaster, Stucco, Grout And Flowable Fill.
2. Concrete Washouts Shall Be Of Sufficient Volume And Quantity To Contain All Liquid And Concrete Waste Generated By Washout Operations. The System Shall Be Designed To Eliminate Run-off And Minimize Precipitation From Entering The Washwater Containment System. Covering Of Containment When Not In Use Is Recommended.
3. Locate Washwater Containments At Least 50 Feet From Any Creeks, Wetlands, Ditches, Karst Features, Or Storm Drains/Manmade Conveyance Systems. Locate When Practical In Relatively Flat Areas With Established Vegetative Cover In Areas That Provide Easy Access For Equipment That Will Require The Use Of Washwater Containment Facilities.
4. Prefabricated Washout Containers Or Roll-off Dumpsters Are Preferred. Structure Must Be Watertight And Have The Strength To Resist Failure Or Collapse For The Duration Of Use. Below Grade Systems Are To Be Used Only When There Is No Other Feasible Way To Implement Containment. Waterproof Lining Is Required To Have A Minimum Thickness Of 10 Mil, Be A Single Continuous Sheet Sufficient To Adequately Line The Entire Containment And Be Free Of Defects, Holes, Rips, Or Tears. Signage Is Required To Identify Washout Areas.
5. Washouts Shall Not Be Used For Trash Or Construction Debris. Containers Should Not Be Filled Beyond 75 Percent Of Containment Capacity. When A Containment Is At Capacity And Can No Longer Accept Washwater, Identify With "closed" Sign. No Spillage Of Washwater Shall Occur From The Transport Of The Unit. Closure Of Washwater Shall Be Accomplished When All Fluids Are Removed Or Evaporated. The Remaining Solid Cementitious Material May Be Used As Clean Fill.

FLOATING OUTLET "SKIMMER":

1. Sediment Basins Where Feasible, Must Withdraw Water From The Surface Of The Water Column Unless Equivalent Sediment Reduction Can Be Achieved By Use Of Alternative Measures. Alternative Measures Include But Are Not Limited To Increasing The Basin Length To Width Ratio To 4:1 Or Greater, Implementation Of Porous Baffles, Use Of Flocculants/Polymers, And Or Phasing Of Project Land Disturbance And Rapid Stabilization.
2. Floating Outlets Can Be Implemented With The Permanent Basin Outlet Structure.
3. Dewatering Zone Volume/Dewatering Time = Required Flow Rate Of Skimmer. Locate Floating Devices Where They Can Be Easily Accessed To Facilitate Maintenance Activities And To Be Appropriately Tethered Or Restrained To Prevent Flexible Boom Damage. If Ice Formation Is A Concern, Install Boom And Inlet At An Incline To Maintain Positive Drainage Through The Device. Install Following The Manufacturer's Recommendation.
4. The Floating Inlet Is Designed To Drain The Dewatering Zone In No Less Than 48 Hours And No Longer Than 72 Hours For The Minimum Required Storage Volume. Inspect Weekly And Prior To Anticipated Rain Events. The Floating Outlet Practice Shall Only Be Removed When The Contributing Drainage Area Has Been Properly Stabilized And No Longer Contributing Sediment-laden Run-off Or When Freezing Conditions Are Anticipated.

NATURAL BUFFERS:

1. Preserve Existing Natural Buffers That Are Adjacent To Waters Of The State To Promote Infiltration And Provide Protection Of The Water Resource. Natural Buffers Must Be Preserved, Including The Entire Buffer Bordering And/Or Surrounding The Water Resource.

Buffers:

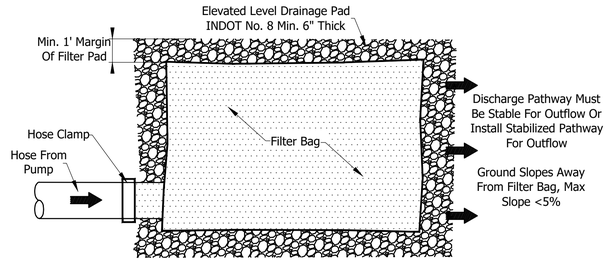
1. Buffer Conditions
   A. 50 Feet Or More In Width Must Be Preserved To A Minimum Of 50 Feet
   B. Less Than 50 Feet In Width Must Be Preserved In Their Entirety.
   C. May Be Enhanced With Vegetation That Is Native And Promotes Ecological Improvements And Sustainability.
2. Run-off Directed To The Natural Buffer Must Be Treated With Appropriate Erosion And Sediment Control Measures Prior To Discharging To The Buffer And Managed To Prevent Erosion From Occurring Within The Buffer Area.
3. Stormwater Conveyances And Outfalls Are Allowed To Impact The Buffer And Must Be Designed To Minimize The Width Of Disturbance And Impact To The Buffer.

WASTE CONTAINERS (TRASH RECEPTACLES):

1. Must Be Managed To Reduce The Discharge Of Pollutants And Blowing Of Debris. If Stormwater Has The Potential To Come Into Contact With Waste, A Cover Is Required. Waste That Is Not Disposed Of In A Trash Receptacle Must Be Protected From Exposure To The Weather And/Or Removed At The End Of The Day From The Site And Disposed Of Properly.

ANIONIC POLYMERS (FLOCCULANTS):

1. Are Authorized For Sediment Control Provided Their Use Is In Conformance With Current State Of Indiana Standards And Specifications, And The Use Is Identified In The Stormwater Pollution Prevention Plan (SWP3). The Manufacture Representative Or Properly Trained Individual Is Required To Oversee The Use Of All Polymers. Prior To The Use Of The Polymer, Notification Must Be Made To The City Of Delphi.



NOTES:

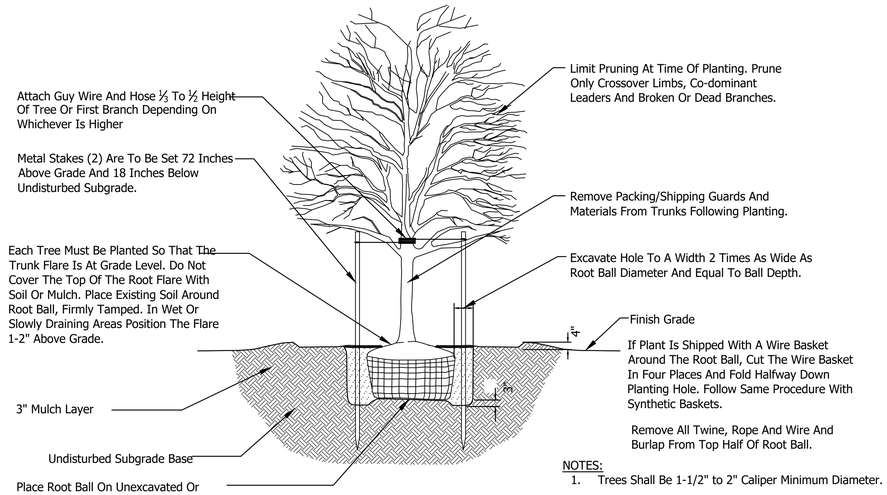
1. Dewatering Bags Are Used To Minimize The Discharge Of Sediment For Pump Induced Dewatering Activities.
2. Bag Size Is Dependent On The Pumping Rate And Soil Conditions.
3. Clamp Pump Hose With Steel Hose Clamp Over The Rigid Hose Connector Area To A Tight Secure Connection To Filter Bag.
4. Locate Filter Bags Where Outflows Can Easily Drain. Preferred Locations Are Areas Of Undisturbed Densely Vegetated Areas. Locate For Ease Of Access, Monitoring, Maintenance, And Removal.

MATERIALS:

1. Nonwoven Polyethylene Geotextile Or Geotextile Bag. Steel Hose Clamps Or Equivalent To tightly Attach Pump Hose To The Filter Bag. Elevated Drainage Pad (No. 8 Stone, Wood Mulch, Straw Bales, Wood Pallet). Secondary Containment Berm (Optional)

FILTER BAGS (PUMP DISCHARGE FILTER BAGS)

Not To Scale



NOTES:

1. Trees Shall Be 1-1/2" to 2" Caliper Minimum Diameter.

TREE PLANTING DETAIL

Not To Scale

REVISIONS		
Rev. No.	Description	Date

CHRISTOPHER M. LINAC REGISTERED No. PE11800287 STATE OF INDIANA PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL: DESIGN ENGINEER — DATE 12/12/2023

APPROVED: CITY BOARD OF PUBLIC WORKS & SAFETY PRESIDENT — DATE 01/15/2024

CITY OF DELPHI

EROSION CONTROL TYPICAL DETAILS AND NOTES

SHEET 20 OF 20