LEBANON, INDIANA

LEBANON STANDARDS

DATE OF CURRENT ISSUANCE: 02/03/2025

DIRECTIONS FOR USE

1.) The Entire Set Of Full Size Standards Shall Be Attached To The Construction Drawings And Shall Be Considered Part Thereto. Partial Set May Be Used For Small Projects When Approved By The Lebanon Utility Service Board, The Lebanon Board Of Public Works And Safety, The Water And Wastewater Operations Manager And The City Engineer (All Entities Hereinafter Referred To As The City Of Lebanon).

2.) Details Prepared By Outside Sources Shall Not Be Included In The Construction Drawings When Said Details Cover Work Which Is Covered By Lebanon Standards.

3.) Individual Lebanon Standards That Do Not Apply May Be Crossed-Out By Design Engineer Through The Placement Of A Single Large X Over Detail. Minor Reference Notations May Be Placed Adjacent To Individual Standard Titles For Coordination However, The Standards Themselves Shall Not Be Modified In Any Way.

4.) Details Prepared By Outside Sources Covering Work Which Is Not Covered By Lebanon Standards Are The Sole Responsibility Of The Design Engineer And Shall Be Placed On Sheets Other Than The Lebanon Standards Sheets.

5.) Upon Discovery Of Any Discrepancies Between City Of Lebanon Standards And The Project Documents, The More Stringent Specifications Shall Apply.

GENERAL NOTES

1.) Contractor Shall Verify The Exact Location Of All Existing Utilities At Least 48 Hours Prior To Any Construction Or Excavation. During Construction, All Utilities Shall Be Adequately Protected And Supported To Minimize Damage. The Contractor Shall Be Responsible For Repairing Or Replacing Damaged Utilities To The Satisfaction Of The City Of Lebanon And The Owner Of The Affected Utility.

2.) All Construction Drawings Shall Be Submitted To Lebanon Utilities In Electronic Format, Autocad* And PDF. All Coordinate Data Shall Be U.S. Survey Feet. All Benchmarks And Elevations Shall Be From NAD 1983 (CONUS) Datum. (*Autocad Data Interchange, If Created From A Non-Autocad System.)

3.) Wherever Proprietary Equipment Is Specified, All Proposals For Substitution Shall Be Submitted In Writing To The City Of Lebanon And Shall Be Subject To The Findings Of There Of.

4.) Whenever Trench Opening Encroaches Within 5' Of An Existing Right-Of-Way, Flowable Fill Shall Be Used For Trench Backfill.

5.) Installation Of Or Provisions For The Installation Of All Underground Utilities (Including Service Laterals) To Be Placed Under Pavement Areas Shall Be Established Prior To The Construction Of The Pavements.

6.) Contractor Shall Contact Lebanon Utilities For Electrical Standards, Terms, And Conditions During Project Planning And At Least 1 Month Prior To Construction Or Excavation.

7.) Contractor Is Required To Provide A Performance Bond For 125% Of The Construction Cost Of The Work To Be Dedicated To The City Of Lebanon For Improvements Not Completed And Accepted At Time Of Secondary Platting, And/Or A Three-Year Maintenance Bond In The Amount Of 25% Of The Said Construction Cost For Work Completed And Accepted At Time Of Secondary Platting. In Addition, The Contractor Shall Make A Written Request For Permission To Start Construction 7 Calendar Days Prior To Intended Start Of Construction. Construction Shall Not Start Until Contractor Has Received Written Permission From City Of Lebanon Including All Required State And Local Permits And Fees.

8.) Attention Is Drawn To The Plan Review Fees As Adopted By The City Of Lebanon.

9.) Contractor Shall Provide And Assume Full Responsibility For All Services For Fuel, Power, Light, Heat, Telephone, Water, Sanitary Facilities, Temporary Facilities, And All Other Necessary Facilities And Incidentals For A Period Of Either One Year Or Through Substantial Completion, Whichever Is Longer.

10.) Contractor Is To Maintain And Produce An Accurate Schedule Of Construction Operations And When Requested By The City Of Lebanon Shall Provide Said Schedule To The City Of Lebanon And/Or It's Representatives.

11.) Contractor Shall Ensure Job Site Is Compliant With All Applicable OSHA Regulations.

12.) As-Built Drawings Of All Storm Sewer, Water Main, And Sanitary Sewer Installation Shall Be Submitted To Lebanon Utilities. As-Built Drawings Shall Be A Red Lined PDF Version Of The Drawing Showing All Changes And Deviations And GIS Shapefiles Showing Coordinates Of All Utility Locations. All Horizontal Coordinates Shall Be In The Horizontal Datum NAD 83 Indiana State Plane West Datum And All Elevations Provided In The As-Built Drawings Shall Be In The Vertical Datum NGVD 1988. GPS Collected Coordinates Shall Depict Actual Horizontal And Vertical Locations Of Utility Assets Such As, But Not Limited To: Manholes, System Valves, Hydrant, Blow-offs, Air Release Valves, Master Meters, Cleanouts, Risers, Pump Stations/Wet Wells, And BMPs. Contractor Shall Submit As-Built Drawings Within 30 Days Of Successful Completion Of All Testing Requirements.

13.) Tracer Wire Shall Be Installed With All Underground Water And Sanitary Sewer Piping.

Indiana 811 Know what's below. Call before you dig.

INDEX

CITY OF LEBANON

MATT GENTRY — MAYOR

ED BASQUILL, P.E. — UTILITIES MANAGER

KEVIN KRULIK, P.E., P.S., A.I.C.P. — CITY ENGINEER

REVISIONS		
Rev. No.	Description	Date

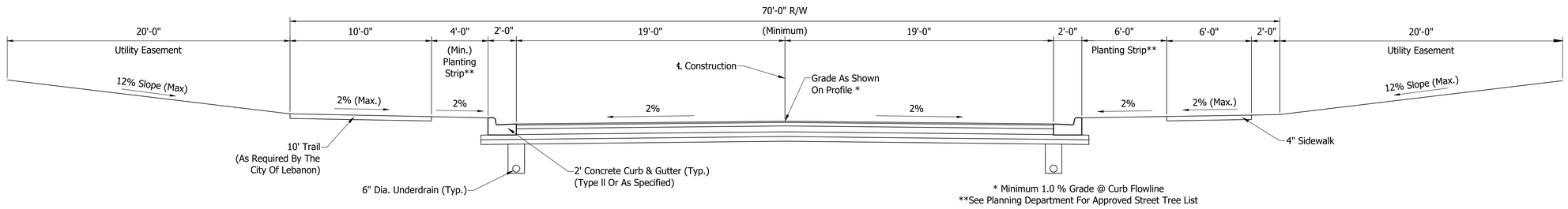
JOHN G. LIGHTNER IV — REGISTERED — No. PE11500016 — STATE OF INDIANA — PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 02/03/2025 DATE

CITY OF LEBANON

DIRECTIONS FOR USE, GENERAL NOTES & REVISION LOG

SHEET 01 OF 25



SECONDARY ARTERIAL AND RESIDENTIAL/COMMERCIAL COLLECTORS STREETS

Scale: ¼"=1'-0"

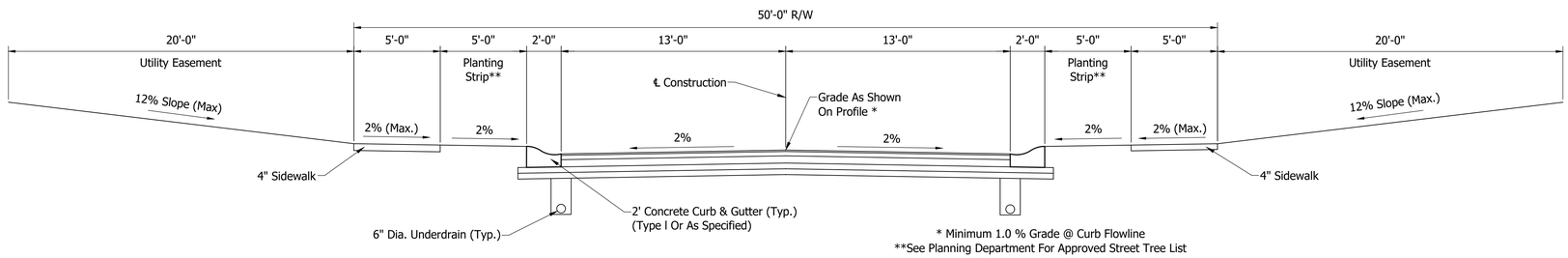
GENERAL NOTES

1.) The Right-Of-Way Widths, Pavement Widths, And Easements Widths Indicated On This Sheet Are Minimum Distances Required By The City Of Lebanon. Greater Widths May Be Provided And/Or Required By The City Of Lebanon. The Contractor Shall Review The Plat And The Plans To Confirm The Various Widths Indicated On This Sheet And Shall Report Any Discrepancy To The City Of Lebanon Prior To Proceeding With Construction.

2.) Secondary Arterial And Residential/Commercial Collector Streets Require At Least One 8' Emergency Access/Breakdown Aisle As Directed By The City Of Lebanon.

3.) The Location Of Proposed Utilities As Indicated Hereon Are Based Upon The Experience Of The City Of Lebanon And Are So Indicated To Ensure The Orderly Development Of The Land. Strict Adherence To The Indicated Location Is Required. Requests To Change The Location Of The Proposed Utilities Shall Be Submitted In Writing. Utilities Not Meeting These Requirements Shall Be Removed And Replaced As Directed By The City Of Lebanon.

4.) Primary Arterial Streets And Divided Arterial Streets Are To Be Coordinated With The City Of Lebanon Planning Department And Shall Be In Accordance With The Minimum Design Standards Outlined By The Subdivision Control Ordinance And Thoroughfare Plan Or As Directed By The City Engineer.



LOCAL RESIDENTIAL STREETS

Scale: ¼"=1'-0"

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No. PE11500016
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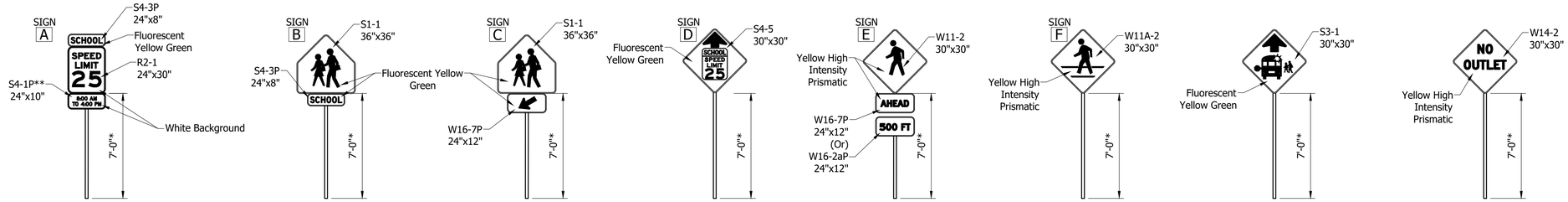
CITY OF LEBANON

RIGHT–OF–WAY, UTILITY EASEMENT, UTILITY LOCATION & STREET LIGHTING GUIDELINES

SHEET 02 OF 25

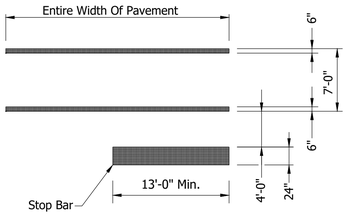


NOTES:

1.) * Mounting Height From Roadway Edge Of Pavement. (Typ. 2.).
2.) ** Confirm Times With City Of Lebanon.
3.) All Black Lettering Is Scotchcal 7725 (Or Equal).

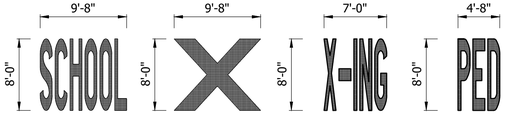
REGULATORY/WARNING SIGN DETAILS

Scale: None



INTERSECTION CROSSWALK DETAIL

Scale: ⅛"=1'-0"



PAVEMENT MARKING DETAIL

Scale: ⅛"=1'-0"

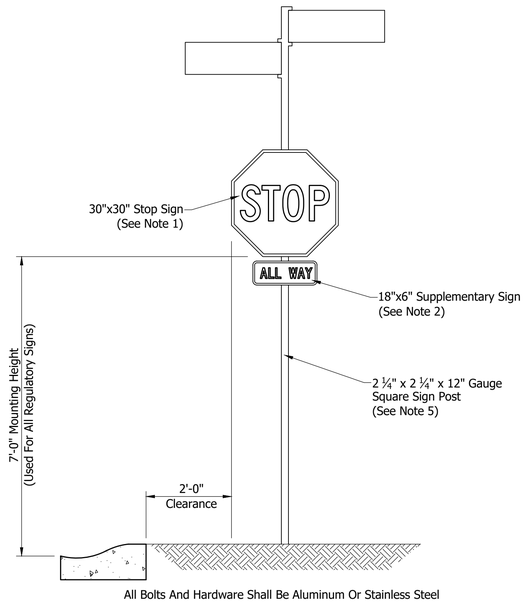
GENERAL NOTES:

1.) All Regulatory Signs Shall Be High Intensity And In Accordance With The Indiana Manual On Uniform Traffic Control Devices, Most Recent Edition.

2.) All Pavement Markings Shall Be White Thermoplastic And Span Across Approach Lanes.

3.) Signs S3-1 & W14-2 To Be Installed When Required By The City Of Lebanon.

4.) Where Pedestrian Cross Traffic Is Not Established, School Crossing Pavement Markings And Sign "C" May Be Omitted At The Discretion Of The City Of Lebanon.



All Bolts And Hardware Shall Be Aluminum Or Stainless Steel

TYPICAL REGULATORY/WARNING SIGN REQUIREMENTS

Scale: None

GENERAL NOTES:

1.) Stop Sign (R1-1) Shall Be High Intensity And In Accordance With Most Recent Indiana Manual On Uniform Traffic Control Devices. Unless Otherwise Detailed On This Sheet, Other Regulatory Signs Shall Be A Minimum Of 18"x24".
2.) A Multi-Way Stop Intersection Requires An "ALL WAY" (R1-3P) Supplementary Sign 18" Wide By 6" Tall In Accordance With Said Manual.
3.) Streets Shall Be So Signed At Non-Signalized Intersections With Two Such Street Sign Assemblies Typically Required. Separate 12' Square Sign Post For Street Signs Permitted Only At Signalized Intersections.
4.) Street Signs Shall Be 8" Tall Extruded Aluminum (6063-T6) "Vegas Gold" Background With Black Letters W/Black Border.
5.) Regulatory Signs, Other Than Stop Signs, Shall Be Mounted On 12' - 2 ¼" x 2 ¼" x 12 Gauge Square Sign Posts. SUPR-LOK Cap Shall Be Model #97SQX. Regardless If Material For Posts Is Other Than As Shown Hereon, Mounting Height Shall Be 7'-0" From Roadway Edge Of Pavement
6.) For Urban Intersections See Curb Ramp Details On Sheet 08 Of The City Standards.
7.) All Regulatory Signs To Receive Black Finish On Back.
8.) Contractor Shall Provide A 4" Diameter PVC Sleeve For Signs Placed Within New Sidewalks.

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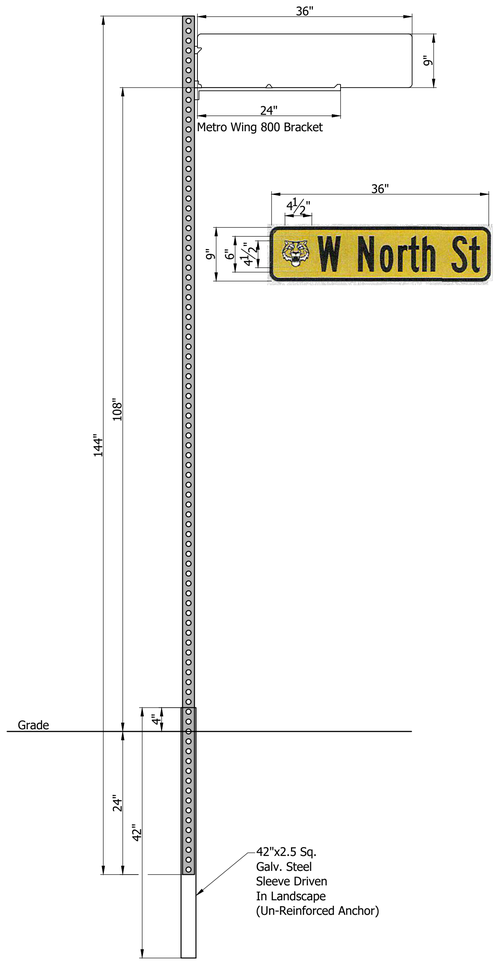
CITY OF LEBANON

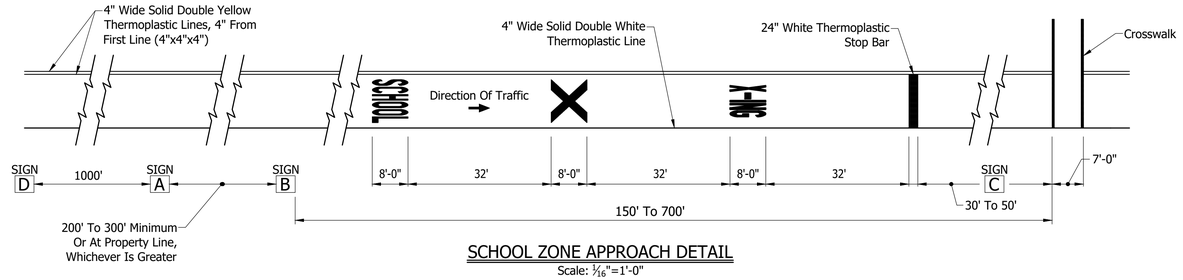
TRAFFIC CONTROL DETAILS

SHEET 03 OF 25



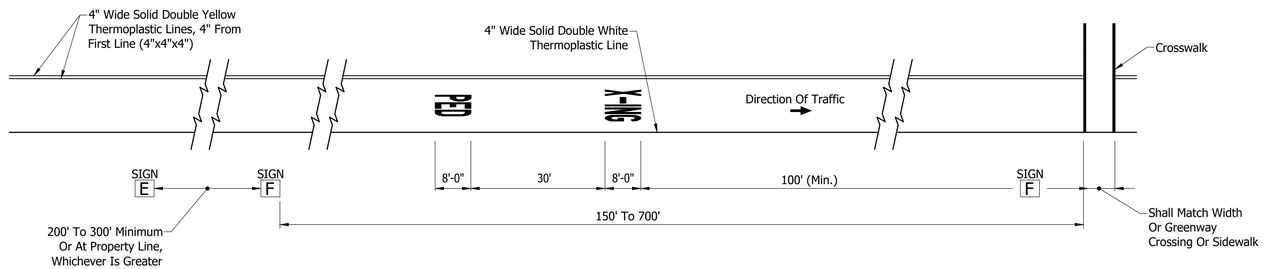
TYPICAL STREET BLADE SIGN DETAIL

Scale: 1"=1'-0"



SCHOOL ZONE APPROACH DETAIL

Scale: 1/16"=1'-0"



PEDESTRIAN CROSSING APPROACH DETAIL - COLLECTOR OR ABOVE

Scale: 1/16"=1'-0"

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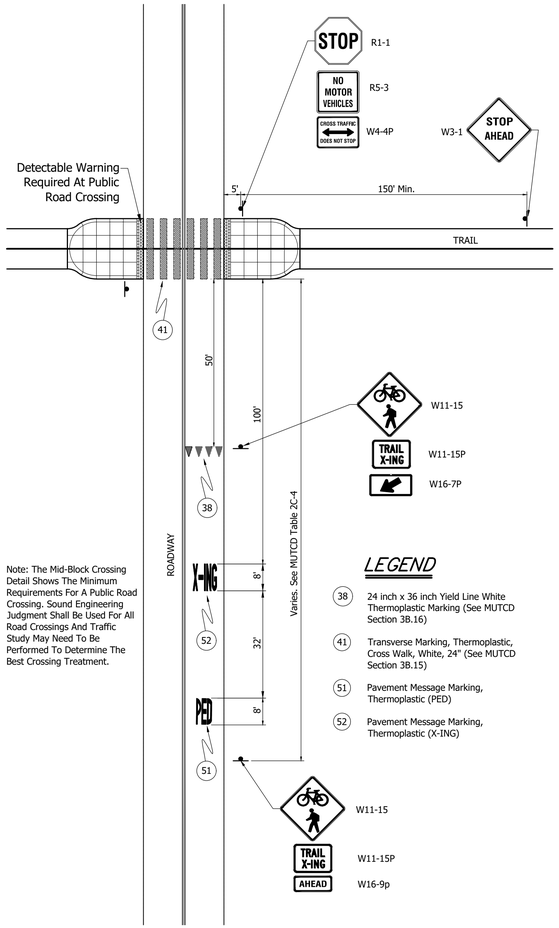
CITY OF LEBANON

TRAFFIC CONTROL DETAILS

SHEET 04 OF 25



Note: The Mid-Block Crossing Detail Shows The Minimum Requirements For A Public Road Crossing. Sound Engineering Judgment Shall Be Used For All Road Crossings And Traffic Study May Need To Be Performed To Determine The Best Crossing Treatment.

LEGEND

(38) 24 inch x 36 inch Yield Line White Thermoplastic Marking (See MUTCD Section 3B.16)

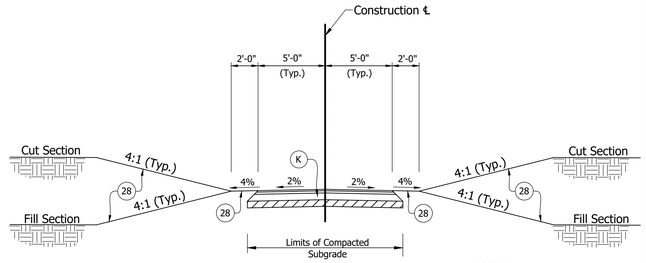
(41) Transverse Marking, Thermoplastic, Cross Walk, White, 24" (See MUTCD Section 3B.15)

(51) Pavement Message Marking, Thermoplastic (PED)

(52) Pavement Message Marking, Thermoplastic (X-ING)

TYPICAL TRAIL MID-BLOCK CROSSING

Scale: None



LEGEND

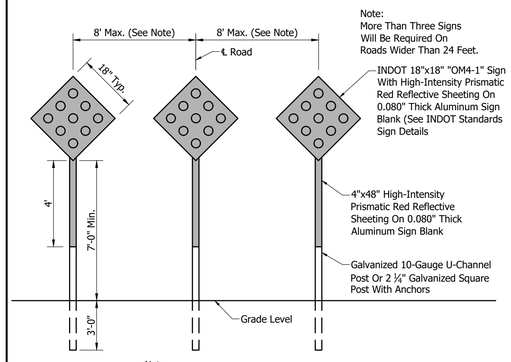
1. Cross Slope Shall Be 2% Maximum For Crowns, Transitions, And Superelevations.
2. Clear Graded Shoulders Shall Be 4% Maximum.
3. Side Slopes Shall Be 4:1. A 3:1 Maximum Side Slope May Be Used Provided That A 5 Foot Wide Recovery Shoulder Or A 42" Tall Guard Rail Is Provided.

(K) HMA For Sidewalks:
140#/SYS HMA Surface Type B
220#/SYS HMA Intermediate Type B
6" Compacted Aggregate No. 53, Base
Compacted Subgrade Type III

(28) Seed Mixture,"R" or "U"

TYPICAL TRAIL CROSS SECTION

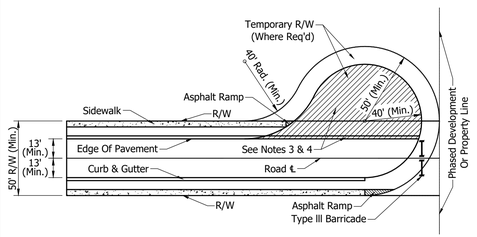
Scale: $\frac{3}{16}$"=1'-0"



Note:
End Of Roadways (Dead-End) Must Have CUL-DE-SAC Or Hammerhead Turn-Around Sufficient For Fire Trucks.

END OF ROADWAY DETAIL

Scale: None



TEMPORARY CUL-DE-SAC

Scale: None

1.) When Streets Are Temporarily Dead-End, A Temporary Cul-De-Sac Shall Be Constructed. Permanently Dead-End Streets Are Prohibited By The Subdivision Control Ordinance.

2.) Right-Of-Way And Back-Of-Curb Diameter Shall Be In Conformance With The Minimum Design Standards For Streets In The Subdivision Control Ordinance.

3.) For Residential Streets, Continue Proposed Pavement and Curb Through The Temporary Cul-De-Sac To The End Of Pavement. Concrete Roll Curb & Gutter Shall Be Used Through The Temporary Cul-De-Sac And Mainline Pavement Shall Be Used Beyond The Proposed Curb And Gutter.

4.) For Industrial Streets, Continue Proposed Pavement Through The Temporary Cul-De-Sac. Extending Concrete Roll Curb & Gutter Through The Temporary Cul-De-Sac Is Optional. 8" Of INDOT No. 2 Stone May Be Used Throughout The Temporary Cul-De-Sac.

5.) Typical Cross Slope To Be Maintained Through The Temporary Cul-De-Sac And Temporary Drainage Should Be Provided.

STREET LIGHTING

1.) Street Lighting Is Required On All Streets. For Newly Platted Streets, The Developer Shall Provide The Design For Street Lighting In Accordance With Those Requirements Outlined Hereon And Clarified Through The Approval Process. Provide Lighting At Intersections, Cul-De-Sacs, And Other Locations Requiring Added Safety.

2.) All Lighting Plans Submitted For Approval, Shall Include, But Are Not Limited To, Location Of Each Light Standard, Transformer, And Junction Box. Note That Light Standards Are Typically The Direct Burial Type And Impact An Approximate Area Of 18" In Diameter And 5' Deep.

3.) Light Standards, Luminaires, Transformers, Junction Boxes, And Wires Are Supplied By The Lebanon Utilities So As To Ensure Uniformity In System Operation And Maintenance. Deviations Are Not Permitted.

4.) Noting That Wire Size Shall Be #6AL And That A Typical Run Includes 3 Wires, The Developer Shall Furnish And Install, 2-Inch Diameter Rigid Conduit At All Street Crossings. Certain Crossings May Require Additional Conduits Or Upsizing In Accordance With The Lighting Plans.

5.) Lighting Is To Be Installed By The Utility Service Board With Cost Paid By The Developer In Accordance With The Schedule Of Values In Effect At Time Of Installation. The Lighting Will Then Be Dedicated To The Lebanon Utilities For Ownership, Operation, And Maintenance.

COMMERCIAL TRANSFORMER SETTING

1.) The Developer Is Responsible For Placing Conduit From The Riser Pole To The Concrete Pad As Well As Pouring The Transformer Pad To The Lebanon Utilities Specifications.

2.) The Developer Is Responsible For All Secondary Installations.

3.) If Deemed Necessary By The Lebanon Utilities Electric Department, The Transformer Pad Shall Include A Termination Enclosure.

4.) The Lebanon Utilities Will Furnish And Install The Transformer.

5.) All Wiring Shall Be Located In Dedicated Utility Easements.

6.) All Primary Wiring Under Parking Lots, Streets, Or Similar Features Shall Be Placed In Rigid Conduit, Which Shall Be Furnished And Installed By The Developer.

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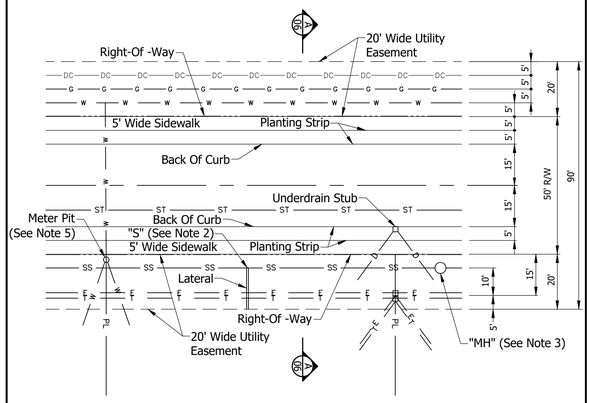
CITY OF LEBANON

TRAIL, BIKE & PEDESTRIAN STANDARDS

SHEET 05 OF 25



NOTES:

1.) Right-Of-Way Width, Back-To-Back Of Curbs Dimension, And Planting Strip Width Shown Above Are Based Upon Local Residential Street.

2.) Imprint "S" Into Curb At The Location Of The Sanitary Sewer Lateral.

3.) Imprint "MH" Into Curb On The Appropriate Side Of Street At The Location Of The Sanitary Sewer Manholes.

4.) Imprint "ST" Into Curb On The Appropriate Side Of Street At The Location Of The Storm Sewer Structures.

5.) Imprint "W" Into Curb On The Appropriate Side Of Street At The Location Of The Water Meters.

6.) Imprint "E" Into Curb At The Location Of The Electric.

7.) Imprint "T" Into Curb At The Location Of The Telephone.

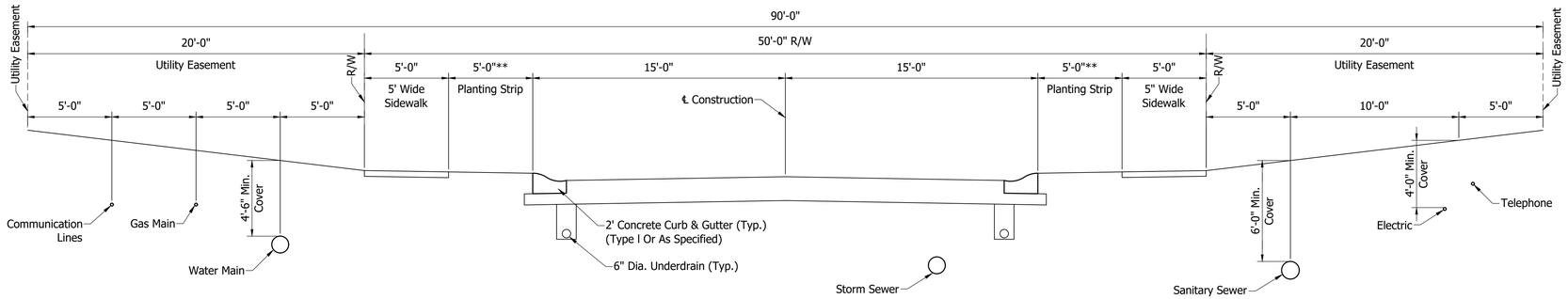
8.) Imprint "DL" Into Curb At The Location Of The Private Drain Line.

TYPICAL LOT DETAIL

Not To Scale

LEGEND

W	Water Main
ST	Storm Sewer
SS	Sanitary Sewer
G G	Gas Main
DC DC	Communications
E	Electric
T	Telephone
D	Private Drain Line



UTILITY ROAD SECTION

Scale: ¼"=1'-0"

A 06

**See Planning Department For Approved Street Tree List

GENERAL NOTES

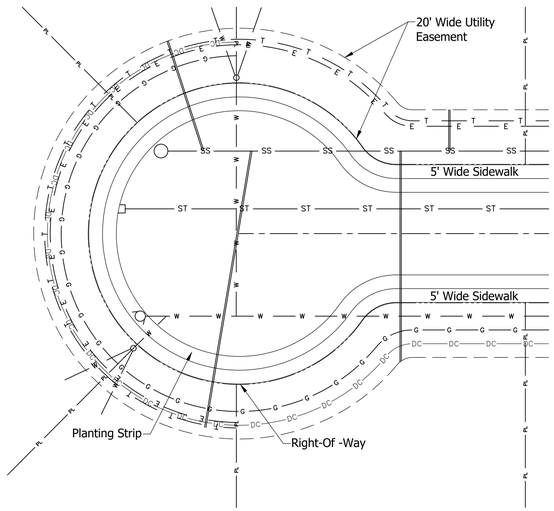
1.) The Location Of Proposed Utilities As Indicated Hereon Are Based Upon The Experience Of The City Of Lebanon And Are So Indicated To Insure The Orderly Development Of The Land. Strict Adherence To The Indicated Location Is Required. Requests To Change The Location Of The Proposed Utilities Shall Be Submitted In Writing. Utilities Not Meeting These Requirements Shall Be Removed And Replaced As Directed By The City Of Lebanon.

2.) The 5 Foot Wide Planting Strip Must Be Continued Around The Cul-De-Sac, Which Is To Say That The Front Edge Of The Sidewalk Needs To Remain 5 Feet Behind The Back-Of-Curb At All Points Around The Cul-De-Sac.

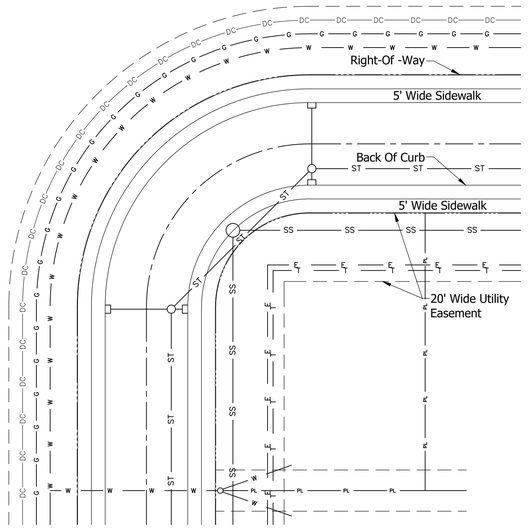
3.) Provide Conduit Crossings As Directed By Lebanon Utilities Electrical Department Which Should Be Made Part Of The Lighting Plans As Required By Sheet 05.

UTILITY ALIGNMENT

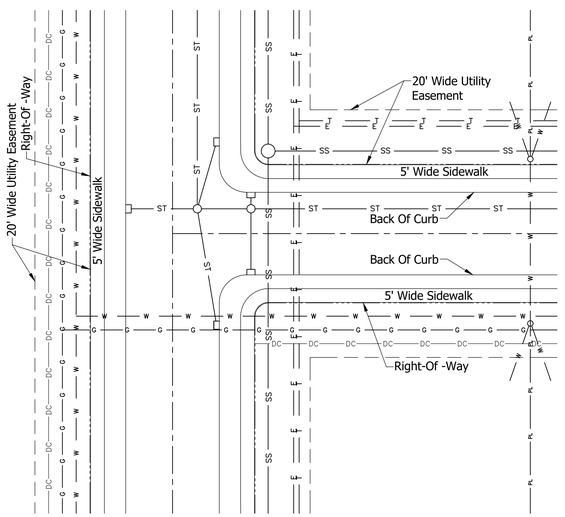
Not To Scale



CUL-DE-SAC



HORIZONTAL CURVE



"T" INTERSECTION

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Rev. No.	Description	Date

JOHN G. LIGHTNER IV REGISTERED No. PE11500016 STATE OF INDIANA PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 01/03/2015 DATE

CITY OF LEBANON

PLACEMENT OF UTILITIES

SHEET 06 OF 25

PAVEMENT CONSTRUCTION

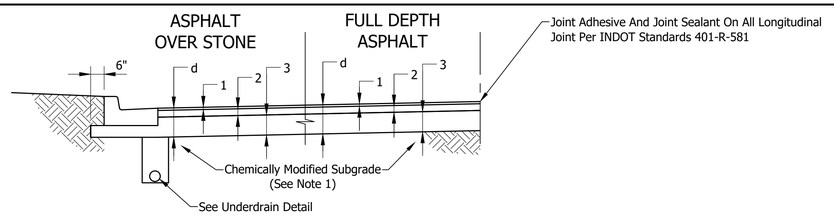
1.) Subgrade Shall Be 100 Percent Of The Maximum Dry Density In Accordance With AASHTO T99. Compaction Test Shall Be At The Contractor's Expense And Shall Be Performed By An Independent Laboratory, Approved By The City Of Lebanon. Tests Results Shall Be Submitted To The City Engineer Prior To Placing Any Material On The Subbase Subgrade. One-In Place Density Test Shall Be Completed For Each Lift For Every 400 Linear Feet Of Traffic Lanes. The City Of Lebanon Required 48 Hours Written Notice Prior To Testing. All Subgrade For New Pavement Shall Undergo Chemical Modification & Stabilization. Testing Agency Is Required To Provide Evidence Of Testing Equipment Calibration, Upon Request.

2.) Place Tack Coat In Accordance With The Most Recent INDOT Standard Specifications For Asphalt Pavement Sections.

3.) Wherever Rigid Pavement Is To Be Used, The Contractor Shall Submit A Detailed Paving Plan To The City 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 Meet The Requirements Of The Most Recent INDOT Standard Details.

4.) Upon Approval Of The Mix Design By The City Engineer Chemical Modification Of Soils Per INDOT Standard Specifications Section 215, Shall Be Performed To A Minimum Depth Of 16 Inches. Following Soil Modification, Compaction Shall Be Performed Until The Modified Layer Has A Density Not Less Than 100% Of The Maximum Dry Density Or The Zone Below The Modified Layer Has A Density Not Less Than 95% Of The Maximum Dry Density. Maximum Dry Densities Shall Be Determined In Accordance With AASHTO T99. The Mix Design Shall Be Determined In Accordance With INDOT Design Procedures For Soil Modification Or Stabilization. The Proposed Design And Construction Procedure Shall Be Submitted To The City Engineer. Unsatisfactory Soil Modifications As Determined By The City Engineer May Require An Increase In Depth Of The Aggregate Base Or Binder. Tensar TriAx Geogrid May Be Used In Lieu Of Or In Conjunction With The Chemical Modification Of Soils, As Directed By The City Engineer. In Conjunction With The Usage Of Tensar TriAx Geogrid, A Modified Pavement Section May Be Approved By The City Engineer.

5.) Following The Passing Of Specified Cure Time The Contractor Is To Roll The Entirety Of The Subgrade In Accordance w/INDOT Standard Specifications 203 In The Presence Of The City Engineer Or It's Representative. Any Areas Not Passing A Proof Roll After Stabilization Shall Be Repaired By Methods Acceptable To The City Engineer At Contractor's Expense Until A Passing Proof Roll Is Obtained.



LOCAL RESIDENTIAL STREETS

d=13"

1. 1 ½" Surface (165#/SYD HMA, Type B)
2. 2 ½" Intermediate (275#/SYD HMA, Type B)
3. 9" Compacted Aggregate No. 53

LOCAL RESIDENTIAL COLLECTOR AND LOCAL COMMERCIAL STREETS

d=14"

1. 1 ½" Surface (165#/SYD HMA, Type B)
2. 2 ½" Intermediate (275#/SYD HMA, Type B)
3. 4" Base (440#/SYD HMA, Type B)
4. 6" Compacted Aggregate No. 53

RESIDENTIAL/COMMERICAL COLLECTOR AND SECONDARY ARTERIAL STREETS

d=15"

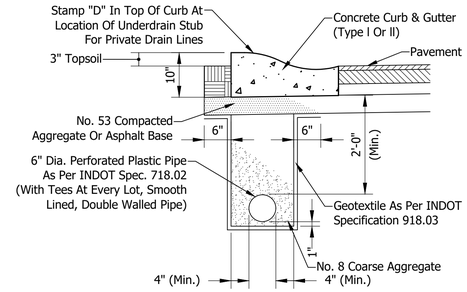
1. 1 ½" Surface (165#/SYD HMA, Type C)
2. 2 ½" Intermediate (275#/SYD HMA, Type C)
3. 4" Base (440#/SYD HMA, Type C)
4. 7" Compacted Aggregate No. 53

INDUSTRIAL STREETS AND ARTERIALS

The Asphalt Over Stone And Full Depth Asphalt Pavement Sections Shall Be Designed Based Upon California Bearing Ratio (CBR) Tests Performed On The Subgrade Soils. Pavement Thickness Designs Shall Be Submitted To The City Of Lebanon For Approval.

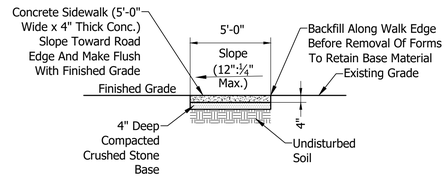
PAVEMENT CONSTRUCTION

Scale: None



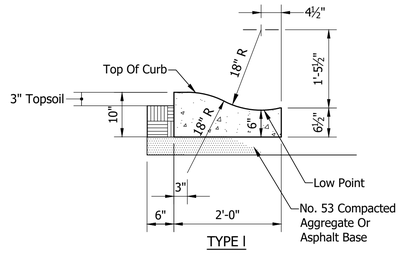
UNDERDRAIN DETAIL

Scale: ¾"=1'-0"



TYPICAL SIDEWALK DETAIL

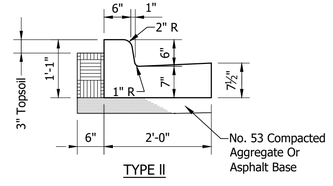
Scale: None



TYPE I

2' CONCRETE ROLL CURB & GUTTER

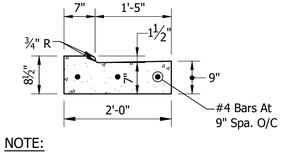
Scale: ¾"=1'-0"



TYPE II

2' COMBINED CONCRETE CURB & GUTTER

Scale: ¾"=1'-0"



NOTE:
Reinforced Concrete Gutter Is Required At All Commercial/Industrial Drives That Intersect A Public Road With Type II 2' Combined Concrete Curb And Gutter Or Similar.

REINFORCED CONCRETE GUTTER

Scale: ¾"=1'-0"

REVISIONS		
Rev. No.	Description	Date

JOHN D. LIGHTNER IV
REGISTERED
No.
PE11500016
STATE OF
INDIANA
PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL

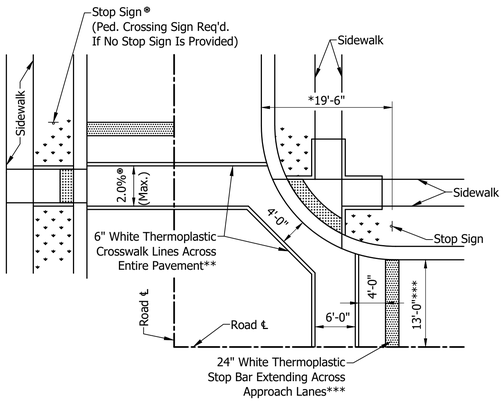
DESIGN ENGINEER

02/03/2025
DATE

CITY OF LEBANON

PAVEMENT,
CURB & SIDEWALK DETAILS &
NOTES

SHEET
07
OF
25



(See Curb Ramp Construction Notes On Sheet 07 Of Lebanon Standards)

PUBLIC ROAD APPROACH-RESIDENTIAL

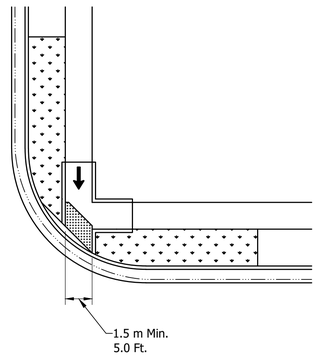
Scale: None

* Distance To Be Adjusted For Acute Angle Intersections

** See General Note 4 On Sheet 2 For Thermoplastic Requirements

*** Unless Otherwise Approved By The ADA Coordinator Or City Engineer

⊛ 5.0% Max Cross Slope Is Allowed If Intersection Is Not Stop Or Yield Controlled



CURB RAMP, SINGLE DIRECTION CORNER

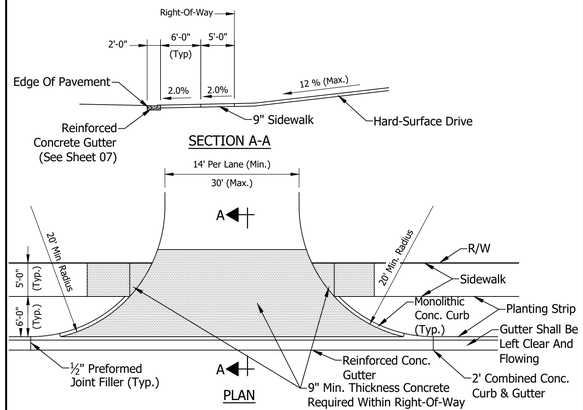
Scale: None

NOTES:

1.) Tactile Warning Surface Shall Be Replaceable Composite Material Panels, Dark Brick Red Color And Shall Be Manufacture By ADA Solutions, INC., Or As Approved By The ADA Coordinator Or City Engineer.

2.) This Type Of Ramp Construction May Be Approved In The Field At The Discretion Of The ADA Coordinator Or City Engineer.

3.) Thermoplastic Crosswalk Markings Must Be Used To Identify The Direction Of The Single Crossing Path.



TYPICAL COMMERCIAL PRIVATE DRIVE

Scale: None

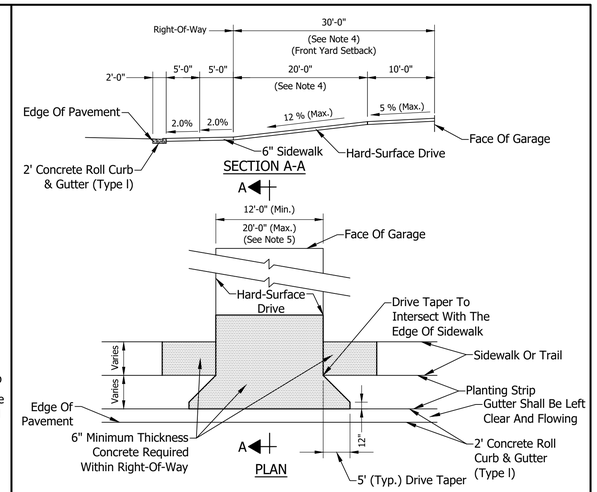
NOTES:

1.) The Maximum Algebraic Difference In Grades For Any 10 Foot Interval Shall Not Exceed 8% For Crest Vertical Curves, Nor 10% For Sag Vertical Curves.

2.) Concrete Drives Require Control Joints At A Maximum Of Every 10 Feet Each Way.

3.) Use Actual Setback As Shown On Plat And As Provided By The City Of Lebanon Zoning Ordinance.

4.) City Of Lebanon May Approve Alternate Paving Materials.



TYPICAL RESIDENTIAL PRIVATE DRIVE

Scale: None

NOTES:

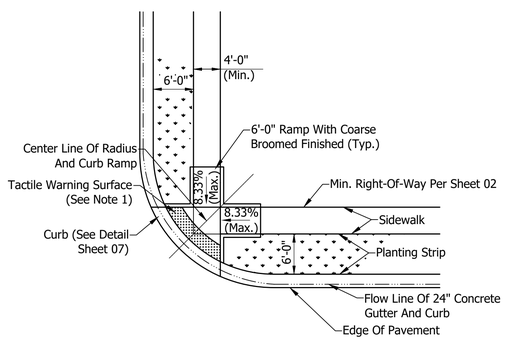
1.) The Maximum Algebraic Difference In Grades For Any 10 Foot Interval Shall Not Exceed 8% For Crest Vertical Curves, Nor 10% For Sag Vertical Curves.

2.) The Frontage Of All Lots Shall Drain To Adjacent Streets Except With The Prior Approval Of City Of Lebanon.

3.) Concrete Drives Require Control Joints Per ACI 301.

4.) Use Actual Setback As Shown On Plat And As Provided By The City Of Lebanon Zoning Ordinance.

5.) A 30' Max. Width May Be Permitted By The Lebanon Planning Department.



(See Curb Ramp Construction Notes On Sheet 07 Of Lebanon Standards)

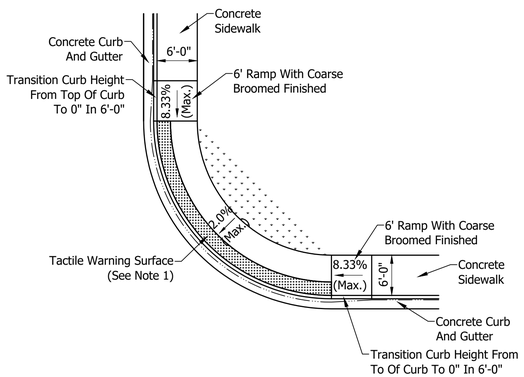
CURB RAMP, TYPE E

Scale: None

NOTES:

1.) Tactile Warning Surface Shall Be Replaceable Composite Material Panels, Dark Brick Red Color And Shall Be Manufacture By ADA Solutions, INC., Or As Approved By The ADA Coordinator Or City Engineer.

2.) Transition Gutter Flowline To Midpoint Of Concrete Curb And Gutter At Curb Ramp.



(See Curb Ramp Construction Notes On Sheet 07 Of Lebanon Standards)

CURB RAMP, TYPE F

Scale: None

NOTES:

1.) Tactile Warning Surface Shall Be Replaceable Composite Material Panels, Dark Brick Red Color And Shall Be Manufacture By ADA Solutions, INC., Or As Approved By The ADA Coordinator Or City Engineer.

2.) Transition Gutter Flowline To Midpoint Of Concrete Curb And Gutter At Curb Ramp.

CURB RAMP CONSTRUCTION

1.) Type F/E Ramps Shall Be Provided Adjacent To Each Point Of Tangency At All Corners Of Every Street Intersection Where There Is An Existing Or Proposed Sidewalk And Curb. In Case Of "T"-Intersection, A Type C/K Ramp Shall Be Provided Adjacent To Each Corner Ramp. Type C/K Ramps Also Shall Be Provided At Walk Locations At Mid-Block In Vicinity Of Hospitals, Medical Centers Or Athletic Stadiums. The Use Of Details Contrary To Those Shown Hereon Shall Require The Prior Written Approval Of The ADA Coordinator Or City Engineer.

2.) Surface Texture Of The Ramp Shall Be That Obtained By A Coarse Brooming Transverse To The Slope Of The Ramp.

3.) Ramps Shall Be Provided Where The Driveway Curb Extends Across The Sidewalk.

4.) Care Shall Be Taken To Assure A Uniform Grade On All Ramps With No Breaks In Grade.

5.) Drainage Structures Shall Not Be Placed In Line With The Ramps Except Where Existing Drainage Structures Are Being Utilized In The New Construction. Location Of The Ramps Shall Take Precedence Over Location Of Drainage Structures.

6.) The Normal Gutter Line Profile Shall Be Maintained Through The Area Of The Ramp.

7.) Expansion Joint For The Ramp Shall Be A Maximum ½" Wide. The Top Of The Joint Filler For All Ramp Types Shall Be Flush With Adjacent Concrete.

8.) Thermoplastic Crosswalk And Stop Line Marking, If Used, Shall Be So Located As To Stop Traffic Short Of Ramp Crossing.

9.) Curb Ramps At Marked Crossings Shall Be Wholly Contained Within The Markings, Excluding Any Flared Sides.

10.) Slope Of Ramp May Be Warped When Field Conditions Warrant And When Approved By The ADA Coordinator Or City Engineer.

11.) Tactile Warning Surface Shall Be Replaceable Composite Material Panels, Dark Brick Red Color And Shall Be Manufactured By ADA Solutions, INC., Or As Approved By The ADA Coordinator Or City Engineer.

RAMP CONSTRUCTION

1.) All Ramps Shall Meet The Requirements Of The American With Disabilities Act, The Most Recent INDOT Standard Specifications, Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) And These Lebanon Standards, Curb Swipes Required For Handicap Ramps Shall Be Provided At Time Of Initial Construction And Shall Be Per Lebanon Standards.

2.) Minimum Width Of Curb Ramp Shall Be 4 Feet Not Including Flares. Maximum Slope Of Ramps Shall Be 12:1.

3.) Ramps Are To Be Located As Shown On The Plans Or As Directed By The ADA Coordinator Or City Engineer.

REVISIONS		
Rev. No.	Description	Date

JOHN G. LIGHTNER IV · REGISTERED · No. PE11500016 · STATE OF INDIANA · PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 02/03/2025 DATE

CITY OF LEBANON

PRIVATE DRIVE DETAILS & NOTES

SHEET 08 OF 25

GENERAL NOTES:

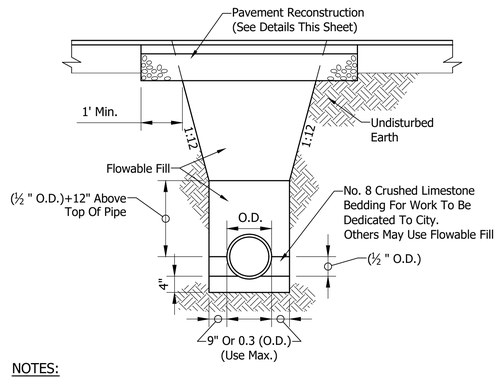
1.) Trench Backfill Within Streets, Alleys Or Sidewalks Shall Be Type 1 Structural Backfill In Accordance With INDOT Standard Specifications Section 904.05 As Shown.

2.) Type 2 Structure Backfill, In Accordance With INDOT Standard Specifications Section 904.05, May Be Used If The Trench Has Adequate Space To Allow Entrance Of Proper Equipment And Materials To Achieve The Required 95% Compaction.

3.) The City Engineer Shall Have The Authority To Require Type 1 Structure Backfill When, In His Opinion, Minimum Compaction Cannot Be Obtained.

4.) The Contractor Shall Notify The City Engineer At Least 24 Hours Prior To Beginning Backfill Of Excavation. If The Permanent Patch Placement Is To Be A Separate Operation, The Contractor Shall Also Notify The City Engineer 24 Hours Prior To Placement Of Patch.

5.) The Contractor Shall Be Responsible To Maintain And Repair Any And All Open Cuts Permitted Within The City Of Lebanon For A Period Of One Year Upon Final Acceptance By The City.



NOTES:

1.) Trench Spoil Is To Be Removed From The Work Site And Disposed Of Out Of The Right-Of-Way.

2.) Flowable Fill Is To Be Poured Into The Trench To Serve As Backfill, To The Dimensions And Specifications Listed In This Detail.

3.) The Flowable Fill Mix Shall Have Been Previously Reviewed And Approved By The City Of Lebanon.

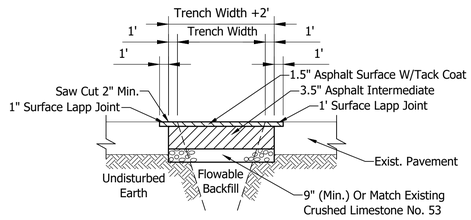
4.) The Compressive Strength Of The Flowable Fill Shall Not Be Less Than 50 PSI Nor Greater Than 100 PSI At 28 Days.

5.) When Type 1 Structure Backfill Is Used, The Existing Paved Surface Is Required To Be Over-Cut 1 Foot Minimum Each Side. Provide A Vertical, Neat 2-Inch Saw-Cut Edge.

6.) Flowable Fill Shall Not Be Placed On Frozen Subgrade, During Freezing Conditions. Flowable Fill Shall Be Protected From Freezing For 72 Hours. Flowable Fill Shall Not Placed In Standing Water. Flowable Fill Shall Be Brought Up Uniformly To Fill Line.

TRENCH BACKFILL FLOWABLE FILL DETAIL

Scale: None



* If Existing Pavement Is Thicker Than 5", Additional Binder Is To Be Used To Match The Existing Pavement Thickness.

NOTES:

1.) Saw Cuts Shall Provide A Vertical, Neat And Uniform Edge.

2.) All Materials Shall Comply With Specifications As Required By The City.

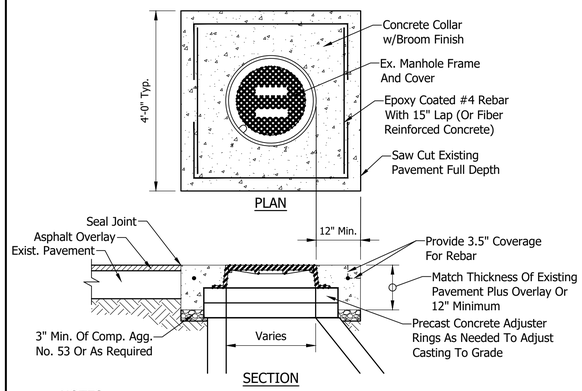
3.) The Existing Vertical Edge Of Pavement Is To Be Tack Coated Prior To The Laying Of New Asphalt. Tack Coat Is To Be Applied As Specified In The Latest Standard INDOT Standard Specifications Sections 409 And 902.

4.) The New Surface Pavement Grade Shall Match The Existing Surface Pavement Grade.

5.) A 2 (Two) Inch Wide Band Of Crack Sealant Is To Be Applied Along The Joint Between The Existing And New Asphalt Surface. Sealant Is To Be Applied In Accordance With INDOT Standard Specifications Section 305.

BITUMINOUS PATCH

Scale: None



NOTES:

1.) A 4,000 PSI Concrete Collar Is To Be Installed Around Existing Manholes To Be Adjusted To Grade In All Asphalt Surfaces. Collar Shall Be Adjusted To The Proposed Transverse And Longitudinal Slope Of The Roadway.

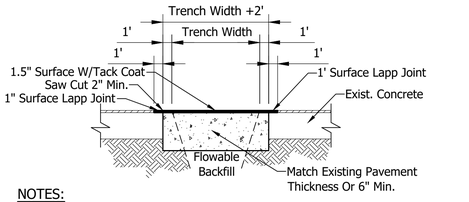
2.) Cut And Remove The Asphalt Pavement Around The Existing Manhole Casting With 12 Inch Minimum Separation From The Casting.

3.) Concrete Collar Shall Match The Thickness Of The Adjacent Existing Pavement Plus The Thickness Of The Proposed Overlay And Shall Be A Minimum Of 12 Inches In Depth. If Casting Adjustment Exceeds Existing Pavement Depth A Minimum Of 3 Inches Of Compacted Aggregate No. 53 Below The Concrete Cone Shall Be Placed And Up To The Concrete Collar.

4.) Precast Concrete Adjuster Rings For Storm Sewer And Sanitary Manholes Shall Be Per Sheet 17 And Sheet 16 Respectively.

ADJUST CASTING TO GRADE WITH CONCRETE COLLAR

Scale: None



NOTES:

1.) Saw Cuts Shall Provide A Vertical, Neat And Uniform Edge.

2.) All Materials Shall Comply With Specifications As Required By The City.

3.) Concrete Surface Shall Be Broom Finish At Right Angles To Traffic Flow.

4.) All Concrete Shall Be Air Entrained-6 Bags Per Cubic Yard Minimum 4000 PSI Concrete.

5.) Contractor Shall Contact The Lebanon City Engineer To Determine If Anchors Are Required On Existing Concrete Pavement Repairs.

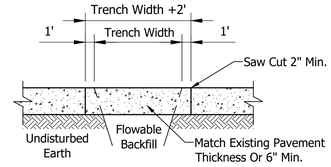
6.) The Concrete Pavement And The Existing Vertical Edge Of Pavement Are To Be Tack Coated Prior To The Laying Of New Asphalt. Tack Coat Is To Be Applied As Specified In The Latest INDOT Standard Specifications Section 409 And 902.

7.) The New Surface Pavement Grade Shall Match The Existing Surface Pavement Grade.

8.) A 2 (Two) Inch Wide Band Of Crack Sealant Is To Be Applied Along The Joint Between The Existing And New Asphalt Surface. Sealant Is To Be Applied In Accordance With INDOT Standard Specifications Section 305.

CONCRETE W/BITUMINOUS SURFACE PATCH

Scale: None



NOTES:

1.) Saw Cuts Shall Provide A Vertical, Neat And Uniform Edge.

2.) All Materials Shall Comply With Specifications As Required By The City.

3.) Surface Of Repair Shall Be Broom Finish At Right Angles To Traffic Flow.

4.) All Concrete Shall Be Air Entrained-6 Bags Per Cubic Yard Minimum 4000 PSI Concrete.

5.) Contractor Shall Contact The Lebanon Street Commissioner To Determine If Anchors Are Required On Existing Concrete Pavement Repairs.

CONCRETE PATCH

Scale: None

REVISIONS		
Rev. No.	Description	Date

JOHN G. LIGHTNER IV
REGISTERED
No. PE11500016
STATE OF INDIANA
PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 02/03/2025 DATE

CITY OF LEBANON

STREET CUT DETAILS

SHEET 09 OF 25

STORM SEWER GENERAL NOTES

1.) Storm Sewer Pipe Of Other Material Or Material Not Meeting These Specifications Shall Require The Prior Written Approval Of The City Of Lebanon.

2.) As-Built Drawings Shall Be Submitted To The City Of Lebanon For Their Records. Contractor Shall Submit As-Built Drawings Within 30 Days of Successful Completion Of All Testing Requirements.

3.) Contractor Shall Allow The City Of Lebanon The Opportunity To Inspect The Installation Of The Pipe And Bedding Material Prior To Proceeding With Backfilling An Open Trench. The City Of Lebanon Shall Be Given 48 Hours Notice Of The Contractor's Intent To Install Storm Sewer Piping And Structures.

4.) The Smallest Permissible Storm Sewer Pipe Diameter Is 12 Inches.

5.) Drawings And Calculations For Runoff, Retention And Discharge Rates Shall Be Provided To The City Engineer. Drawings And Calculations Shall Be Certified By A Registered Professional Engineer.

6.) All Projects With Storm Sewer Systems Must Be Approved By The City Engineer.

7.) All Storm Inlet To Mainline Connections Shall Be Made Concrete Pipe.

8.) Contractor Shall Inspect All Storm Sewer Material Prior To Installation, Removing & Replacing All Unsuitable Material At The Contractor's Expense.

9.) Store Storm Sewer Materials In An Area Safe From Damage And Deterioration.

10.) Keep Interior Of Pipe & Manholes Free From Dirt And Foreign Material.

11.) Load And Unload Material To Avoid Shock & Damage. Do Not Drop Material.

STORM SEWER REINFORCED CONCRETE PIPE

1.) Reinforced Concrete Pipe Shall Be Class III, IV, Or V As Specified In ASTM C76.

2.) Reinforced Elliptical Concrete Pipe Shall Be Class HE-III Or HE-IV As Specified In ASTM C507.

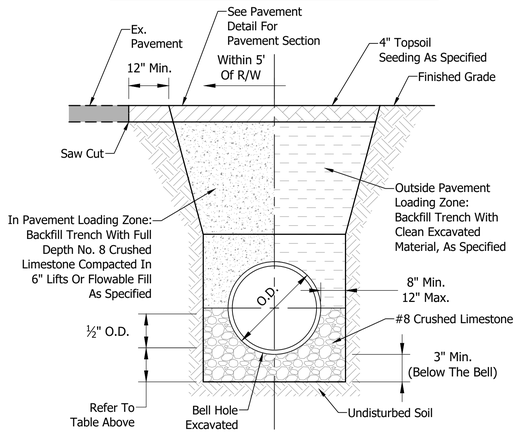
3.) Lift Holes Are Not Allowed For Pipe Less Than 24 Inches In Diameter. A Maximum Of Two Lift Holes Are Allowed For Pipe 24 Inches In Diameter Or Larger. Lift Holes Shall Be Repaired According To Most Recent INDOT Standard Specifications.

4.) Fittings And Specialties Shall Be In Accordance With The Specifications For The Type Of Pipe Being Used.

5.) Each Pipe Section Shall Be Marked With Date Of Manufacturer, Size And Class Of Pipe, Specification Designation, Manufacturer And Plant Identification.

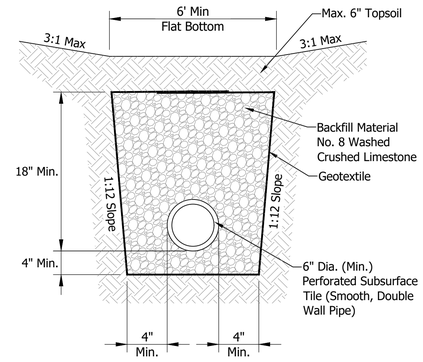
6.) Pipe Shall Be Furnished With A Bell Or Groove On One End Of A Unit Of Pipe And A Spigot Or Tongue On The Adjacent End Of The Adjoining Pipe. All Joints A Shall Have Groove On The Spigot For Placement Of A Rubber "O"-Ring Or Profile Gasket In Accordance With ASTM C443. The Gasket Shall Be A Continuous Ring Which Fits Snugly Into The Annular Space Between The Overlapping Surfaces Of The Assembled Pipe Joint.

PIPE SIZE	12" TO 15"	18" TO 30"	36" & OVER
BEDDING BELOW THE PIPE BARREL	4"	O.D. / 4	8"



NOTE:
1. Pavement Loading Zone Is The Area Within 5 Feet Of Any Right-Of-Way Of The City Of Lebanon.

RCP PIPE TRENCH
Scale: None



NOTE:
1. Swales Shall Be Constructed With A Minimum 0.5 Percent Profile Grade.
2. No Sump Pump Discharge Shall Be Directed So As To Impact Neighboring Properties Or Streets. Sump Pumps Shall Be Properly Connected To The Storm Sewer System Or A Subsurface Drain Provided By The Project Developer.
3. Gutters And Downspouts Shall Not Be Connected To The Sanitary Sewer System Or To The Street Underdrain System.

SWALE UNDERDRAIN DETAIL
Scale: None

STORM SEWER DEFLECTION AND TELEVISING

1.) Televising Is Required For All Pipe City Of Lebanon Shall Be Given 24 Hour Written Notice Of Televising. A Camera Equipped With Remote Control Devices To Adjust Light Intensity And 1,000 Linear Feet Of Sewer Cable Shall Be Provided. The Camera Shall Transmit A Continuous Image To The Television Monitor As It Is Being Pulled Through Pipe. The Image Shall Be Clear Enough To Enable The City Of Lebanon Representative And Others Viewing The Monitor To Easily Evaluate The Interior Condition Of The Pipe. The Camera Shall Stamp The Video Tape With Linear Footage And Project Number, And An Audio Voice-Over Shall Be Made During The Inspection Identifying Problems. Contractor Shall Bear All Televising Costs.

2.) The Pipe Shall Be Thoroughly Cleaned Before Installing Camera And Commencing Televising.

3.) If Any Pipe And/Or Joint Is Found To Be Leaking In Such A Way As Soil Migration Is Likely In The Sole Judgment Of The City, The Contractor Shall Repair That Portion Of The Work To The Satisfaction And Approval Of The City Of Lebanon.

4.) Contractor Is Responsible For All Cost Associated With Testing And Correction Of All Encountered Deficiencies.

POLYPROPYLENE STORM SEWER NOTES

1.) Polypropylene (PP) Storm Sewer Pipe (HP Storm Pipe By Ads Or Approved Equal) Will Be Permitted Outside Of Right-Of-Way Pavement Areas. PP Pipe Material Shall Have An Extended Double Gasketed Bell And Spigot Connection.

2.) All Storm Sewer Structures Shall Be Precast Reinforced Concrete Per Lebanon Standards. All Storm Sewer Structure Connections Shall Meet Lebanon Standards For Interior And Exterior Concrete Collars And Grouting. All Storm Sewer Structures Shall Meet Lebanon Standards For Concrete Flow Lines.

3.) All End Sections Shall Be Precast Reinforced Concrete Per Lebanon Standards.

4.) All PP Storm Sewers Shall Be Subject To And Meet 5.0% Mandrel Testing. All Storm Sewers Shall Be Jet Cleaned Inspected With Video Inspection Equipment And Video Files Provided To The City Prior To Acceptance Per Lebanon Standards.

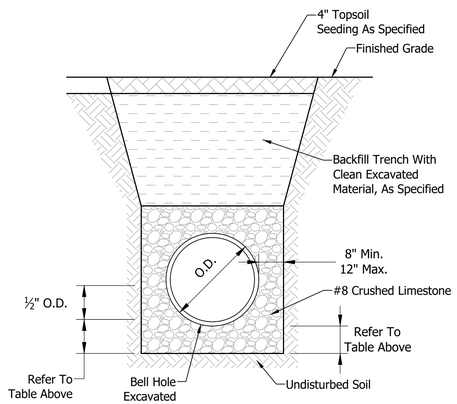
5.) All Storm Sewers Under Right-of-way Pavement Shall Be Reinforced Concrete Pipe Per Lebanon Standards.

6.) All Changes In Storm Sewer Pipe Material Must Be Made At A Precast Reinforced Concrete Storm Sewer Structure.

7.) Bedding For Pp Pipe Material Shall Be 4-inches For 12 To 24-inch Pipe, And 6-inches For 30 To 60-inch Pipe. Bedding And Initial Backfill Shall Be Crushed #8 Limestone Placed To A Minimum Of 12-inches Above Top Of Pipe.

8.) All Other City Of Lebanon Standards Shall Apply To Storm Sewer Construction.

PIPE SIZE	12" TO 24"	30" TO 60'
BEDDING BELOW THE PIPE BARREL	4"	6"



POLYPROPYLENE STORM SEWER TRENCH
Scale: None

REVISIONS		
Rev. No.	Description	Date

JOHN G. LIGHTNER IV · REGISTERED · No. PE11500016 · STATE OF INDIANA · PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 02/03/2025 DATE

CITY OF LEBANON

STORM SEWER BEDDING DETAILS, STORM SEWER DETAILS & NOTES

SHEET 10 OF 25

GENERAL NOTES

1.) Type J, K, L, M And N Manholes As Detailed Herein Require A Certain Minimum Depth. In Cases Where The Depth Of The Storm Sewer Is Not Sufficient To Meet The Minimum Depth As Required By The Detail, "F" Diameter Manhole Section May Be Used Throughout The Depth Of The Manhole.

2.) Manholes Shall Conform To ASTM C478. Joints Shall Conform To ASTM C443 The Use Of Cast-In-Place Concrete Structures Shall Require The Prior Written Approval Of Lebanon Utilities. Regardless Of The Type Of Casting Used, The Casting Shall Be Centered Over The Manhole Steps.

3.) Manholes Shall Be Installed At Distances Not Greater Than 400 Feet For Mainline Pipe Less Than 48" Diameter Or 500 Feet For Mainline Pipe Greater Than Or Equal To 48" Diameter.

4.) Manhole Steps Shall Be Neenah R-1981-J, M.A. Industries PS 1-PF, Or As Approved By The City Of Lebanon.

5.) Castings For Manholes Which Do Not Drain Surface Water Shall Be Neenah R-1772, EJ 1022Z1, Or As Approved By Lebanon Utilities. All Covers Shall Be Stamped "STORM SEWER" With 2" Raised Letters.

6.) Castings Which Drain Roll Curb And Gutter, Type I Curbing Shall Be Neenah R-3501-TR (Flow Right) Or TL (Flow Left), EJ 7495M1 (Flow Right) Or M2 (Flow Left), Or As Approved By The City Of Lebanon. Catch Basin, Type A Required. Manholes Shall Not Be Used To Drain Type I Curbing.

7.) Castings Which Drain Combined Curb And Gutter, Type II Curbing Shall Be Neenah R-3287-10V, EJ 7505Z1-M3-T4, Or As Approved By The City Of Lebanon. Catch Basin Type B Required. Manholes Shall Not Be Used To Drain Type II Curbing.

8.) Castings Which Drain Combined Curb And Gutter, Type II Curbing Shall Be Neenah R-3287-15, EJ 7565ZPT-5425M2-T3, Or As Approved By The City Of Lebanon. Catch Basin Type C Required. Manholes Shall Not Be Used To Drain Type II Curbing.

9.) Castings For Inlets Which Drain Open Pavement Areas Without Curbing Shall Be Neenah R-3405, EJ 5250, Or As Approved By The City Of Lebanon.

10.) Castings For Manholes Which Drain Open Pavement Areas Without Curbing Shall Be Neenah R-2502-G, EJ 1022Z1M2 Or As Approved By The City Of Lebanon.

11.) Castings For Use On Inlets Or Manholes Which Drain Swales Or Dry Bottom Detention Basins Shall Be Neenah R-4342, EJ 6489, Or As Approved By The City Of Lebanon.

12.) Catch Basin Connections Shall Occur At A Manhole. Manholes Which Connect Catch Basins And Mainline Pipe Shall, At A Minimum, Be Located At Each Street Intersection.

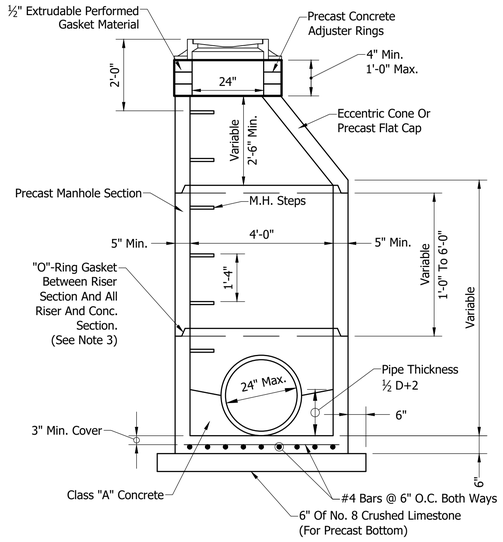
13.) The Contractor Shall Remove Soils Under A Precast Bottom, Which In Its Natural State, Have Good Bearing Strength And Which Have Had Its Characteristics Adversely Changed By The Contractor's Operations And Replace With 6 Inches Of No. 8 Crushed Limestone.

14.) For Type C Manholes, The Base And First Riser Section Of The Precast Concrete Manhole Shall Be Integrally Cast As One Complete Unit.

15.) Non-Shrink Grout Required In Annular Space And Place 6" Collar On Exterior Of Manhole.

16.) Upon Connection To An Existing Storm Manhole With New Infrastructure, That Manhole Shall Be Rehabilitated In Accordance With The Manhole Rehabilitation General Notes On Sheet 16.

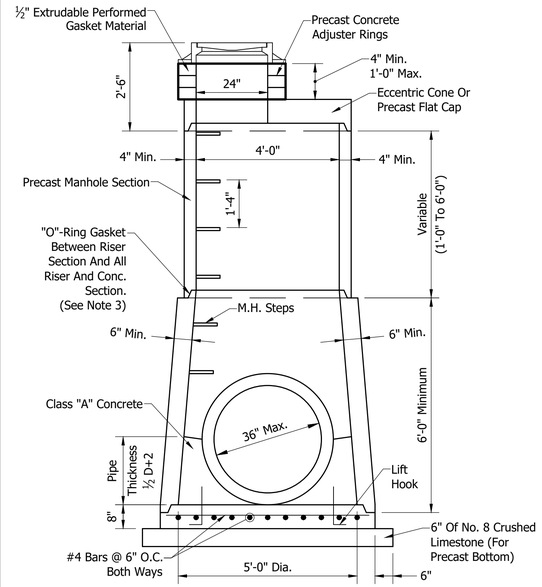
17.) Any Field Tiles Encountered During Construction Shall Be Reconnected And Made Fully Functional. Field Tiles May Be Rerouted And Connected To City Storm Sewer Infrastructure With The Approval Of The City Of Lebanon.



MAXIMUM PIPE SIZE	
Pipe Entering / Pipe Exiting At 0°-45° Bend	Pipe Entering / Pipe Exiting At 45°-90° Bend
24"	21"

MANHOLE, TYPE C

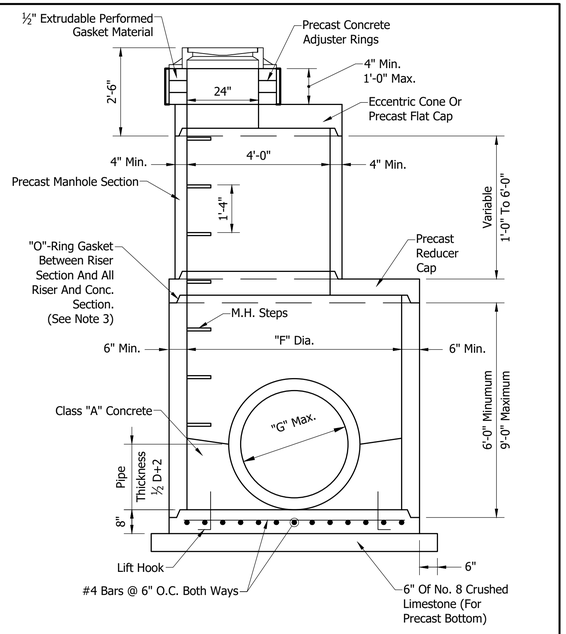
Scale: ½"=1'-0"



MAXIMUM PIPE SIZE	
Pipe Entering / Pipe Exiting At 0°-45° Bend	Pipe Entering / Pipe Exiting At 45°-90° Bend
36"	30"

MANHOLE, TYPE H

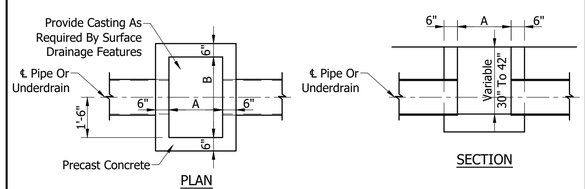
Scale: ½"=1'-0"



Manhole Type	Manhole Diameter "F"	MAXIMUM PIPE SIZE "G"	
		Pipe Entering / Pipe Exiting At 0°-45° Bend	Pipe Entering / Pipe Exiting At 45°-90° Bend
J	60"	36"	33"
K	72"	48"	36"
L	96"	54"	48"
M	102"	72"	66"
N	108"	84"	72"

MANHOLES, TYPE J, K, L, M, & N

Scale: ½"=1'-0"

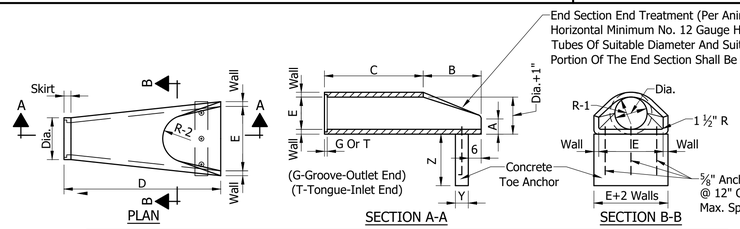


CATCH BASIN

Scale: ⅜"=1'-0"

CATCH BASIN TYPE SIZES:

1. Type A: A = 24", B = 24"
2. Type B: A = 24", B = 36"
3. Type C: A = 30", B = 46"



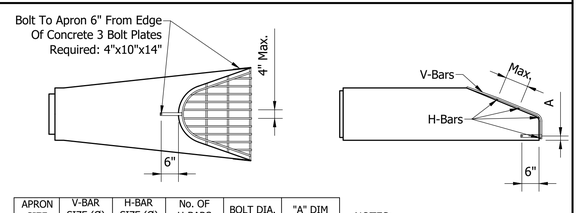
DIA.	WALL	G or T	WT. SEC.	A	B	C	D	E	DIA.+1"	R-1	R-2	SKIRT	Y	Z
12	2	1 1/2	530	4	24	48 7/8	72 7/8	24	13	10 1/16	9	3 1/2	6	24
15	2 1/4	2	740	6	27	46	73	30	16	12 1/2	11	3 1/2	6	24
18	2 1/2	2 1/2	990	9	27	46	73	36	19	15 1/2	12	4	6	24
21	2 3/4	2 1/2	1280	9	35	38	73	42	22	16 1/8	13	4	6	24
24	3	2 1/2	1520	9 1/2	43 1/2	30	73 1/2	48	25	16 11/16	14	4 1/2	6	24
27	3 1/4	2 1/2	1930	10 1/2	48	25 1/2	73 1/2	54	28	17 3/4	14 1/2	4 1/2	6	24
30	3 1/2	3	2190	12	54	19 3/4	73 3/4	60	31	18 5/16	15	5	6	24
33	3 3/4	3 3/8	3150	13 1/2	58 1/2	39 1/4	97 3/4	66	34	23 3/4	17 1/2	5 1/2	6	24
36	4	3 1/2	4100	15	63	34 3/4	97 3/4	72	37	24 1/16	20	5 1/2	6	24
42	4 1/2	3 3/4	5380	21	63	35	98	78	43	27 1/4	22	5 1/2	6	24
48	5	4 1/4	6550	24	72	26	98	84	49	28 1/8	22	5 3/4	24	36
54	5 1/2	4 3/4	8040	27	65	35	100	90	55	32 7/8	24	6 1/4	30	36
60	6	5	8750	30	60	39	99	96	61	36 3/4	24	6 3/4	30	36
66	6 1/2	5 1/2	10630	24	78	21	99	102	67	35 11/16	24	7 1/4	30	36
72	7	6	12520	34	78	21	99	108	73	38 5/8	24	7 3/4	36	36
78	7 1/2	6 1/2	14430	24	78	21	99	114	79	41 15/16	24	8 1/2	36	36
84	8	7	16350	24	78	21	99	120	85	44 13/16	24	9	39	36

NOTES:

1. Precast Flared Reinforced Concrete Pipe End Sections Shall Be Used At Exposed Pipe Ends. Concrete Toe Anchors Shall Be Required.
2. Revetment Riprap In Accordance With The Most Recent INDOT Channel Design Guide Set On Geotextile In Accordance With The Most Recent INDOT Standard Specifications Shall Be Required At Inlet And Outlet Precast Flared Reinforced Concrete Pipe End Sections.
3. Pipe End Sections Shall Have Appropriately Designed Riprap Outlet Protection. Refer To Outlet Protection Detail On Sheet 22.

PRECAST CONCRETE PIPE END SECTION

Scale: None



APRON SIZE	V-BAR SIZE (Ø)	H-BAR SIZE (Ø)	No. OF H-BARS	BOLT DIA.	"A" DIM
12	½	⅜	3	½	4
15	½	⅜	3	½	4½
18	½	⅜	4	½	4½
21	½	½	4	½	5
24	⅜	¾	4	½	5
27	⅜	¼	4	½	5½
30	⅜	¼	4	½	5½
36	½	1	4	¾	8
42	¾	1	4	¾	8
48	¾	1	5	¾	8
54	¾	1 ½	5	¾	8
60	¾	1 ½	5	¾	8
66	¾	1 ½	5	¾	8
72	¾	1 ½	5	¾	9
84	¾	1 ½	5	¾	10
90	¾	1 ½	5	¾	10

NOTES:

1. Animal Guard Is Not Required For Culvert Crossings

ANIMAL GUARD

Scale: None

REVISIONS		
Rev. No.	Description	Date

JOHN G. LIGHTNER IV REGISTERED No. PE11500016 STATE OF INDIANA PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 01/05/2015 DATE

CITY OF LEBANON

STORM SEWER DETAILS & NOTES

SHEET 11 OF 25

WATER MAIN GENERAL NOTES

1.) Provide A Valve On All Runs And Branches Per The Connection Details On Sheet 13 Of The Lebanon Standards Even When Such Runs Or Branches Are Stubs For Future Extensions.

2.) Water Mains Shall Follow The Alignment Of The Road On One Side Of The Street W/Out Alternating From Such Side.

3.) All Water Mains Shall Be Installed With A Minimum Depth Of Cover Of 54 Inches.

4.) For Cul-De-Sacs Run Main Straight-Thru To Back Of Cul-De-Sac, Set Reducer As Required And Provide 6" Valve And Fire Hydrant Per Typical Hydrant Installation Detail On Sheet 13. For Intended Temporary Ends Of Projects, (i.e. Phases Of Development), Terminate With Main Valve Followed By 60' To 80' Of Main With PE-PE Reducer As Required, And Provide Fire Hydrant With Hydrant Shoe Connected To Pipe/Reducer Directly.

5.) Use Polyethylene Cross-Linked Wrap Around All Ductile Iron Water Main.

6.) During Installation Of Water Main, The Line Shall Be Capped For Protection When Unattended.

7.) During Installation Of The Water Main, A Pump Shall Be Utilized To Ensure Groundwater, Storm Or Sanitary Flow Shall Not Enter Or Fill The Water Main.

8.) All Flushings Of New Water Main Shall Be Coordinated With The Utility. Contractors Will Be Billed For Water Utilized To Flush The Line After The First Flush.

9.) Flushing The Water Mains Shall Be Completed With Minimal Waste. Contractors Shall Determine The Capacity Of The Water Main To Be Flushed And Use No More Than 3 Times That Amount.

CONTRACTOR WARRANTIES

1.) Contractor Is Responsible For All Leaks, Faulty Hydrants, Broken Mains, Etc., For One Year After The Date Of Acceptance By The City.

2.) It Is The Contractor's Responsibility To Make Sure The Discharge Of Concentrated Chlorine Does Not Have A Negative Impact On Any Aquatic Life.

WATER MAIN PRESSURE AND LEAKAGE TESTING

1.) Lebanon Utilities Water Department (765-482-8751) Shall Be Given 48 Hours 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 150 PSIG 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	0.55
8	0.74
10	0.92
12	1.10

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.

6.) The Operation Of The City Of Lebanon Water System Valves And Hydrants Shall Only Be Conducted By Authorized Lebanon Utilities Water Department Personnel.

WATER MAIN MATERIALS

1.) All Water Main And Water Service Lines Shall Be Provided With 10-Gauge Tracer Wire.

2.) Fittings For Both Ductile Iron Pipe And PVC C900 Shall Be Ductile Iron.

3.) All Fittings Provided For Use In The City Of Lebanon Water System Shall Be Manufactured By U.S. Pipe, American, Tyler Union, Mueller, Or City Of Lebanon Approved Equal. No Foreign Materials Shall Be Allowed.

4.) Ductile Iron Fittings, 3 Inches Through 48 Inches, Shall Conform To The Latest Revision Of ANSI Specification A21.10 And AWWA C110. Ductile Iron Compact Fittings, 3 Inches Through 16 Inches Shall Conform To The Latest Revision Of ANSI Specification 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.) Water Service Lines ¾" Through 2" To The Customer Shall Be Copper Water Tube, Type K, Soft Temper Conforming To ASTM B88, ASTM B251, And AWWA C800. Water Service Lines 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 11.

6.) All Gate Valves Shall Be Either American flow Control 2500, U.S. Pipe Metroseal 250, Or Mueller A-2360. All Gate Valves Shall Be Assembled With Factory Installed Stainless Steel Bolts. All Valves Shall Open Counterclockwise. Lebanon Utilities Water Department Prefers The Use Of A 2 Piece Valve Box. When Needed Due To Increased Depth, A 3 Piece Valve Box May Be Used.

Ductile Iron Pipe For Water Mains

7.) All Ductile Iron Pipe Provided For Use In The City Of Lebanon Water System Shall Be Manufactured By Griffith, U.S. Pipe, American, Or City Of Lebanon Approved Equal. No Foreign Materials Shall Be Allowed.

8.) Ductile Iron Pipe For Water Mains Shall Be Centrifugally Cast And Shall Conform To The Latest Revision Of ANSI Specification A21.5 And AWWA C151. Ductile Iron Pipe With Push-On Or Mechanical Joints, Shall Be Pressure Class 350. The pipe shall be Provided With A Minimum Laying Length Of 18 Feet.

9.) 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 Cement-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 Painting.

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

11.) Flanged Ductile Iron Pipe Shall Conform To The Latest Revision Of ANSI Specification 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.

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

PVC C900 For Water Mains

13.) All PVC Pipe Provided For Use In The City Of Lebanon Water System Shall Conform To The Latest Edition Of ANSI/AWWA C900.

14.) PVC Pipe Shall Have The Same Outside Diameter As Ductile Iron Pipe.

15.) Materials For Which PVC Pipe Was Manufactured Shall Have Been Tested And Approved For Conveying Potable Water By The NSF And U/L.

16.) All PVC Pipe Shall Be DR 14.

17.) Joints For PVC Pipe Shall Be Slip-On Type With Integral Bell And Spigot. Gasket Lubricant Shall Be As Specified By The Pipe Manufacturer.

18.) Use Of PVC Pipe 12" And Larger Shall Require City Of Lebanon Approval.

As-Built Drawings Of All Storm Sewer, Water Main, And Sanitary Sewer Installations Shall Be Submitted To Lebanon Utilities. As-Built Drawings Shall Be A Red Lined Pdf Version Of The Drawing Showing All Changes And Deviations And GIS Shapefiles Showing Coordinates Of All Utility Locations. All Horizontal Coordinates Shall Be In The Horizontal Datum NAD 83 Indiana State Plane West Datum And All Elevations Provided In The As-Built Drawings Shall Be In The Vertical Datum NGVD 1988. GPS Collected Coordinates Shall Depict Actual Horizontal And Vertical Locations Of Utility Assets Such As, But Not Limited To: Manholes, System Valves, Hydrants, Blow-offs, Air Release Valves, Master Meters, Cleanouts, Risers, Pump Stations/Wet Wells, And BMPs. Contractor Shall Submit As-Built Drawings Within 30 Days Of Successful Completion Of All Testing Requirements.

WATER MAIN DISINFECTION AND BACTERIOLOGICAL TESTING

1.) Prior To Disinfection And Bacteriological Testing, Water Mains Shall Be Cleaned Utilizing The Pipe "Pigging" Method.

2.) Lebanon Utilities Water Department (765-482-8751) Shall Be Given 48 Hours 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 C651. 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.

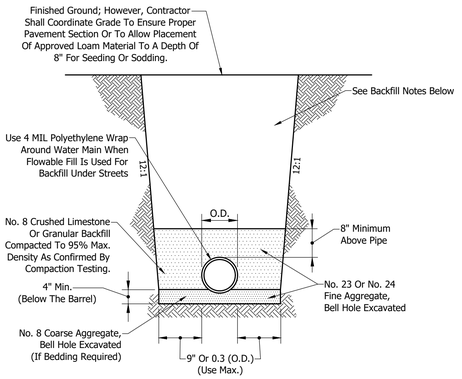
3.) A Minimum Concentration Of 10 MG/L Of Free Chlorine Shall Be Maintained In All Parts Of The Newly Installed Mains For 24 Hours Of Contact Time. Be Advised That Lebanon Utilities Normally Operates With Monochloramine As The Primary Disinfectant. Additional Chlorine Dosing Is Required To Reach The Breakpoint Where A Free Chlorine Residual Is Established.

4.) Following The Initial 24 Hour Contact Time But Prior To 48 Hours Of Contact Time, All Treated Water Shall Be Thoroughly Flushed From The Newly Laid Pipe At Its Extremity Until The Replacement Water Has A Chlorine Residual Equal To Distribution System Residual.

5.) After Flushing, Two Consecutive Water Samples Shall Be Collected On Successive Days From The Treated Piping System As Directed By Lebanon Utilities Water Department. Each Sample Shall Show Satisfactory Bacteriological Results.

6.) The Taking Of Samples And The Testing Of Chlorine Residual Shall Be Carried Out By The Contractor At The Direction Of Lebanon Utilities Water Department. A Copy Of The Test Results Shall Be Provided To Lebanon Utilities Water Department.

7.) Contractors Are Responsible For Chlorination Or Disinfection Of New Water Main As Well As Dechlorination And Disinfection. Contractors Are Responsible For Proper Disposal Of This Waste Stream.



Pipe Size	6" TO 14"	16" And Over
Bedding Below The Pipe Barrel	O.D./4 Min.=4"	O.D./4 Max.=8"

DI AND C900 PIPE BEDDING AND BACKFILL DETAIL

Scale: None

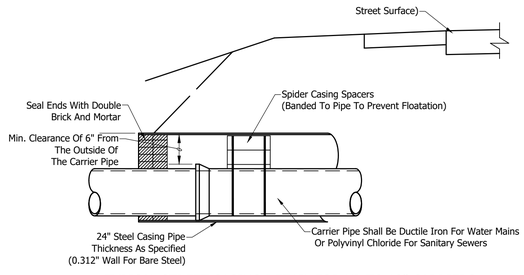
Backfill Notes

1.) Flowable Fill Shall Be Utilized For Backfill Where The Centerline Of Pipe Encroaches Within 3 Feet Of An Existing Street.

2.) Granular Backfill Or Flowable Fill Shall Be Utilized For Backfill Where The Centerline Of Pipe Encroaches Within 3 Feet Of A Proposed Street Or Sidewalk.

3.) Approved Excavated Material May Be Used For Backfill Outside Of Street Or Sidewalk Backfill Limits.

4.) Approved Excavated Material May Be Used For Backfill Under Proposed Sidewalks Provided Sidewalks Are Constructed 6 Months After Backfilling Of The Trench And With Approval From the City Of Lebanon.



TYPICAL STREET CASING DETAIL FOR UP TO 12" CARRIERS

Scale: None

1.) Casing Pipes May Be Required To Be Placed Under An Existing Or Proposed Street For Water Mains At The Direction Of The City Of Lebanon.

2.) Bored Or Jacked Crossings Require Intimate Knowledge Of Site Conditions; Therefore, Construction Is Subject To Certified Special Provisions Prepared By The Design Engineer.

3.) Casings Depicted Hereon Do Not Necessarily Comply With INDOT Permit Requirements, But Are Intended To Be Used For Crossings Of Public Roads Under The Jurisdiction Of The City Of Lebanon When Open Cut Of Such Roads Is Not Permitted.

4.) Refer To Appropriate Lebanon Standards For Carrier Pipe Requirements.

5.) HDPE May Be Utilized As The Material For The Casing Pipe With Written Approval From The City Of Lebanon.

REVISIONS		
Rev. No.	Description	Date

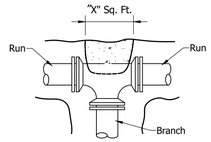
JOHN G. LIGHTNER IV — REGISTERED — No. PE11500016 — STATE OF INDIANA — PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 02/03/2025 DATE

CITY OF LEBANON

WATER MAIN
BEDDING DETAILS & NOTES

SHEET 12 OF 25



TEE OR DEAD-END CROSS

MINIMUM LENGTH OF RESTRAINED JOINT PIPE EACH SIDE OF FITTING (FEET) FOR D.I. POLY WRAP OR C900 PIPE				
PIPE SIZE	6"	8"	12"	16"
Tee Including Thrust Block (See Note 5)	91	120	170	219
Horizontal 90° Or Vertical 45° Down	24	31	43	55
Horizontal 45° Or Vertical 22 ½° Down	10	13	18	23
Horizontal 22 ½° Or Vertical 11 ¼° Down	5	7	9	11
Horizontal 11 ¼°	3	3	5	6
Dead End	91	120	170	219

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 54" 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 Lebanon Utilities Water Department.

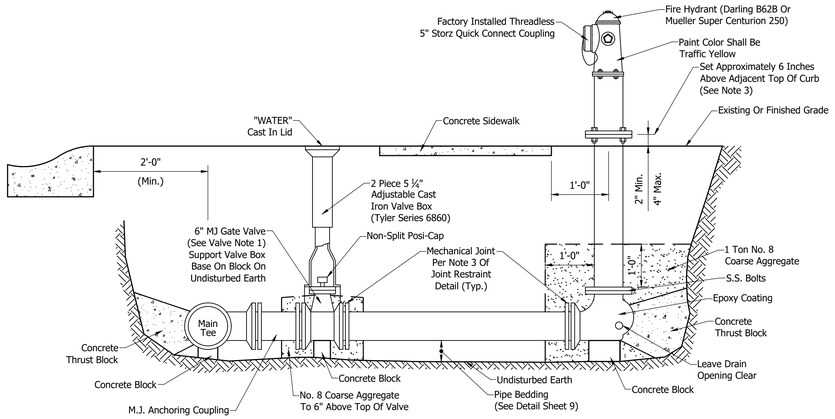
3.) Restraints To Be Accomplished With Romac Gripring, Megalug Series 1100, Field Lok Gaskets For DI Pipe, Anchor Couplings For Valves And Adjacent Tees, And Romac Series 600 Bell Restraints For Existing Pipe.

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, & 10 Square Feet For 6, 8, 12, & 16 Inch Pipe, Respectively. Other Than Restraint Of MJ Fittings Adjacent To Tee, No Run Restraint Length Is Required.

5.) Concrete Shall Not Be Allowed To Come In Contact With Any Joint, Flanges, Gaskets, Bolts Or Nuts. Four Mil High Density Polyethylene Plastic Shall Be Used To Cover All Fittings, Piping And Valves Prior To Pouring The Thrust Block.

JOINT RESTRAINT DETAILS

Scale: None



TYPICAL HYDRANT INSTALLATION DETAIL

Scale: None

NOTES:

1.) Hydrants Shall Be Provided At Each Street Intersection And At Intermediate Points Between Intersections Or As Directed By The Lebanon Utilities Water Department Or The Lebanon Fire Department.

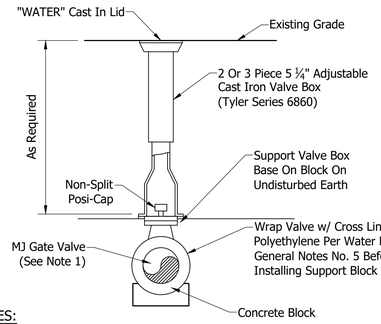
2.) Generally, Hydrants Shall Be Spaced Per The Requirements Of Appendix III-B Of The Uniform Fire Code. In Addition, When Any Portion Of A Building Is In Excess Of 150 Feet From A Water Supply On A Public Street, On-Site Fire Hydrants And On-Site Mains Shall Be Provided As Outlined By Section 903.2 Of The Uniform Fire Code.

3.) Extensions Are The Responsibility Of The Developer.

4.) Hydrant Shall Be Placed Outside Of The Recognized Collapse Zone For All Commercial Structures, Or As Directed By The Lebanon Utilities Water Department And The Lebanon Fire Department.

5.) A Commercial Structure Fire Department Connection (FDC) Shall Be Placed Outside Of The Recognized Collapse Zone For All Commercial Structures, Or As Directed By The Lebanon Utilities Water Department And The Lebanon Fire Department.

6.) A Fire Department Connection (FDC) Shall Be Placed In A Location That Is No Greater Than 75 feet From The Hydrant Closest To The Commercial Structure, Or As Directed By The Lebanon Utilities Water Department And The Lebanon Fire Department.



NOTES:

Consult Lebanon Utilities Water Department For Valves With Bury Depth In Excess Of 10 Feet. Use Longer Model For Depth Greater Than Minimum.

TYPICAL VALVE INSTALLATION DETAIL

Scale: None

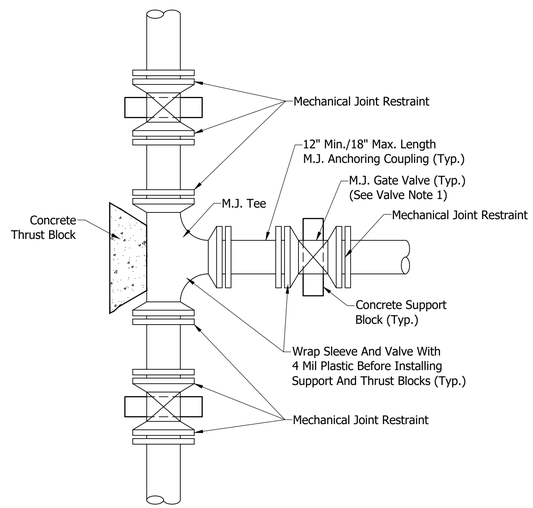
NOTES:

1.) All Gate Valves Shall Be Either American Flow Control 2500, U.S. Pipe Metroseal 250 Or Mueller A-2360.

2.) All Gate Valves Shall Be Assembled With Factory Installed Stainless Steel Bolts.

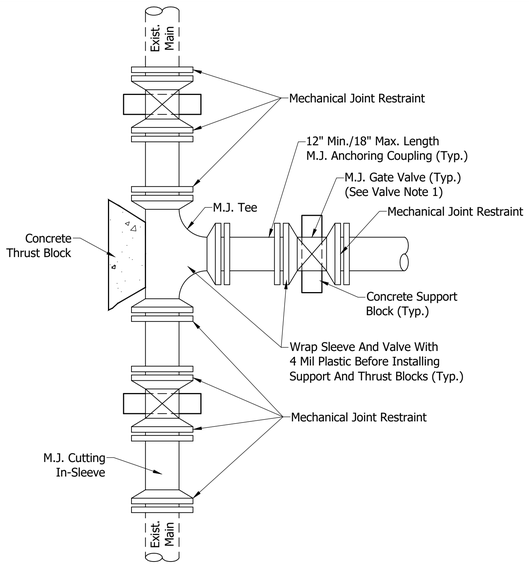
3.) All Valves Shall Open Counterclockwise.

4.) Lebanon Utilities Water Department Prefers The Use Of A 2 Piece Valve Box. When Needed Due To Increased Depth, A 3 Piece Valve Box May Be Used.



STANDARD NEW WORK BRANCH CONNECTION

Scale: None

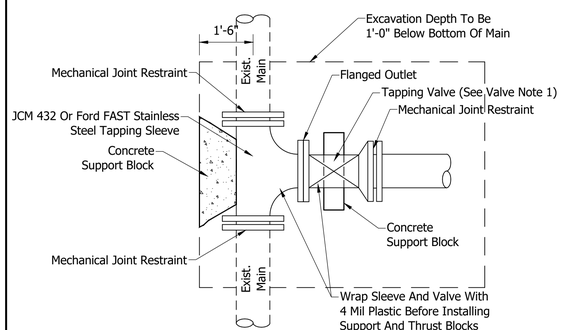


CUTTING-IN-SLEEVE AND TEE CONNECTION

Scale: None

NOTES:

1.) Contractor Must Obtain Written Approval From Lebanon Utilities Water Department In Order To Use Either The Tapping Sleeve And Valve Connection Or The Cutting-In-Sleeve And Tee Connection.



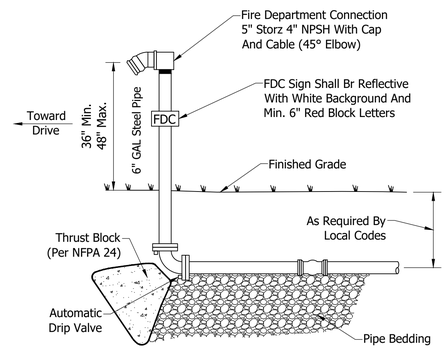
TAPPING SLEEVE AND VALVE CONNECTION

Scale: None

NOTES:

1.) JCM 432 Or Ford FAST Stainless Steel Tapping Sleeve With a Stainless Steel Flange Is Required For All Tapping Connections On Mains 4-Inches And Larger.

2.) Lebanon Utilities Shall Be Present To Witness The Tapping Sleeve Pressure Test Prior To Tapping. 48-Hour Notice To Lebanon Utilities In Advance Of The Tap Is Required.



NOTES:

Contractor Shall Coordinate FDC Material, Check Valve And Installation Requirements With The Lebanon Utilities Fire Department

FIRE DEPARTMENT CONNECTION DETAIL

Scale: None

REVISIONS		
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JOHN G. LIGHTNER IV REGISTERED No. PE11500016 STATE OF INDIANA PROFESSIONAL ENGINEER

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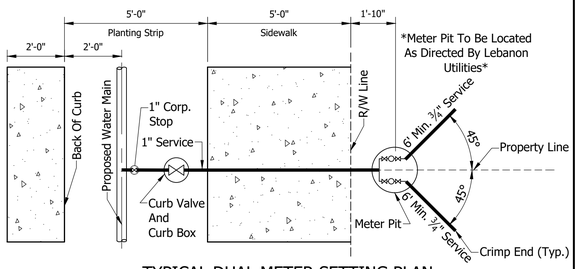
CITY OF LEBANON

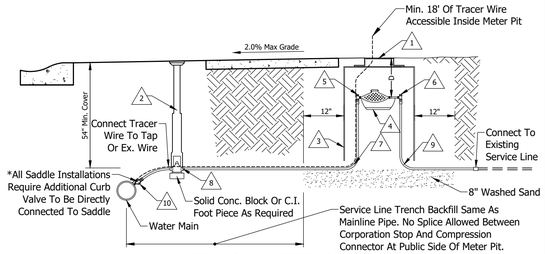
WATER MAIN DETAILS & NOTES

SHEET 13 OF 25



TYPICAL DUAL METER SETTING PLAN

Scale: None



TYPICAL METER SETTING

Scale: None

RESIDENTIAL COMMERCIAL

		Dual 5/8" x 3/4"	Single 5/8" x 3/4"	Single 1" x 1"	Single 2" x 2"
D	Depth	13"	13"	17.125"	23"
1	Cover	12.25" Meter Pit Lid, Type X (Badger x2)	12.25" Lid Assembly X-Style w/Badger CBORE	12.25" Lid Assembly X-Style w/Badger CBORE	12.25" Lid Assembly X-Style w/Badger CBORE
2	Curb Box	Tyler Union Series 6500	Tyler Union Series 6500	Tyler Union Series 6500	Tyler Union Series 6500
3	Meter Pit	Fratco PVC 20"x24"	Fratco PVC 18"x24"	Fratco PVC 20"x24"	Fratco PVC 36"x24"
4	Yoke	Ford 5/8" Y501	Ford 5/8" Y501	Ford 1" Y504	
5	Inlet Valve	Ford U48-43-Q-NL, Ford AV94-313W-NL	Ford AV94-313W-Q-NL	Ford AV94-444W-NL	Mueller B-2427-2N / VBHH87-18B-11-77-NL
6	Outlet Valve	Ford AV94-313W-Q-NL	Ford AV94-313W-Q-NL	Ford AV94-444W-NL	
7	Inlet Pipe	1" Copper Type K w/10 Ga. Tracer Wire	3/4" Copper Type K w/10 Ga. Tracer Wire	1" Copper Type K w/10 Ga. Tracer Wire	2" Copper Type K w/10 Ga. Tracer Wire
8	Curb Valve	Ford B44-444-Q-NL	Ford B44-333-Q-NL	Ford B44-444-Q-NL	Ford B44-777-Q-NL
9	Outlet Pipe	3/4" Copper Type K Or CTS w/ Tracer Wire	3/4" Copper Type K Or CTS w/ Tracer Wire	1" Copper Type K Or CTS w/ Tracer Wire	2" Copper Type K Or CTS w/ Tracer Wire
10	Tapping Hardware	DI: Mueller B25008 Or Ford F1000 Corp Valve C900: Mueller BR2S Or Ford 202BS Saddle			DI: Mueller BR2B Or Ford 202B Saddle C900: Mueller BR2S Or Ford 202S Saddle

METER SETTING NOTES:

1.) Residential Construction Requires The Use Of Dual Meter Installations Whenever Possible.

2.) New Water Meters Are Purchased By The Contractor Through Lebanon Utilities And Installed By The Contractor.

3.) 1 ½" And Larger Meters Require A By-Pass Around The Meter With A Locking Valve. The Lock Will Be Supplied By Lebanon Utilities And Shall Remain Locked At All Times With The Exception Of Lebanon Utilities Repairing Or Replacing The Meter.

4.) Curb Valve And Box Required On City Side Of Meter.

5.) The Contractor Is Required To Fix Services Through Meter Pit To Connection With Customer.

6.) The Contractor Shall Make All Tubing Connections Utilizing Mueller Or Ford Quick Compression Connectors.

7.) Meter Lid Adjustment Shall Be Accomplished With Adjusting Rings Manufactured by Mueller Or Ford. The Maximum Adjustment Shall Be 4 Inches.

8.) A Backflow Preventer Is Required For Commercial And Industrial Services.

PRIVATE DISTRIBUTION METER PIT NOTES:

1.) Provide #4 Rebars At 12" O.C. In Top, Bottom And All Sides.

2.) All Labor And Materials To Be Provided By The Contractor, Except City Will Furnish Meter. Contractor Shall Install Meter And Shall Provide Mounting Plate For City To Install Touchread.

3.) Piping And Valves For Double Detector Check Valve Assembly And Piping And Valves For Meter With Bypass Shall Be Same Size Throughout.

4.) Access Hatch Shall Be On Meter Side Of Pit And Shall Be Bilco Model J-4AL With Drain Coupling Or As Approved By Lebanon Utilities Water Department.

5.) Manhole Steps Shall Be Neenah R-1981-J, M.A. Industries PS-1-PF, Or As Approved By Lebanon Utilities Water Department.

6.) Double Detector Check Valve Assembly Shall Be Watts Series LF709, Febco LF856 Or As Approved By Lebanon Utilities Water Department.

7.) All Piping Within Vault Shall Be Ductile Iron, Copper Or Brass (Lead Free). Ductile Iron Piping In And Within 2 Feet Of Meter Pit Shall Be Class 53 Flanged And Then Transition To Class 50 At A Mechanical Joint.

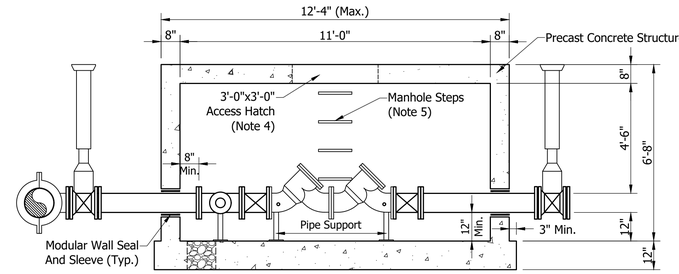
8.) Provide 1/4"x12"x12" Cast Iron Plate With Two 1-5/8" Diameter Holes At 4" On Center For Touchread Mounting. After SSPC-SP-6 Preparation, Paint Plate With 5 Mils DFT Tnemec 740 (Gray - ANSI No. 61) Over 3 Mils DFT Tnemec 90-97 Primer. Center Plate Over 8"x8" Opening. Secure Plate With Four 1/4"Ø 304 S.S. Anchor Bolts, Nuts & Washers.

9.) Refer To Typical Meter Setting Detail And Meter Setting Notes Regarding Domestic Water Service Lines.

10.) Bypass Line Has Water Meter In Series With An Approved Double Check Valve.

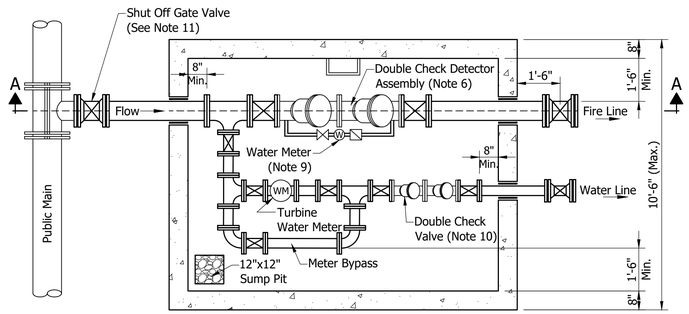
11.) The Lebanon Utilities Water Department Does Not Maintain Past The City Side Shut Off Gate Valve As The Downstream Side Of The Valve Begins The Private System.

12.) Sump Pumps Shall Be Provided In All Private Distribution Meter Pits.



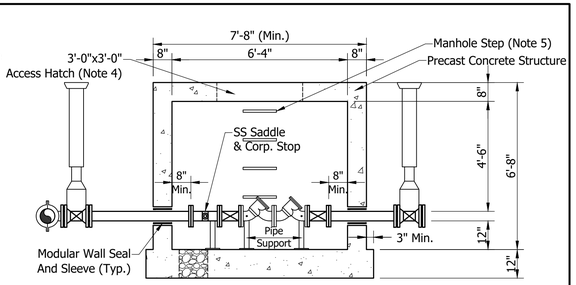
LARGE PRIVATE DISTRIBUTION METER PIT - SECTION "A-A"

Scale: None



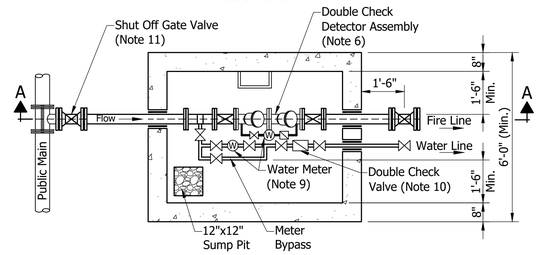
LARGE PRIVATE DISTRIBUTION METER PIT - PLAN

Scale: None



PRIVATE DISTRIBUTION METER PIT - SECTION "A-A"

Scale: None



PRIVATE DISTRIBUTION METER PIT - PLAN

Scale: None

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JOHN G. LIGHTNER IV REGISTERED No. PE11500016 STATE OF INDIANA PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 02/03/2025 DATE

CITY OF LEBANON

WATER MAIN METER SETTING & PITS

SHEET 14 OF 25

SANITARY SEWER TELEVISING

1.) The Lebanon Utilities Sewer Department (765-482-8843) Shall Be Given 48 Hour Written Notice Of The Required Televising Procedure To Be Performed By The Contractor. A Camera Equipped With Remote Control Devices To Adjust The Light Intensity And 1,000 Linear Feet Of Sewer Cable Shall Be Provided. The Camera Shall Transmit A Continuous Image To The Television Monitor As It Is Being Pulled Through The Pipe. The Image Shall Be Clear Enough To Enable The Lebanon Utilities Sewer Department Representative And Others Viewing The Monitor To Easily Evaluate The Interior Condition Of The Pipe. The Camera Shall Stamp The Video Tape With Linear Footage And Project Number.

2.) The Pipe Shall Be Thoroughly Cleaned Before The Camera Is Installed And Televising Is Commenced.

3.) If Any Pipe And/Or Joint Is Found To Be Leaking, The Contractor Shall Repair That Portion Of The Work To The Satisfaction And Approval Of The Lebanon Utilities Sewer Department.

4.) The DVD Disc Of The Entire Sewer Line, Reproduction Map Indicating The Pipe Segment Numbers Of All The Pipe That Has Been Televised, And As-Built Drawings Shall Be Submitted To Lebanon Utilities Sewer Department For Their Records. Contractor Shall Submit DVD's And As-Built Drawings Within 30 Days Of Successful Completion Of All Testing Requirements.

SANITARY SEWER POLYVINYL CHLORIDE (PVC) PIPE

1.) PVC Pipe Diameters Of 4 Inches Through 15 Inches Shall Meet Or Exceed All The Requirements Of ASTM D3034, And Shall Have A Cell Classification Of 12454-B, 12364 Or 13364. Reference Should Be Made To ASTM D1784 For A Summarization Of Cell Class Properties. PVC Pipe Diameters Greater Than 15 Inches Shall Meet Or Exceed All Requirements Of ASTM F679, And Shall Have A Minimum Cell Classification Of 12454 Or 12364.

2.) The Minimum Wall Thickness Of PVC Pipe, 4 Inches Through 15 Inches In Diameter, Shall Conform To SDR-26, Type PSM, As Specified In ASTM D3034 (See Note 5 For Fittings). The Minimum Wall Thickness For PVC Pipe Greater Than 15 Inches Shall Conform To PVC PS115, As Specified In ASTM F679. PVC PS115 Pipe Shall Have A Minimum Pipe Stiffness Of 115 Pounds Per Square Inch For Each Diameter When Measured At Five Percent Deflection And Tested In Accordance With ASTM D-2412.

3.) PVC Open Profile Or Closed Profile Sewer Pipe Shall Meet Or Exceed All Requirements Of ASTM F794 Or ASTM F949, And Shall Have A Minimum Cell Classification Of 12454 And A Minimum Uniform Pipe Stiffness Of 50 Pounds Per Square Inch For Each Diameter When Measured At Five Percent Deflection And Tested In Accordance With ASTM D2412 (See Note 5 For Fittings). Contractor May Only Use PVC Open Profile Or Closed Profile Pipe Where Sewer Pipe Diameter Is Between 18 Inches And 30 Inches. Pipe Joints Shall Have A Bell Wall, Gasket Groove And Spigot Which Is Integral With The Pipe.

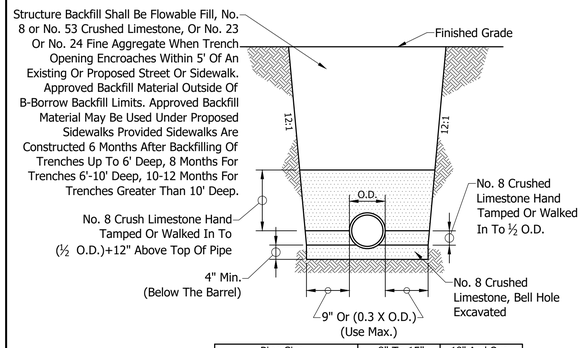
4.) The Assembly Of Joints Shall Be In Accordance With Pipe Manufacturers' Recommendations And ASTM D3212. Solvent Cement Joints Shall Not Be Allowed For Mainline Pipe.

5.) Pipe Fittings Shall Be SDR-26 Manufactured Fittings Made Of PVC Plastic Having A Cell Classification Of 12454, Or 13343, As Defined In ASTM D1784. Saddle Connections Shall Not Be Allowed For New Construction. Lateral Connections Shall Occur At SDR-26 Tee-Wyes.

6.) Each Pipe Section Shall Be Marked With The Name Of Manufacturer, Trademark Or Trade Name, Nominal Pipe Size, Production/Extrusion Code, Material And Cell Classification, And ASTM Number.

7.) Installation Shall Be In Accordance With ASTM Recommended Practice D2321.

8.) No. 8 Crushed Stone Shall Be Used For Bedding Of Sanitary Main And Sanitary Laterals. No Substitutions Allowed.



Pipe Size	8" To 15"	18" And Over
Bedding Below The Pipe Barrel	O.D./4 Min.=4"	O.D./4 Max.=8"

PVC PIPE BEDDING DETAIL

Scale: None

SANITARY SEWER LEAKAGE TESTING

1.) Lebanon Utilities Sewer Department (765-482-8843) Shall Be Given 48 Hour Written Notice Of The Required Leakage Testing Procedure To Be Performed By The Contractor. Low Pressure Air Shall Be Slowly Introduced Into The Sealed Line Until The Internal Air Pressure Reaches 4 PSIG Plus The Groundwater Head Divided By 2.31 (Maximum Test Pressure Is 9 PSIG).

2.) At A Stable Internal Air Pressure Within 0.5 PSIG Of The Initial Internal Air Pressure, Timing Shall Commence With A Stopwatch Or Similar Device Of 99.8 Percent Accuracy. Timing Shall End When The Internal Air Pressure Drops 1 PSIG Below The Stable Internal Air Pressure.

3.) The Line Shall Be Accepted If The Time Shown In Table 1 For The Designated Pipe Size And Length Elapses Before The Air Pressure Drops 1 PSIG Below The Stable Internal Air Pressure At Which Time The Test Can Be Discontinued For The Accepted Line.

TABLE 1

SPECIFICATION TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP
FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q=0.0015

1 Pipe Diameter (In.)	2 Minimum Time (Min:Sec)	3 Length For Minimum Time (Ft.)	4 Time For Longer Length (Sec.)	Specification Time For Length (L) Shown (Min.: Sec.)							
				100 Ft.	150 Ft.	200 Ft.	250 Ft.	300 Ft.	350 Ft.	400 Ft.	450 Ft.
4	3:46	597	.380L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.306L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.366L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25.852L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46

NOTE:

For More Efficient Testing Of Long Test Sections And/Or Sections Of Larger Diameter Pipes, A Timed Pressure Drop Of 0.5 PSIG May Be Used In Lieu Of The 1.0 PSIG Timed Pressure Drop. If A 0.5 PSIG Pressure Drop Is Used, The Required Test Time Shall Be Exactly Half As Long As Those Shown Above.

SANITARY SEWER DEFLECTION TESTING

1.) Lebanon Utilities Sewer Department (765-482-8843) Shall Be Given 48 Hour Written Notice Of The Required Deflection Testing Procedure To Be Performed By The Contractor. An In-Place Deflection Test Shall Be Performed On All Flexible Pipe Installed Within The City Of Lebanon For The Purposes Of Conveying Sanitary Sewage. An Allowable Deflection Of 5 Percent Internal Pipe Diameter Will Be Acceptable After All Backfilling Has Been In Place For 30 Days. A Nine-Point, "Go-No-Go" Mandrel Shall Be Used For The Defection Test. A Proving Ring Shall Be Provided For Each Mandrel - Proving Ring Is Provided By Contractor And Is Stamped With Pipe Dia. And Type Of Pipe 8" - SDR 26.

2.) All Pipe Exceeding The Allowable Deflection Shall Be Replaced Or Rerounded. The Replaced Or Rerounded Section Shall Be Retested 30 Days After Replacement Or Rerounding. The Contractor Shall Bear All Costs For Testing And Testing Equipment. The "Go-No-Go" Mandrel Shall Be Manually Pulled Without The Use Of Any Winching Or Other Mechanical Device.

SANITARY SEWER LATERAL PIPE AND FITTINGS

1.) Service Laterals Shall Be Either SDR-26 Or Schedule 40 PVC Pipe From The Sewer Main To The Property Line. Service Laterals Shall Be SDR-26 Or Schedule 40 PVC Pipe Outside Of The Right-Of-Way.

2.) Service Laterals Shall Be Constructed With A Minimum Slope Of ¼" Per Foot (2.08%).

3.) Joints Shall Be Flexible Gasket Push-On-Compression Type Conforming To ASTM D3212 And ASTM F477. Solvent Cement Joints Are Allowed For Service Laterals.

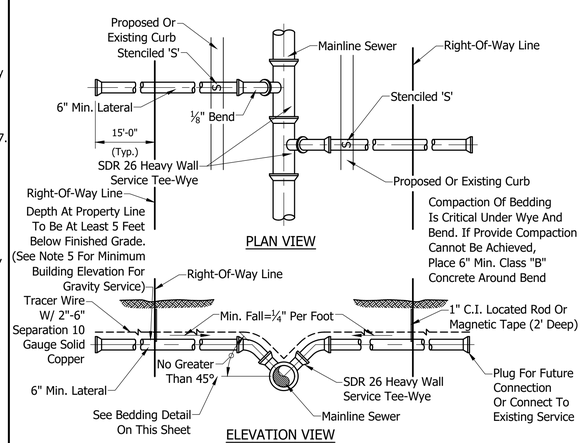
4.) Lateral Size Shall Be A Minimum Of 6 Inches In Diameter Between Mainline Sewer And Right-Of-Way. 90 Degree Bends Are Prohibited. Laterals Shall Have Tracer Wire 10 Gauge Solid Copper, Wire Should Be Taped To Top Of Pipe Every 24".

5.) All Laterals Shall Be Inspected By Lebanon Utilities Sewer Department Prior To Backfilling. Prior To Receiving Approval Of The Lateral, Contractor Shall Provide The Following Information On A Legible Diagram: Depth And Position Of Lateral Between Mainline Sewer To The Building, Lot Number, Address, Date And Time Of Installation, Pipe Material, Bedding Type, Pipe Installer And City Inspector.

6.) A Minimum Of One Cleanout Shall Be Installed For Each Service Lateral. Cleanouts Shall Be Located Within 24-Inches Outside Of Building Foundations And Provided At The Private Property And Right-Of-Way Boundary Unless Otherwise Approved By The City Engineer. Where The Length Of A Lateral Exceeds 100 Feet Then One Cleanout Shall Be Installed For Every 100 Feet Of Lateral Length. The Property Owner Shall Be Responsible For the Lateral From The Property To The Connection At The Sewer Main.

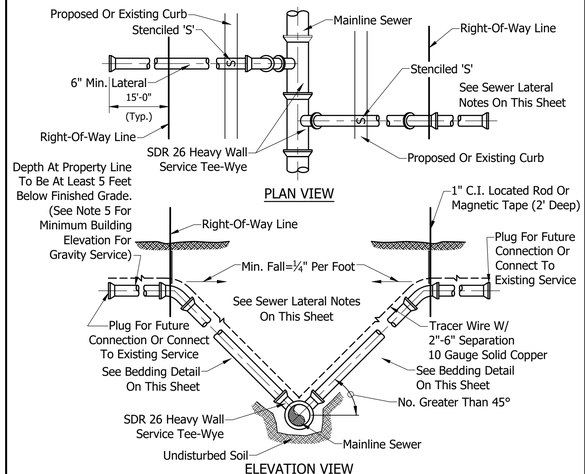
7.) Contractor Shall, When Curbs Are Available, Engrave A 3-Inch High By ½-Inch Deep "S" On The Curb Directly Above Each Service Lateral. Where Curbs Are Not Available, Contractor Shall Notch The Sidewalk Directly Above Each Service Lateral.

8.) A Separate Lateral Sewer Is To Be Constructed From Each Side Of The Common Wall(s) Separating Units Of Multi-Unit Housing (Sometimes Referred To As Doubles, Triples And Quads), Up To And Including 4-Units, With Each Lateral Sewer Connecting To The Public Mainline Sewer.



SERVICE CONNECTION FOR SHALLOW SEWERS
(LESS THAN 15' DEPTH)

Scale: None



SERVICE CONNECTION FOR DEEP SEWERS
(15' DEEP AND OVER

Scale: None

REVISIONS		
Rev. No.	Description	Date

JOHN G. LIGHTNER IV — REGISTERED — No. PE11500016 — STATE OF INDIANA — PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 02/03/2025 DATE

CITY OF LEBANON

SANITARY SEWER BEDDING DETAILS & NOTES

SHEET 15 OF 25

MANHOLES

1.) Precast Concrete Manholes Shall Conform To ASTM C478, With Rubber Type Gaskets Equal To ASTM C443. Monolithic Cast-In-Place Manholes Shall Only Be Used With The Prior Written Approval Of Lebanon Utilities Sewer Department. The Base And First Riser Section Of The Precast Concrete Manhole Shall Be Integrally Cast As One Complete Unit. Precast Concrete Cones Shall Be Of The Eccentric Cone Type. No "See Through" Lift Holes Shall Be Allowed On Precast Concrete Manholes 48 Inches In Diameter Or Less. In Addition To The Rubber Type Gaskets All Joints Shall Receive A 1/2 Inch Diameter Non-Asphaltic Mastic (Kent-Seal Or City Approved Equal) Conforming To AASHTO M198 And Federal Specifications Specifications SS-S-210A. Manhole/Sewer Connection Shall Be Made With A Flexible Watertight Connection.

2.) Final Adjustment In Elevation Of The Frame And Cover Shall Be Accomplished By The Use Of A 4 Inch Minimum Thickness Adjusting Ring As Detailed Herein To A Maximum Combined Thickness Of 12 Inches. Brick Or Block Shall Not Be Used In The Construction Of A Manhole Or To Adjust The Elevation Of The Frame And Cover.

3.) Manhole Ladder Rungs Shall Be Neenah No. R-1981-J, M.A. Industries No. PS 1-PF Or As Approved By Lebanon Utilities Sewer Department.

4.) Manhole Frame And Cover Shall Be Neenah R-1772 With Gasketed Lid, EJ 1022Z1 With Gasketed Lid, Or As Approved By Lebanon Utilities Sewer Department. All Covers Shall Be Stamped "SANITARY SEWER" With 2" Raised Letters. When Watertight Frame And Cover Are Required By Lebanon Utilities Sewer Department Or Developer, Neenah R-1772 With Locking Lid, EJ 1022Z1PT With Locking Lid, Or As Approved By Lebanon Utilities Sewer Department Shall Be Provided.

5.) The Lowest Elevation To Receive Gravity Sanitary Service Must Be One (1) Foot Above The Top Of Manhole Casting Elevation Of Either The First Upstream Or Downstream Manhole On The Public Sewer To Which Connection Is To Be Made. Those Portions Of The Building Not Meeting The Stated Gravity Sanitary Service Requirement Shall Be Provided And Maintained By The Property Owner With A Grinder Pump System Or Lebanon Utilities Sewer Department Approved Equal Discharging To The Gravity Building Connection Outside Of The Public Right-Of-Way.

6.) Manholes Shall Be Installed At Distances Not Greater Than 400 Feet.

7.) Contractor Shall Install An External Rubber Sleeve Sealing System Wrapped Over The Flange Of The Manhole Frame To 2-Inches Below The Bottom Of The Lowest Adjusting Ring. The External Rubber Sealing Sleeve Shall Have A Minimum Thickness Of 60 Mils And Meet The Requirements Of ASTM C923, ASTM C443 And ASTM F477. The Rubber Sleeve Shall Be Infi-Shield External Manhole Seal, Or As Approved By Lebanon Utilities Sewer Department.

8.) Apply Bituminous Coating, MasterSeal 614 (Hydrocide 700) Mastic, On The External Face At All Manhole Section Joints. Hydrocide Mastic Shall Be Applied To 6" Above And Below Each Joint.

9.) Commercial Taps As Determined By The Lebanon Utilities Sewer Department Shall Have Lateral Connections Made Directly To An Existing Or Proposed Manhole Using Details Per This Sheet.

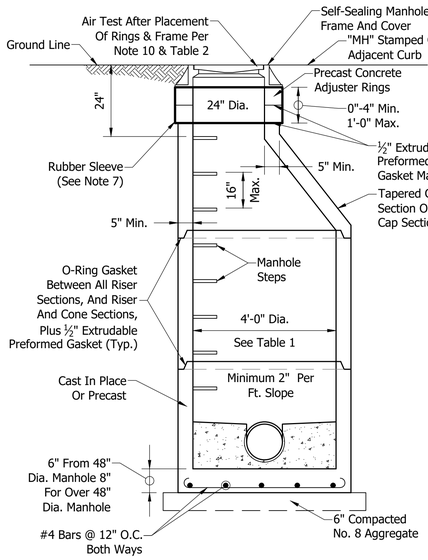
10.) All Sanitary Manholes Shall Be Vacuum Tested With Castings Per ASTM C124 Following Full Installation. All Sanitary Manhole Sections Shall Be Vacuum Tested In the Shop Prior To Shipping.

11.) Infiltration Barrier Shall Be 60 Mils Minimum EPDM Sealed With A 2 Inch Mastic Strip To Cone (Manhole) And To Top Of Casting Lip And Shall Be Infi-Shield Or City Approved Equal.

12.) Under Certain Conditions, A Maximum Of One Lateral Connection To A Manhole Structure May Be Permitted By Lebanon Utilities On The Upstream End Of A Sanitary Sewer.

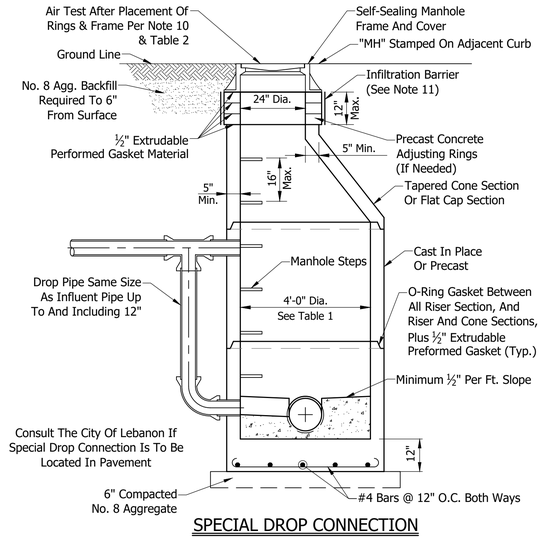
13.) Upon Connection To An Existing Sanitary Manhole With New Infrastructure, That Manhole Shall Be Rehabilitated In Accordance With The Manhole Rehabilitation General Notes.

14.) If No Manhole Is Present On Property A New Doghouse Structure Is Required To Be Provided Installed By Contractor.



TYPICAL MANHOLE TYPE A

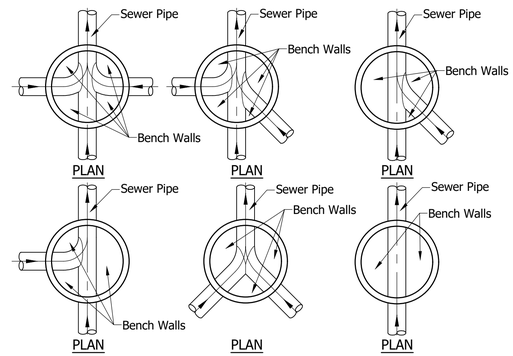
Scale: ½"=1'-0"



SPECIAL DROP CONNECTION

Scale: None

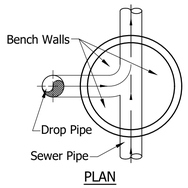
(For Use Outside Of Pavement Only)



Note: All Bench Walls To Be Sloped @ 1/2" per Ft.

BENCH WALL DETAILS

Scale: None



BENCH WALL DETAIL WITH DROP

Scale: None

MANHOLE REHABILITATION GENERAL NOTES

1.) Structural Manhole Rehabilitation Materials Shall Be Either Mainstay ML-72, Reliner MSP Cement, Parsons CA Liner 100, Or Strong Seal MS-2C. Within Roadway Limits Structure Manhole Rehabilitation Materials Shall Be OBIC Or Mainstay Composite Liner.

2.) Corrosion-Resistant Manhole Rehabilitation Materials Shall Be Either Mainstay DS-5 Epoxy Coating, PARSONPOXY SEL-80 Epoxy Coating, Strong Seal Epoxy, Sprayroq Polyurethane, Or Raven 405 Epoxy.

3.) Structural and Corrosion-Resistant Manhole Rehabilitation Materials Shall Be Mainstay ML-72 With DS-5 Epoxy Coating, PARSON MH LINER Cement Mortor With Top Coat of PARSONPOXY SEL-80 Epoxy Coating, Strong Seal Epoxy Over Strong Seal Profile Plus Mix, Or Reliner MSP Cement With Raven 405.

4.) Hand Application Of Manhole Rehabilitation Materials Is Not Permitted.

5.) Active Infiltration Must Be Stopped Prior To Application.

6.) Large Voids And Defective Joints Must Be Grouted Prior To Application.

7.) Structural Materials Will Be Applied At A Minimum 1 Inch Thickness Unless Specified Otherwise.

8.) Corrosion-Resistant Materials Will Be Applied At A Minimum 60 Mils Thickness Unless Specified Otherwise.

TABLE 1: Manhole Diameter Table

Pipe Size	Minimum Manhole Diameter	
	Pipe Entering/ Pipe Exiting At 0° To 45° Bend	Pipe Entering/ Pipe Exiting At 45° To 90° Bend
8" - 21"	48"	48"
24"	48"	60"
27" - 30"	60"	60"
33" - 36"	60"*	72"

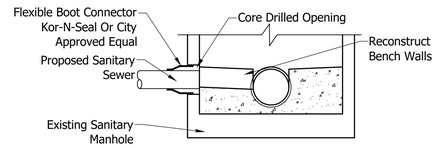
* 72" With A-Lock Connector

TABLE 1

TABLE 2: Manhole Vacuum Test Times Table

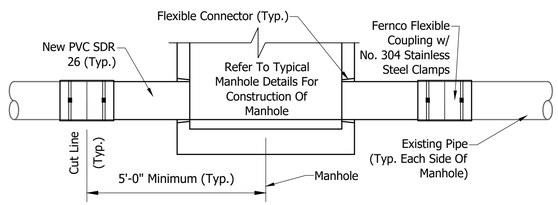
Depth Of Manhole (Feet)	Diameter Of Manhole						
	48"	60"	72"	84"	96"	108"	120"
	Minimum Time (Second)						
8	20	26	33	39	45	51	57
10	25	33	41	48	56	64	72
12	30	39	49	58	67	77	86
14	35	46	57	68	79	89	100
16	40	52	67	77	90	102	114
18	45	59	73	87	101	115	129
20	50	65	81	96	112	127	143
22	55	72	89	106	123	140	157
24	59	78	97	116	134	153	171
26	64	85	105	125	145	166	186
28	69	91	113	135	157	178	200
30	74	98	121	144	168	191	214

TABLE 2



EXISTING MANHOLE CONNECTION DETAIL

Scale: ½"=1'-0"



SPECIAL MANHOLE CONNECTION DETAIL

Scale: ½"=1'-0"

REVISIONS

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JOHN G. LIGHTNER IV REGISTERED No. PE11500016 STATE OF INDIANA PROFESSIONAL ENGINEER

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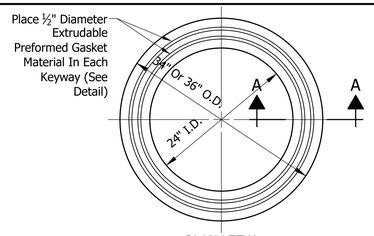
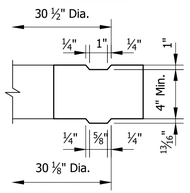
CITY OF LEBANON

SANITARY SEWER DETAILS & NOTES

SHEET 16 OF 25

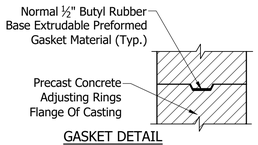


PLAN VIEW



Riser Ring Thickness 4"-12"
Outside Dia. 34" or 36"

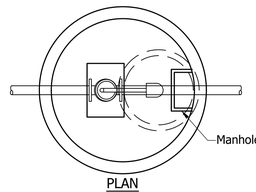
SECTION "A-A"



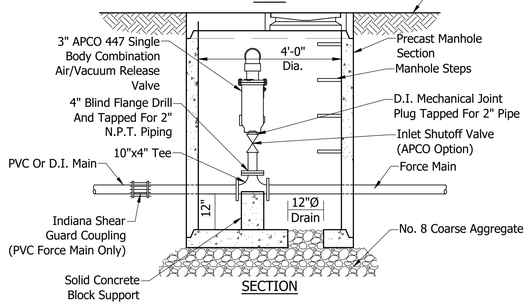
GASKET DETAIL

PRECAST ADJUSTING RINGS

Scale: None



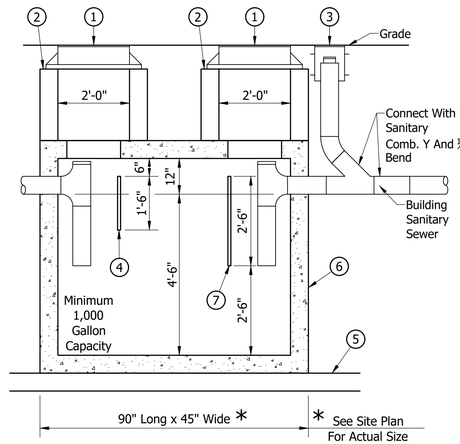
PLAN



SECTION

SANITARY FORCE MAIN AIR/VACUUM RELEASE VALVE STRUCTURE DETAIL

Scale: ½"=1'-0"



Grease Interceptor Subject To Sanitary Sewer Manhole Construction Requirements Including Vacuum Testing

GREASE INTERCEPTOR DETAIL

Scale: Not To Scale

NOTES:

1. Cast Iron Manhole Frame And Cover R-6462-FH Or Approved Equal
2. 24" Diameter Concrete Pipe Riser
3. Cast Iron Cleanout And Cover
4. Precast Concrete Inlet Baffle
5. 6" Leveled Sand Bed
6. Precast Concrete Structure Designed For Vehicle Traffic. (Must Be Approved By The Authority Having Jurisdiction)
7. Precast Concrete Outlet Baffle

MINIMUM CIPP REQUIREMENTS

1.) CIPP Shall Be Designed Per ASTM F1216, Appendix X.1 And Shall Assume No Bonding To The Original Pipe Wall. The Required Structural CIPP Wall Thickness Shall Be Based, As A Minimum, On The Physical Properties And Design Parameters Below:

A.) Modulus Of Elasticity Per ASTM D790 Test Method Shall Be A Minimum 250,000 PSI Per ASTM F1216 Or A Minimum 400,000 PSI For Enhance Resin.
B.) Flexural Stress Per ASTM D790 Test Method Shall Be A Minimum 4,500 PSI.
C.) Design Safety Factor Shall Be A Minimum 2.0
D.) Minimum Ovality Of 2%
E.) Enhancement Factor "K" Shall Be 7.
F.) Minimum Soil Modulus Of 120 PSI
G.) Minimum Soil Density Of 1,000 PCF
H.) Live Loading Shall Be Based On A Minimum H20 Highway

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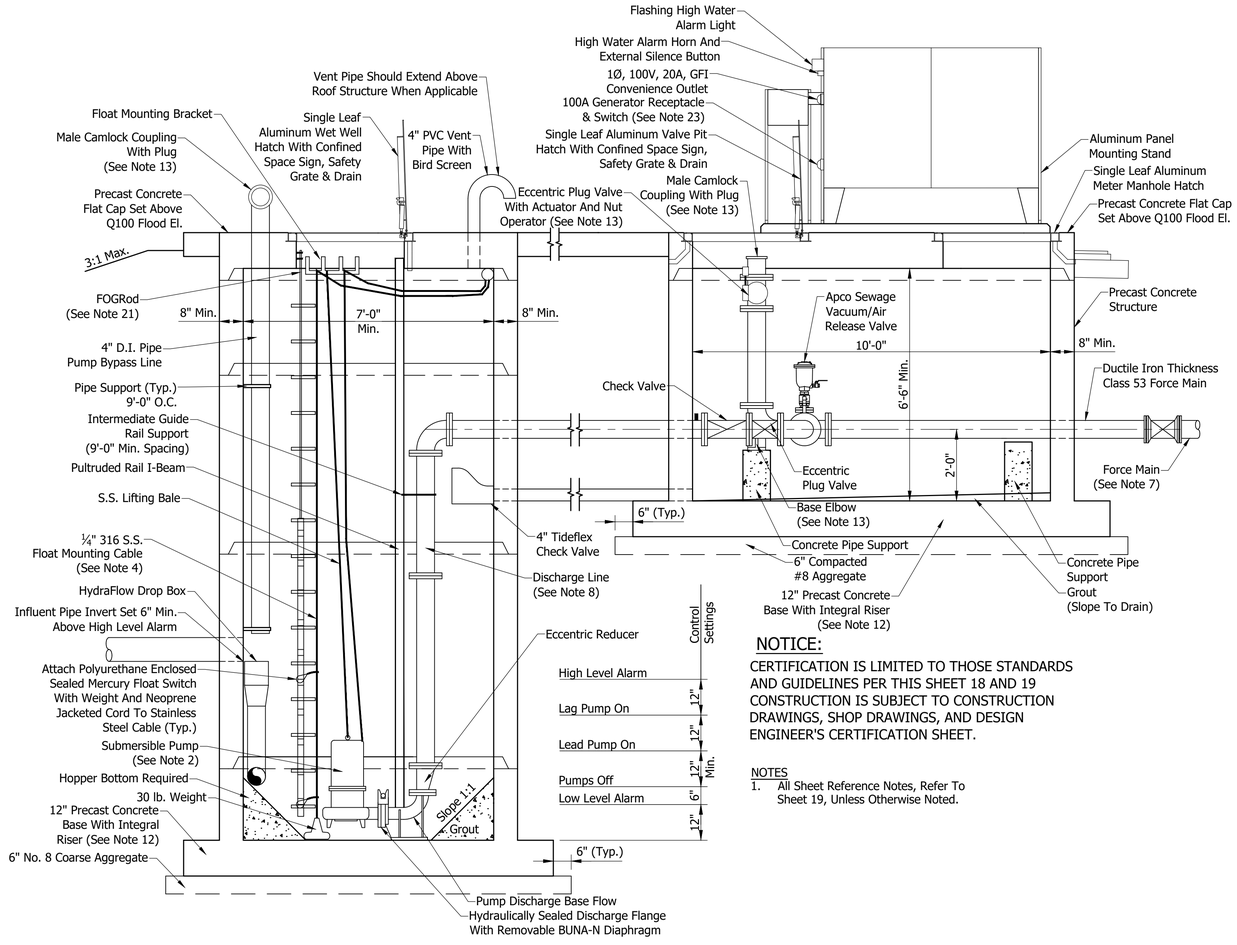
CITY OF LEBANON

SANITARY SEWER DETAILS & NOTES

SHEET 17 OF 25



LIFT STATION - SECTION

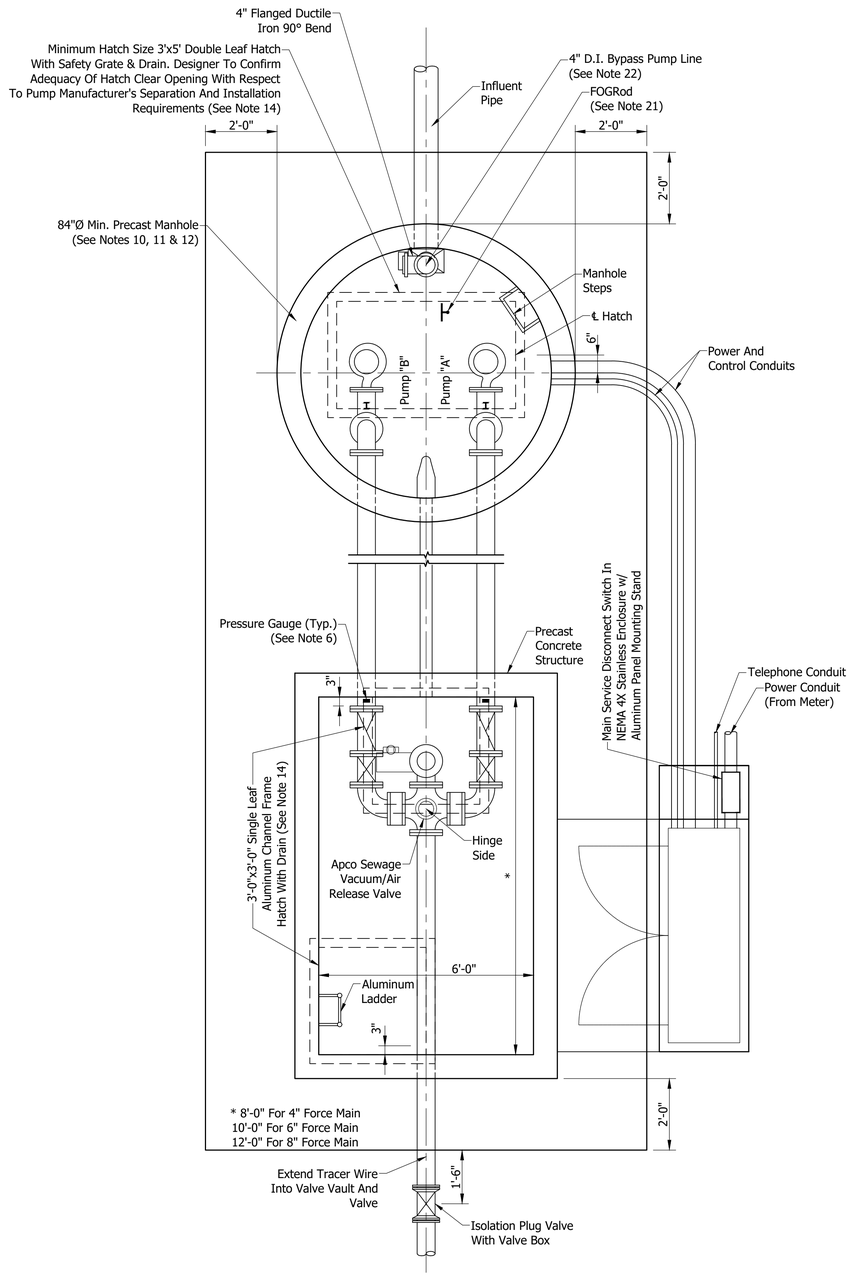
Scale: ½"=1'-0"

NOTICE:

CERTIFICATION IS LIMITED TO THOSE STANDARDS AND GUIDELINES PER THIS SHEET 18 AND 19 CONSTRUCTION IS SUBJECT TO CONSTRUCTION DRAWINGS, SHOP DRAWINGS, AND DESIGN ENGINEER'S CERTIFICATION SHEET.

NOTES

1. All Sheet Reference Notes, Refer To Sheet 19, Unless Otherwise Noted.



LIFT STATION - PLAN

Scale: ½"=1'-0"

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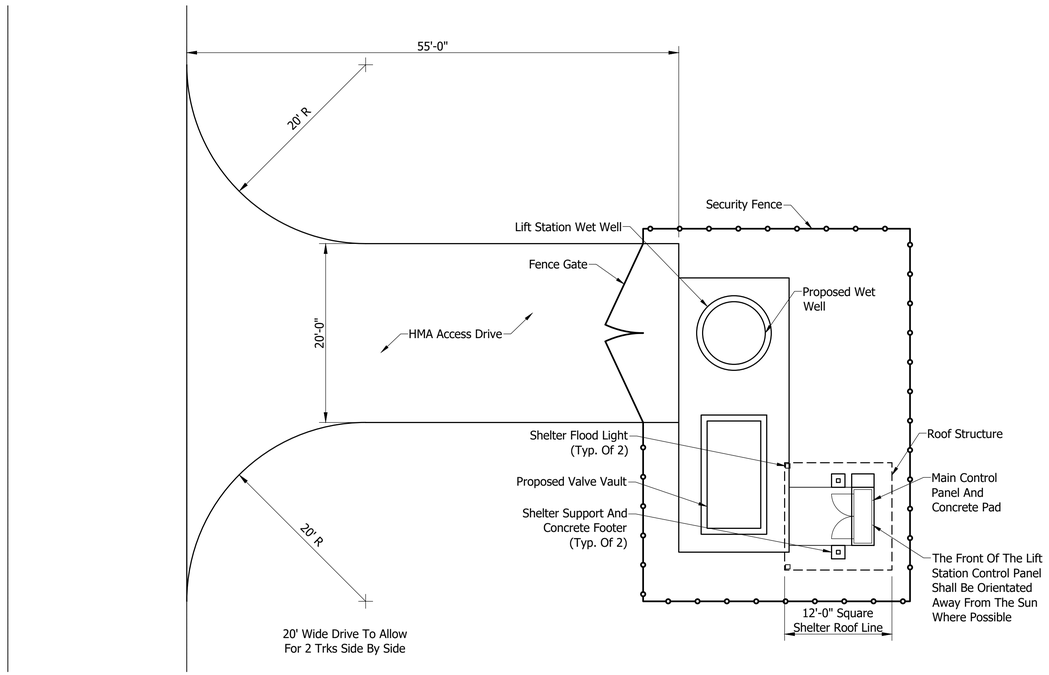
SANITARY SEWER LIFT STATION STANDARDS & GUIDELINES

SHEET 18 OF 25



LIFT STATION - SITE PLAN

Scale: ⅛"=1'-0"

GENERAL NOTES:

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

2.) Pumps "A" And "B" Shall Be Identical, Centrifugal, Submersible, Solids Handling, Non-Clog Design Capable Of Handling 3" Sphere Solids, Fibrous Material, Sludge, And Material Found In Typical Raw Sewage. Fit Replaceable Bronze Wear Ring To Volute. Pumps Shall Be Hydromatic, Tsurumi AVANT, Or Lebanon Utilities Sewer Department Approved Equal. Manufacturer Shall Warrant The Pumps For One Year After Installation. Developer Shall Pay All Operation And Maintenance Costs Until Acceptance. Developer Shall Warrant Pumps And Controls For One Year After Acceptance.

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.

Lift Station Control Panel Shall Be Manufactured By Custom Control Technologies And Be A Minimum 36"x60" NEMA 4X Stainless Steel With Padlockable 3-Point Handle With Stainless Steel Floor Stands. The Control Cabinet Shall House The Following Controls And Indications: Telemetry System Per Note 21 Of This Sheet, Warning Lights For Each Pump, Indicator Lights, Common Alarm, H-O-A Switches, Silence Button, Pump Alternator, Warning Reset Buttons, Relays, Heater, Surge Protection, Phase Monitoring, Hour Meters, Amp Meters, Volt Meters, And A GFI 110 Volt, Single Volt, Single Phase Convenience Outlet. Enclosure Shall Be Suitable 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.

NEMA Rated Motor Starters With Solid State Overloads Shall Be Used For All Pumps 25HP And Below, Minimum NEMA Size 1.

Pumps Between 25HP And 75HP Shall Utilize A Reduced-Voltage Soft Starter (RVSS) With Integrated Overload Protection Adjusted Per The Manufacturer's Recommendation For The Proposed Motor HP.

Pumps Over 75HP Shall Use Variable Frequency Drives (VFD) With Integrated Overload Protection Adjusted Per The Manufacturer's Recommendation For The Proposed Motor HP.

4-Wire 460 Volt Shall Be Used Between Electric Metering Panel To The Lift Station Control Panel.

The Main Power Fuse Block, Power Distribution Block, And Terminal Blocks Shall Be Located Near The Top Of The Lift Station Control Panel.

Provide A Disconnect Switch Housed In A Separate NEMA 4X S.S. Enclosure With External Operation Handle Capable Of Being Locked In The "ON" Position.

Lower Seal Failure Alarm Shall Be Engaged By Seal Failure Sensor Provided In The Seal Chamber Which Senses Water Intrusion Through Through Lower Seal. A Mini-Float In The Motor Chamber Which Signals Pump Shut-Down And Alarm Upon Water Intrusion Through Upper Seal May Be Acceptable When Approved By Lebanon Utilities.

Overtemperature 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. Housing Shall Be Filled With High-Dielectric Oil. Air Filled Housing May Be Acceptable When Approved By Lebanon Utilities Sewer Department. Pump And Motor Shall Be Designed To Operate Partially Or Fully Submerged In Pumped Media Without The Use Of Cooling Jackets.

Alarm Conditions To Be Transmitted To The Utility's SCADATA SCADA System Shall Be Pump Run, Pump Seal Failure, Phase Fail, Pump Overtemperature, Door Open, Wet Well Low Level, Wet Well High Level. All Alarms Shall Be Wired Such That They Will Remain On Until Manually Reset.

Rail System Shall Enable The Easy Removal Of The Pump Without The Need For A Person To Enter The Wet Well. Fiberglass Guide Rails 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.

3.) Check Valve Shall Use Packing Material To Seal The Integral Shaft Or Hinge Pin. O-Ring Side Plug And O-Ring Shall Not Be Used To Seal Integral Shaft Or Hinge Pin. Check Valve Shall Be Provided With Bolted Covers For Easy Access To The Discs And Shall Be Outside Adjustable Weight & Lever And Shall Be CCNE Series 8000 Swing Check Valve Or Approved By Lebanon Utilities Sewer Department.

4.) Provide Sufficient Lifting Bale, Float Mounting Cable, And Pump Power & 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 & Sensor Cable Shall Be Suitable For Submersible Pump Applications And This Shall Be Indicated By A Code/Legend Permanently Embossed On The Cable.

5.) Plug Valve Shall Be Hand Lever Operated And Shall Be Dezurik Fig.118, Val-Matic Cam-Centric 500 Series, Or Lebanon Utilities Sewer Department Approved Equal.

6.) Pressure Gauge Shall Be Trerice Model 450 LFB Or Lebanon Utilities Sewer Department Approved Equal. Drill & Tap Run Of Pipe To Install Pressure Gauge.

7.) Piping Beyond 2 Feet Of Valve Pit Shall Be DI AWWA C151, PVC ASTM D2241, PVC AWWA C900, Or Lebanon Utilities Sewer Department Approved Equal. Piping Shall Be Bedded In Accordance With The PVC Bedding Detail On Sheet 12, Except Stone Backfill Above Springline Of Pipe Is Not Required For DI Force Main Pipe. Piping Shall Be Pressure Tested In Accordance With Water Main Pressure And Leakage Testing Requirements Outlined On Sheet 12, Except Test Pressure Shall Be 1.25 Times Pump Cut-Off Head Converted To PSI. See Design Engineer's Certification Sheet For Class.

8.) Piping In And Within 2 Feet Of Wet Well And Valve Pit Shall Be Class 53 Flanged Ductile Iron Pipe. All Fasteners Within The Wet Well And Valve Vault Shall be 316 S.S.

9.) Piping, Valves, And Fittings In Wet Well And Valve Pit Shall Be Factory Primed Tnemec Series 140-1211 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.

10.) Dampproof All Exterior Vertical Surfaces Which Are Backfilled Against With A Shop Applied Bituminous Coating, MasterSeal 614 (Hydrocide 700) Mastic.

11.) Lift Station And Valve Pit Manholes Shall Be Pre-Cast Concrete In Accordance With ASTM C-478, With Rubber Gaskets Equal To ASTM-443 With 1/2" Gasket Material Or Lebanon Utilities Sewer Department 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 Model 633-LAS Flanged Adaptor And 634-B Dust Cap Shall Be Used At Wet Well. Camlock Model 633-LBS Flanged Coupler And 634-A Dust Ring Shall Be Used Within Valve Vault. Camlock Coupling And Eccentric Plug Valve On By-Pass 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 By-Pass Line Being Up Close To Hatch Opening As Shown.

14.) Aluminum Hatches Shall Be U.S.F. Fabrication Type TPS (Single-Leaf) Or TPD (Double-Leaf) w/ Optional Protective Grating Panel Or Lebanon Utilities Sewer Department Approved Equal. Leaf Shall Be 1/4" Aluminum Diamond Plate Live Load Rated To 300 PSF. Channel Frame Shall Be 1/4" Extruded Aluminum With A Mill Finish And Bituminous Coating On Exterior Surfaces. Hatch Shall Be Provided With Type 316 S.S. Hardware Throughout, Compression Spring Operators, Automatic Hold-Open Arm With Release Handle, Recessed Lock Hasp With Flush Cover, And 1-1/2" Drain Coupling.

15.) Sewer Connection To Wet Well Shall Be KOR-N-SEAL, A-LOK, Dura-Seal, Or Lebanon Utilities Sewer Department Approved Equal.

16.) Force Main Penetrations Of Wet Well And Valve Pit Shall Be Core Drilled And Made Watertight Through The Use Of KOR-N-SEAL, A-LOK, Dura-A-Seal, Or Lebanon Utilities Sewer Department Approved Equal.

17.) Automatic Pump Control System Shall Include All Necessary Items And Appurtenances Which Might Normally Be Considered A Part Of A Complete System. System Shall Be Supplied By One Manufacturer, Shall Be Factory Assembled, Wired, And Tested, And Shall Be Per Complete Electrical Drawings And Instructions. Major Components And Sub-Assemblies Shall Be Identified As Function With Laminated, Engraved, Bakelite Nameplates.

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

An Incoming Power Terminal Block Shall Be Located At The Bottom Of The Control Enclosure. A Lightning Arrestor Shall Be Provided At The Terminal 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 Circuit Breaker And Transformer To Power The Control Panel With 1Ø, 115 Volt Service For All Control Functions. 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" Diameter, Schedule 40 Conduit Shall Be Provided From Wet Well To Control Panel Enabling Pump Power & 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 Pre-Set Level Causes Lead Pump To Operate. Lead Pump Operating And Sump Level Falling To Pumps Off Pre-Set Level Causes Lead Pump To Shut Off. Lead Pump Operating And Sump Level Rising To Lag Pump Run Pre-Set Level Causes Lag Pump To Operate. Lag Pump Operating And Sump Level Falling To Pumps Off Pre-Set Level 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 Pre-Set Level Is De-Energized. If One Pump Fails For Any Reason, The Remaining Pump Shall Operate Upon Sump Level Rise To Lag Pump Run Pre-Set Level. An Hour Meter Shall Be Provided For Each Pump To Record The Elapsed Operating Time Of Each Pump. Provide A Low Level And High Level Float for Redundant Operation If The FOGRod Control Is Inoperative.

18.) Four Hard Copy Manuals And A Digital Copy 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, & 7) Bill Of Materials.

19.) Provide Telephone Conduit Without Conductors So That The Telephone Conductors May Be Pulled At A Future Date.

20.) Contractor Shall Construct A 12 Foot Wide HMA Access Drive From Existing Edge Of Pavement To Proposed Edge Of Stone Lot. The Asphaltic Concrete Pavement Section Shall Comply With The Bituminous Patch Detail Shown On Sheet 6. A 20' Radius Is Required On Both Sides Of 12' Lane At Intersection Of 12' Lane And Adjacent Street.

21.) The Telemetry System Shall Be Installed Complete To Communicate With The Utilities Existing SCADA System Including The Programming Of The Master Station As Required. The System Must Utilize An Omnisite Remote Monitoring Device. The System Shall Be Housed Within The Lift Station Control Panel. Telemetry System Shall Operate From A 120 Volt, 60 Hertz Power Source And Be Provided Complete With A Battery Backup, Low Temperature Strip Heater. Provide Pump Run Time Meters, Amp Meter, And Voltage Meter. Pump Run, Pump Seal Failure, Phase Fail, Pump Overtemperature, Wet Well Low Level, Wet Well High Level, Amp Meter Shall Be Monitored. All Control Cables Shall Be Terminated At Labeled Terminal Strips. FOGRod Shall Be Used For Level Sensing.

22.) Contractor To Fasten Pump Bypass Line To Interior Wet Well Wall With Stainless Steel Clamps Spaced Every 9'-0", Nothing But Stainless Steel Inside Of Wet Well, Bolts, Nuts & Clamps.

23.) The Lift Station Shall Be Provided With A Generator Receptacle And Transfer Switch For Emergency Operation. The Receptacle Shall Be A Crouse Hinds Model AR647 Or Utilities Approved Equal. The Transfer Switch Shall Be Submitted To Lebanon Utilities Sewer Department For Approval Prior To Installation.

24.) A Sump Pump Shall Be Provided In The Meter Vault.

25.) A Weir Wall Is Required Within The Wet Well For Industrial And Commercial Lift Station Applications.

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JOHN G. LIGHTNER III REGISTERED No. PE11500016 STATE OF INDIANA PROFESSIONAL ENGINEER

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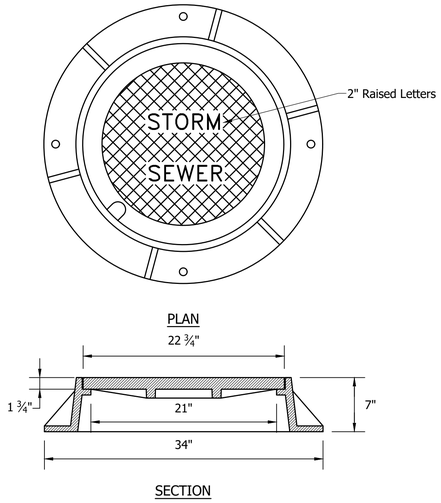
CITY OF LEBANON

SANITARY SEWER
LIFT STATION STANDARDS
& GUIDELINES

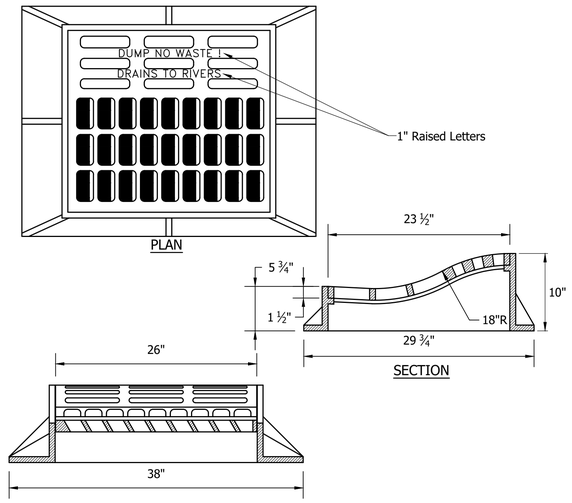
SHEET 19 OF 25



Weight = 250 Lbs.

NEENAH R-1772
OR EJ 1022Z1
Scale: None

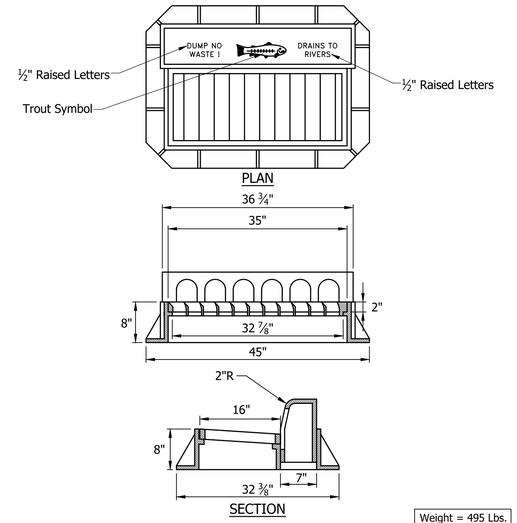
Castings For Manholes Which Do Not Drain Surface Water. All Covers Shall Be Stamped "STORM SEWER" With 2" Raised Letters.



Weight = 340 Lbs.

NEENAH R-3501-TR OR TL
OR EJ 7495M1 OR M2
Scale: None

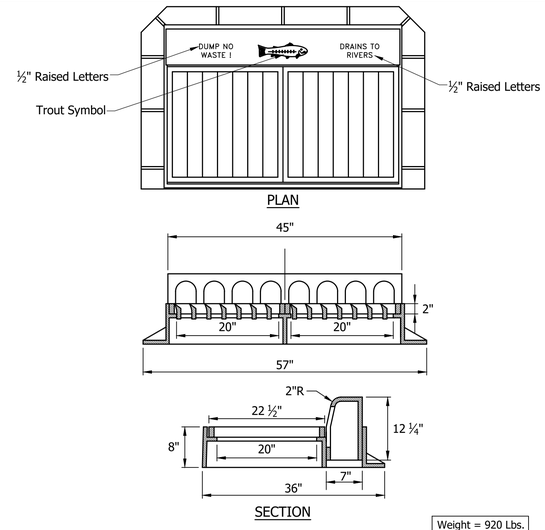
Castings Which Drain Roll Curb And Gutter, Type I Curbing Shall Be Neenah R-3501-TR (Flow Right) Or TL (Flow Left), EJ 7495M1 (Flow Right) Or M2 (Flow Left), Or As Approved By The City Of Lebanon. Catch Basin, Type A Required. Manholes Shall Not Be Used To Drain Type I Curbing.



Weight = 495 Lbs.

NEENAH R-3287-10V
OR EJ 7505Z1-M3-T4
Scale: None

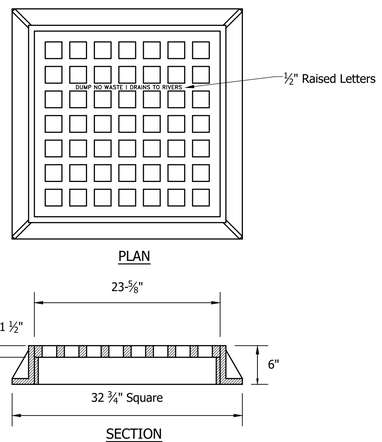
Castings Which Drain Combined Curb And Gutter, Type II Curbing. Catch Basin, Type B Required. Manholes Shall Not Be Used To Drain Type II Curbing.



Weight = 920 Lbs.

NEENAH R-3287-15
OR EJ 7565ZPT-5425M2-T3
Scale: None

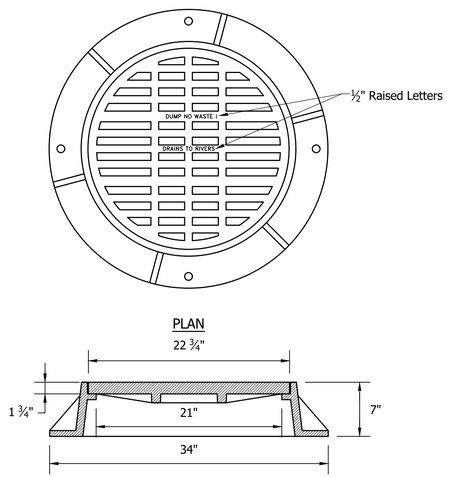
Casting Which Drains Combined Curb And Gutter, Type II Curbing. Catch Basin, Type C Required. Manholes Shall Not Be Used To Drain Type II Curbing.



Weight = 260 Lbs.

NEENAH R-3405
OR EJ 5250
Scale: None

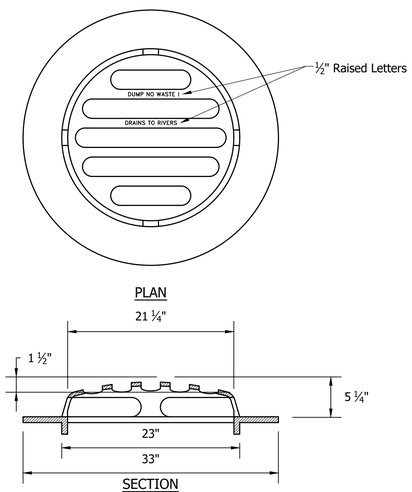
Castings For Inlets Which Drain Open Pavement Areas Without Curbing.



Weight = 245 Lbs.

NEENAH R-2502-G
OR EJ 1022Z1M2
Scale: None

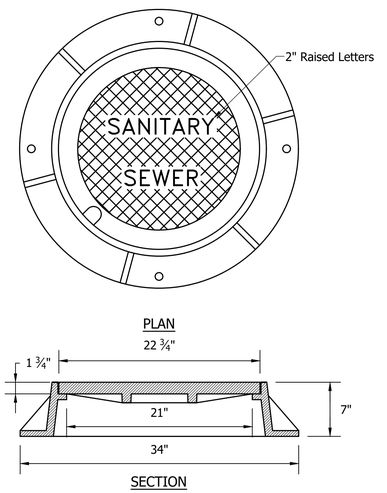
Castings For Manholes Which Drain Open Pavement Without Curbing.



Weight = 170 Lbs.

NEENAH R-4342
OR EJ 6489
Scale: None

Castings For Use On Inlets Or Manholes Which Drain Swales Or Dry Bottom Detention Basins.



Weight = 250 Lbs.

NEENAH R-1772
OR EJ 1022Z1
Scale: None

Casting For Sanitary Sewer Manholes, Gasketed Lids Are Required. All Covers Shall Be Stamped "SANITARY SEWER" With 2" Raised Letters. When Watertight Frame And Cover Are Required By Lebanon Utilities Sewer Department Or Developer, Neenah R-1772 With Locking Lid, EJ 1022Z1PT With Locking Lid, Or As Approved By Lebanon Utilities Sewer Department Shall Be Provided.

REVISIONS		
Rev. No.	Description	Date

JOHN G. LIGHTNER IV · REGISTERED · No. PE11500016 · STATE OF INDIANA · PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 01/03/2015 DATE

CITY OF LEBANON

CASTING STANDARDS

SHEET 20 OF 25

EROSION CONTROL NOTES

GENERAL:
Take Measures To Control Erosion And Sedimentation 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.

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.

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.

Clean Public Or Private Roadways Daily And After Major Storms Using Acceptable Methods 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.

For Construction Sequence, Maintenance, And Other Soil Erosion Requirements, See Specifications For Site Clearing, Slope Protection, Erosion Control, Landscaping, And Seeding.

Erosion And Sediment Control Practices Must Adhere To, Or Exceed Those Shown On The Erosion Control Plan, (And Rule 5 327 IAC 15-5) And Shall Be In Accordance With The Indiana Storm Water Quality Manual, Indiana Department Of Environmental Management.

SURFACE STABILIZATION:
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).

Stabilize All Disturbed Ground Left Inactive For Seven Or More Days By Seeding, Sodding, Mulching, Or By Other Equivalent Erosion Control Practices. See The Landscape Plan For Permanent Ground Cover Requirements Adjacent To The Building And Parking Areas.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT PAD:
Construct The Temporary Gravel Drive Using 2-3 Inches INDOT CA No. 53 Washed Stone Over A Stable Foundation, 6 Inches Minimum Thickness. Geotextile Fabric May Be Used Under Wet Conditions Or For Soils Within A High Seasonal Water Table To Provide Greater Bearing Strength. Grade For Positive Drainage.

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:
Do Not Install Sod On Hot, Dry Soil, Frozen Soil, Compacted Clay, 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.

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, Disk, Harrow, Or Rake.

Apply Topsoil If The Site Is Otherwise Unsuited For Establishing Vegetation. Shape, Smooth, And Firm The Soil Surface.

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.

Fertilize As Recommended By The Soil Test. If Testing Was Not Done, Consider Applying 400-600 Lbs./Acre Of 12-12-12 Analysis, Or Equivalent Fertilizer, As Recommended By The Soil Test. Work The Fertilizer Into The Soil To 2-4 Inches Deep.

TREE CONSERVATION/PROTECTION:
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.

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.

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.

Minimize Changes In The Drainage Pattern. Avoid Putting Fill Over The Root System.

Prune Low Hanging Limbs That Could Otherwise Be Broken Off By Equipment.

Repair Wounds Simply By Removing Damaged Bark And Wood Tissue (Do Not Use Tree Paint).

EROSION CONTROL BLANKETS:
Use Machine Produced Mat Of Straw Fiber Matrix Or Curled Wood Excelsior Of 80 Percent, 6 Inch Or Longer Fiber Length.

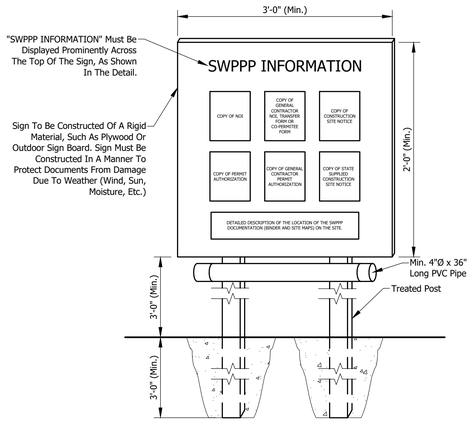
Evenly Distribute Fibers Over Entire Area Of Blanket To Provide Consistent Thickness.

Provide Blanket With Top Side Covered With Biodegradable Extruded Plastic Mesh.

Treat Blankets To Impart Smolder Resistance Without Use Of Chemical Additives.

Provide "Curlex Blankets" By American Excelsior Company, Or "S150" By North American Green, Or Accepted Substitute.

EROSION CONTROL BLANKET STAPLES:
Use Minimum 0.091 Inch Diameter Steel Wire "U" Shape With Legs 6 Inches In Length With 1 Inch Crown.



SWPPP INFORMATION SIGN

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 Lebanon MS4 Coordinator.

5.) Sign Shall Include 24 Hour Site Contact Information.

SEEDING:
The Following Table Is For General Seeding Information Only. Consult Section 3.12 Of The Indiana Handbook For Erosion Control In Developing Areas 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

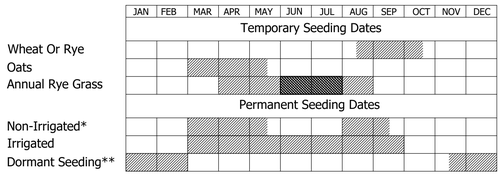
Spread Fertilizer Uniformly Over Finish Graded Surfaces At A Rate Of 20 Pounds Per 1,000 Square Feet. Thoroughly Disk, Harrow, Or Rake Fertilizer Into Soil To Depth Not Less Than 2 Inches.

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.

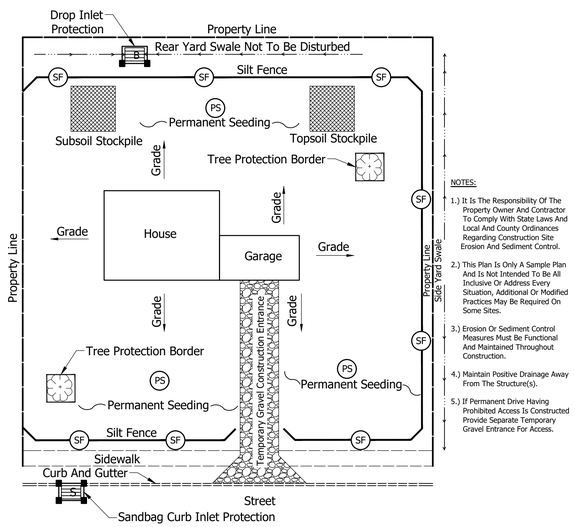
Hold Sloped Areas Steeper Than 2 (Horizontal) To 1 (Vertical) With Wire Mesh Or Stakes And Wire.



▨ Irrigation Required

* Seeding Dates May Be Extended 5 Days If Mulch Applied And Planted Late Summer

** Increase Seeding Rate By 50%



SAMPLE EROSION CONTROL SITE PLAN

Not To Scale
(For Construction Of Typical Single Family Dwelling)

DEWATERING PROCEDURES

Installation

Locate The Desired Outflow Location For The Dewatering System, This Should Be A Stabilized Area.

Discuss The Pump Capacity, Piping Components, And Filter Bag Type And Size With The Installer.

Place Filter Bag On A Flat Stable Surface Outside Of The Waterway And Behind Secondary Containment.

Place The Filter Bag In A Location That Can Be Easily Removed Without Causing Damage To The Bag Or Loss Of Sediment.

Connect The Pump Hose To The Filter Bag Using A Tight Connection Such As With A Steel Hose Band Clamp. Do Not Connect More Than One Pump Hose Per Bag.

Maintenance

Monitor The Outflow To Nearby Water Resources. Cease Pumping When Impacts Are Identified And Evaluate For Improvements.

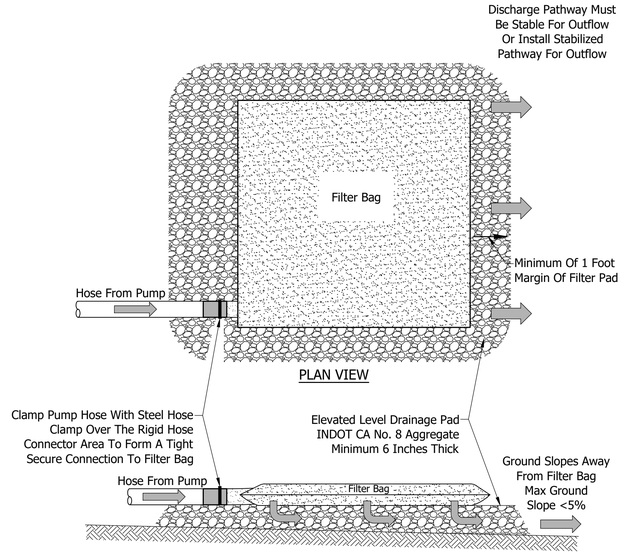
Filter Bags Require Frequent Monitoring. At A Minimum, Inspect At The Beginning Of Pumping Operations And Once Every Hour Thereafter.

Cease Pumping When Bag Can No Longer Pass Water At A Reasonable Rate And Threatens To Rupture, Replace With A New Filter Bag.

Monitor Bag For Holes, Rips, Or Tears. Immediately Cease Pumping When Holes, Rips Or Tears Are Identified And Replace Filter Bag Prior To Resumption Of Pumping.

Maintain Positive Drainage Away From Filter Bags For Efficient Operation.

Have Ready Access To Additional Filter Bags In The Event Of Bag Failure Or Bag Is Full.



FILTER BAGS (PUMP DISCHARGE FILTER BAGS) TYPICAL PRACTICE DIAGRAM

Not To Scale

REVISIONS

Rev. No.	Description	Date

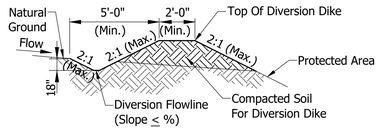
JOHN G. LIGHTNER IV — REGISTERED — No. PE11500016 — STATE OF INDIANA — PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 02/03/2025 DATE

CITY OF LEBANON

EROSION CONTROL MEASURES

SHEET 21 OF 25



Notes:
Installation:
Lay Out The Diversion By Setting Grade And Alignment To Fit Site Needs And Topography, Maintaining A Stable, Positive Channel Grade Towards The Outlet.

Remove And Properly Dispose Of Brush, Trees, And Other Debris From The Foundation Area.

Construct The Diversion To Dimensions And Grades Shown In The Construction Plans.

Construct The Diversion Ridge In Six To Eight-Inch Lifts. Compact Each Lift By Driving Wheels Of Construction Equipment Along The Ridge. Overfill And Compact The Ridge To Design Height Plus 10 Percent To Allow For Settlement.

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.

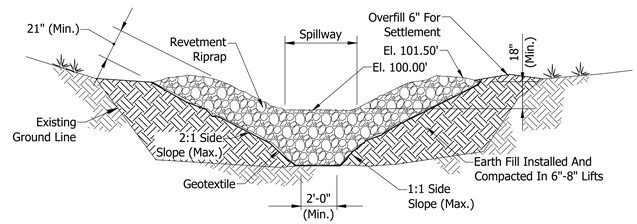
Maintenance:
Inspect Within 24 Hours Of Each Rain Event And At Least Once Every Seven Calendar Days.

Remove Sediment From Channel To Maintain Positive Grade.

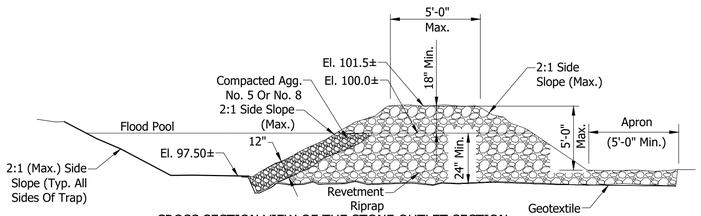
Check Outlets And Make Necessary Repairs Immediately.

Adjust Ridge Height To Prevent Overtopping.

TEMPORARY DIVERSION
Not To Scale



EARTH EMBANKMENT AND STONE OUTLET SECTION



CROSS SECTION VIEW OF THE STONE OUTLET SECTION

TEMPORARY SEDIMENT TRAP
Not To Scale

Notes:
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:
Clear, Grub, And Strip All Vegetation And Root Mat From The Embankment Area.

Create Embankment Using Material Free Of Roots, Rocks, Brush, And Debris. Overfill The Embankment 6 Inches To Allow For Settling.

Excavate A Trapezoidal Stone Outlet Section From The Compacted Embankment (Section A-A).

Install Geotextile And Place Specified Stone To The Lines And Grades Shown.

Stabilize The Embankment And Other Disturbed Areas With Seed And Mulch Or Another Suitable Erosion Resistant Cover.

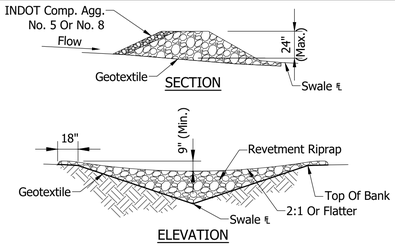
Maintenance:
Inspect Traps Weekly And Following Each Storm Event And Immediately Repair. Check Embankment For Any Erosion And Piping Holes And Repair.

Remove Sediment When It Has Accumulated To One Half The Design Depth. Check Pool Area Side Slopes For Erosion And Repair.

Replace Spillway Gravel Facing If Clogged.

Inspect Vegetation And Seed Again, If Necessary.

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.



ELEVATION

NOTES:
Installation:
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.

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.

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)

Stabilize The Channel Above The Uppermost Dam.

Erosion Resistant Lining Shall Extend At Least 6" Below Lowest Dam.

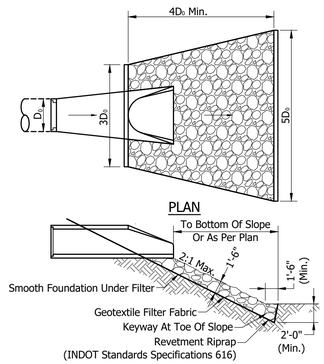
Maintenance:
Inspect Check Dams And The Channel After Each Storm Event, And Repair Any Damage Immediately. If Significant Erosion Occurs Between Dams, Install A Riprap Liner In That Portion Of The Channel.

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.

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



SECTION

NOTES:
Installation:
Excavate Only Deep Enough For Both Filter And Riprap. Compact Any Fill Material to The Density Of The Surrounding Undisturbed Soil.

Cut A Keyway In Stable Material At The Base Of The Slope to Reinforce The Toe; Keyway Depth Should Be 1-1/2 Times The Design Thickness Of The Riprap And Should Extend A Horizontal Distance Equal To The Design Thickness.

Place Geotextile Fabric On The Smoothed Foundation, Overlapping The Edges 12 Inches Min. Secure With Anchor Pins Spaced Every 3 Feet Along The Overlap.

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.

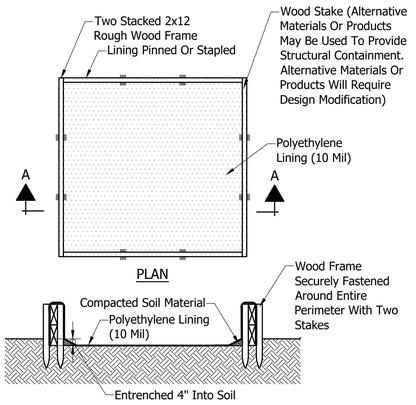
If Fabric Is Damaged, Remove The Riprap And Repair By Adding Another Layer Of Fabric, Overlapping The Damaged Area By 12 Inches.

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.

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

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

PRECAST CONCRETE END SECTION W/ RIPRAP
Not To Scale



SECTION A-A

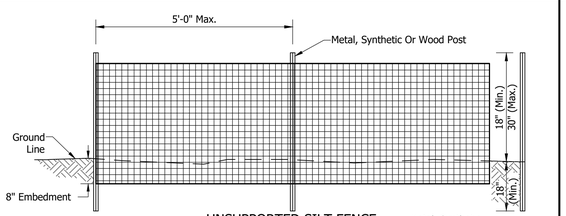
NOTES:
Concrete Washouts Shall Be Located Away From Inlets, Open Drainage Facilities, Watercourses And Construction Traffic.

There Shall Be Concrete Washouts Of Sufficient Volume And Quantity To Contain All Liquid And Concrete Waste Generated By Washout Operations.

Once Concrete Wastes Are Washed Into The Designated Area And Allowed To Harden, The Concrete Should Be Broken Up, Removed, And Disposed Of Offsite. Dispose Of Concrete On A Regular Basis.

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



UNSUPPORTED SILT FENCE

NOTES:
Installation:
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.

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

Along The Entire Fence Line, Dig An 8 Inch Deep Flat Bottomed Or V-Shaped Trench. Place Fence According To Manufacturer's Recommendations.

Maintenance:
Inspect The Silt Fence Weekly, And After Each Storm Event.

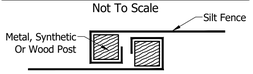
If Fence Fabric Tears, Starts To Decompose, Or In Any Way Becomes Ineffective, Replace The Affected Portion Immediately.

Remove Deposited Sediment When It Reaches Half The Height Of The Fence At Its Lowest Point Or Is Causing The Fabric To Bulge.

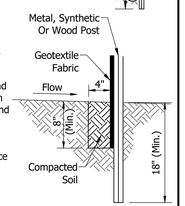
Take Care To Avoid Undermining The Fence During Clean Out.

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



FENCE JOINT DETAIL
Not To Scale



TRENCH DETAIL

SKIMMER DETAIL

Installation

Follow The Manufacturer's Recommended Install Specifications.

Install The Flexible Boot With Watertight Connections To The Basin Principal Outlet Structure Depending Upon The Type Of Designed Basin Discharge Outlet.

When Connection To A Permanent Basin Outlet Structure The Height May Need To Be Modified And Any Additional Unused Orifice Holes Will Require A Temporary Watertight Plug.

When the Use Of A Perforated Riser Outlet Or Rock Horseshoe Is Anticipated Due To Land Disturbing Activities That Will Not Be Completed Prior To Winter Weather, Then Install The Alternative Dewatering Device With Basin Construction But Keep It Offline Until Onset Of Potential Freezing Time Periods.

Floating Outlets Are Recommended To Be Restrained To Prevent Damage From Excessive Side To Side Movement.

Dry Basin Landing Device: Provide A landing Device Such As An Aggregate Pad Or Concrete Block That Will Allow The Floating Outlet To Rest At The Bottom Of The Dewatering Zone Elevation. The Landing Device Is Required To Keep The Floating Outlet Above Sediment Deposits.

Maintenance

The Floating Inlet Is Designed To Drain The Dewatering Zone In No Less Than 48 Hours And On Longer Than 72 Hours.

Floating Outlet Shall Be Inspected At A minimum Weekly.

If Flow Is Restricted, Inspect Device For Debris Clogging.

Ensure That The Floating Outlet Cannot Be Stuck In Sediment Deposits And Can Float With Basin Fill.

Check All Components To Ensure They Are Free Of Cracks, Leaks, And Deteriorations.

Avoid Use During Periods Of Ice Formation.

Remove When The Contributing Drainage Area Has Been Properly Stabilized And No Longer Contributing Sediment-Laden Run-Off Or When Freezing Conditions Are Anticipated.

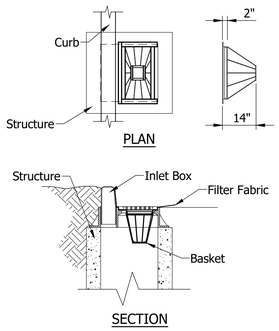
REVISIONS		
Rev. No.	Description	Date

JOHN G. LIGHTNER IV · REGISTERED · No. PE11500016 · STATE OF INDIANA · PROFESSIONAL ENGINEER

RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 02/03/2025 DATE

EROSION CONTROL MEASURES

SHEET 22 OF 25



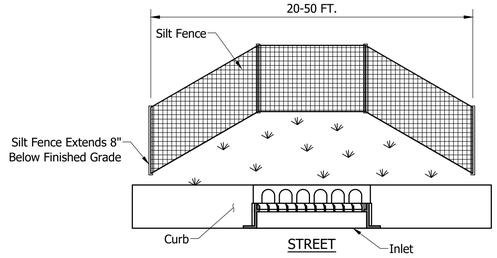
NOTES:
Installation:
Install Basket Curb Inlet Protection As Soon As Inlet Boxes Are Installed (New Development) Or Prior To Land Disturbing Activities (Existing Development).

If Necessary, Adapt Basket Dimensions To Fit Inlet Box Dimensions.

Remove The Grate And Install The Frame Into The Grate Opening. Cut And Install Geotextile Fabric According To The Manufacturer's Recommendations. Replace The Grate.

Maintenance:
Inspect Daily And After Each Storm And Remove Sediment. Replace Or Clean Geotextile Fabric 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:
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.

Along The Entire Fence Line, Dig An 8-Inch Deep Flat Bottomed Or V-Shaped Trench. Place Fence According To Manufacturer's Recommendations.

Maintenance:
Inspect The Silt Fence Weekly And After Each ½" Rainfall Event.

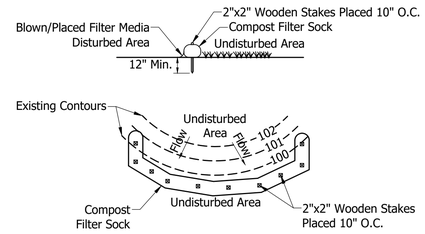
If Fence Fabric Tears, Starts To Decompose, Or In Any Way Becomes Ineffective, Replace The Affected Portion Immediately.

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.

After The Contributing Drainage Area Has Been Stabilized, Remove The Fence And Sediment Deposits, Bring The Disturbed Area To Grade, And Stabilize.

SILT FENCE BEHIND CURB
Not To Scale



NOTES:
Installation:
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.

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.

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:
Traffic Shall Not Be Permitted To Cross Filter Socks.

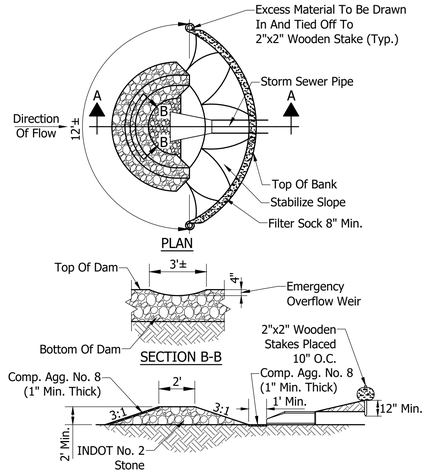
Inspect The Structure Weekly And After Each Rainfall Event. Damaged Socks Shall Be Repaired According To The Manufacturer's Specifications Or Replaced Within 24 Hours Of Inspection.

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.

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:
Foundation Shall Be Laid On Geotextile Fabric.

Maintenance:
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

COFFERDAM

Installation

Ensure Proper Permits, Including 401/404 Permits, Have Been Obtained For Use Of Temporary Cofferdams.

Working Drawings For A Cofferdam Installation Shall Be Submitted By The Contractor And Will Provide The Method Of Construction For Details Not Fully Shown In The Plans.

Dewatering With Sediment Filtering Shall Be Used.

If Concrete Is Being Poured Inside A Dewatered Excavation, Any Water That Mixes With Uncured Concrete Shall Be Pumped Into An Approved Concrete Waste Water Containment And Disposed Of Properly.

Ensure All Banks Are Stable Prior To Removal Of Cofferdams.

Remove Carefully With As Little Disturbance As Possible.

Maintenance

Remediate Any Movement Or Bowing Of The Cofferdam Body Prior To Re-Entry. If Cofferdams Have Titled Or Shifted, Straighten As Necessary And Brace To Prevent Future Movement.

Repair Any Leaks To The Cofferdam Body To Provide A Buffer To Any Sediment Leaving The Area.

Regrade And Reseed Work Areas Adjacent To The Water Bank As Soon As Practical Prior To Removal Of The Cofferdam.

Do Not Leave Tools And Equipment In The Cofferdam Overnight Or Prior To A Rain Event.

PUMP AROUND

Installation

Place Watertight Cofferdams In The Waterway Both Upstream And Downstream Of The Work Area.

Pump Water From The Upstream Side, Around The Work Area, And Outlet On A Stable Outlet (Usually Riprap) On The Banks Of The Waterway Downstream Of Downstream Cofferdam.

The Pump Should Be Sized To Ensure Upstream Water Does Not Overtop The Cofferdam And Allow Water Into The Work Areas.

Stream Water Should Not Be Allowed To Flow Through The Work Area Until The Area Is Completely Stable, Which Includes The Final Shaping Of The Disturbed Stream Banks And Stabilization Of Those Banks With Riprap, Erosion Control Blankets, Etc.

Maintenance

Adjust Outlet Stabilization If Bank Erosion Is Noticed.

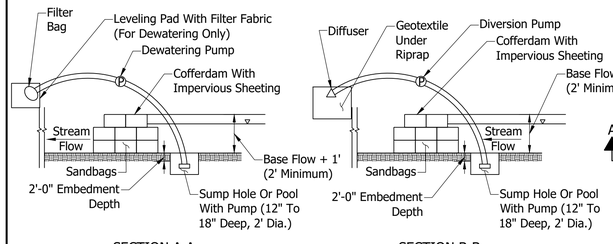
Adjust Pump Capacity As Needed To Handle Stream Water Volume.

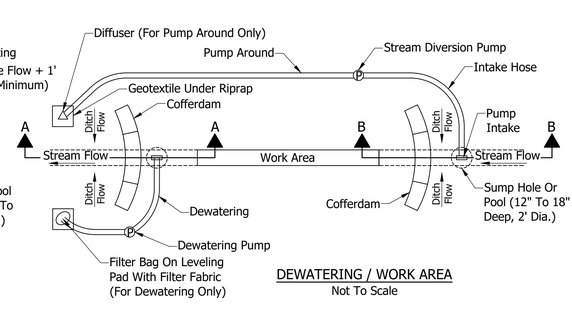
Have A Plan In Place For Monitoring Of The Pump Outside Of Normal Work Hours.

Fix Leaks Or Otherwise Stabilize Coffers If Water Is Back Flowing Into Work Area.

Inspect Multiple Times Per Day And Monitor The Weather Forecast.

**Note - Diagram Should Show A Secondary Measure Around The Dewatering Bag, Such As Stone Or Waffle.





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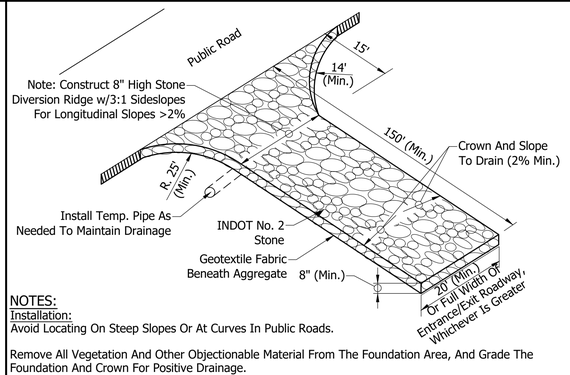


NOTES:
Installation:
Avoid Locating On Steep Slopes Or At Curves In Public Roads.

Remove All Vegetation And Other Objectionable Material From The Foundation Area, And Grade The Foundation And Crown For Positive Drainage.

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).

Install Pipe Under The Pad (If Needed) To Maintain Proper Public Road Drainage.

If Wet Conditions Are Anticipated, Place Geotextile Fabric On The Graded Foundation To Improve Stability.

Place Aggregate To Dimensions And Grade Shown On The Erosion Control Plan, Leaving The Surface Smooth And Sloped For Drainage.

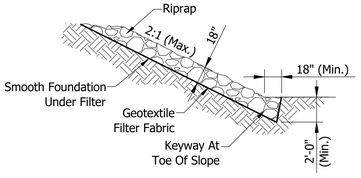
Top-Dress The Drive With Washed Aggregate (INDOT Compacted Aggregate No. 53).

Divert All Surface Runoff And Drainage From The Stone Pad To A Sediment Trap Or Basin.

Maintenance:
Inspect Daily And After Each Storm Event Or Heavy Use.

Reshape Pad And Topdress As Needed For Drainage And Runoff Control. 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:
Excavate Only Deep Enough For Both Filter And Riprap. Compact Any Fill Material To The Density Of The Surrounding Undisturbed Soil.

Cut A Keyway In Stable Material At The Base Of The Slope To Reinforce The Toe. Keyway Depth Should Be 1½ Times The Design Thickness Of The Riprap, And Should Extend A Horizontal Distance Equal To The Design Thickness.

Place Geotextile Fabric On The Smoothed Foundation, Overlapping The Edges 12 Inches Minimum. Secure With Anchor Pins Spaced Every 3 Feet Along The Overlap.

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.

If Fabric Is Damaged, Remove The Riprap And Repair By Adding Another Layer Of Fabric, Overlapping The Damaged Area By 12 Inches.

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.

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

RIPRAP
Not To Scale

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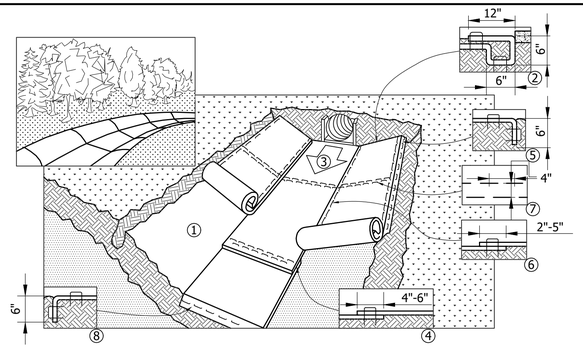
RECOMMENDED FOR APPROVAL — DESIGN ENGINEER — 02/03/2025 DATE

CITY OF LEBANON

EROSION CONTROL MEASURES

SHEET 23 OF 25



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.

⑤ 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.

⑥ 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.

⑦ 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.

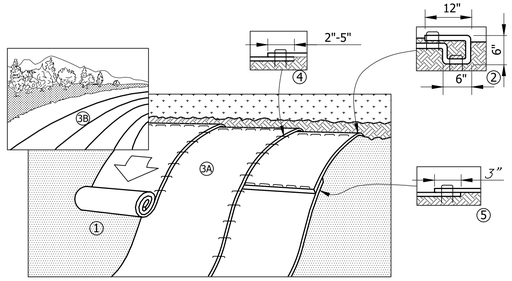
⑧ The Terminal End Of The Blankets Must Be Anchored With A Row Of Staples/Stakes Approximately 12 Inches Apart In A 6 Inch Deep By 6 Inch Wide Trench. Backfill And Compact The Trench After Stapling.

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.

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

ROCK CHUTE

Installation

Excavate The Foundation And Apron Subgrades Below Design Elevation And Compact The Channel Prior To Placement Of Geotextile. Construct The Channel Excavation With A Swale Depression Through The Length Of The Channel For Flow Direction. Riprap Is Recommended To Be Placed At A Depth Of Twice The Stone Diameter Or 12 Inches, Whichever Is Greater.

Place Geotextile On The Compacted, Relatively Smooth Surface, Overlap Geotextile Sheets 18" With The Upstream Sheet Over The Downstream Sheet. Blend The Lining Material Into The Surrounding Grade.

The Chute Must Be Cut To Final Cross Section/Grade In A Concave Shape. Water Shall Be Directed To Flow Down The Middle Of The Rock Chute And Not Along The Sides Causing Erosion.

Construct A Small Plunge Pool Within The Outlet Apron. Riprap Aprons Must Be Level With Or Slightly Lower Than The Channel Grade And Should Not Restrict Channel Flow Or Produce An Overall.

Maintenance

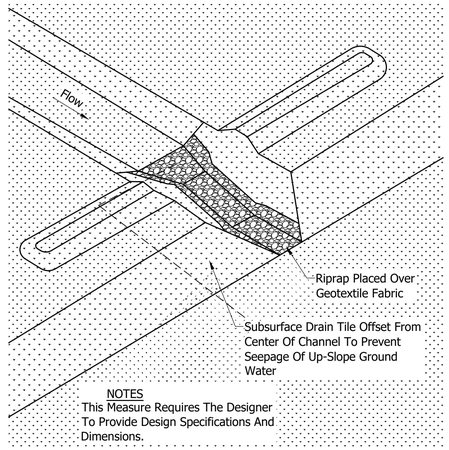
If Scour Is Found Along The Sides Of The Chute, Reshape Chute As Needed For Water To Flow Through The Riprap.

Promptly Repair And Reseed/Mulch Any Small Rills That Form.

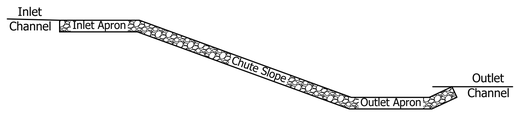
Repair Or Replace And Breaks, Gaps, Washouts Or Damage In The Geotextile Or The Channel Lining Material.

If Sediment Is Found In The Riprap, Stabilize Slopes And Areas Upstream Of Channel. Clean Out Or Replace Riprap.

If Scour Is Found Downstream Of The Chute, Additional Riprap May Be Needed.



PLAN



SECTION

ROCK CHUTE DETAIL

Scale: None

ROCK FILTER BERM DETAIL

Installation

Coordinate The Installation, Location, And Timing With Proper Phase Of Construction.

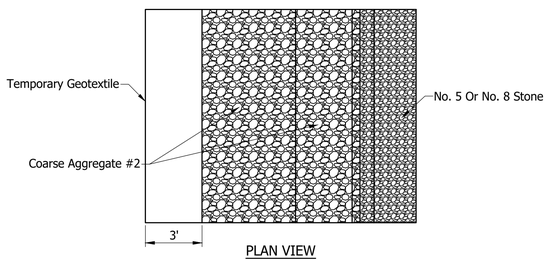
Install Close To Locations Where Runoff Would Enter An Adjacent Waterway.

Rock Filter Berms Require A Layer Of Geotextile Fabric With Riprap Placed On Top. No. 5 Or No. 8 Filter Stone Should Be Added To The Upslope Of The Riprap Berm.

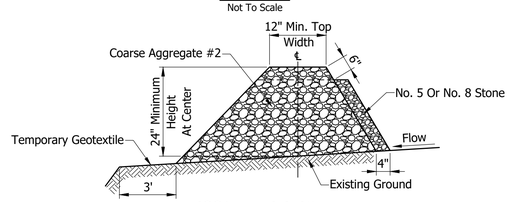
Maintenance

Remove Sediment Once It Reaches ¼ The Height Of The Berm.

Repair Damage Areas As Needed Or Directed.



PLAN VIEW
Not To Scale



ROCK FILTER BERM
SECTION VIEW
Not To Scale

EARTHEN/MULCH BERM DETAIL

Installation

For Use Only In Areas Of Sheet Flow.

Install On The Contours

Five To 10 Feet From The Toe Of Slope.

End Of Filter Ridge Are Turned Upslope So That The Base Of Ridge Ends Terminate At A higher Elevation That The Top Of The Berm At Its Lowest Point.

Create A Ridge Of Soil Or Mulch A Minimum Of 12 Inches In Height And 24 Inches Width.

Table 1. Filter Ridge Size Requirements

Slope		Maximum Distance Above Filter Ridge (Linear Feet)	Filter Ridge Minimum Size Requirements (Width To Height Ratio Of 2:1)
0% - 2%	<50:1	100	2 Ft. x 1 Ft.
2% - 10%	50:1 To 10:1	75	2 Ft. x 1 Ft.
10% - 20%	10:1 To 5:1	50	2 Ft. x 1 Ft.
20% - 33%	5:1 To 3:1	25	2.6 Ft. x 1.3 Ft.
>33%	>3:1	15	3 Ft. x 1.5 Ft.

Maintenance

Inspect Regularly, Reshape As Needed.

Remove Accumulated Sediment When It Reaches ¼ The Height Of The Filter Ridge.

If The Berm Does Not Hold Back Sediment, Another Sediment Control Measure Is Likely Required.

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CITY OF LEBANON

EROSION CONTROL MEASURES

SHEET 24 OF 25

STOCKPILES

Installation

Stockpiles Should Be Placed As Indicated On Approved Grading Plan. The Stockpiles Shall Be 50-Feet From Any Floodway Or Waters Of The State. Perimeter Control Shall Be Placed On The Downslope Side Of The Stockpile.

Maintenance

Maintain Proper Perimeter Control And Temporary Vegetation Of The Stockpile Per The SWPPP. Any Stockpile To Remain Longer Than 180 Days Shall Be Graded To A 3:1 Slope, Vegetated, Trenched And Perimeter Control Placed.

FLOCCULANTS

Flocculants Play A Role In Treating Construction Stormwater Runoff As Part Of A Comprehensive Treatment Plan. The Selection, Dosage, And Applications Of These Agents Can Differ, Requiring Oversight From Someone Trained In Their Usage.

TRAVERSABLE CHECK DAM

Installation

Place Fiber Roll Or Filter Sock On Geotextile Fabric That Extends Downstream Of The Check Dam.

Place The Bottom Of The Check Dam Into The Ground 4 Inches.

Check Dam Ends Shall Be Positioned As Shown Such That Storm Water Flows Over The Weir Low Point And Does Not Flow Around The Ends.

Check Dams Shall Be Spaced Such That The Top Of The Downstream Check Dam Is At The Same Elevation As The Toe Of The Adjacent Upstream Check Dam.

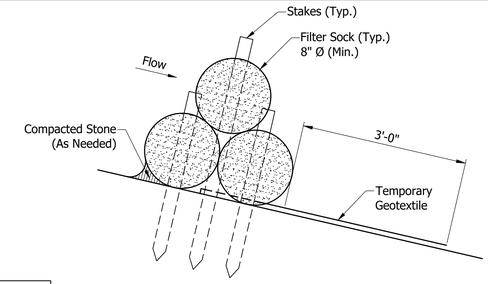
Stake Length Shall Be Sufficient To Wedge Filter Sock To The Ground To Prevent Movement And Undercutting.

Maintenance

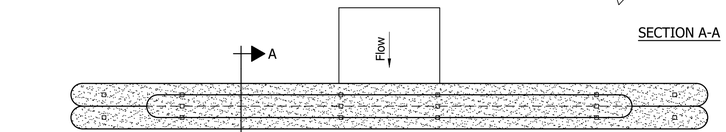
Remove Sediment Once It Reaches ½ The Height Of The Check Dam.

If Undercutting Is Observed, Place Compacted #5 Or #8 Stone On Front Face Of Dam.

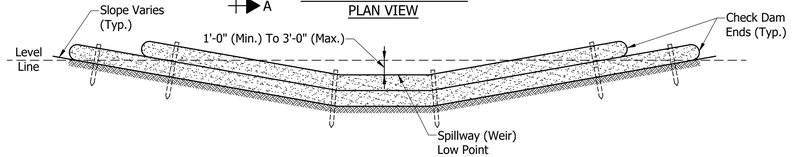
Repair Or Replace If The Check Dam Is Damaged Or Ineffective.



SECTION A-A



TRAVERSABLE CHECK DAM
PLAN VIEW



TRAVERSABLE CHECK DAM
ELEVATION

TRAVERSABLE CHECK DAM

Not To Scale

PERIMETER PROTECTION, FILTER SOCK

Installation

Fiber Roll Or Filter Sock Shall Be Installed As Shown Or In Accordance With Manufacturer's Recommendations.

Install In Sheet Flow Areas With Small Watersheds And Low Velocities.

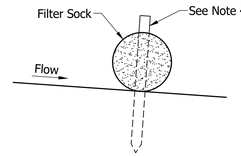
Secure Into The Soil With Wooden Stakes.

When Joining Two Pieces The Ends Should Be Overlapped Minimum One Foot.

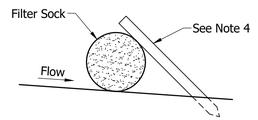
Maintenance

Secure Or Replace Damaged Filter Socks.

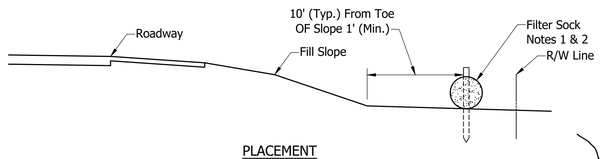
Remove Accumulated Sediment Once It Reaches ¼ Of The Height Of The Filter Sock.



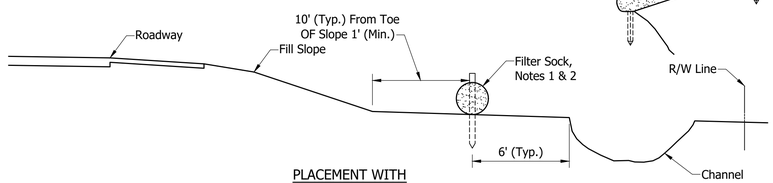
STAKE THROUGH
SECURING METHOD



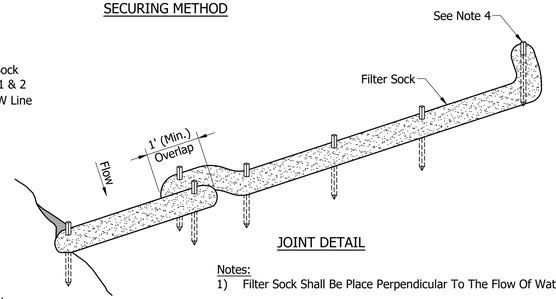
SLANTED STAKE
SECURING METHOD



PLACEMENT
RELATIVE TO RIGHT-OF-WAY LINE



PLACEMENT WITH
CHANNEL IN RIGHT-OF-WAY



JOINT DETAIL

Notes:

1) Filter Sock Shall Be Place Perpendicular To The Flow Of Water.

2) Filter Sock Does Not Require Staking When Fill Slope Is Less Than Or Equal To 12%, Except When Fill Slope Is Below the Q_{100} Water Surface Elevation And Flood Prone Area.

3) Filter Sock Shall Be Secure In Locations Below The Q_{100} Water Surface Elevation And Flood Prone Locations. Filter Sock End Shall Be Secured Using The Stake Through Method. Intermediate Points May Be Secured Using Either The Stake Through Or Slanted Stake Method.

4) Stake Angle And Length Shall Be Sufficient To Wedge Filter Sock To The Ground To Prevent Movement And Undercutting.

PERIMETER PROTECTION
FILTER SOCK

Not To Scale

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EROSION CONTROL MEASURES

SHEET 25 OF 25