



STANDARD DETAIL DRAWINGS

ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.

GI0.1

GREEN INFRASTRUCTURE DETAILS

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DRAWING INDEX

GREEN INFRASTRUCTURE DETAILS

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GI0.2

Sheet Number	Drawing Title	Description
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			<div style="text-align: center;"> <h2>DRAWING INDEX</h2> <h3>GREEN INFRASTRUCTURE DETAILS</h3> </div>	ISSUE DATE: DECEMBER 2023
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		STANDARD DETAIL DRAWINGS ENGINEERING SERVICES - VANCOUVER, B.C.		DRAWING No. GI1.1
<h1>USER GUIDE: GI TYPICAL DETAILS</h1>				
<p>THESE TYPICAL DETAILS AND SPECIFICATIONS WERE DEVELOPED TO BE REVISED AND CUSTOMIZED FOR EACH INDIVIDUAL PROJECT BY DESIGN PROFESSIONALS. AUTOCAD FILES OF THESE DETAILS CAN BE PROVIDED UPON REQUEST TO THE GREEN INFRASTRUCTURE IMPLEMENTATION (GII) BRANCH (GREEN.INFRASTRUCTURE@VANCOUVER.CA).</p> <p>THEY SHOW TYPICAL CONFIGURATIONS, RATHER THAN A REQUIRED CITY STANDARD CONFIGURATION. THIS DISTINCTION IS DELIBERATE. WE RECOGNIZE THAT TO CREATE GI PROJECTS THAT ARE FUNCTIONAL, CONTEXTUAL, AND AESTHETIC, DESIGN PROFESSIONALS MUST USE THEIR PROFESSIONAL JUDGMENT AND CREATIVE THINKING TO BE RESPONSIVE TO EACH SITE-SPECIFIC CONDITION.</p> <p>REFERENCES ARE MADE THROUGHOUT THESE STANDARD DRAWINGS TO THE "DESIGN MANUAL", OTHER DRAWINGS, AND STANDARD CITY OF VANCOUVER CONSTRUCTION MATERIALS. THE DESIGN MANUAL REFERS TO THE GREEN INFRASTRUCTURE AND INTEGRATED RAINWATER MANAGEMENT CHAPTER OF THE CITY OF VANCOUVER ENGINEERING DESIGN MANUAL. GI STANDARD DRAWINGS ARE REFERRED TO BY THEIR DRAWING TITLE (i.e GI4.3). AGGREGATE MATERIALS ARE REFERRED TO BY THEIR CITY OF VANCOUVER DESIGNATION (i.e. COV #9)</p>				
<h2>CONTENT</h2>				
<p>THESE TYPICAL DETAILS ARE FORMATTED, ORGANIZED, AND DEVELOPED WITH THE NECESSARY INFORMATIONAL TOOLS TO GUIDE THE DESIGN PROFESSIONAL THROUGH THE PROPER SELECTION, LAYOUT, AND DESIGN OF GI PRACTICES AND THE SELECTION OF APPROPRIATE SITE-SPECIFIC COMPONENTS DETAILS (I.E. INLETS, OUTLETS, AND EDGE TREATMENTS, ETC.).</p> <ul style="list-style-type: none">PURPOSE: SUMMARY OF EACH FACILITY’S INTENDED PERFORMANCE AND FUNCTION.DESIGNER NOTES & GUIDELINES: TECHNICAL DESIGN REQUIREMENTS AND/OR SIZING CRITERIA GUIDELINES ARE PROVIDED SUCH THAT EACH FACILITY IS DESIGNED AND APPROPRIATELY CUSTOMIZED BY THE DESIGN PROFESSIONAL.LAYOUT REQUIREMENTS: TECHNICAL INFORMATION, DESIGN REQUIREMENTS, AND REFERENCE TO RELATED CITY REQUIREMENTS.DESIGNER CHECKLIST: TECHNICAL DESIGN INFORMATION THAT MUST BE DETERMINED AND SHOWN IN THE CONSTRUCTION DOCUMENTS TO ENSURE PROPER DESIGN AND CONSTRUCTABILITY.BMP PLANS: TYPICAL PLAN VIEW WITH GENERAL CONFIGURATION FOR PROPER FUNCTION. DIMENSIONAL LAYOUT AND EDGING MATERIALS SHOULD BE ADJUSTED BASED ON PROPOSED SITE DESIGN AND PROGRAMING.BMP SECTIONS AND PROFILES: A TYPICAL SECTION AND/OR PROFILE WITH GENERAL CONFIGURATION FOR PROPER FUNCTION. DIMENSIONAL LAYOUT AND EDGING MATERIALS SHOULD BE ADJUSTED BASED ON PROPOSED SITE DESIGN AND PROGRAMING.CONSTRUCTION NOTES: CONSTRUCTION RELATED NOTES FOR USE BY THE CONTRACTOR.DETAILS FOR INDIVIDUAL COMPONENTS SUCH AS INLETS, SEDIMENT PADS, PERFORATED PIPES, MONITORING WELLS, AND MORE				
<h2>USE ON CONSTRUCTION DOCUMENTS</h2>				
<p>DESIGN PROFESSIONALS USING THE AUTOCAD DRAWINGS MUST REVIEW AND ADJUST THE DETAILS AND CONSTRUCTION NOTES TO ADDRESS THEIR SITE-SPECIFIC CONDITIONS . TO ALLOW FOR SITE-SPECIFIC DESIGN ADJUSTMENTS THE TYPICAL DETAILS ARE DEVELOPED AS “NOT FOR CONSTRUCTION” DRAWINGS. TITLE BLOCKS ARE PROVIDED FOR DOCUMENT ORGANIZATION AND REFERENCE ONLY. DRAWINGS THAT DO NOT REQUIRE ADJUSTMENT CONTAIN THE FOLLOWING NOTE: "FIXED: THIS DETAIL MAY BE REFERENCED ON ENGINEERING DRAWINGS WITHOUT AN ADJUSTED SITE-SPECIFIC DETAIL" .</p> <ul style="list-style-type: none">DO NOT INCLUDE THE NON-ADJUSTED DETAIL WITH TITLE BLOCK WITHIN THE CONSTRUCTION DOCUMENTS.DO NOT INCLUDE NON-ADJUSTED DETAIL PLANS, SECTIONS, OR CONSTRUCTION NOTES WITHIN THE CONSTRUCTION DOCUMENTS.DO NOT REFERENCE THE GI TYPICAL DETAIL SHEET NAME AND/OR NUMBER (i.e. GI 2.1) AS A STANDARD DETAIL CALL-OUT ON DRAWINGS.DO NOT EXPECT CONTRACTORS TO CONDUCT CALCULATIONS OR BE RESPONSIBLE FOR MISSING DESIGN INFORMATION.				
<p>NOTE: ALL UNITS ARE IN METERS UNLESS OTHERWISE NOTED</p>				
		GENERAL INFORMATION		ISSUE DATE: DECEMBER 2023
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GI INLETS AND OUTLETS

DESIGN NOTES AND GUIDANCE

PURPOSE:

THE FOLLOWING DETAILS PROVIDE DESIGN ALTERNATIVES FOR CONVEYING WATER INTO AND OUT OF ROADSIDE GREEN INFRASTRUCTURE SYSTEMS. CAD FILES OF THESE DETAILS CAN BE PROVIDED UPON REQUEST TO THE GREEN INFRASTRUCTURE IMPLEMENTATION BRANCH (GREEN.INFRASTRUCTURE@VANCOUVER.CA). DESIGN REQUIREMENTS FOR INLETS AND OUTLETS IS PROVIDED IN THE DESIGN MANUAL.

DESIGNER NOTES & GUIDELINES:

- 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.
- 2. THE DESIGNER MUST SIZE INLETS AND OUTLETS PER DESIGN GUIDANCE INCLUDED IN THE GI DESIGN MANUAL.
- 3. GI SYSTEMS WITH INTERNAL CATCHBASINS CONNECTED TO MUNICIPAL SEWERS SHOULD BE DESIGNED TO ACCOMMODATE THE FULL DESIGN FLOW OF THE RECEIVING SEWER.
- 4. INLETS FOR GI SYSTEMS THAT ARE ARE NOT DIRECTLY CONNECTED TO MUNICIPAL SEWER SYSTEMS SHOULD BE DESIGNED TO ACCOMMODATE THE PEAK FLOW OF THE 24hr 48mm GI DESIGN STORM.
- 5. ALL GI INLETS SHOULD BE DESIGNED WITH A SAFETY FACTOR OF 1.5.

STANDARD DRAWING DESCRIPTIONS		
2.1.	STRAIGHT STEEL INLET COVER	THE STRAIGHT STEEL CURB INLET COVER IS A STEEL COVER THAT PROVIDES A CONTINUOUS, FLUSH TOP-OF-CURB SURFACE OVER A CURB CUT. GI2.1 AND GI2.2 ARE OFTEN PAIRED WITH GI4.5.
2.2.	CURVED STEEL INLET COVER	THE CURVED STEEL CURB INLET IS A MODIFICATION OF THE STRAIGHT STEEL COVER INLET USED TO COVER CURB CUTS ON A ROADWAY BULGE.
2.3.	OPEN CURB CUT INLET	GI2.3. SHOWS THE CURB AND GUTTER GEOMETRY FOR A ROADSIDE CURB CUT INLET WITHOUT A STEEL COVER. THIS DETAIL SHOULD BE COMBINED WITH GI2.1 OR GI2.2 AND IS INTENDED FOR LOWER TRAFFIC AREAS OR AREAS WITHOUT STREET PARKING.
2.4.	COVERED CURB CUT INLET	GI2.4 IS A SIMILAR DESIGN TO GI2.3 BUT WITH A STEEL INLET COVER SUCH AS THOSE SHOWN IN GI2.1 AND GI2.2. THIS TYPE OF CURB INLET MAY ALSO BE PAIRED WITH A SEDIMENT CONTROL FEATURE SUCH AS THOSE SHOWN IN GI4.4 AND GI4.5.
2.5.	PRETREATMENT SEDIMENT PAD	PRETREATMENT SEDIMENT PADS ARE PLACED DOWNSTREAM OF A CURB CUT INLET AND ARE USED TO PREVENT EROSION OF BIORETENTION MEDIA AND REDUCE SEDIMENT ENTERING INTO GREEN INFRASTRUCTURE ASSETS. THEY MAY BE INSTALLED UPSTREAM OF BIORETENTION SYSTEMS OR TREE TRENCHES.
2.6.	PRETREATMENT SEDIMENT BASIN	PRETREATMENT SEDIMENT BASINS HAVE A SIMILAR FUNCTION AND ARE PLACED IN SIMILAR LOCATIONS TO SEDIMENT PADS, BUT THEY ARE INTENDED FOR LARGER CONTRIBUTING DRAINAGE AREAS AND HIGHER SEDIMENT LOADS.

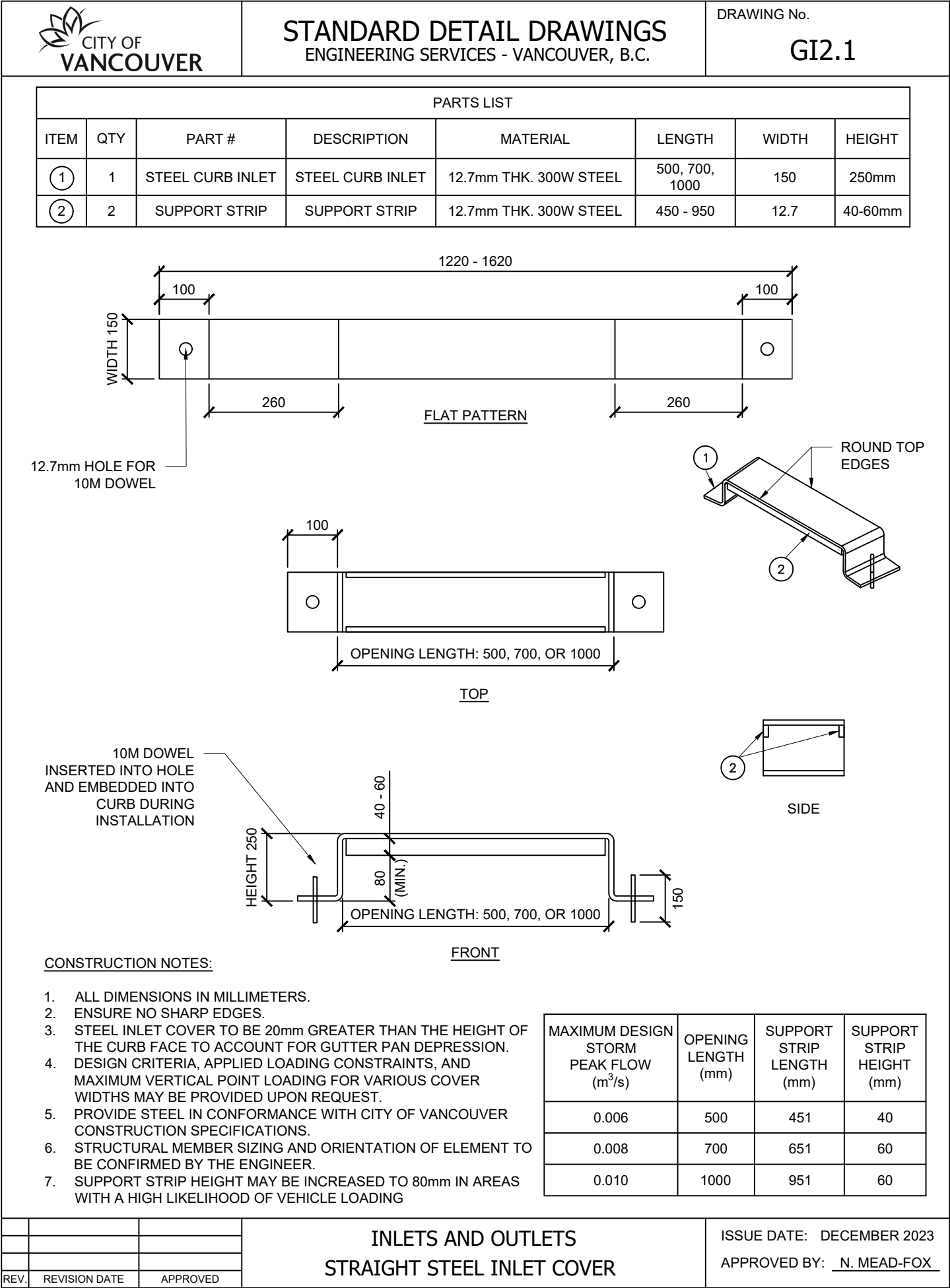
DESIGNER CHECKLIST (MUST SPECIFY, AS APPLICABLE):

- ☐ INLET WIDTH AND LENGTH
- ☐ CROSS-SLOPE AND LONGITUDINAL SLOPE
- ☐ INLET CAPACITY DURING SEWERS DESIGN STORM (DEPTH OF FLOW AT DESIGN STORM PEAK FLOW)
- ☐ DOWNSTREAM PRETREATMENT COMPONENTS

LAYOUT REQUIREMENTS:

- 1. REFER TO THE CITY OF VANCOUVER ACCESSIBILITY STRATEGY, STANDARD DRAWINGS AND CONSTRUCTION SPECIFICATIONS FOR RIGHT-OF-WAY, PARKING SPACE, AND ACCESSIBLE PATH REQUIREMENTS.
- 2. LOCATE CURB CUTS AND GUTTER MODIFICATIONS TO AVOID CONFLICTS WITH ACCESSIBILITY REQUIREMENTS (E.G., LOCATE OUTSIDE OF CROSSWALKS).

			INLETS AND OUTLETS INLETS AND OUTLETS DESIGN GUIDANCE	ISSUE DATE: DECEMBER 2023 APPROVED BY: <u>N. MEAD-FOX</u>
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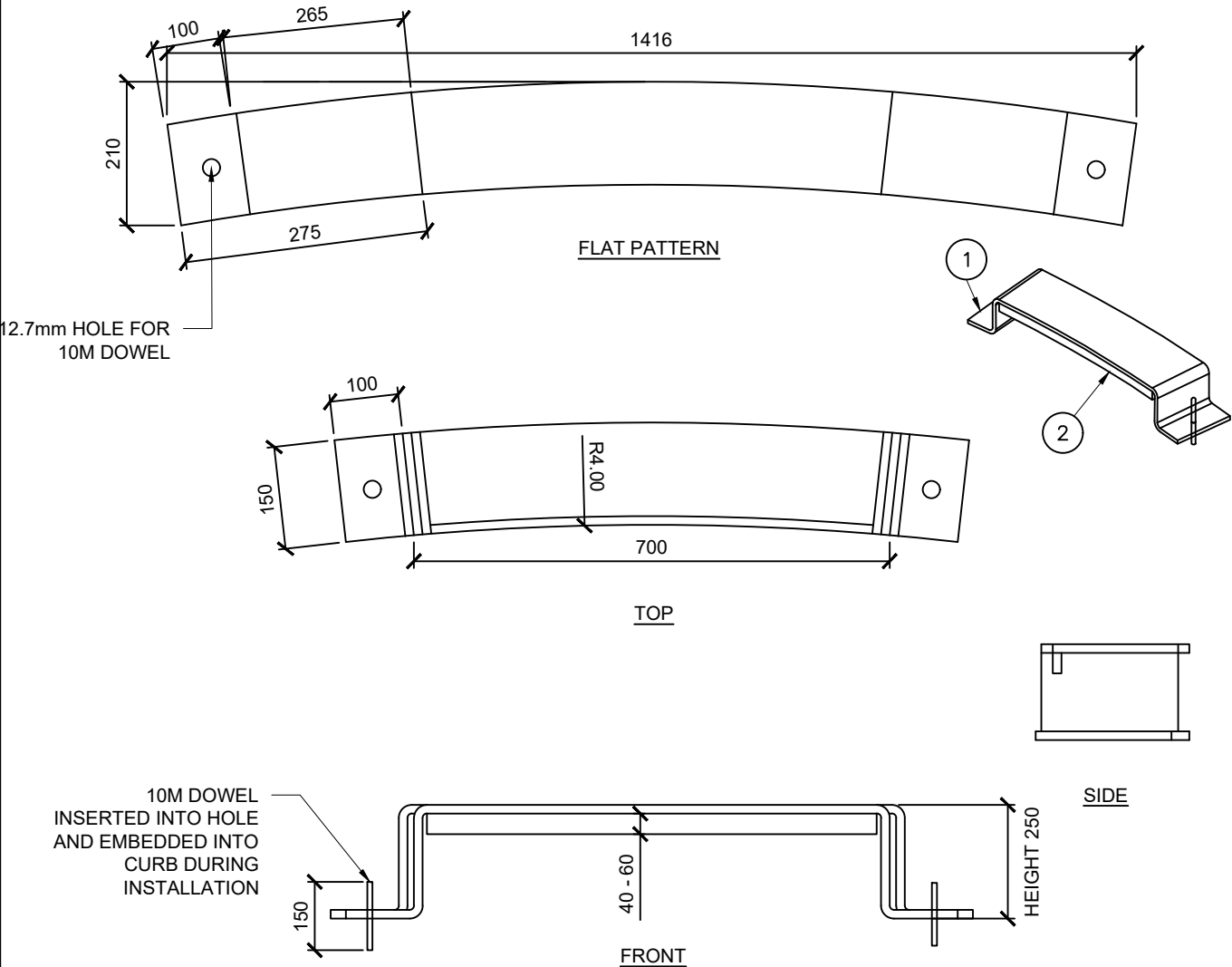


STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.

GI2.2

PARTS LIST							
ITEM	QTY	PART #	DESCRIPTION	MATERIAL	LENGTH	WIDTH	HEIGHT
1	1	STEEL CURB INLET	STEEL CURB INLET	STEEL, MILD, 12.7mm	1137.7mm	150	250
2	1	SUPPORT STRIP	SUPPORT STRIP	STEEL, MILD, 12.7mm	650.9mm	12.7	40



CONSTRUCTION NOTES

1. ALL DIMENSIONS IN MILLIMETERS.
2. ENSURE NO SHARP EDGES.
3. STEEL INLET COVER ARE TO BE 20mm GREATER THAN THE HEIGHT OF THE CURB FACE TO ACCOUNT FOR GUTTER PAN DEPRESSION.
4. DESIGN CRITERIA, APPLIED LOADING CONSTRAINTS, AND MAXIMUM VERTICAL POINT LOADING FOR VARIOUS COVER WIDTHS MAY BE PROVIDED UPON REQUEST.
5. PROVIDE STEEL IN CONFORMANCE WITH CITY OF VANCOUVER CONSTRUCTION SPECIFICATIONS.
6. STRUCTURAL MEMBER SIZING AND ORIENTATION OF ELEMENT TO BE CONFIRMED BY THE ENGINEER.
7. SUPPORT STRIP HEIGHT MAY BE INCREASED TO 80mm IN AREAS WITH A HIGH LIKELIHOOD OF VEHICLE LOADING

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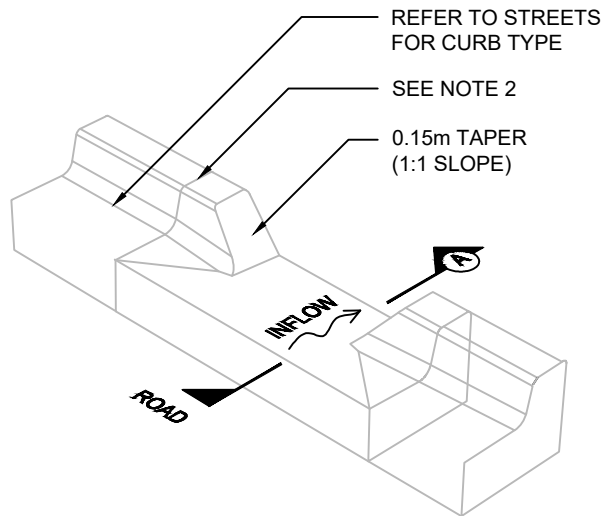
INLETS AND OUTLETS
CURVED STEEL INLET COVER

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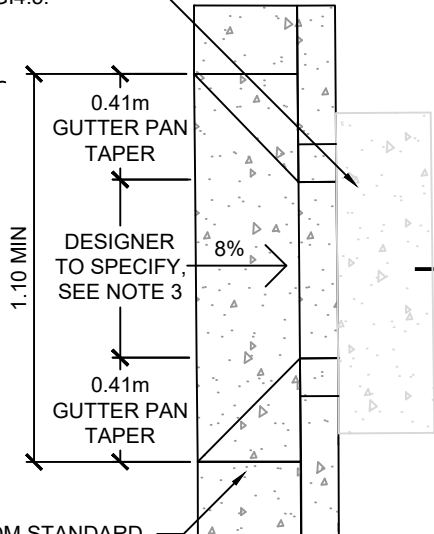
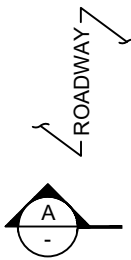
STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI2.3

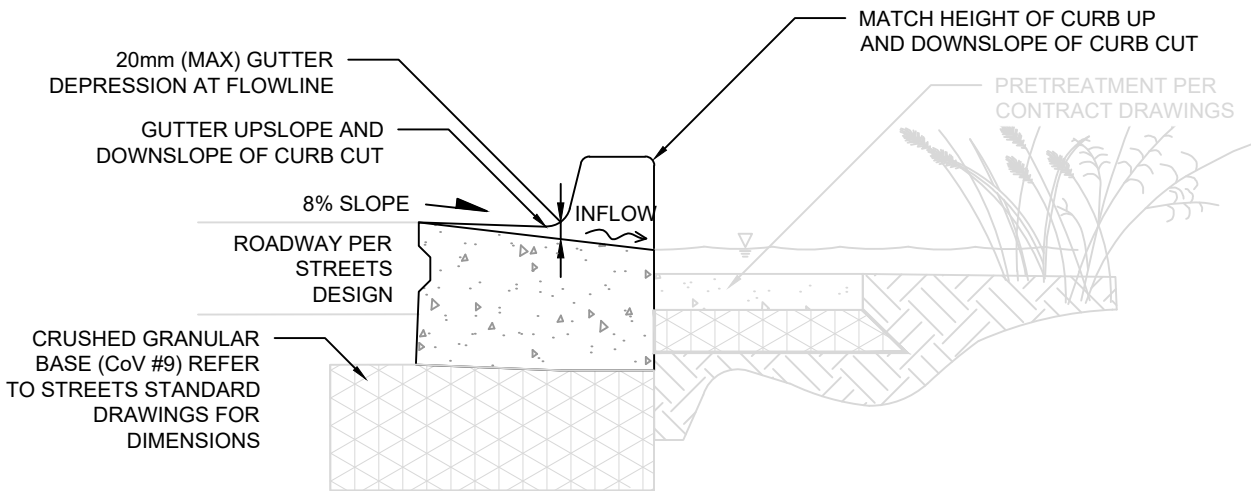


ISOMETRIC

DOWNSLOPE
PRETREATMENT MAY
BE REQUIRED. SEE
GI2.5, GI4.4., GI4.5.



PLAN



SECTION A

CONSTRUCTION NOTES

1. ALL MATERIAL AND WORKMANSHIP FOR CURB CUTS SHALL CONFORM TO CITY OF VANCOUVER STANDARD SPECIFICATIONS AND GUIDELINES
2. IF CURB CUT CANNOT BE INSTALLED AT CURB CONTROL JOINTS, BOND NEW CURB AND GUTTER TO EXISTING CURB AND GUTTER WITH EPOXY AND DOWEL CONNECTION
3. SEE DESIGN MANUAL FOR GUIDANCE ON DESIGNING INLET CURB CUT WIDTH.
4. CONCRETE TO BE POURED IN PLACE OVER STEEL COVER WING WALLS.
5. SEE GI2.5 FOR PRETREATMENT SEDIMENT PAD DETAILS

INLETS AND OUTLETS
OPEN CURB CUT INLET

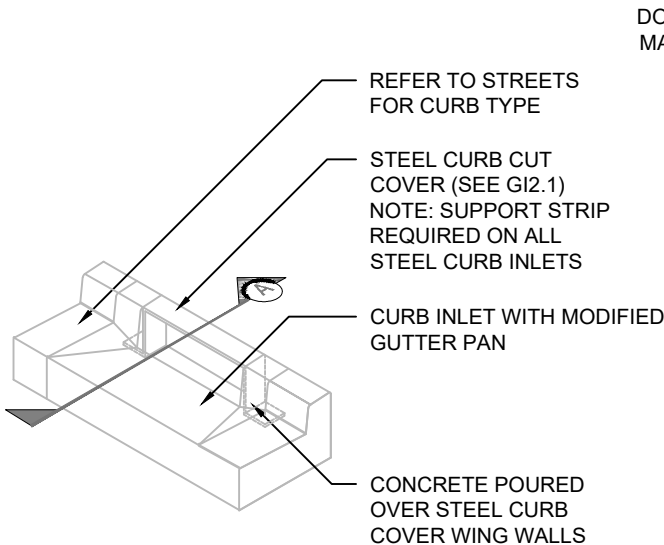
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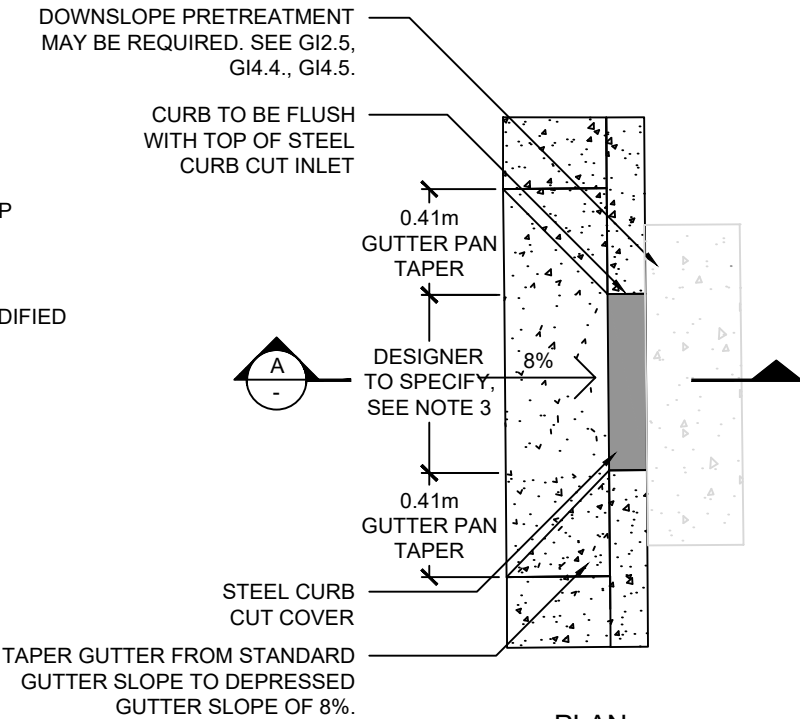


STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

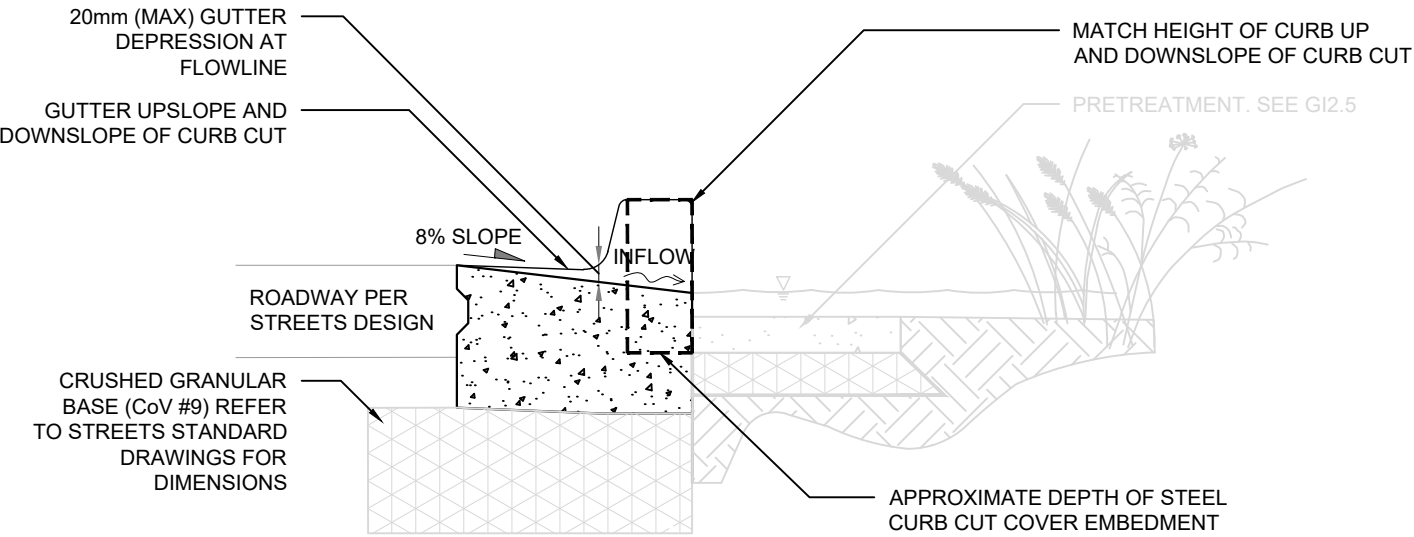
DRAWING No.
GI2.4



AXONOMETRIC



PLAN



SECTION A

CONSTRUCTION NOTES

1. ALL MATERIAL AND WORKMANSHIP FOR CURB CUTS SHALL CONFORM TO CITY OF VANCOUVER STANDARD SPECIFICATIONS AND GUIDELINES
2. IF CURB CUT CANNOT BE INSTALLED AT CURB CONTROL JOINTS, BOND NEW CURB AND GUTTER TO EXISTING CURB AND GUTTER WITH EPOXY AND DOWEL CONNECTION
3. SEE DESIGN MANUAL FOR GUIDANCE ON DESIGNING INLET CURB CUT WIDTH.
4. CONCRETE TO BE POURED IN PLACE OVER STEEL COVER WING WALLS.
5. SEE GI2.5 FOR PRETREATMENT SEDIMENT PAD DETAILS

INLETS AND OUTLETS
COVERED CURB CUT INLET

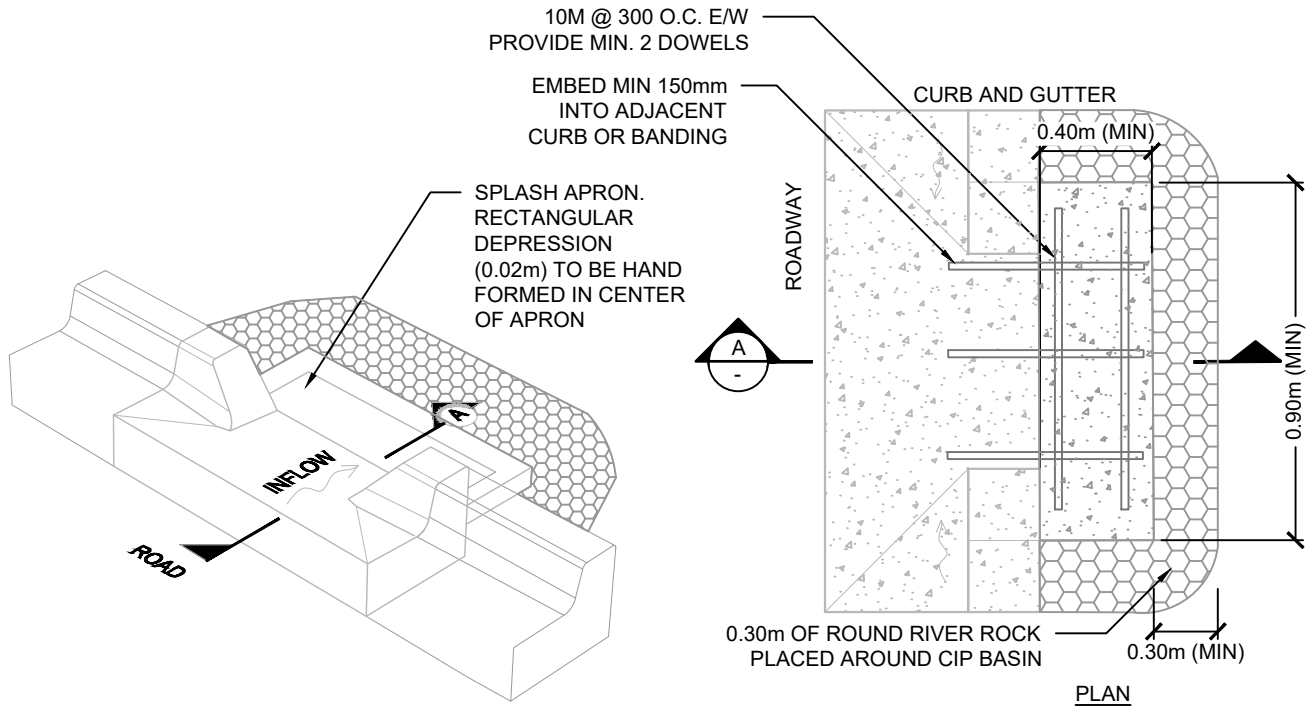
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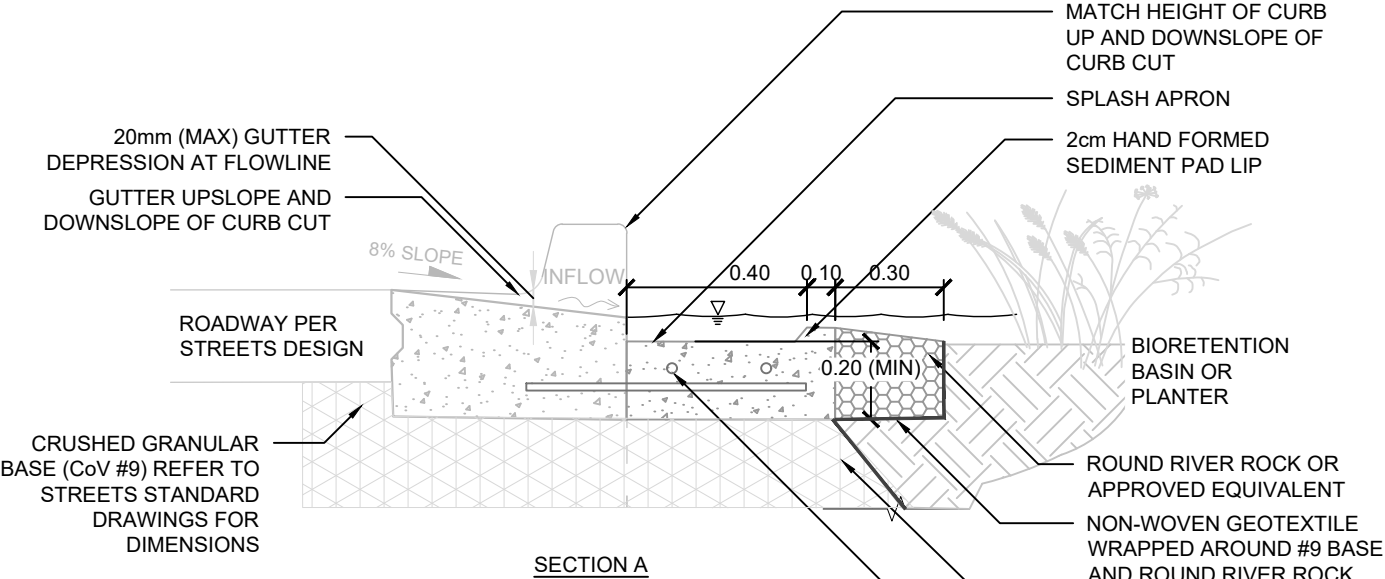


STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI2.5



AXONOMETRIC



SECTION A

NOTES

- HAND PACK GROWING MEDIUM AND #9 BASE UNDER AND AROUND THE SEDIMENT PAD TO A DISTANCE OF 0.3m
- ROUND RIVER ROCK MAY BE REPLACED WITH ALTERNATIVE EROSION AND SEDIMENT CONTROL MEASURES SUCH AS COMPOST SOCKS.
- ALL MATERIAL AND WORKMANSHIP FOR CURB CUTS SHALL CONFORM TO CITY OF VANCOUVER STANDARD SPECIFICATIONS AND GUIDELINES
- IF CURB CUT CANNOT BE INSTALLED AT CURB CONTROL JOINTS, BOND NEW CURB AND GUTTER TO EXISTING CURB AND GUTTER WITH EPOXY AND DOWEL CONNECTION.
- INLET CURB CUT WIDTH SHALL BE 0.7m OR GREATER ON GUTTER SLOPES > 5%
- GI2.5. TO BE USED WHEN CONTRIBUTING DRAINAGE AREA IS LESS THAN 100 m². REFER TO GI2.6, GI4.4 AND GI4.5 FOR ALTERNATE PRETREATMENT OPTIONS.

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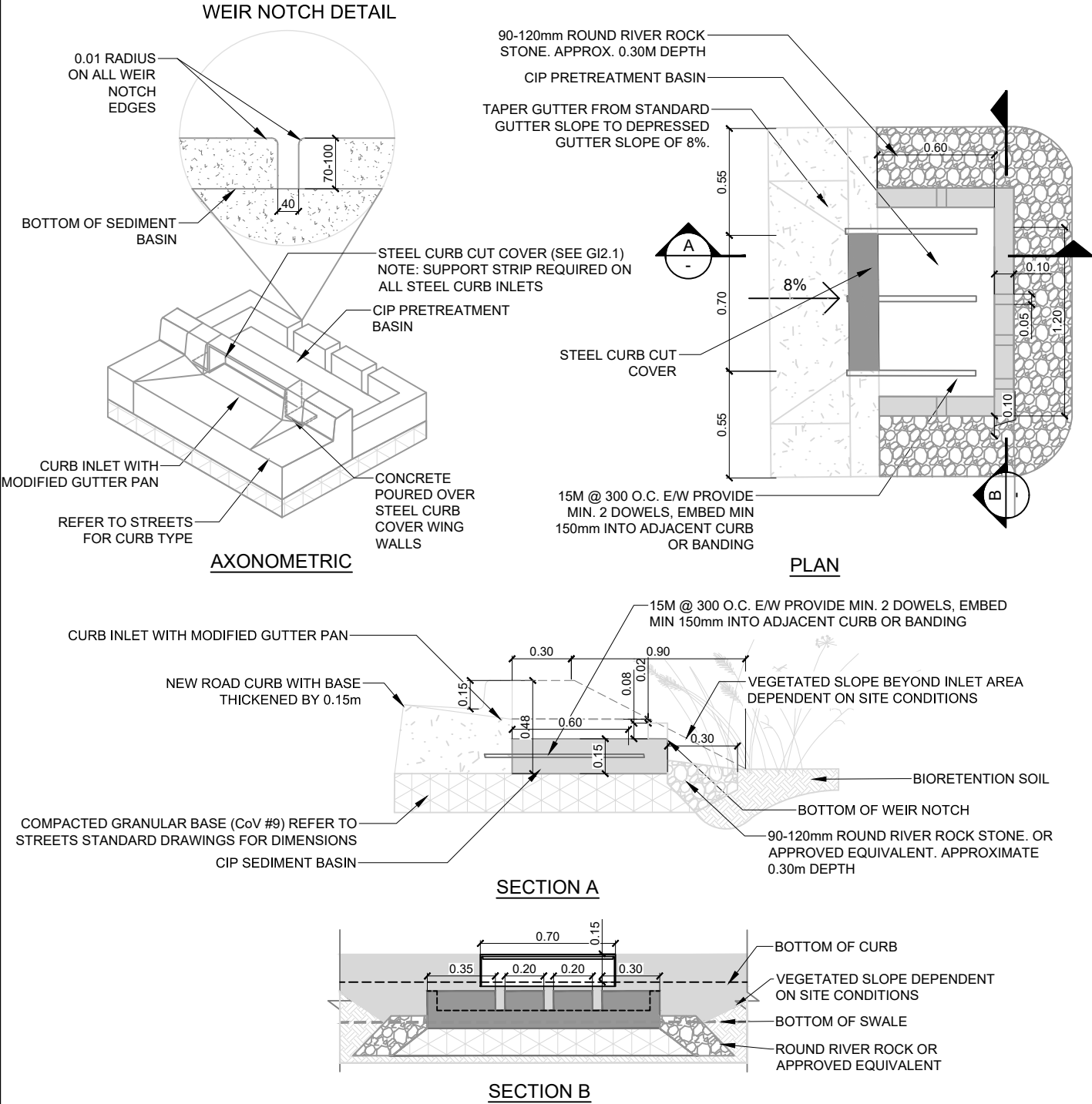
INLETS AND OUTLETS
PRETREATMENT SEDIMENT PAD

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STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI2.6




- NOTES**
- HAND PACK GROWING MEDIUM AND #9 BASE UNDER AND AROUND THE SEDIMENT PAD TO A DISTANCE OF 0.3m
 - TOP OF SOIL/MULCH SHOULD BE AT MINIMUM 0.05 METERS BELOW THE WEIR WALL NOTCHES
 - ROUND RIVER ROCK MAY BE REPLACED WITH ALTERNATIVE EROSION CONTROL MEASURES
 - ALL MATERIAL AND WORKMANSHIP FOR CURB CUTS SHALL CONFORM TO CITY OF VANCOUVER STANDARD SPECIFICATIONS AND GUIDELINES
 - IF CURB CUT CANNOT BE INSTALLED AT CURB CONTROL JOINTS, BOND NEW CURB AND GUTTER TO EXISTING CURB AND GUTTER WITH EPOXY AND DOWEL CONNECTION.
 - INLET CURB CUT WIDTH SHALL BE 0.7m OR GREATER ON GUTTER SLOPES > 5%

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INLETS AND OUTLETS
PRETREATMENT SEDIMENT BASIN

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	STANDARD DETAIL DRAWINGS ENGINEERING SERVICES - VANCOUVER, B.C.	DRAWING No. GI3.0
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GI GENERAL COMPONENTS

DESIGN NOTES AND GUIDANCE

PURPOSE:

THE FOLLOWING COMPONENTS MAY BE USED IN A VARIETY OF GI SYSTEMS. THESE COMPONENTS SHOW PHYSICAL INFRASTRUCTURE COMPONENTS THAT MAY HAVE FIXED OR VARIED DIMENSIONS.

DESIGNER NOTES & GUIDELINES:

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.

2. THE DESIGNER MUST ADAPT COMPONENT DIMENSIONS TO ADDRESS SITE-SPECIFIC CONDITIONS. DETAILS REQUIRING CUSTOM DIMENSIONS SHOULD BE SHOWN ON CONSTRUCTION DRAWINGS. UNADJUSTED COMPONENTS MAY BE REFERENCED.

3. THE COMPONENTS REQUIRED AND RECOMMENDED FOR SPECIFIC GI SYSTEMS ARE REFERENCED ON THE SYSTEM TEMPLATES SHOWN IN GI STANDARD DRAWING SECTION 4, SECTION 5, AND SECTION 6.

4. THE DESIGNER MUST EVALUATE UTILITY SURVEYS FOR POTENTIAL UTILITY CROSSINGS OR CONFLICTS.

5. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT CITY OF VANCOUVER ASSET PROTECTION STANDARDS AND OTHER UTILITY PROVIDER REQUIREMENTS.

6. BIORETENTION VEGETATION MUST BE SPECIFIED BY DESIGN PROFESSIONAL PER CoV GREEN INFRASTRUCTURE VEGETATION GUIDANCE

LAYOUT REQUIREMENTS:

1. REFER TO THE CITY OF VANCOUVER ACCESSIBILITY STRATEGY, STANDARD DRAWINGS AND CONSTRUCTION SPECIFICATIONS FOR RIGHT-OF-WAY, PARKING SPACE, AND ACCESSIBLE PATH REQUIREMENTS.

2. LOCATE CURB CUTS AND GUTTER MODIFICATIONS TO AVOID CONFLICTS WITH ACCESSIBILITY REQUIREMENTS (E.G., LOCATE OUTSIDE OF CROSSWALKS).

3. REFER TO THE DESIGN MANUAL FOR GUIDANCE ON PLACING CONCRETE CHECK DAMS

DESIGNER CHECKLIST (MUST SPECIFY, AS APPLICABLE):

☐ CONFIRM UTILITY PROTECTION MEASURES WITH GII STAFF

☐ CONFIRM MONITORING REQUIREMENTS WITH GII STAFF

☐ SELECT CURB EDGES AND BANDING ACCORDING TO GII STAFF INSTRUCTION

☐ CONFIRM PERFORATED PIPE LAYOUT AND PERFORATION REQUIREMENTS WITH GII STAFF

☐ CONFIRM ACCEPTABILITY OF ALL CATCHBASINS AND INSPECTION CHAMBERS WITH SEWER DEPARTMENT

GENERAL COMPONENT DRAWING DESCRIPTIONS		
3.1.	PRECAST CONCRETE CATCHBASIN	PRECAST OFFSET CBS ARE A SHORTENED CATCHBASIN WITH A SMALL SUMP. PRECAST CBS SHOULD BE USED WHEN SDD S11.9 IS INFEASIBLE DUE TO PROJECT CONSTRAINTS. OFFSET CBS ARE TO BE USED WHEN DRAINAGE IS BEING DIRECTED TO ANOTHER FEATURE THAT CAN REPLICATE THE FUNCTION OF THE SUMP SUCH AS AN INSPECTION CHAMBER.
3.2.	MONITORING WELL	MONITORING WELLS ARE USED TO MEASURE THE SATURATION LEVEL OF SOIL IN A GREEN INFRASTRUCTURE SYSTEM. SATURATION LEVEL IS A GOOD INDICATOR OF HOW WELL A GREEN INFRASTRUCTURE SYSTEM IS DRAINING. THIS DRAWING PROVIDES MULTIPLE MONITORING WELLS FOR DIFFERENT SURFACE TREATMENTS.
3.3.	INSPECTION CHAMBER	INSPECTION CHAMBERS ARE USED TO MONITOR DRAINAGE IN LARGER GREEN INFRASTRUCTURE SYSTEMS. THEY CONNECT UNDERDRAINS SUCH AS THOSE IN GI3.7. TO CATCHBASINS AND SEWER LEADS.
3.4.	GI CLEANOUT	CLEANOUTS ARE INSTALLED AT THE "UPSTREAM" END OF PERFORATED PIPES. THEY ARE INSTALLED TO MAKE IT EASIER TO FLUSH UNDERDRAINS AND CLEAR PERFORATIONS.
3.5.	TREE TRENCH CURB EDGES	THESE CURB EDGES ARE DESIGNED TO CONFINE OPEN TREE PIT AREAS. THEY ARE TO BE PLACED PERPENDICULAR TO STREET CURBS AND SIDEWALKS.
3.6.	GI BANDING	GI BANDING IS DESIGNED TO CONFINE GREEN INFRASTRUCTURE ASSETS AND CONTAIN PONDED WATER. BANDING IS USED ALONG THE EDGES OF A GREEN INFRASTRUCTURE SYSTEM THAT ARE NOT ADJACENT TO A ROADWAY. PREFERRED BANDING OPTIONS DEPEND ON THE DEPTH OF PONDING AND THE ADJACENT SURFACE TREATMENT.
3.7.	UNDERDRAIN AND DISTRIBUTION PIPES	PERFORATED PIPES MAY BE USED AS UNDERDRAINS TO SLOWLY REMOVE WATER FROM A GREEN INFRASTRUCTURE ASSET, OR AS DISTRIBUTION PIPES, WHICH CAN CONVEY WATER INTO A GREEN INFRASTRUCTURE ASSET. PERFORATED PIPE DESIGN DEPENDS ON THE DESIRED RATE OF FLOW THROUGH THE PIPE AND THE EXPECTED INFILTRATION RATE OF THE SYSTEM.
3.8.	PVC CATCHBASIN	A PVC CATCHBASIN IS USED TO CAPTURE OVERFLOW FROM A GI SYSTEM AN DIRECT IT INTO THE SEWER SYSTEM. PVC CATCHBASINS MAY ONLY BE USED WHEN SURROUNDED BY GROWING MEDIUM. THEY ARE A MORE AFFORDABLE ALTERNATIVE TO TRADITIONAL CATCHBASINS AND THE OVERLYING DOMED INLET GRATE HELPS PREVENT CLOGGING FROM SEDIMENT AND DEBRIS.

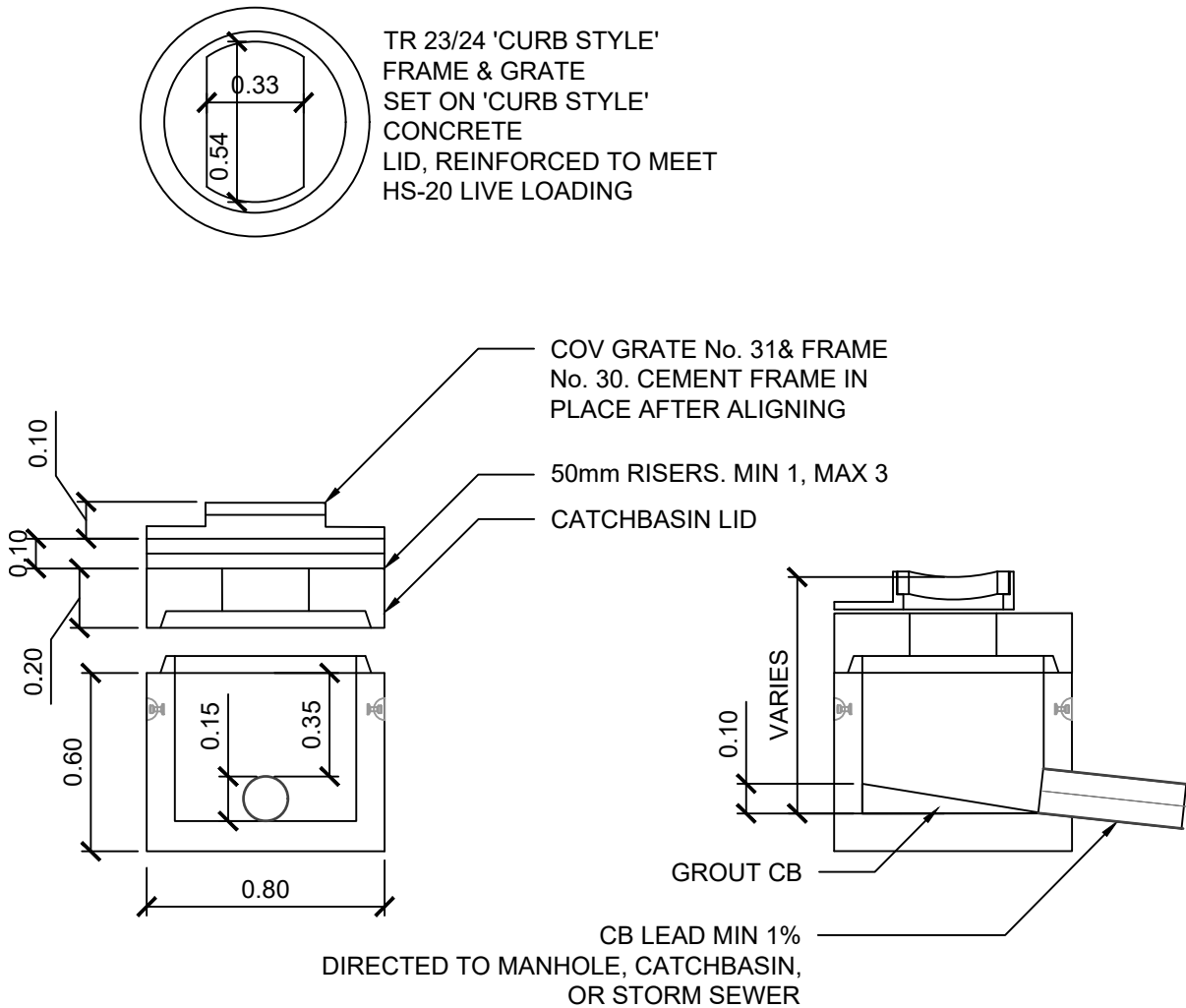
			GENERAL COMPONENTS GI COMPONENTS DESIGN GUIDANCE	ISSUE DATE: DECEMBER 2023	
				APPROVED BY: <u>N. MEAD-FOX</u>	
REV.	REVISION DATE	APPROVED			



STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.

GI3.1



NOTES:

- 1. WHEN SUMP IS INSTALLED ROADSIDE TO CATCHBASIN, CONNECTION PIPE FROM CB TO SUMP SHALL BE DUCTILE IRON OR CONCRETE ENCASED.
- 2. USE 750mm BARREL AT ALL SAG POINTS.
- 3. EXPANSION JOINT REQUIRED IN CURB AND GUTTER AT MIDDLE OF CB FRAME FOR 600mm BARREL INSTALLATIONS OR 1m EACH SIDE OF FRAME FOR 750mm BARREL INSTALLATIONS.
- 4. GROUT TO SEAL PIPE OPENING, LIFTING HOLES, TEMPORARY DRAIN HOLE(S), SECTIONS, AND SPACER RINGS, INSIDE AND OUT.

REV.	REVISION DATE	APPROVED

GENERAL COMPONENTS
PRECAST OFFSET CATCHBASIN

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX

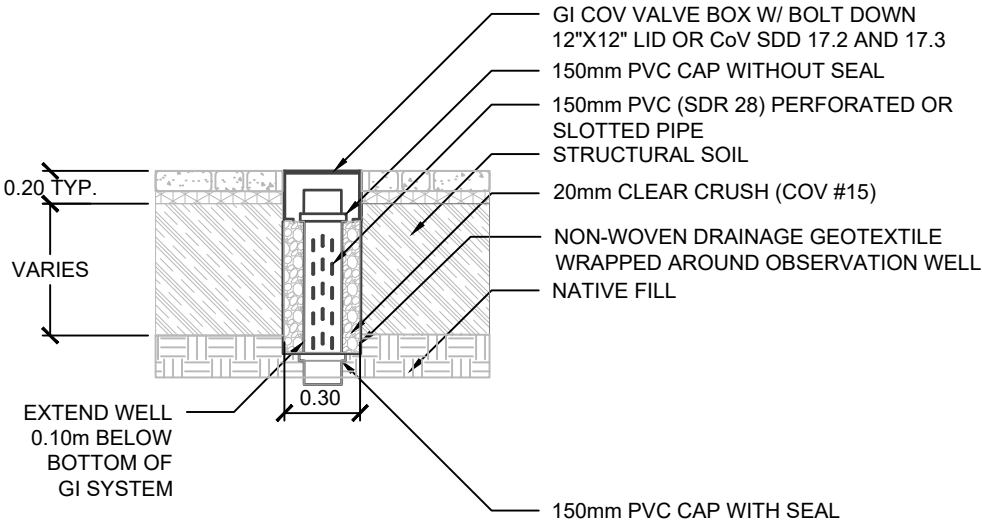


STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

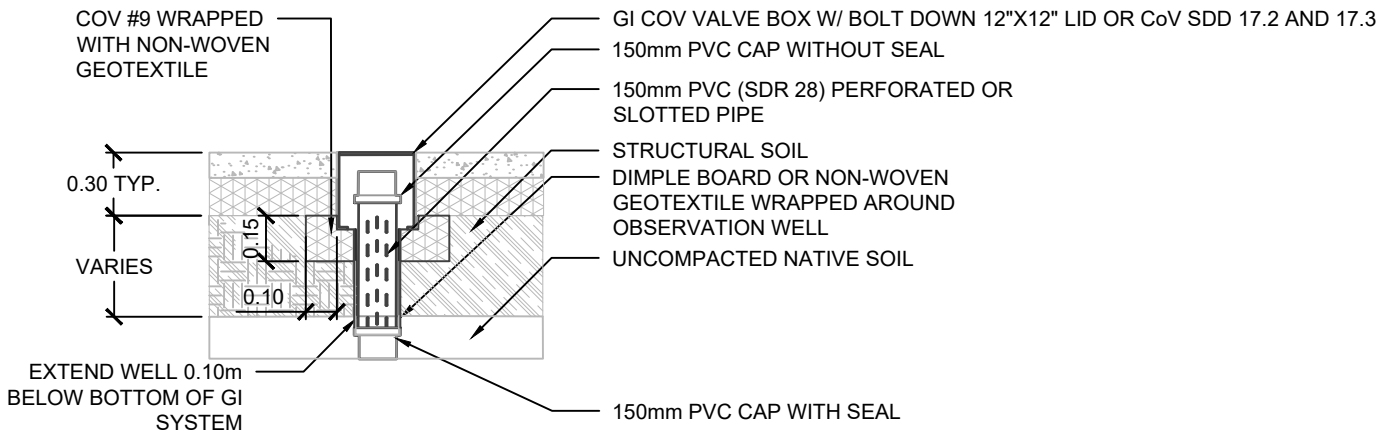
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GI3.2

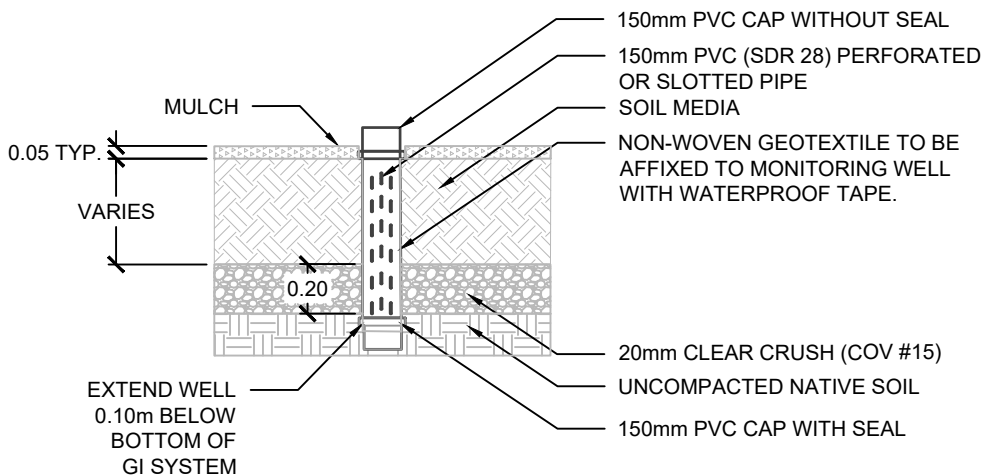
3.2A: MONITORING WELL WITH CLEAR CRUSHED AGGREGATE UNDER PAVEMENT



3.2B: MONITORING WELL WITH DIMPLE BOARD UNDER PAVEMENT



3.2C: MONITORING WELL IN SOIL



- NOTES:
- 3.2A TO BE USED FOR GI UNDER PAVEMENT OR CONCRETE
 - 3.2B TO BE USED FOR GI UNDERNEATH PAVEMENT OR CONCRETE WHERE DIMPLE BOARD IS AVAILABLE ON SITE
 - 3.2C TO BE USED IN GI WITH EXPOSED VEGETATION

REV.	REVISION DATE	APPROVED

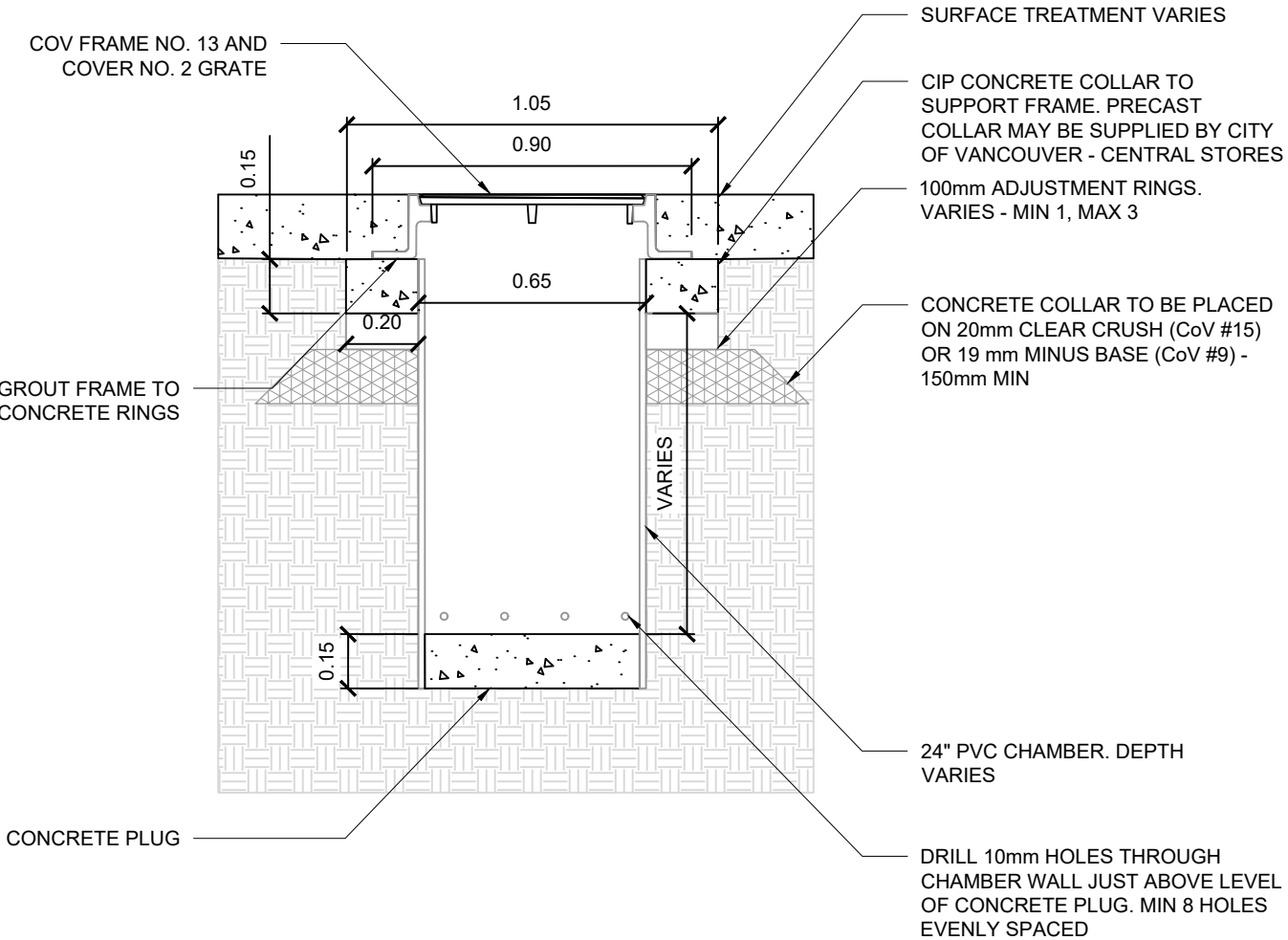
GENERAL COMPONENTS
MONITORING WELL

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX



STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI3.3

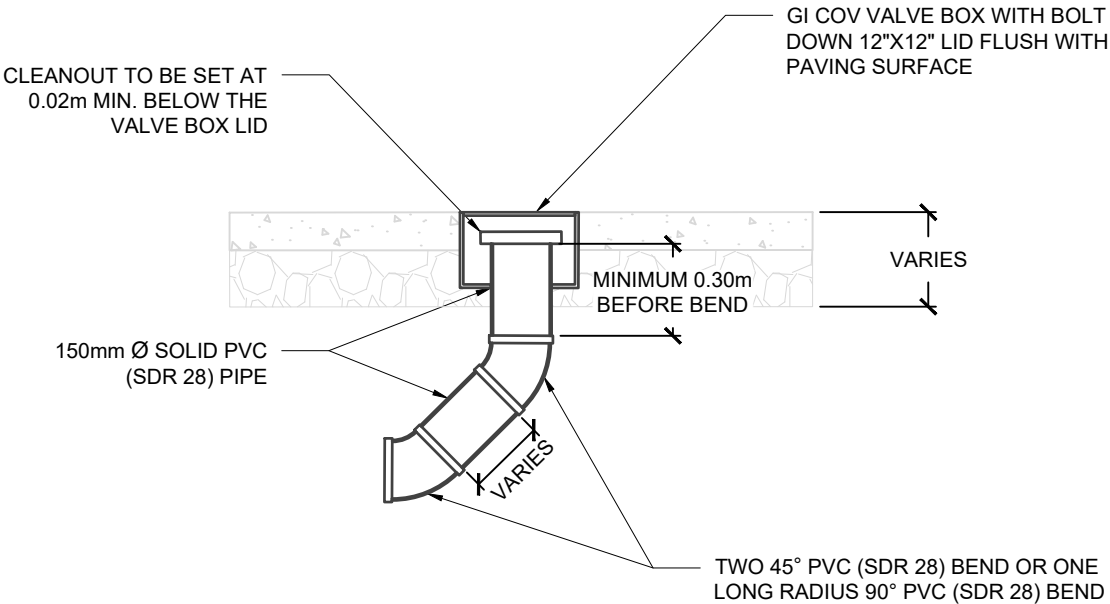


- NOTES:
- 1. MAX 24" PVC CHAMBER LENGTH IS 1.0m
 - 2. TO BE CUT IN ACCORDANCE WITH ON-SITE UTILITY OR SERVICE CONFLICTS PER CITY OF VANCOUVER GUIDELINES

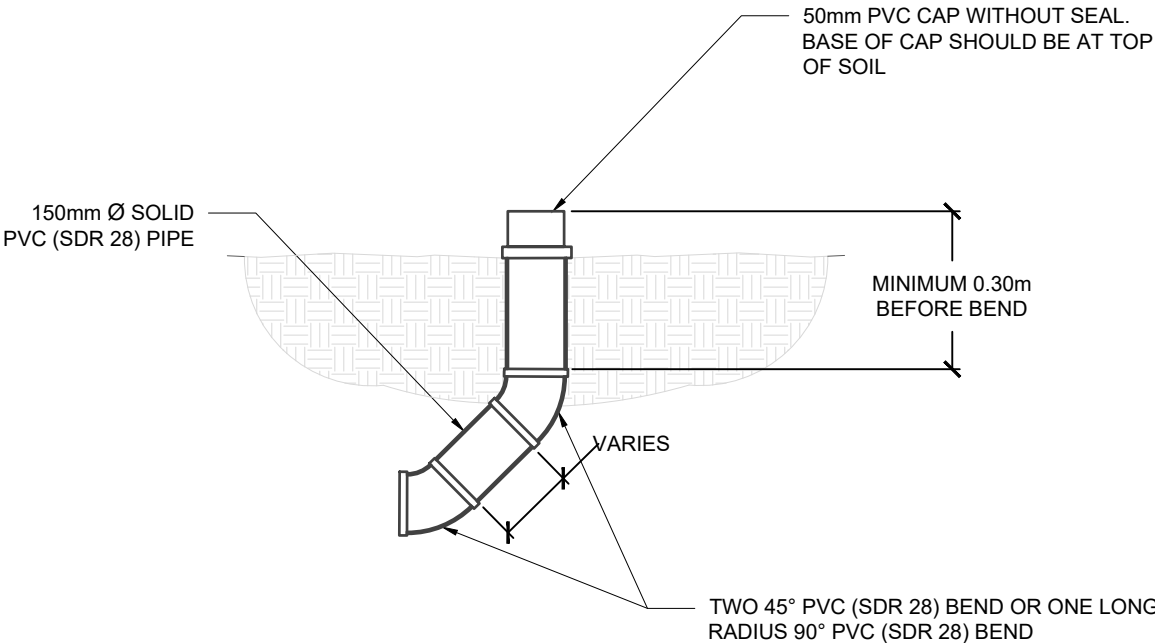
			GENERAL COMPONENTS INSPECTION CHAMBER	ISSUE DATE: DECEMBER 2023	
REV.	REVISION DATE	APPROVED			APPROVED BY: <u>N. MEAD-FOX</u>



3.4A CLEANOUT IN PAVEMENT



3.4B CLEANOUT IN SOIL



REV.	REVISION DATE	APPROVED

GENERAL COMPONENTS
GI CLEANOUT

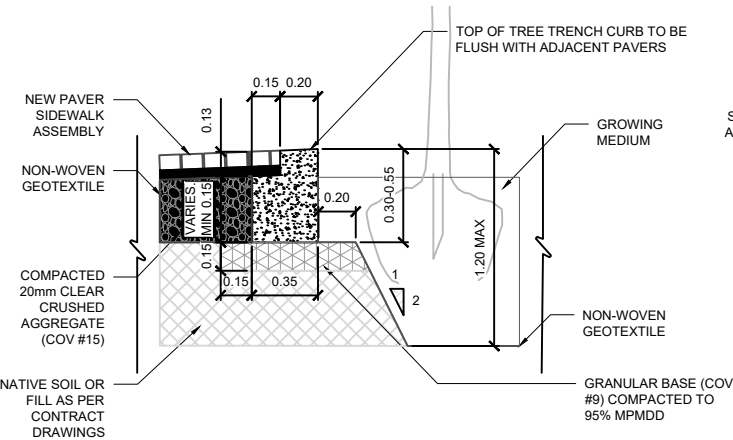
ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX



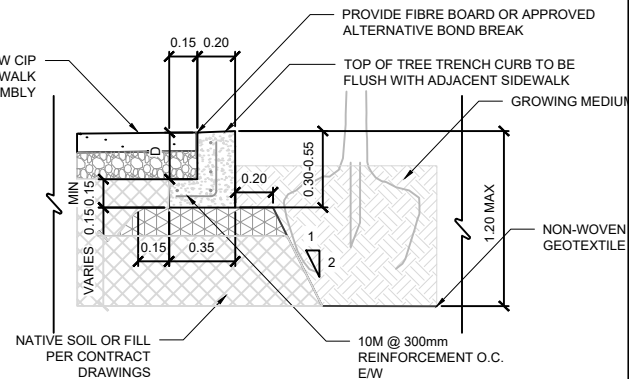
STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI3.5

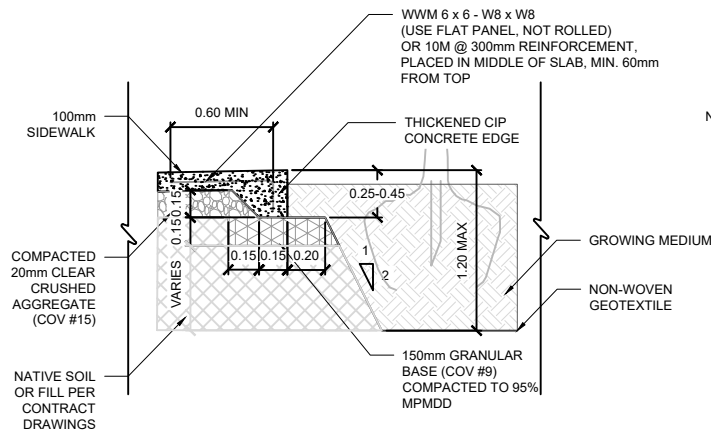
3.5A. L-SHAPE UNDER PAVERS



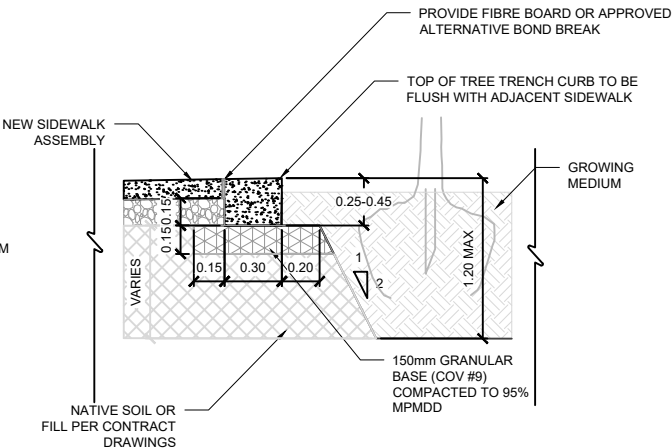
3.5B. L-SHAPE UNDER CIP SIDEWALK



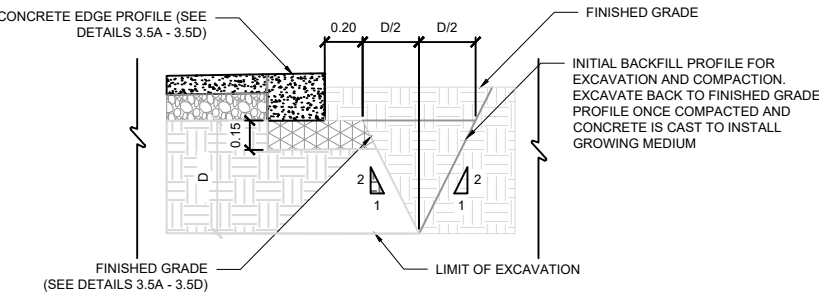
3.5C. THICKENED CONCRETE EDGE



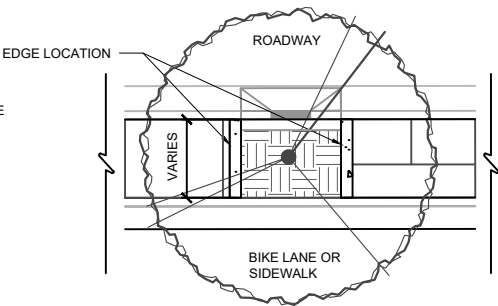
3.5D. RECTANGULAR BANDING



SOIL EXCAVATION, COMPACTION AND BACKFILLING



CONTEXTUAL PLAN VIEW



- NOTES:
1. ALL GROWING MEDIUM TO BE WRAPPED WITH NON-WOVEN GEOTEXTILE
 2. TYPE A TO BE USED IF ADJACENT SIDEWALK IS BEING CONSTRUCTED WITH PERMEABLE PAVERS. GROWING MEDIUM MAY BE UP TO 550mm BELOW TOP OF THE ADJACENT SIDEWALK.
 3. TYPE B TO BE USED IF ADJACENT SIDEWALK IS A STANDARD CIP SIDEWALK.
 4. TYPE C TO BE USED IF ADJACENT SIDEWALK IS BEING CONSTRUCTED AND GROWING MEDIUM IS WITHIN 50mm OF THE TOP OF THE ADJACENT SIDEWALK (NO PONDING DEPTH IS REQUIRED).
 5. TYPE D TO BE USED WITH EXISTING SIDEWALK AND GROWING MEDIUM IS WITHIN 50mm OF THE TOP OF THE BANDING (NO PONDING DEPTH IS REQUIRED).
 6. DESIGN CRITERIA, APPLIED LOADING CONSTRAINTS, AND MAXIMUM VERTICAL POINT LOADING FOR VARIOUS COVER WIDTHS MAY BE PROVIDED UPON REQUEST.
 7. INSTALL EMBEDDED REINFORCEMENT AND CONCRETE IN CONFORMANCE WITH CITY OF VANCOUVER CONSTRUCTION SPECIFICATIONS.
 8. STRUCTURAL MEMBER SIZING AND ORIENTATION OF ELEMENT TO BE CONFIRMED BY THE ENGINEER. REINFORCEMENT TO BE INSTALLED AS OUTLINED IN THIS DRAWING, UNLESS OTHERWISE NOTED BY THE ENGINEER.
 9. NOTIFY THE ENGINEER IF EXISTING SITE CONDITIONS DIFFER FROM THOSE SHOWN IN THIS DETAIL.
 10. ALL DIMENSIONS IN METERS UNLESS OTHERWISE NOTED.
 11. REINFORCEMENT IS NOT REQUIRED FOR 3.5B IF VERTICAL PORTION OF BANDING WALL "D" IS LESS THAN 200mm.

GENERAL COMPONENTS
TREE TRENCH CURB EDGES

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX

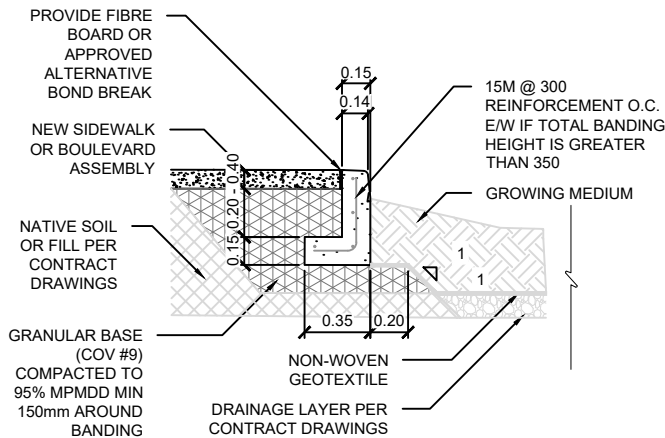
REV.	REVISION DATE	APPROVED



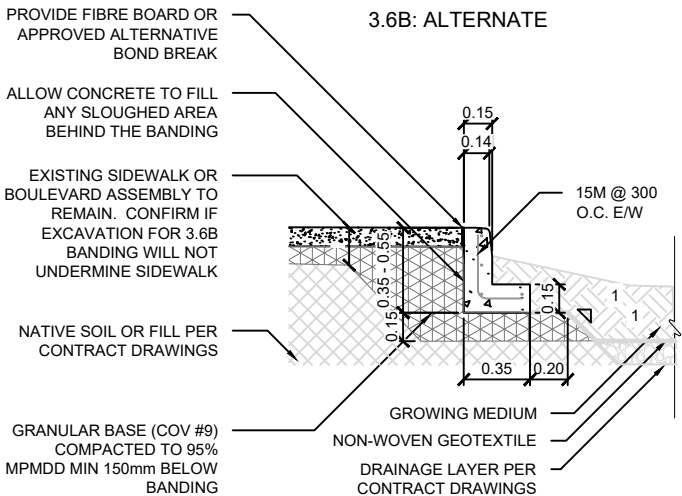
STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI3.6

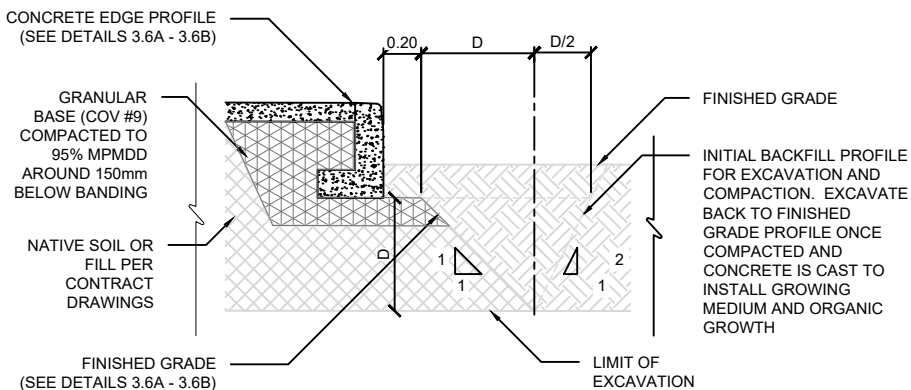
3.6A: PREFERRED



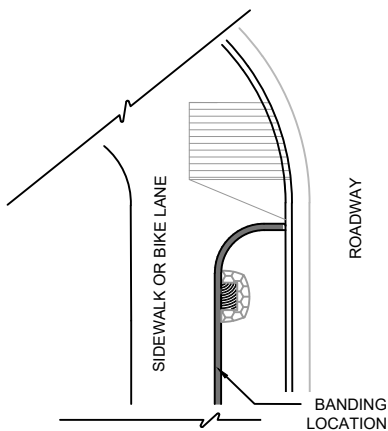
3.6B: ALTERNATE



SOIL EXCAVATION, COMPACTION AND BACKFILLING



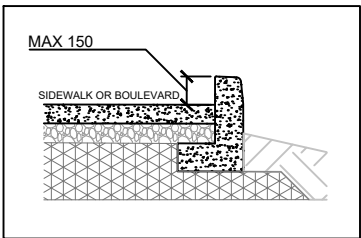
PLAN VIEW FOR CONTEXT



NOTES:

1. TYPE A TO BE USED IF ADJACENT SIDEWALK IS BEING RECONSTRUCTED.
2. TYPE B TO BE USED IF ADJACENT SIDEWALK WILL REMAIN.
3. DESIGN CRITERIA, APPLIED LOADING CONSTRAINTS, AND MAXIMUM VERTICAL POINT LOADING FOR VARIOUS COVER WIDTHS MAY BE PROVIDED UPON REQUEST.
4. IF THE ADJACENT SURFACE IS NOT A SIDEWALK (I.E. A RETAINED BOULEVARD) TYPE A AND TYPE B CURBS MAY BE RAISED UP TO 150mm ABOVE THE ADJACENT SURFACE ELEVATION (AS SHOWN IN THE SCHEMATIC TO THE RIGHT) IF REQUIRED BY GRADING CONDITIONS. THE MAXIMUM BANDING HEIGHT SHALL BE 600mm.
5. INSTALL EMBEDDED REINFORCEMENT AND CONCRETE IN CONFORMANCE WITH CITY OF VANCOUVER CONSTRUCTION SPECIFICATIONS.
6. STRUCTURAL MEMBER SIZING AND ORIENTATION OF ELEMENT TO BE CONFIRMED BY THE ENGINEER. REINFORCEMENT TO BE INSTALLED AS OUTLINED IN THIS DRAWING, UNLESS OTHERWISE NOTED BY THE ENGINEER.
7. NOTIFY THE ENGINEER IF EXISTING SITE CONDITIONS DIFFER FROM THOSE SHOWN IN THIS DETAIL.
8. REINFORCEMENT IS NOT REQUIRED IF THE TOTAL HEIGHT OF THE BANDING WALL IS LESS THAN 350mm (NOTE REINFORCEMENT WILL ALWAYS BE REQUIRED WHEN BANDING IS RAISED AS SHOWN IN THE SCHEMATIC TO THE RIGHT).

RAISED BANDING SCHEMATIC



GENERAL COMPONENTS
GI BANDING

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX

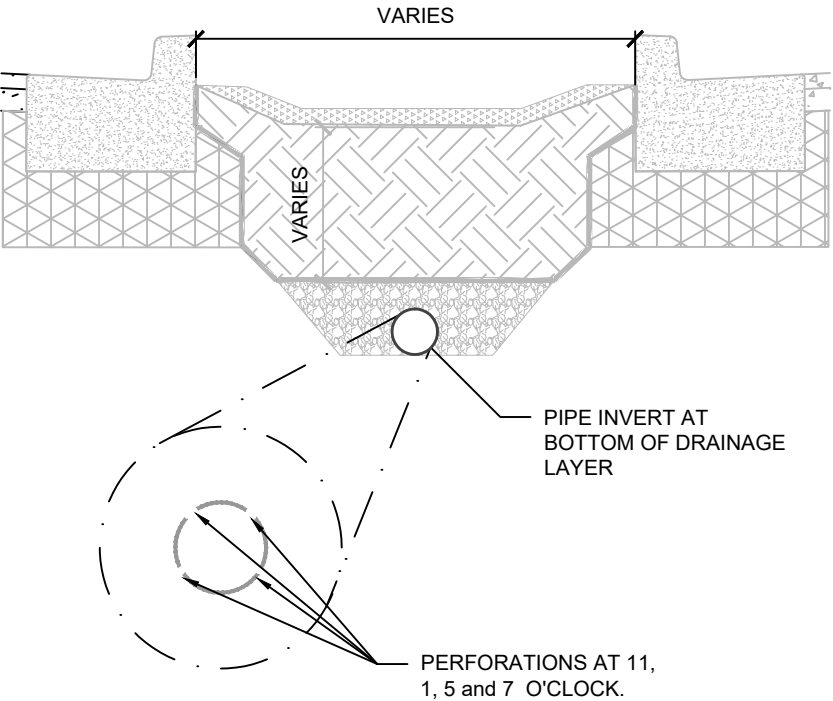
REV.	REVISION DATE	APPROVED



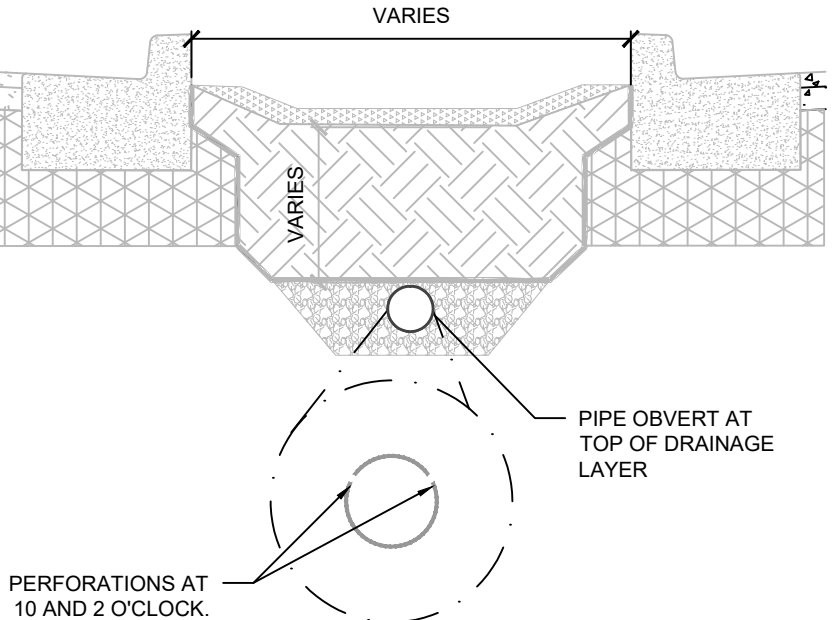
STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI3.7

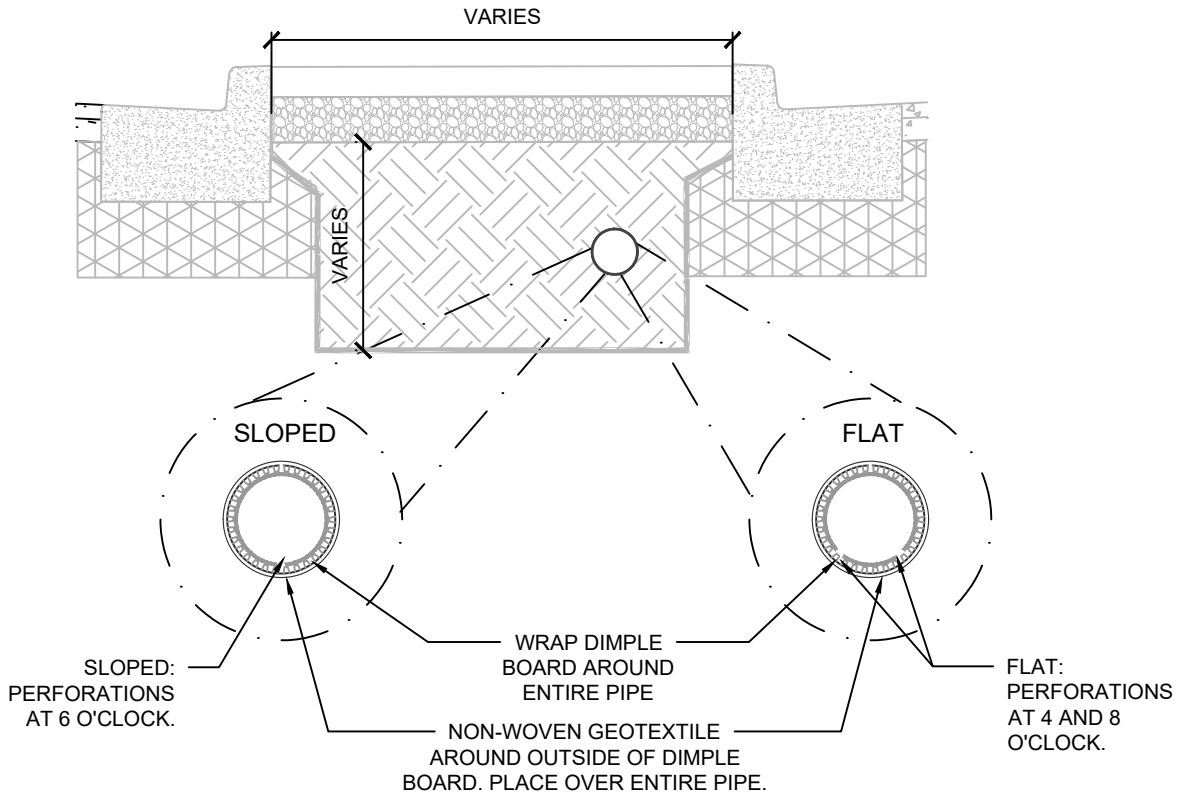
3.7A FILTRATION ONLY
GI UNDERDRAIN



3.7B PARTIALLY INFILTRATING
GI UNDERDRAIN

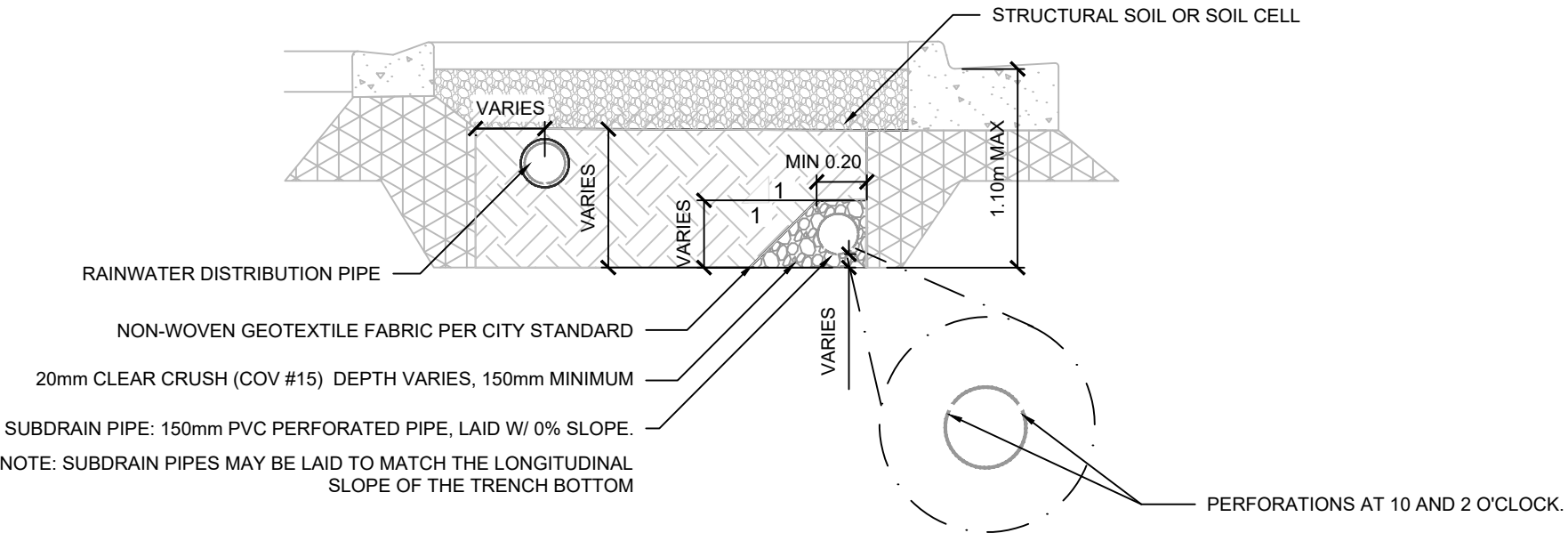


3.7C FLAT (PREFERRED) OR SLOPED
DISTRIBUTION PIPE



- NOTES:
1. TYPE A TO BE USED IF GI ASSET IS NON-INFILTRATING (i.e. FILTRATION ONLY). TYPICALLY USED IN BIORETENTION SYSTEMS.
 2. TYPE B TO BE USED IF GI ASSET CAN INFILTRATE BUT REQUIRES AN UNDERDRAIN FOR DRAWDOWN TIMES. TYPICALLY USED IN BIORETENTION SYSTEMS.
 3. TYPE C TO BE USED TO DISTRIBUTE RAINWATER IN INFILTRATION TRENCHES AND RAINWATER TREE TRENCHES
 4. TYPE D TO BE USED IN A PARTIALLY INFILTRATING OR NON-INFILTRATING RAINWATER TREE TRENCH THAT CONTAINS A DISTRIBUTION PIPE
 5. ALL DISTRIBUTION PIPES TO BE LAID AT 0%
 6. SUBDRAIN PIPES MAY BE LAID ON A SLOPE THAT MATCHES THE UNDERLYING SUB-BASE AS SHOWN IN 3.7C
 7. REFER TO DESIGN MANUAL FOR FURTHER DETAILS REGARDING PERFORATED PIPE DESIGN AND PLACEMENT

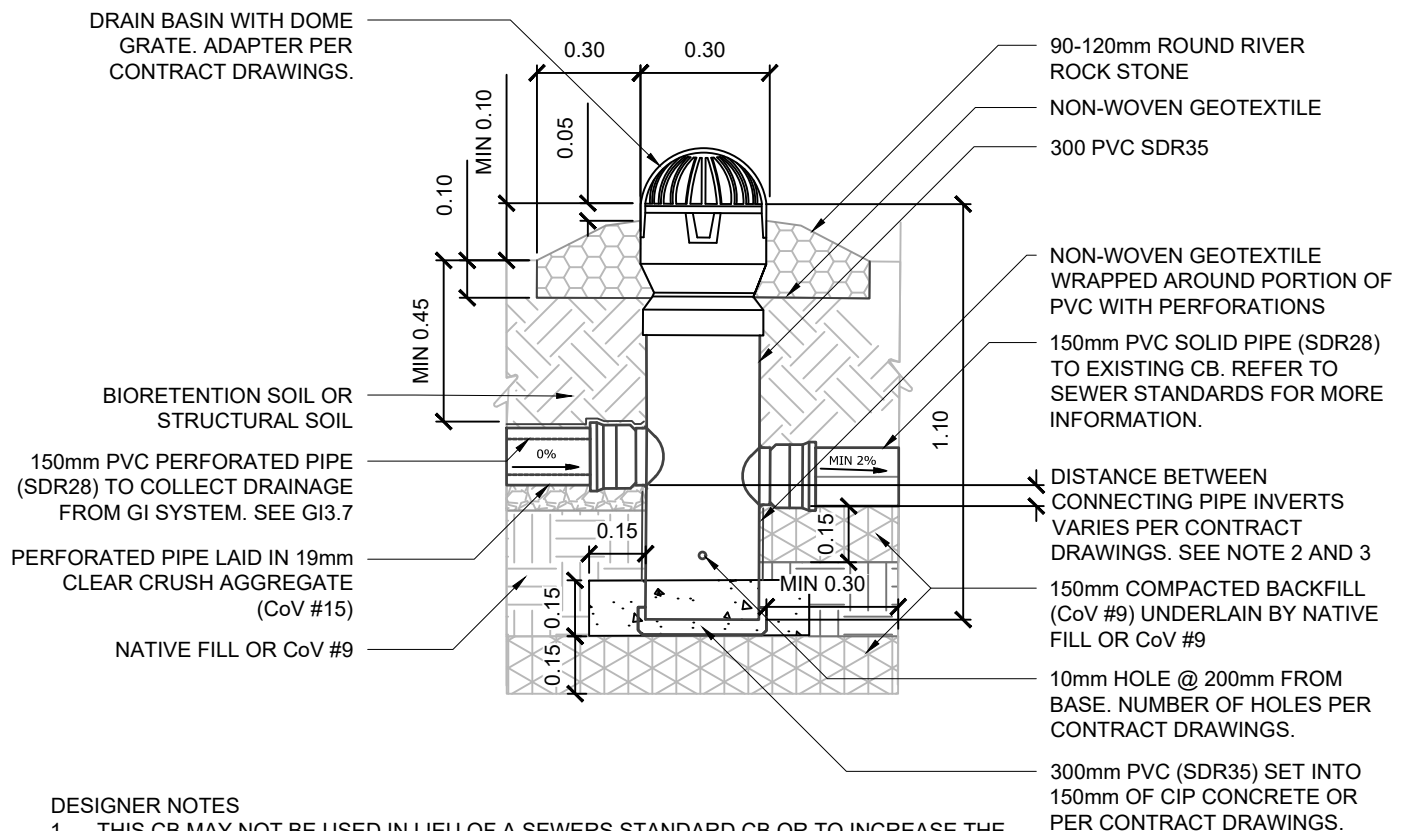
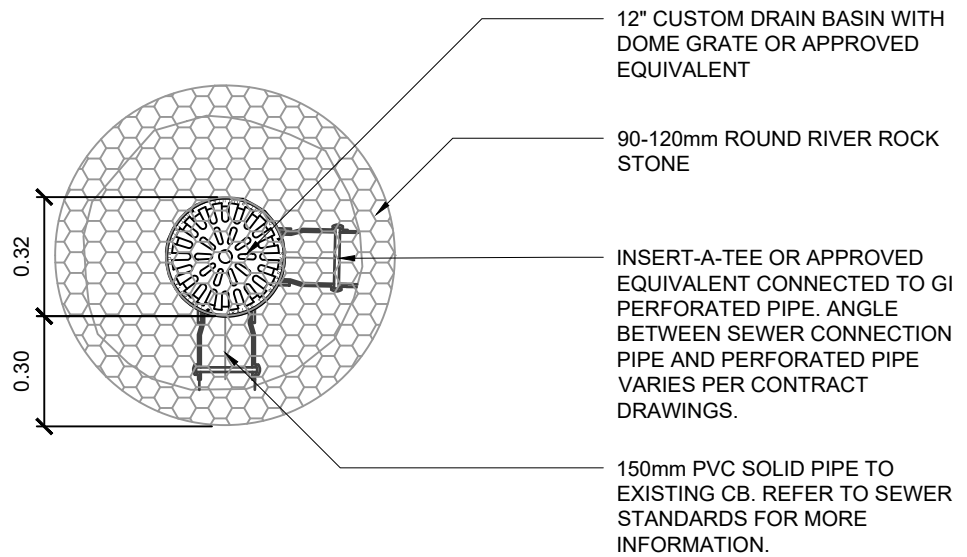
3.7D RAINWATER TREE TRENCH UNDERDRAIN



GENERAL COMPONENTS
UNDERDRAINS AND DISTRIBUTION PIPES

ISSUE DATE: FEBRUARY 2022
APPROVED BY: N. MEAD-FOX

REV.	REVISION DATE	APPROVED



DESIGNER NOTES


1. THIS CB MAY NOT BE USED IN LIEU OF A SEWERS STANDARD CB OR TO INCREASE THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO A SEWERS CB
2. IF THE PERFORATED PIPE IS TO BE USED AS A DISTRIBUTION PIPE TO CONVEY WATER INTO THE GI SYSTEM, THE INVERT SHOULD BE PLACED BELOW THE INVERT OF THE SEWER CONNECTION.
3. IF THE PERFORATED PIPE IS TO BE USED AS AN UNDERDRAIN TO CONVEY WATER OUT OF THE GI SYSTEM, THE INVERT SHOULD BE PLACED ABOVE THE INVERT OF THE SEWER CONNECTION
4. USE OF THIS PVC CB IS DEPENDENT ON APPROVAL FROM CITY OF VANCOUVER SEWERS AND DRAINAGE DESIGN AND GREEN INFRASTRUCTURE IMPLEMENTATION BRANCHES

GENERAL COMPONENTS
PVC CATCHBASIN

ISSUE DATE: DECEMBER 2023

APPROVED BY: N. MEAD-FOX

REV.	REVISION DATE	APPROVED

	STANDARD DETAIL DRAWINGS ENGINEERING SERVICES - VANCOUVER, B.C.	DRAWING No. GI4.0A
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BIORETENTION DESIGN NOTES AND GUIDANCE

PURPOSE:

BIORETENTION SYSTEMS RETAIN RAINWATER RUNOFF BY PROVIDING SURFACE, SUBSURFACE STORAGE AND INFILTRATION INTO NATIVE SOIL. WATER IS ALSO TREATED AS IT FILTERS THROUGH THE BIORETENTION SOIL.

THE FOLLOWING DRAWINGS ARE TEMPLATES FOR DESIGNING BIORETENTION SYSTEMS IN CITY OF VANCOUVER RIGHT-OF-WAYS. THE DRAWINGS CONTAIN THE COMPONENTS, MATERIALS, AND COMPOSITION REQUIRED FOR BEST PRACTICE BIORETENTION DESIGN. EACH DRAWING HAS VARIABLE DIMENSIONS WHICH MUST BE ADAPTED FOR SITE CONDITIONS AND SHOWN ON SITE DRAWINGS. IF A NUMERICAL DIMENSION IS PROVIDED, THE DIMENSION IS REQUIRED AT THE FIXED VALUE.

DESIGNER NOTES & GUIDELINES:

1. THE DESIGNER MUST ADAPT PLAN AND SECTION DRAWINGS TO ADDRESS SITE-SPECIFIC CONDITIONS.

2. BIORETENTION AREA, PONDING DEPTH, BIORETENTION SOIL DEPTH, AND AGGREGATE STORAGE DEPTH MUST BE SIZED TO MEET PROJECT HYDROLOGIC PERFORMANCE GOALS.

3. PONDING AND BIORETENTION SOIL DRAWDOWN TIME (I.E., TIME FOR MAXIMUM SURFACE PONDING TO DRAIN THROUGH THE BIORETENTION SOIL AFTER THE END OF A STORM) RECOMMENDATIONS:

☐ 24 HOUR MAXIMUM SURFACE PONDING DRAWDOWN

☐ 72 HOUR MAXIMUM DRAWDOWN FOR BIORETENTION SOIL AND AGGREGATE STORAGE

4. AN AGGREGATE COURSE IS REQUIRED UNDER THE BIORETENTION SOIL FOR ALL BIORETENTION SYSTEMS WHERE AN UNDERDRAIN IS REQUIRED TO MEET DRAWDOWN REQUIREMENTS.

5. TO ENCOURAGE INFILTRATION AND EVEN PONDING, THE FACILITY SUBGRADE AND BIORETENTION SOIL GRADE SHOULD BE FLAT. MID-CELL WEIR WALLS MAY BE USED TO TERRACE FACILITIES TO PROVIDE SUFFICIENT PONDING FOR INSTALLATIONS WITH HIGHER ADJACENT ROAD SLOPES. DESIGNER MUST SPECIFY WEIR WALL HEIGHT AND SPACING.

6. WHEN FACILITY CONSTRUCTION IMPACTS EXISTING SIDEWALK, ALL SAW CUTS MUST ADHERE TO CITY OF VANCOUVER REQUIREMENTS. SAW CUTS SHOULD BE ALONG SCORE LINES AND ANY DISTURBED SIDEWALK PANELS SHOULD BE REPLACED IN THEIR ENTIRETY.

7. GI FACILITIES IN PUBLIC RIGHT OF WAY SHALL BE DESIGNED WITH A SAFE, DESIGNATED OVERLAND FLOW PATH TO THE STREET IN THE EVENT THAT THE OVERFLOW STRUCTURE IS OBSTRUCTED OR CLOGGED. THIS FLOW PATH SHOULD BE REFLECTED IN SITE GRADING AND LABELED ON GI DRAWINGS.

8. THE DESIGNER MUST EVALUATE UTILITY SURVEYS FOR POTENTIAL UTILITY CROSSINGS OR CONFLICTS. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT CITY OF VANCOUVER ASSET PROTECTION STANDARDS AND OTHER UTILITY PROVIDER REQUIREMENTS.

9. BIORETENTION VEGETATION MUST BE SPECIFIED BY DESIGN PROFESSIONAL PER CoV GREEN INFRASTRUCTURE VEGETATION GUIDANCE

RELATED DETAILS		
EDGE TREATMENTS	GI 3.5	GI 3.6
INLETS	GI 2.1	GI 2.6
UNDERDRAINS:	GI 3.7	
CHECK DAMS:	GI 4.7	
MONITORING WELL	GI 3.2	
CLEANOUTS	GI 3.4	
WEIRS AND SEDIMENT PAD	GI 4.5	GI 4.6
INSPECTION CHAMBERS	GI 3.3	
CATCHBASINS	GI 3.1	GI 3.8

RELATED SPECIFICATIONS	COV SPEC NO.
- BIORETENTION SYSTEMS*	33 51 01S
- BIORETENTION SOIL MIX*	32 91 23S
- AGGREGATE STORAGE	31 05 17S
- MULCH	N/A
- DRAINAGE FABRIC	31 32 19S
- LINERS	33 47 13.13

* TEMPLATE ONLY. AVAILABLE UPON REQUEST FROM THE GII BRANCH.

LAYOUT REQUIREMENTS:

1. REFER TO THE CITY OF VANCOUVER ACCESSIBILITY STRATEGY, STANDARD DRAWINGS AND CONSTRUCTION SPECIFICATIONS FOR RIGHT-OF-WAY, PARKING SPACE, AND ACCESSIBLE PATH REQUIREMENTS.

2. LOCATE CURB CUTS AND GUTTER MODIFICATIONS TO AVOID CONFLICTS WITH ACCESSIBILITY REQUIREMENTS (E.G., LOCATE OUTSIDE OF CROSSWALKS).

DESIGNER CHECKLIST (MUST SPECIFY, AS APPLICABLE):

☐ BIORETENTION WIDTH AND LENGTH

☐ DEPTH OF PONDING

☐ DEPTH OF FREEBOARD

☐ DEPTH OF BIORETENTION SOIL

☐ DEPTH AND TYPE OF AGGREGATE STORAGE, IF ANY

☐ SURFACE ELEVATION (TOP OF BIORETENTION SOIL) AT UPSLOPE AND DOWNSLOPE ENDS OF FACILITY


☐ CONTROL POINTS AT EVERY PLANTER WALL CORNER AND POINT OF TANGENCY

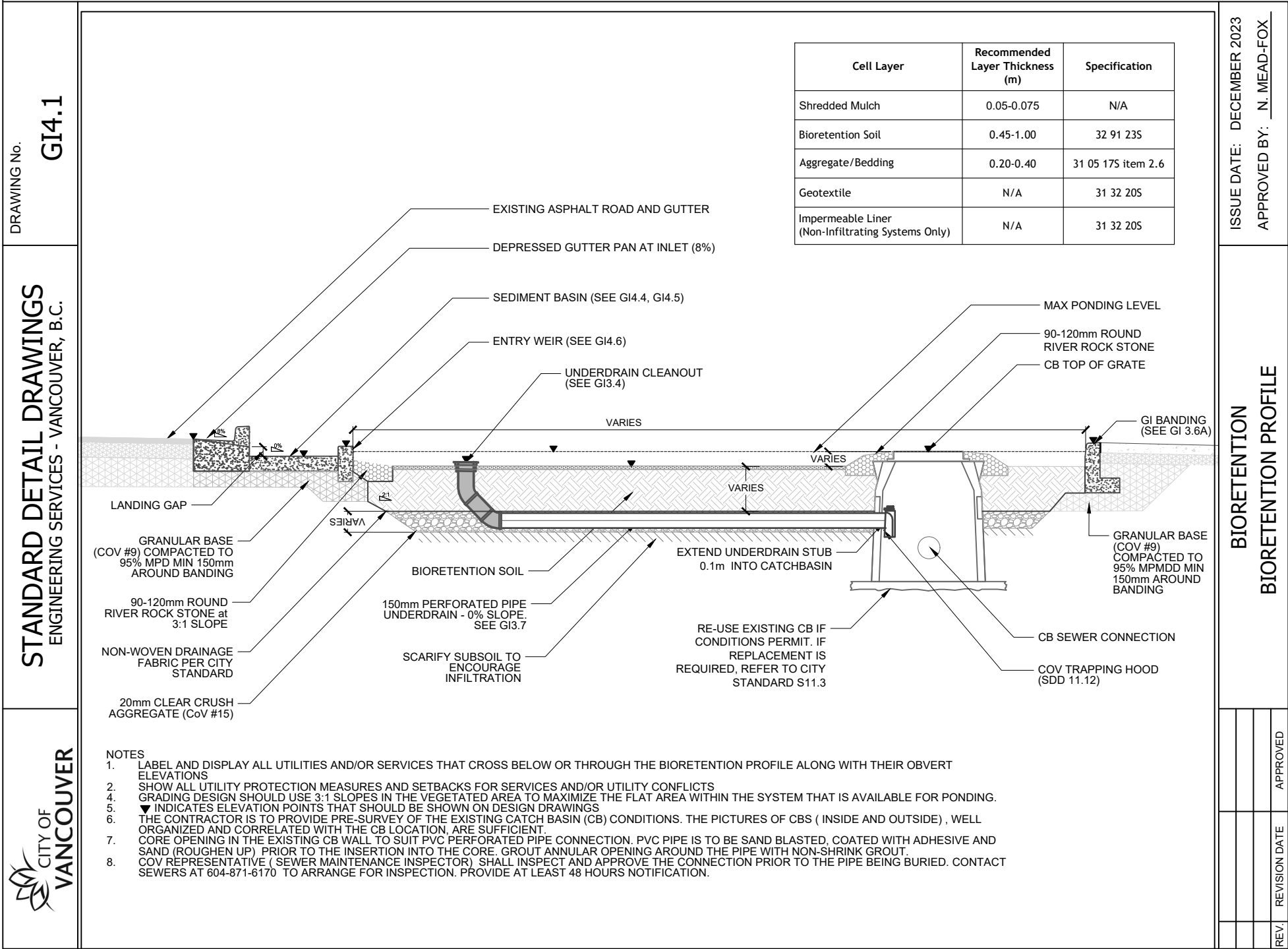
☐ DIMENSIONS AND DISTANCE TO EVERY INLET, OUTLET, CHECK DAM, SIDEWALK NOTCH, ETC.

☐ ELEVATIONS OF EVERY INLET, OUTLET, STRUCTURE RIM AND INVERT, CHECK DAM, PLANTER WALL CORNER, AND SIDEWALK NOTCH

☐ TYPE AND DESIGN OF PLANTER COMPONENTS (E.G., EDGE TREATMENTS, INLETS/GUTTER MODIFICATIONS, UTILITY CROSSINGS, LINER, AND PLANTING DETAILS)

REV.	REVISION DATE	APPROVED		BIORETENTION DESIGN NOTES AND GUIDANCE	ISSUE DATE: DECEMBER 2023 APPROVED BY: <u>N. MEAD-FOX</u>

		STANDARD DETAIL DRAWINGS ENGINEERING SERVICES - VANCOUVER, B.C.		DRAWING No. GI4.0B																																																													
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ISSUE DATE: DECEMBER 2023

APPROVED BY: N. MEAD-FOX

BIORETENTION

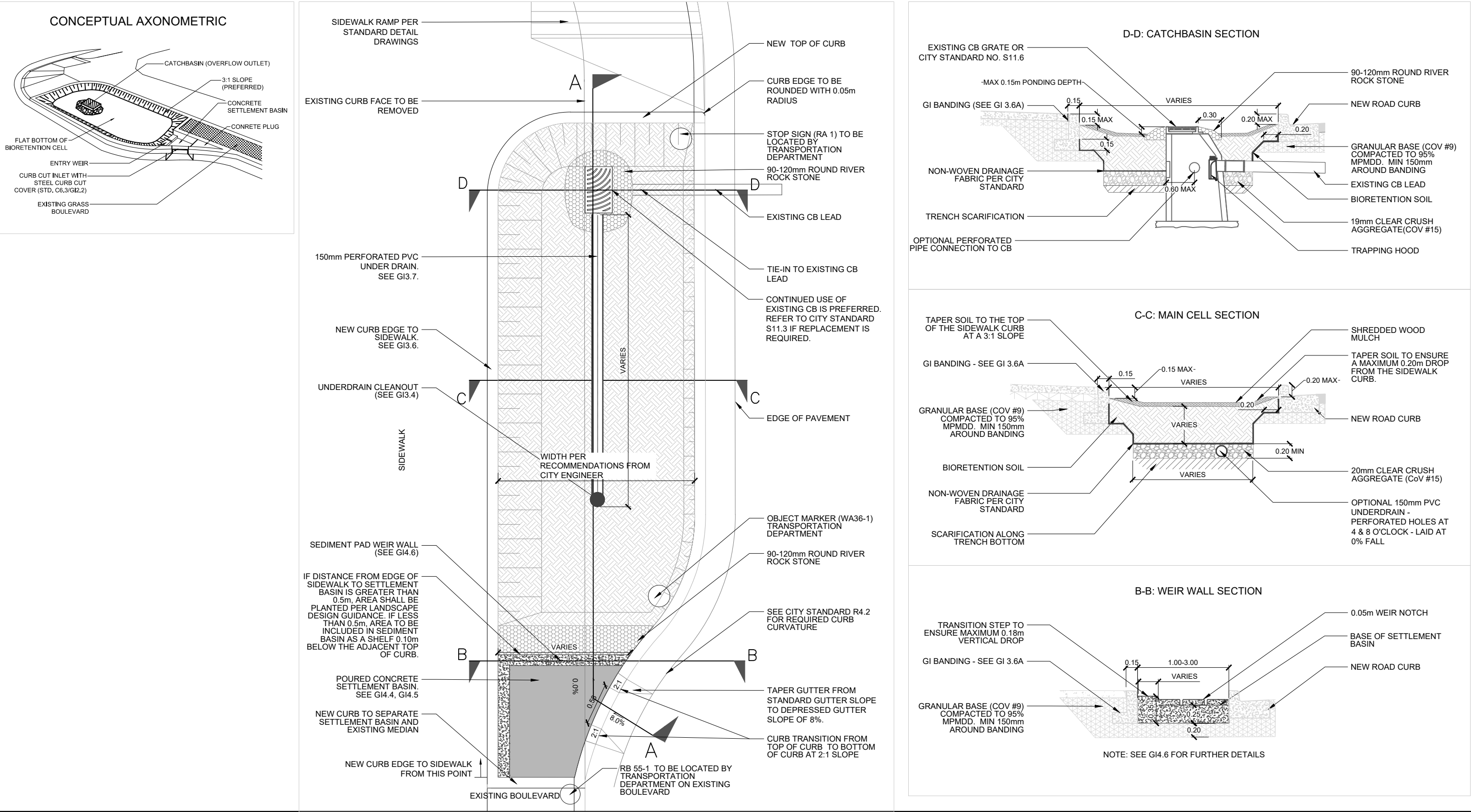
BIORETENTION PROFILE

REV.	REVISION DATE	APPROVED



STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
G14.2



REV.	REVISION DATE	APPROVED

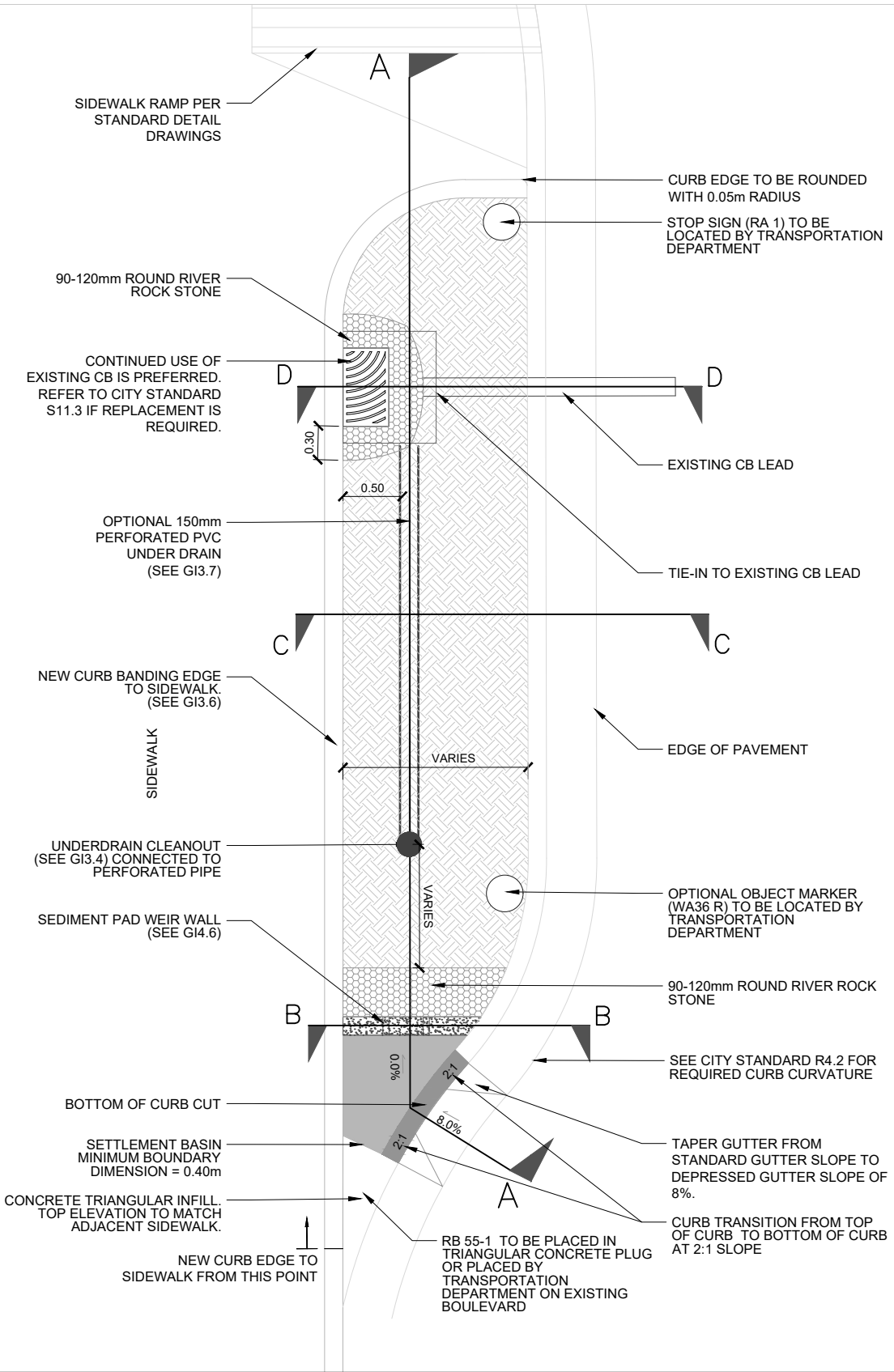
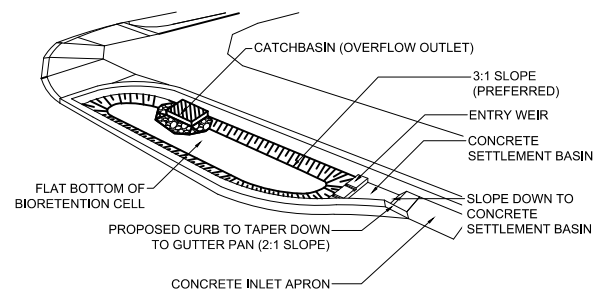
ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX



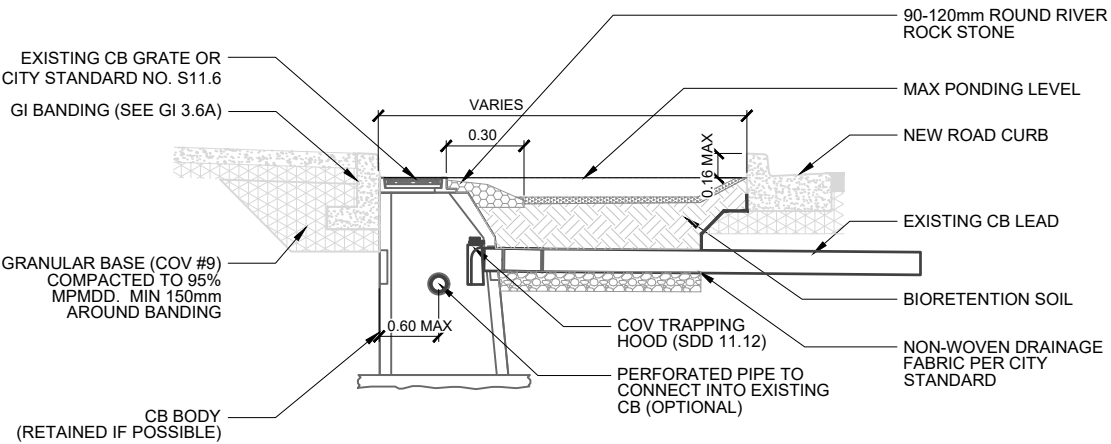
STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI4.2

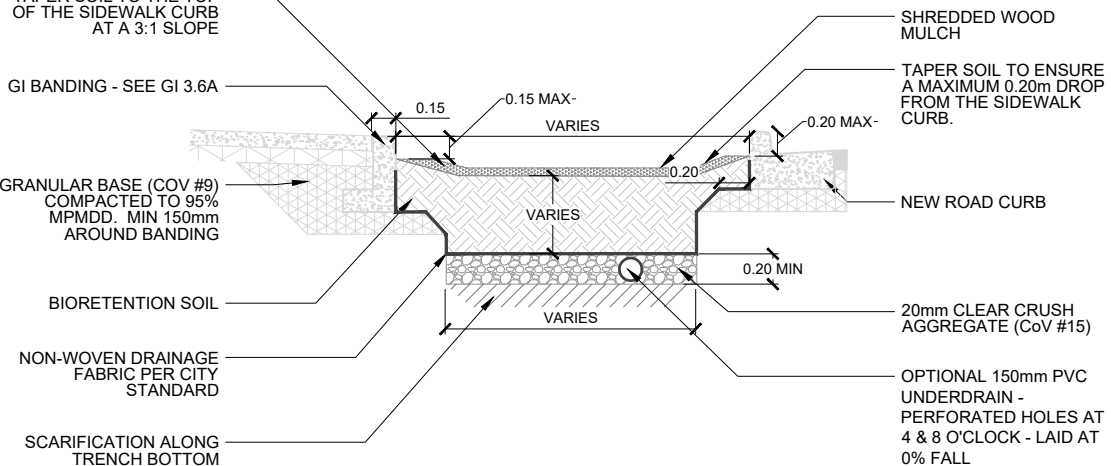
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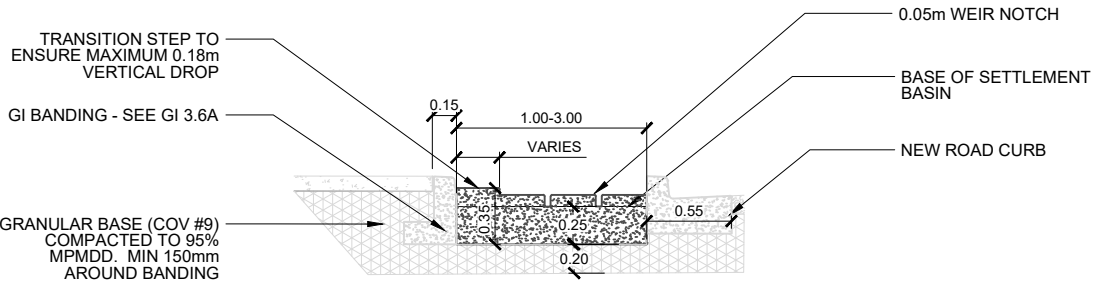
D-D: CATCHBASIN SECTION



C-C: MAIN CELL SECTION



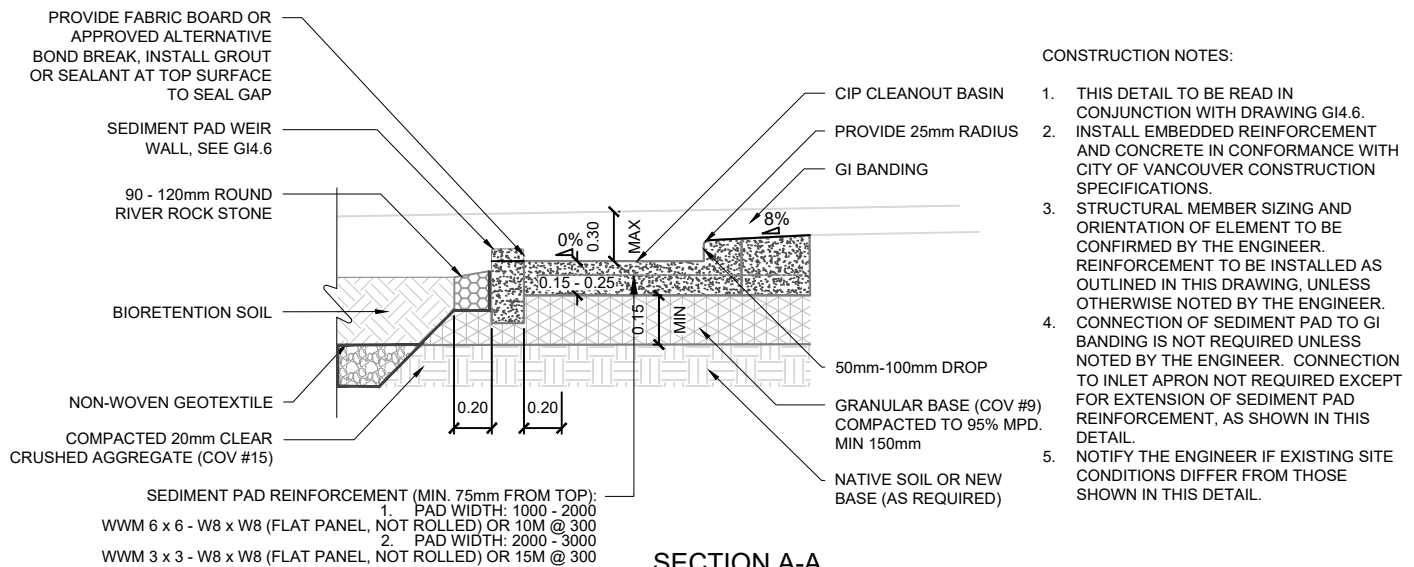
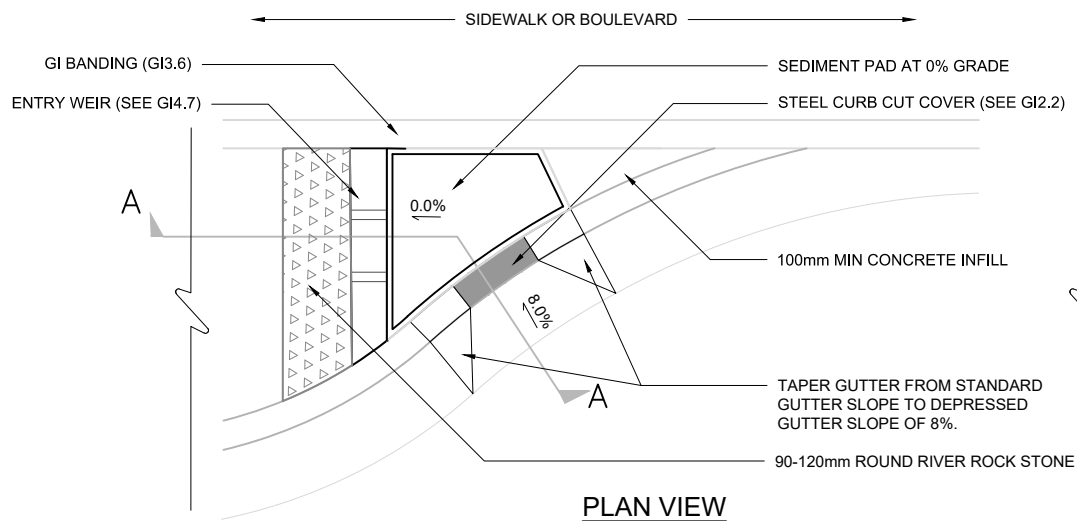
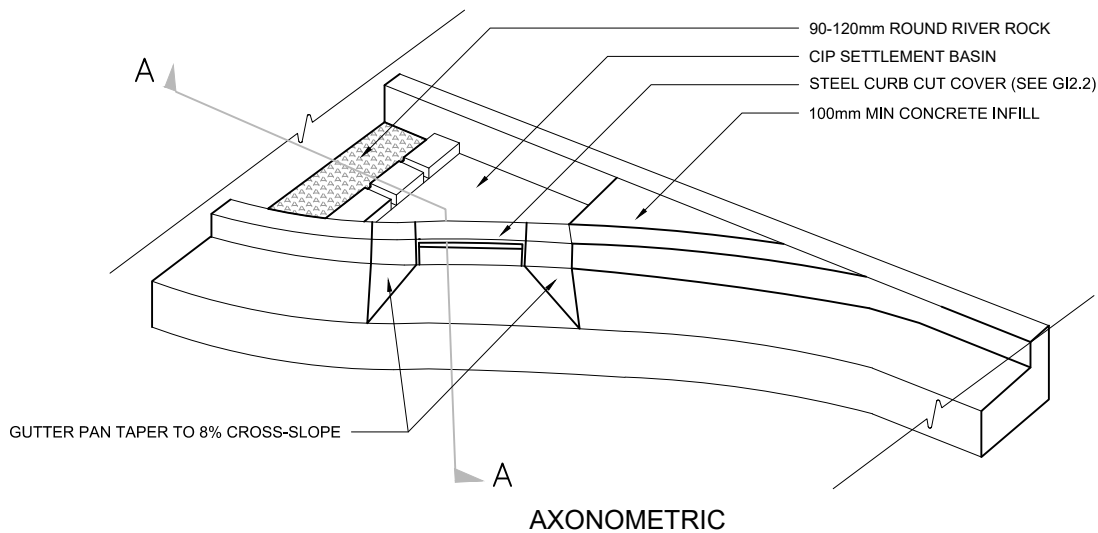
B-B: WEIR WALL SECTION



REV.	REVISION DATE	APPROVED

BIORETENTION
BIORETENTION BULGE WITH ADJACENT BOULEVARD

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX



REV.	REVISION DATE	APPROVED

BIORETENTION
CURB CUT SEDIMENT BASIN

ISSUE DATE: DECEMBER 2023

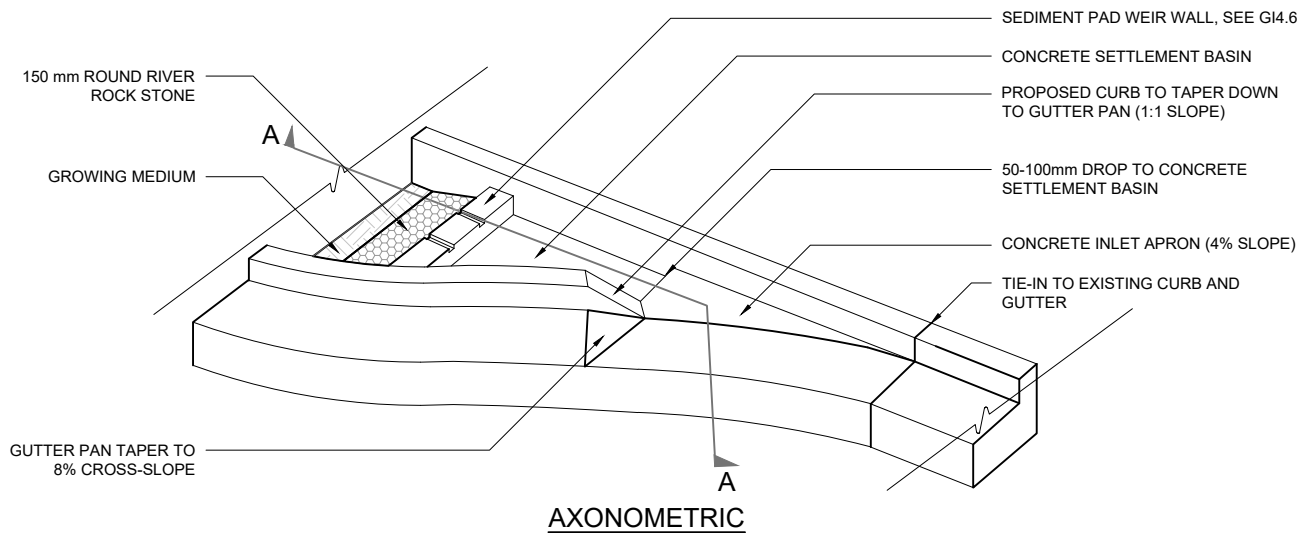
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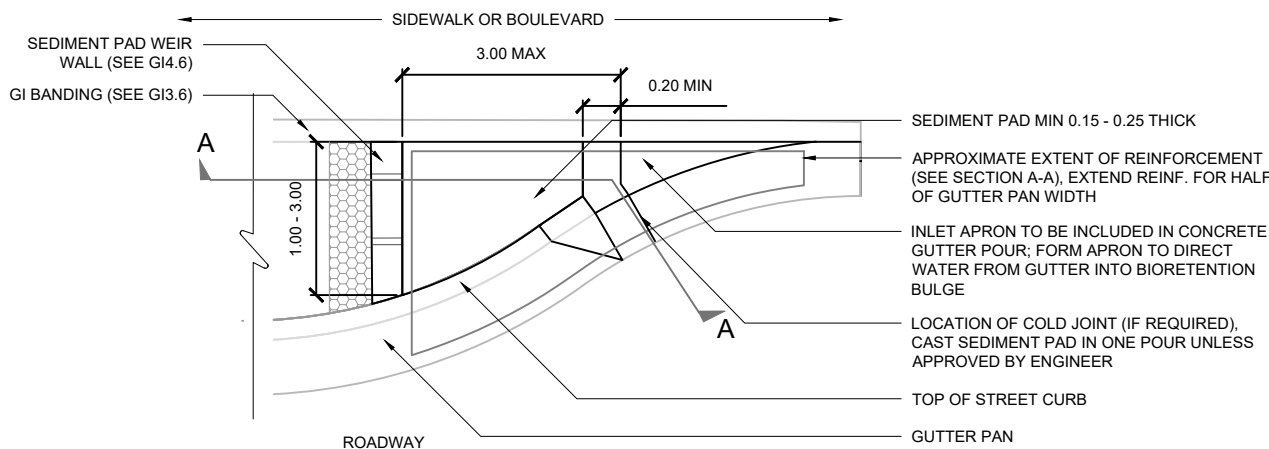
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ENGINEERING SERVICES - VANCOUVER, B.C.

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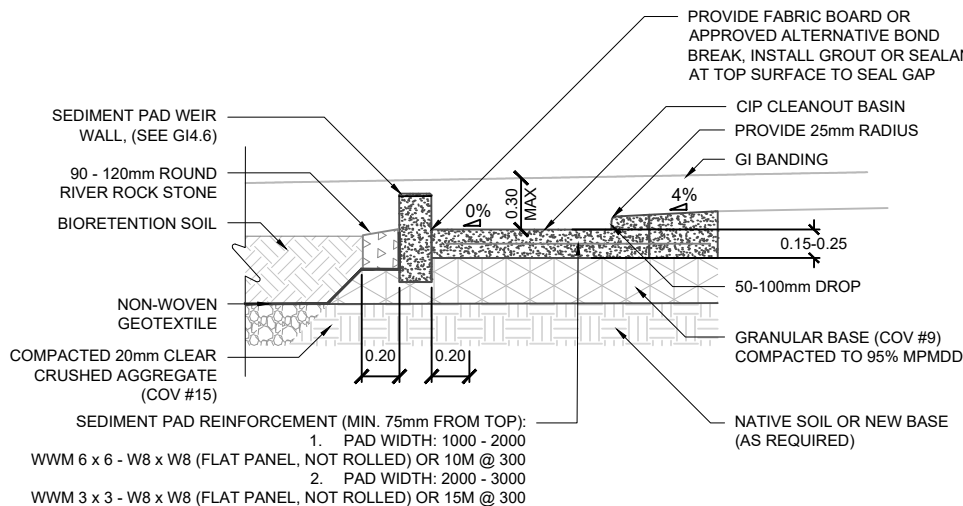
GI4.5



AXONOMETRIC



PLAN VIEW



NOTES:

1. THIS DETAIL TO BE READ IN CONJUNCTION WITH DRAWING GI4.6.
2. SEE DESIGN MEMO FOR THIS STANDARD DETAIL WHICH OUTLINES DESIGN CRITERIA AND APPLIED LOADING.
3. INSTALL EMBEDDED REINFORCEMENT AND CONCRETE IN CONFORMANCE WITH CITY OF VANCOUVER CONSTRUCTION SPECIFICATIONS.
4. STRUCTURAL MEMBER SIZING AND ORIENTATION OF ELEMENT TO BE CONFIRMED BY THE ENGINEER. REINFORCEMENT TO BE INSTALLED AS OUTLINED IN THIS DRAWING, UNLESS OTHERWISE NOTED BY THE ENGINEER.
5. CONNECTION OF SEDIMENT PAD TO GI BANDING IS NOT REQUIRED UNLESS NOTED BY THE ENGINEER. CONNECTION TO INLET APRON NOT REQUIRED EXCEPT FOR EXTENSION OF SEDIMENT PAD REINFORCEMENT, AS SHOWN IN THIS DETAIL.
6. NOTIFY THE ENGINEER IF EXISTING SITE CONDITIONS DIFFER FROM THOSE SHOWN IN THIS DETAIL.

SECTION A-A

REV.	REVISION DATE	APPROVED

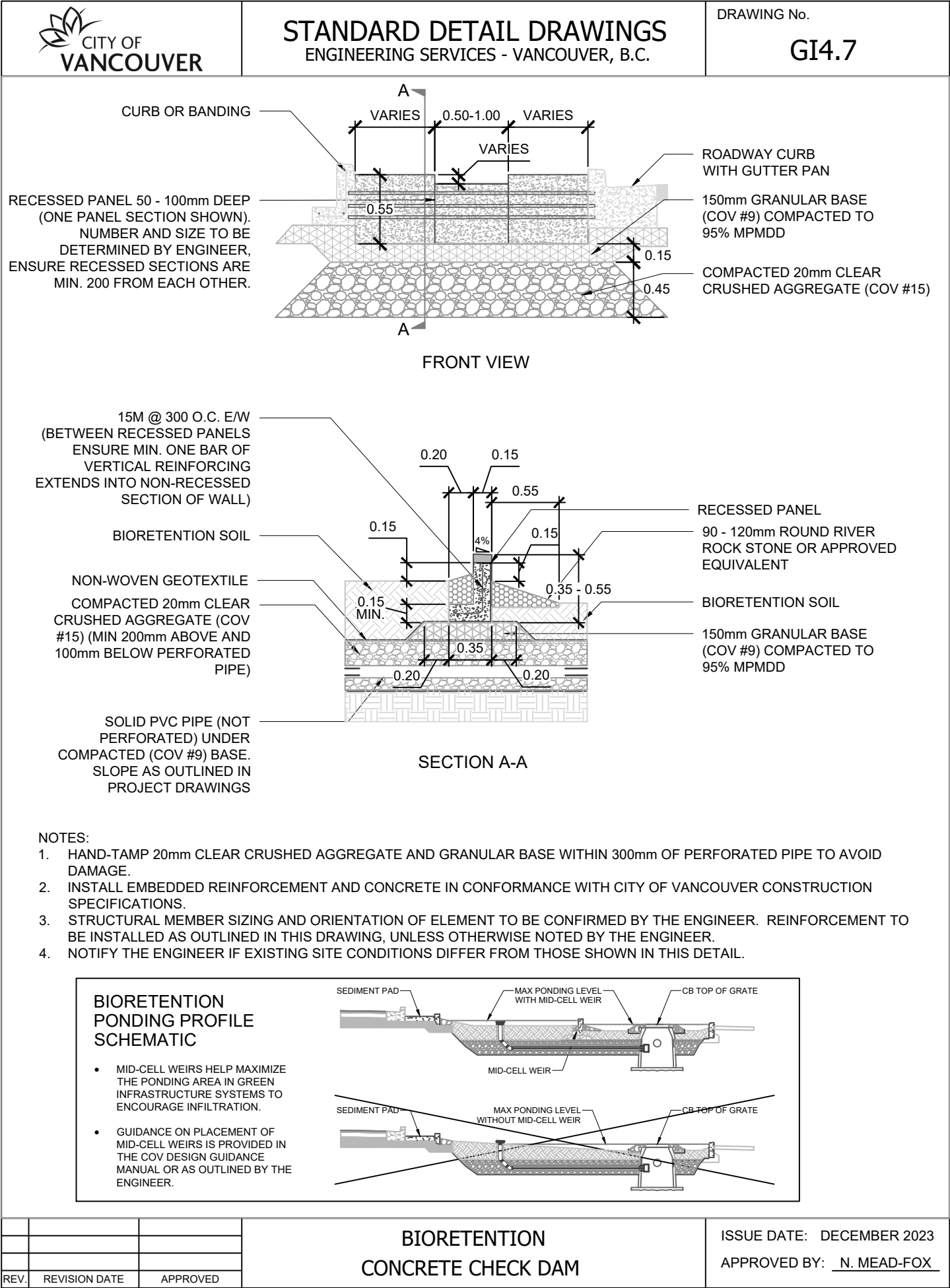
BIORETENTION
STRAIGHTAWAY SEDIMENT BASIN


ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX


NOTES:

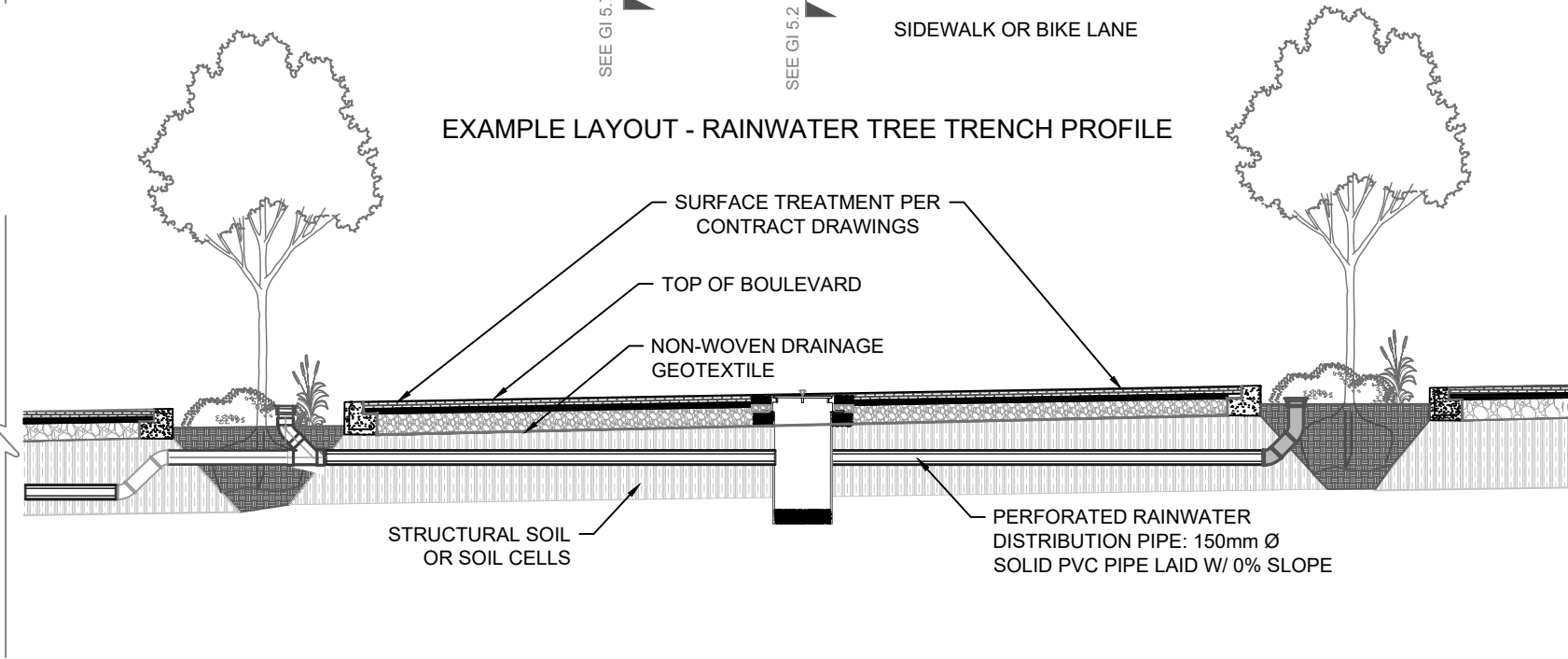
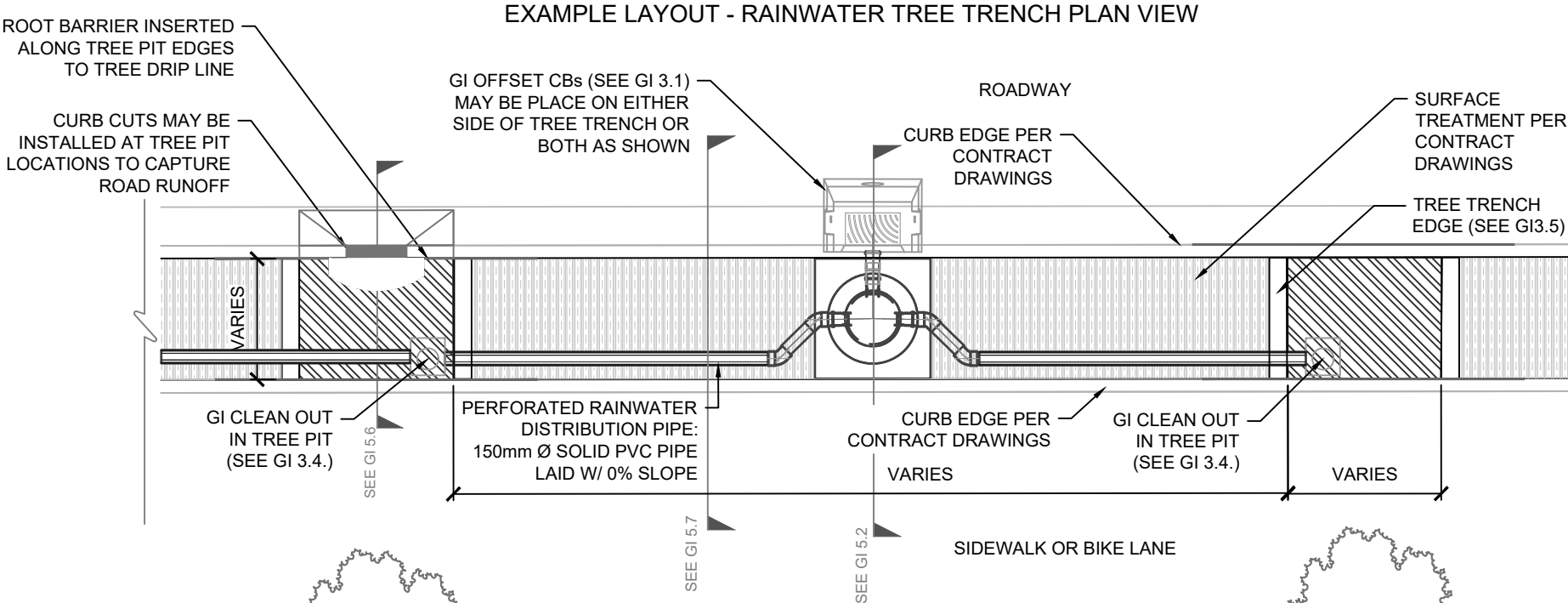
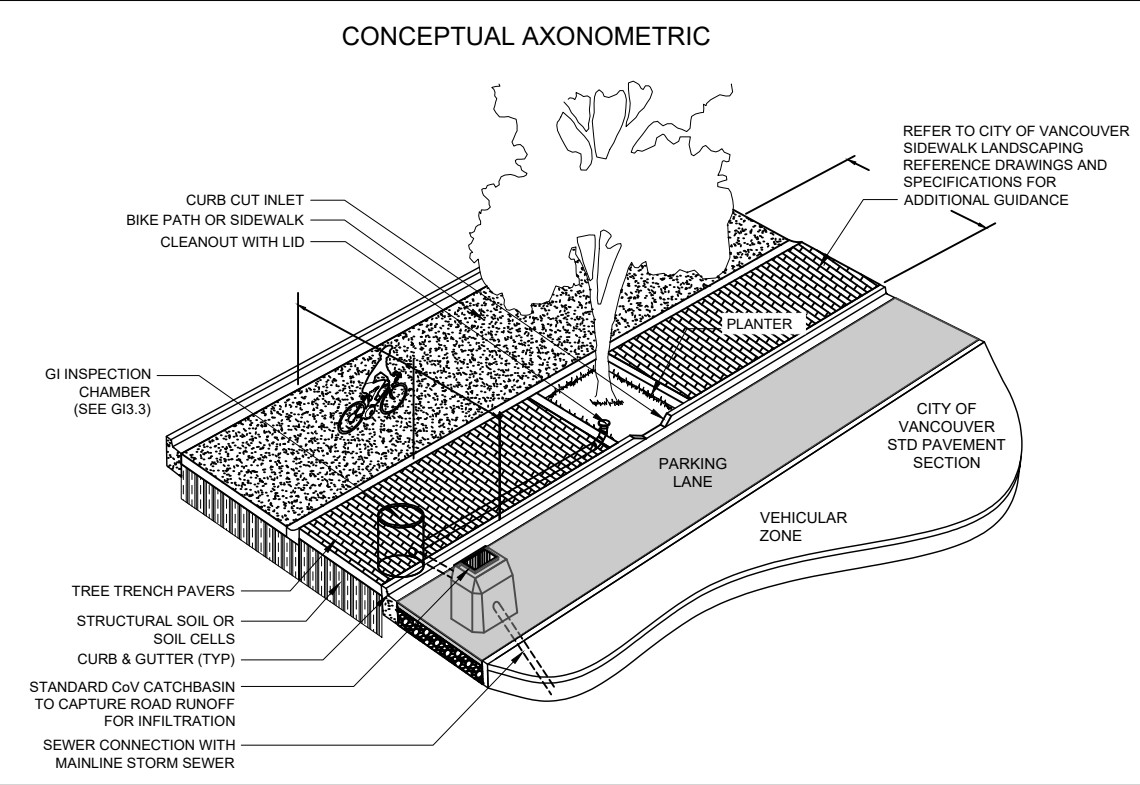
1. THIS DETAIL TO BE READ IN CONJUNCTION WITH DRAWING GI4.4 AND GI4.5
2. WEIR WALL TO BE CONNECTED TO THE ADJACENT BANDING AND CURB USING EMBEDDED DOWELS CONNECTED TO THE WEIR WALLS MAIN REINFORCEMENT
3. INSTALL EMBEDDED REINFORCEMENT AND CONCRETE IN CONFORMANCE WITH CITY OF VANCOUVER CONSTRUCTION SPECIFICATIONS.
4. STRUCTURAL MEMBER SIZING AND ORIENTATION OF ELEMENT TO BE CONFIRMED BY THE ENGINEER. REINFORCEMENT TO BE INSTALLED AS OUTLINED IN THIS DRAWING, UNLESS OTHERWISE NOTED BY THE ENGINEER.
5. NOTIFY THE ENGINEER IF EXISTING SITE CONDITIONS DIFFER FROM THOSE SHOWN IN THIS DETAIL.
6. ALL DIMENSIONS IN MILLIMETERS.

			<div style="text-align: center;"> <h1>BIORETENTION</h1> <h2>SEDIMENT BASIN WEIR WALL</h2> </div>	ISSUE DATE: DECEMBER 2023
REV.	REVISION DATE	APPROVED		APPROVED BY: <u>N. MEAD-FOX</u>



	<div>STANDARD DETAIL DRAWINGS</div> <div>ENGINEERING SERVICES - VANCOUVER, B.C.</div>	<div>DRAWING No.</div> <div>GI5.0A</div>																																
<div>RAINWATER TREE TRENCH</div> <div>DESIGN NOTES AND GUIDANCE</div>																																		
<div>PURPOSE:</div> <div>RAINWATER TREE TRENCHES (RTT) RETAIN RAINWATER RUNOFF BY PROVIDING SURFACE, SUBSURFACE STORAGE AND INFILTRATION INTO NATIVE SOIL. WATER IS ALSO TREATED AS IT FILTERS THROUGH THE SOIL AND THE ROOTS WITHIN THE TREE TRENCH.</div>																																		
<div>DESIGNER NOTES & GUIDELINES:</div> <div><div><div>1. THE DESIGNER MUST ADAPT PLAN AND SECTION DRAWINGS TO ADDRESS SITE-SPECIFIC CONDITIONS.</div><div>2. RTT SURFACE AREA, PONDING DEPTH, BIORETENTION SOIL DEPTH, AND AGGREGATE STORAGE DEPTH MUST BE SIZED TO MEET PROJECT HYDROLOGIC PERFORMANCE GOALS.</div><div>3. PONDING AND SYSTEM DRAWDOWN TIME (i.e., TIME FOR MAXIMUM SURFACE PONDING TO DRAIN THROUGH THE BIORETENTION SOIL AFTER THE END OF A STORM) RECOMMENDATIONS:<div><div><input type="checkbox"/> 24 HOUR MAXIMUM SURFACE PONDING DRAWDOWN</div><div><input type="checkbox"/> 72 HOUR MAXIMUM DRAWDOWN FOR RTT SOIL AND AGGREGATE STORAGE</div></div></div><div>4. RTT'S MAY BE DESIGNED USING STRUCTURAL SOIL OR MANUFACTURED SOIL CELLS. STRUCTURAL SOIL AND SOIL CELLS MUST MEET CITY OF VANCOUVER SPECIFICATIONS REGARDING LOADING CAPACITY OF RIGHT-OF-WAY INFRASTRUCTURE.</div><div>5. WHEN FACILITY CONSTRUCTION IMPACTS EXISTING SIDEWALK, ALL SAW CUTS MUST ADHERE TO CoV REQUIREMENTS. SAW CUTS SHOULD BE ALONG SCORE LINES AND ANY DISTURBED SIDEWALK PANELS SHOULD BE REPLACED IN THEIR ENTIRETY.</div><div>6. GI FACILITIES IN PUBLIC RIGHT OF WAY SHALL BE DESIGNED WITH A SAFE, DESIGNATED OVERLAND FLOW PATH TO THE STREET IN THE EVENT THAT THE OVERFLOW STRUCTURE IS OBSTRUCTED OR CLOGGED. THIS FLOW PATH SHOULD BE REFLECTED IN SITE GRADING AND LABELED ON GI DRAWINGS.</div><div>7. THE DESIGNER MUST EVALUATE UTILITY SURVEYS FOR POTENTIAL UTILITY CROSSINGS OR CONFLICTS.</div><div>8. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT CITY OF VANCOUVER ASSET PROTECTION STANDARDS AND OTHER UTILITY PROVIDER REQUIREMENTS.</div><div>9. RTT VEGETATION MUST BE SPECIFIED BY DESIGN PROFESSIONAL PER CoV GREEN INFRASTRUCTURE VEGETATION GUIDANCE.</div><div>10. RTT TREE SPECIES SELECTION SHOULD BE CONFIRMED WITH PARKS BOARD STAFF</div></div></div>																																		
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<div>*TEMPLATE ONLY. AVAILABLE UPON REQUEST FROM THE GII BRANCH.</div>																																		
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<div>DESIGNER CHECKLIST (MUST SPECIFY, AS APPLICABLE):</div> <div><div><input type="checkbox"/> RTT WIDTH AND LENGTH</div><div><input type="checkbox"/> DEPTH OF PONDING</div><div><input type="checkbox"/> DEPTH OF FREEBOARD</div><div><input type="checkbox"/> DEPTH OF SYSTEM</div><div><input type="checkbox"/> DEPTH AND TYPE OF AGGREGATE STORAGE, IF ANY</div><div><input type="checkbox"/> SURFACE ELEVATION AT UPSLOPE AND DOWNSLOPE ENDS OF FACILITY</div><div><input type="checkbox"/> DIMENSIONS AND DISTANCE TO EVERY MUNICIPAL SERVICE/UTILITY WITHIN 10m OF THE FACILITY</div><div><input type="checkbox"/> ELEVATIONS OF EVERY INLET, OUTLET, STRUCTURE RIM AND INVERT,</div><div><input type="checkbox"/> TYPE AND DESIGN OF COMPONENTS (E.G., EDGE TREATMENTS, INLETS/GUTTER MODIFICATIONS, UTILITY CROSSINGS, LINER, AND PLANTING DETAILS)</div></div>																																		
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		STANDARD DETAIL DRAWINGS ENGINEERING SERVICES - VANCOUVER, B.C.		DRAWING No. GI5.0B	
RAINWATER TREE TRENCH DRAWING DESCRIPTIONS					
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GI5.0B	RAINWATER TREE TRENCH DRAWING DESCRIPTIONS	THIS DRAWING DESCRIBES THE PURPOSE AND INTENDED USE OF EACH RAINWATER TREE TRENCH DRAWING.			
GI5.1	TREE TRENCH LAYOUT	THE TREE TRENCH LAYOUT STANDARD PROVIDES PLAN AND PROFILE DRAWINGS OF A TYPICAL TREE TRENCH, ALONG WITH A CONCEPTUAL AXONOMETRIC DIAGRAM. THE STANDARD PROVIDES AN EXAMPLE OF ONE SECTION OF A TREE TRENCH. THE DESIGN MAY BE EXTENDED IN EITHER DIRECTION AND ALONG THE FULL LENGTH OF A CITY BLOCK.			
GI5.2	TREE TRENCH INSPECTION CHAMBER	THIS STANDARD PROVIDES ADDITIONAL DETAILS ON HOW INSPECTION CHAMBERS (GI3.3.) CAN BE CONNECTED CATCHBASINS IN THE ROADWAY AND INTEGRATED INTO TREE PIT DESIGN. IT HIGHLIGHTS THE SEWER DESIGN CONSTRAINTS OF THESE SYSTEMS AND THE IMPACT OF INVERT ELEVATIONS ON TREE TRENCH SATURATION LEVELS.			
GI5.3	STRUCTURAL SOIL UNDER ADJACENNT HARDSCAPES	GI5.3. DEPICTS THE INTERFACE BETWEEN RAINWATER TREE TRENCH AREAS WITHIN THE BOULEVARD AND ADJACENT SIDEWALKS OR BIKELANES WITH UNDERLYING STRUCTURAL SOIL. STRUCTURAL SOIL IS USED TO PROVIDE SUFFICIENT SOIL VOLUME FOR STREET TREES WHILE PROVIDING STRUCTURAL SUPPORT FOR ADJACENT PAVED SURFACES.THESE PAVED AREAS MUST BE SEPARATED FROM THE UNCOMPACTED GROWING MEDIUM IN THE BOULEVARD WITHOUT PREVENTING ROOTS FROM ACCESSING THE STRUCTURAL SOIL.			
GI5.4	GI SWALE BOULEVARD WITH STREET TREES	RAINWATER TREE TRENCHES MAY BE DESIGNED WITH A VARIETY OF DIFFERENT SURFACE TREATMENTS. GI5.4 DEPICTS A RAINWATER TREE TRENCH WHERE THE BOULEVARD SPACE BETWEEN TREES IS VEGETATED. THE TREE TRENCH CROSS-SECTIONS PROVIDE ADDITIONAL DETAILS ON TREE DESIGN, LAYERING, COMPONENTS, AND INTEGRATION WITH ADJACENT STRUCTURAL SOIL.			
GI5.5	GI TREE PIT WITH STRUTURAL SOIL	GI5.5 DEPICTS A RAINWATER TREE TRENCH WHERE THE SPACE BETWEEN TREES IS COVERED WITH A PAVEMENT OR PAVER SURFACE TREATMENT. THIS DESIGN VARIANT IS APPROPRIATE IN HIGH DENSITY AREAS WITH SIGNIFICANT FOOT TRAFFIC AND IN AREAS WITH ADJACENT STREET PARKING. ROADWAY RUNOFF IS DIRECTED TO THE TREES THROUGH A DISTRIBUTION PIPE (SEE GI5.6.) AND THROUGH SURFACE LEVEL CURB CUTS INTO THE TREE PIT AREAS.			
GI5.6	GI TREE PIT WITH DISTRIBUTION PIPE	ROADWAY RUNOFF MAY BE DIRECTED INTO RAINWATER TREE TRENCHES THROUGH A PERFORATED DISTRIBUTION PIPE THAT RUNS ALONG THE TRENCH AND THROUGH THE TREE PLANTING AREAS. GI5.6. DEPICTS A TREE PIT WITH WITH A DISTRIBUTION PIPE PASSING THROUGH THE TREE PIT AREA. THE DRAWING INCLUDES INFORMATION ON INTEGRATION WITH ADJACENT STRUCTURAL SOIL.			
GI5.7	VERTICAL EDGE TREE PIT	GI5.7. DEPICTS A TREE PIT WITH A VERTICAL INTERFACE BETWEEN THE ROADWAY AND THE RTT AREAS. IN CONSTRAINED BOULEVARD SPACES, IT MAY BE NECESSARY TO OPTIMIZE THE SOIL VOLUME AVAILABLE TO STREET TREES. THIS MAY BE ACHIEVED BY EXCAVATING VERTICALLY FROM THE BACK OF CURB INSTEAD OF RETAINING A SLOPED CURB BASE AND SUB-BASE. THE USE OF VERTICAL EDGES IS ONLY ACCEPTABLE IN LOW-RISK AREAS AND REQUIRES APPROVAL FROM STREETS DESIGN STAFF AND THE PROJECT ENGINEER.			
		RAINWATER TREE TRENCHES		ISSUE DATE: DECEMBER 2023	
		RTT DRAWING DESCRIPTIONS		APPROVED BY: <u>N. MEAD-FOX</u>	
REV.	REVISION DATE	APPROVED			



- NOTES:
1. TREE TRENCH SEGMENTS MAY BE CONNECTED IN SERIES TO IMPROVE WATER DISTRIBUTION AND DRAINAGE. S-BENDS CAN BE USED TO CONNECT SEGMENTS AT DIFFERENT ELEVATIONS.
 2. UNDERDRAIN PIPES SHOULD BE PLACED AT A MINIMUM OF 0.30m FROM THE BOTTOM OF THE SURFACE TREATMENT.
 3. DRAINAGE MAY BE DIRECTED TO THE SOIL MEDIUM THROUGH CURB CUTS OF CATCHBASINS AND DRAINAGE PIPES.
 4. STRUCTURAL SOIL MUST BE FULLY COMPACTED PRIOR TO TREE PIT EXCAVATION
 5. ARRANGEMENTS OF INSPECTION CHAMBERS, OFFSET CBs AND TREE PITS MAY VARY.
 6. EXTENT OF STRUCTURAL SOIL OR SOIL CELLS MAY VARY.
 7. TREES IN RAINWATER TREE TRENCHES SHALL HAVE THE APPROPRIATE SOIL VOLUME AS OUTLINED IN THE CITY OF VANCOUVER URBAN FOREST STRATEGY

REV.	REVISION DATE	APPROVED

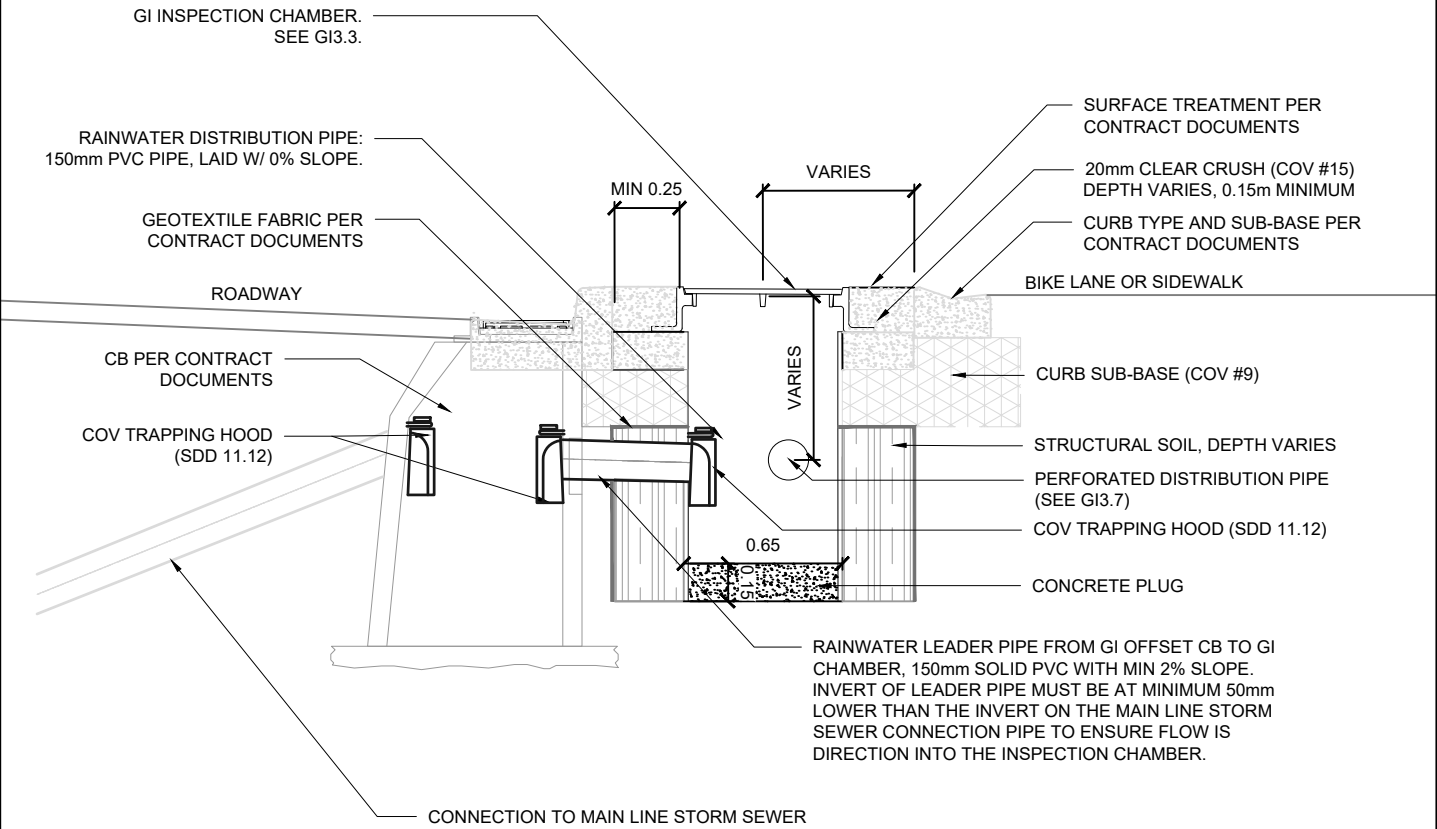
RAINWATER TREE TRENCHES
RAINWATER TREE TRENCH LAYOUT

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX



STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI5.2



- NOTES:
- 1. CROSS-SLOPE OF TREE TRENCH AND ADJACENT PAVED SURFACES MAY VARY DEPENDING ON SITE CONDITIONS
 - 2. CONNECTIONS TO INSPECTION CHAMBER AND LOCATION OF OFFSET CBs MAY VARY DEPENDING ON SITE CONDITIONS
 - 3. OFFSET CBs MAY REPLACE STANDARD CBs
 - 4. CBs MAY BE PLACED ON ONLY ONE SIDE OF TREE TRENCH OR ON BOTH SIDES AS SHOWN
 - 5. INVERT OF CONNECTION TO MAIN LINE CB MUST BE AT MINIMUM 50mm ABOVE THE DISTRIBUTION PIPE INVERT

REV.	REVISION DATE	APPROVED

RAINWATER TREE TRENCHES
RTT INSPECTION CHAMBER

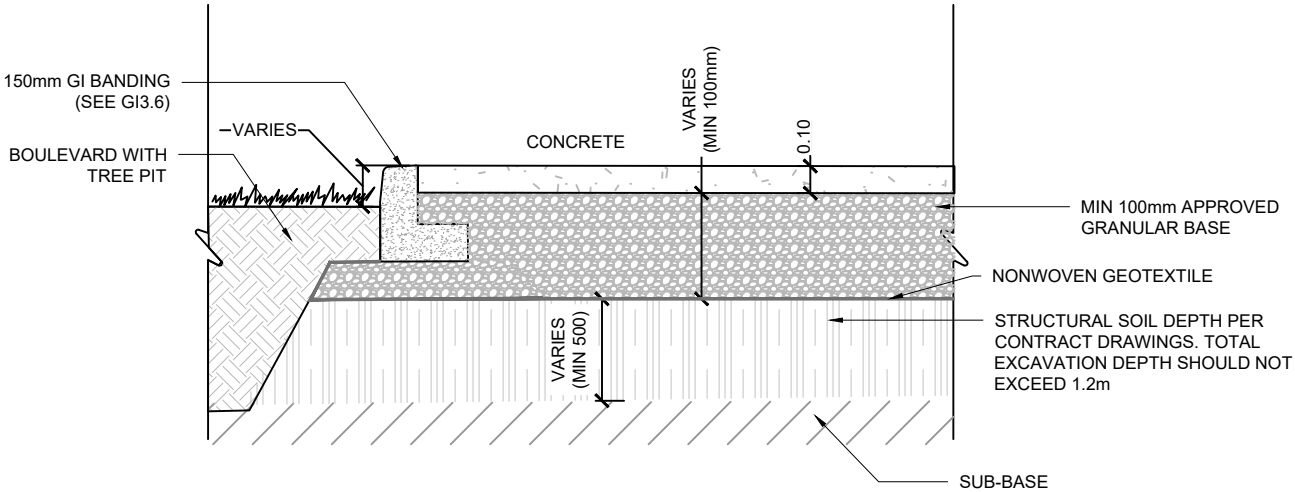
ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX



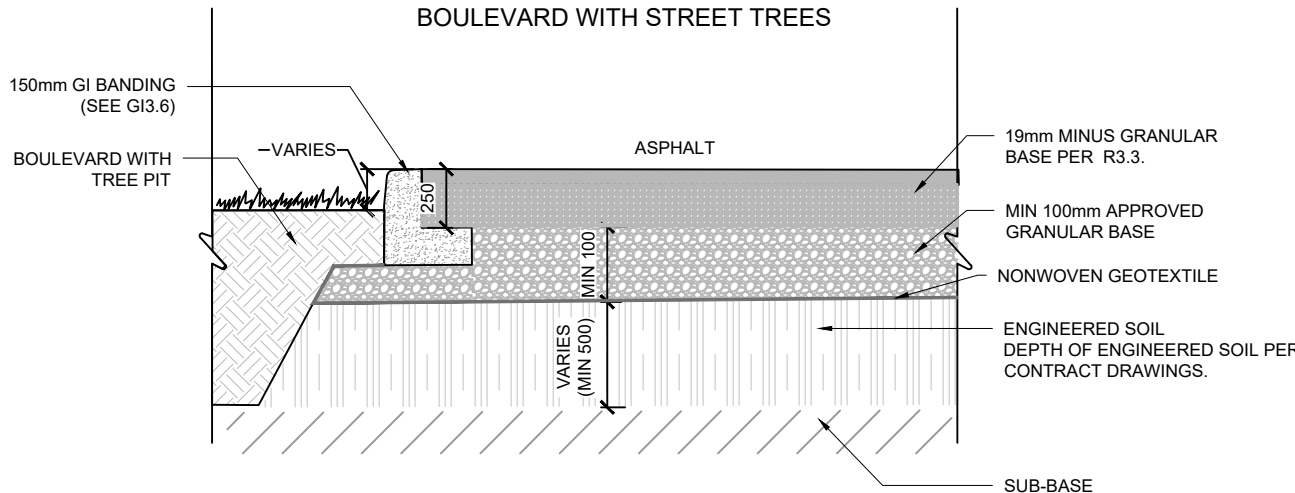
STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI5.3

CONCRETE SIDEWALK
ADJACENT TO GI BOULEVARD WITH STREET TREES



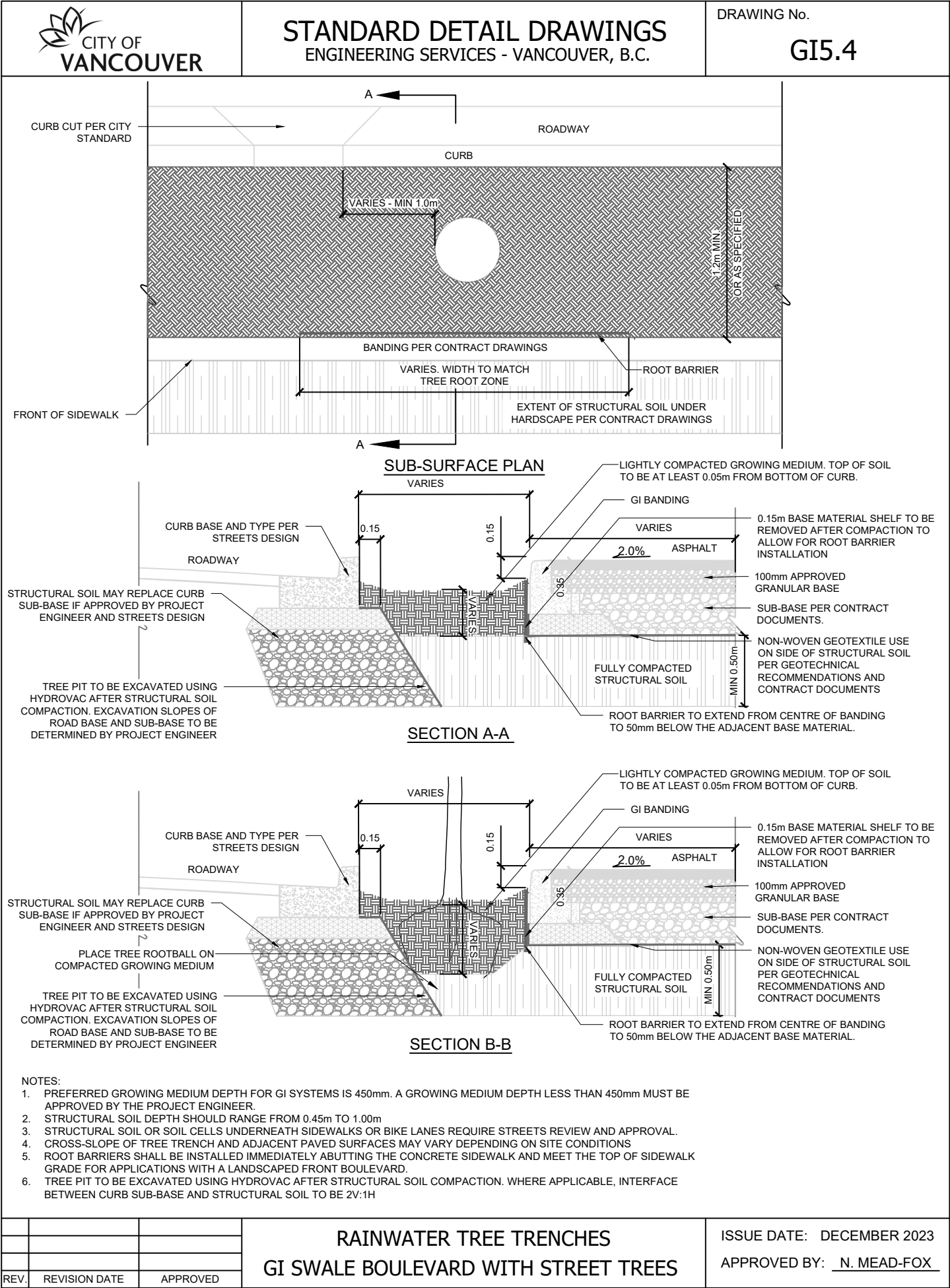
ASPHALT ADJACENT TO GI
BOULEVARD WITH STREET TREES



REV.	REVISION DATE	APPROVED

RAINWATER TREE TRENCHES
STRUCTURAL SOIL ADJACENT TO GI

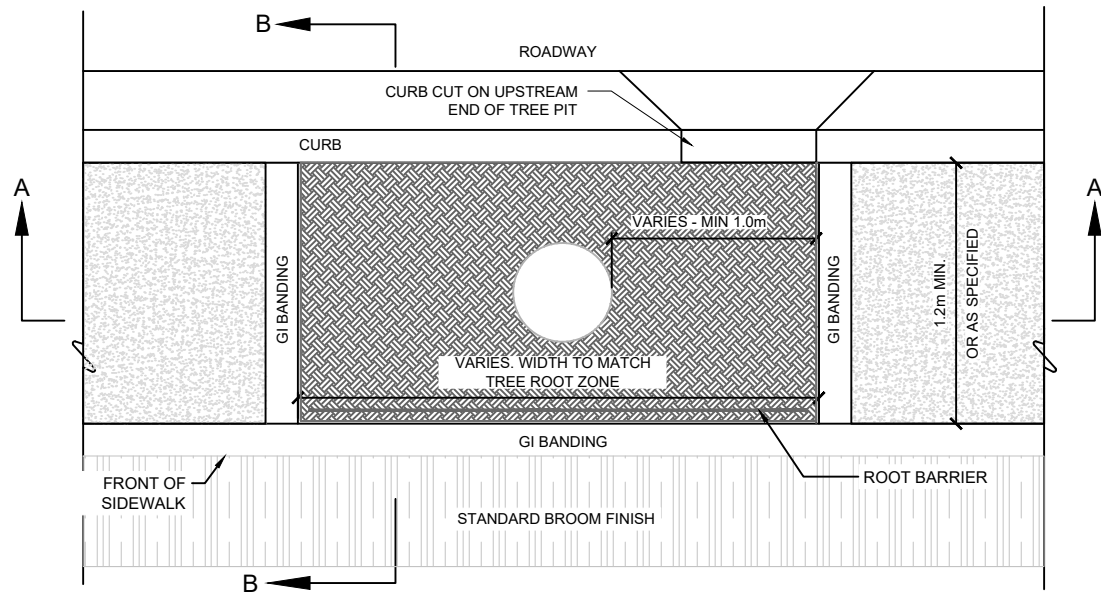
ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX



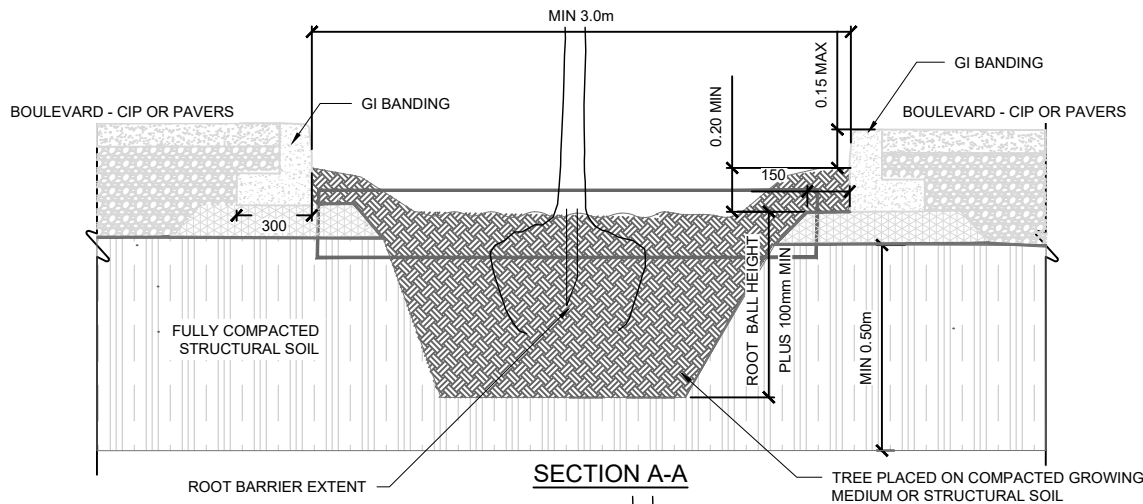


STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

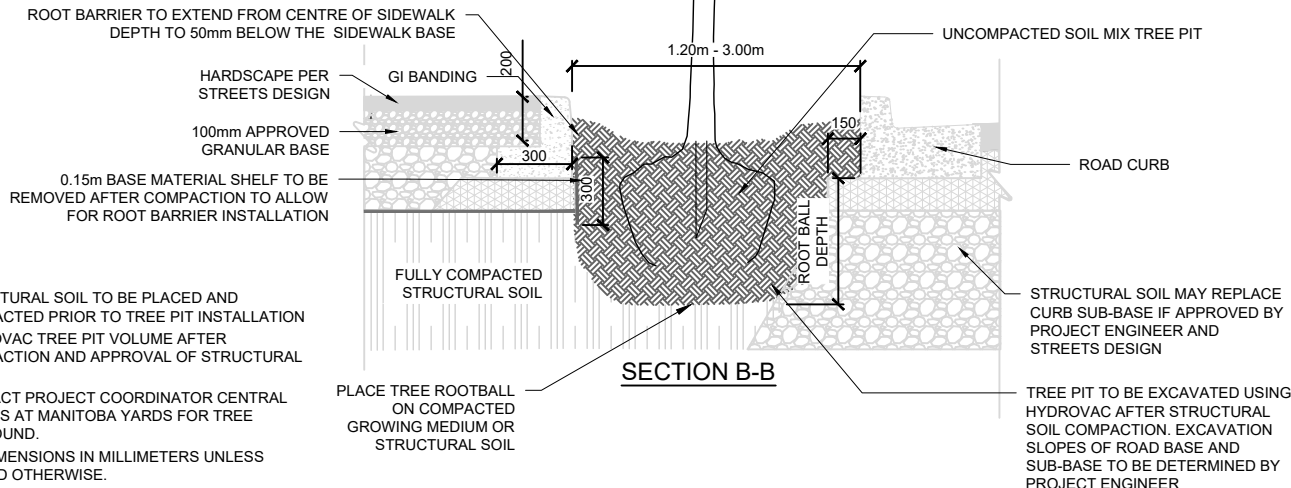
DRAWING No.
GI5.5



SUBSURFACE PLAN



SECTION A-A



SECTION B-B

NOTES:

1. STRUCTURAL SOIL TO BE PLACED AND COMPACTED PRIOR TO TREE PIT INSTALLATION
2. HYDROVAC TREE PIT VOLUME AFTER COMPACTION AND APPROVAL OF STRUCTURAL SOIL
3. CONTACT PROJECT COORDINATOR CENTRAL STORES AT MANITOBA YARDS FOR TREE SURROUND.
4. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

REV.	REVISION DATE	APPROVED

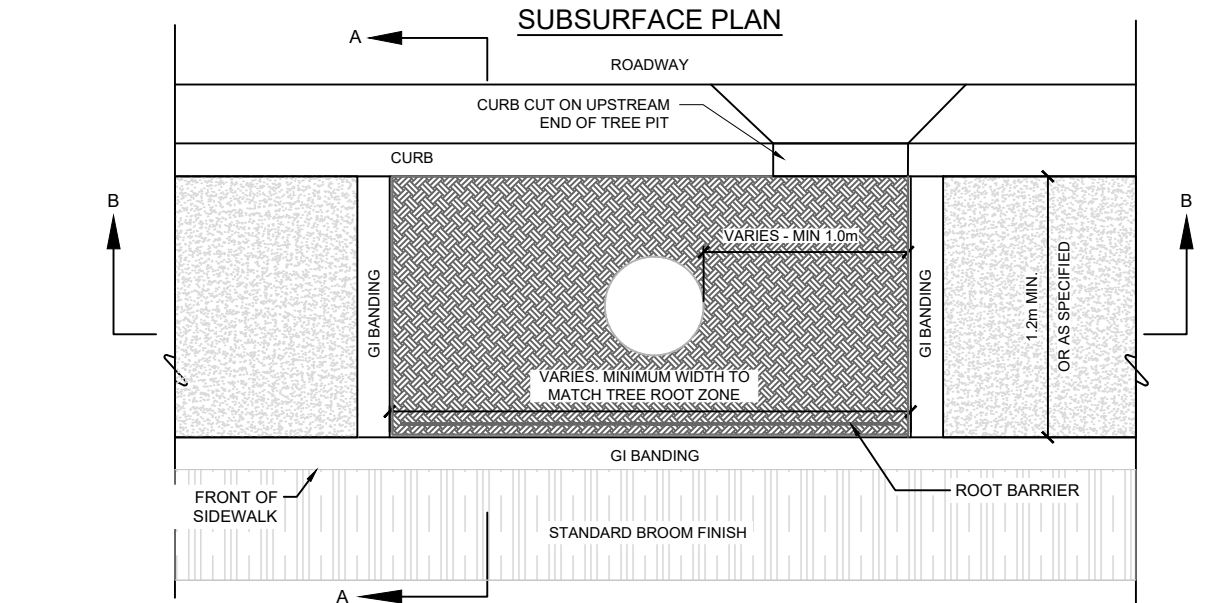
RAINWATER TREE TRENCHES
GI TREE PIT WITH STRUCTURAL SOIL

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX

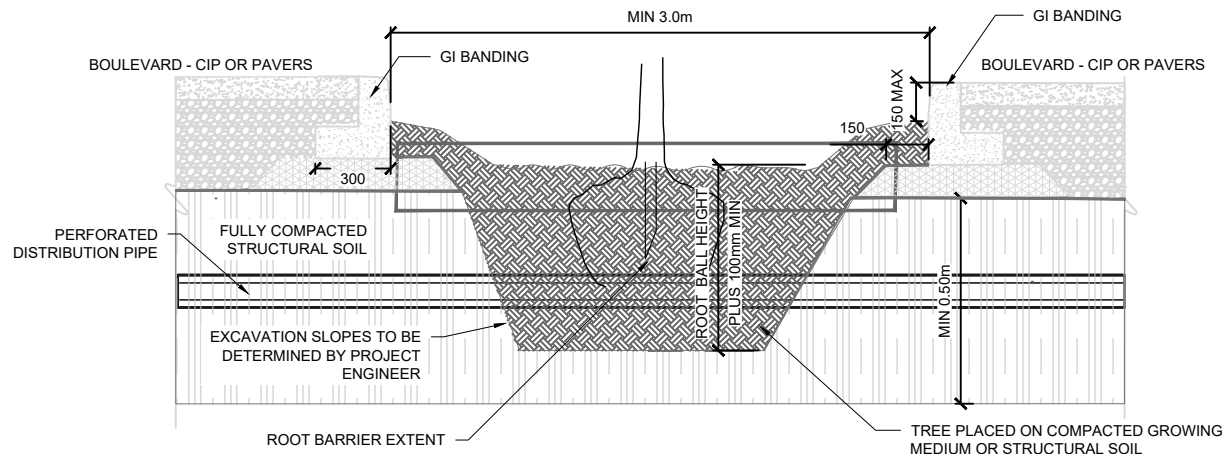


STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

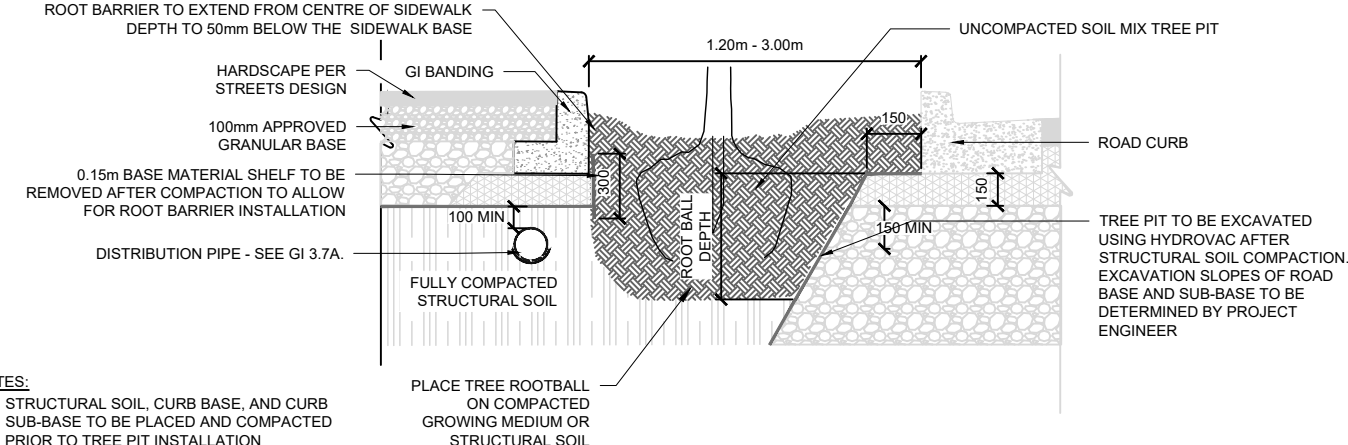
DRAWING No.
GI5.6



SECTION B-B



SECTION A-A



- NOTES:**
- 1. STRUCTURAL SOIL, CURB BASE, AND CURB SUB-BASE TO BE PLACED AND COMPACTED PRIOR TO TREE PIT INSTALLATION
 - 2. HYDROVAC TREE PIT VOLUME AFTER APPROVAL OF STRUCTURAL SOIL
 - 3. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

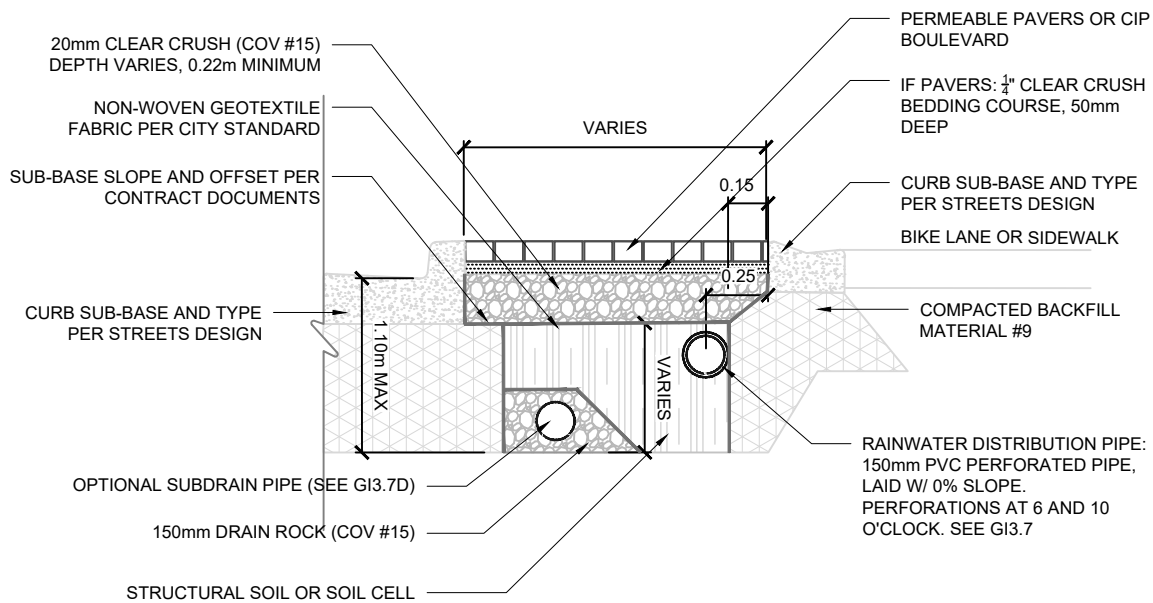
			RAINWATER TREE TRENCHES GI TREE PIT WITH DISTRIBUTION PIPE	ISSUE DATE: DECEMBER 2023	
REV.	REVISION DATE	APPROVED			APPROVED BY: <u>N. MEAD-FOX</u>



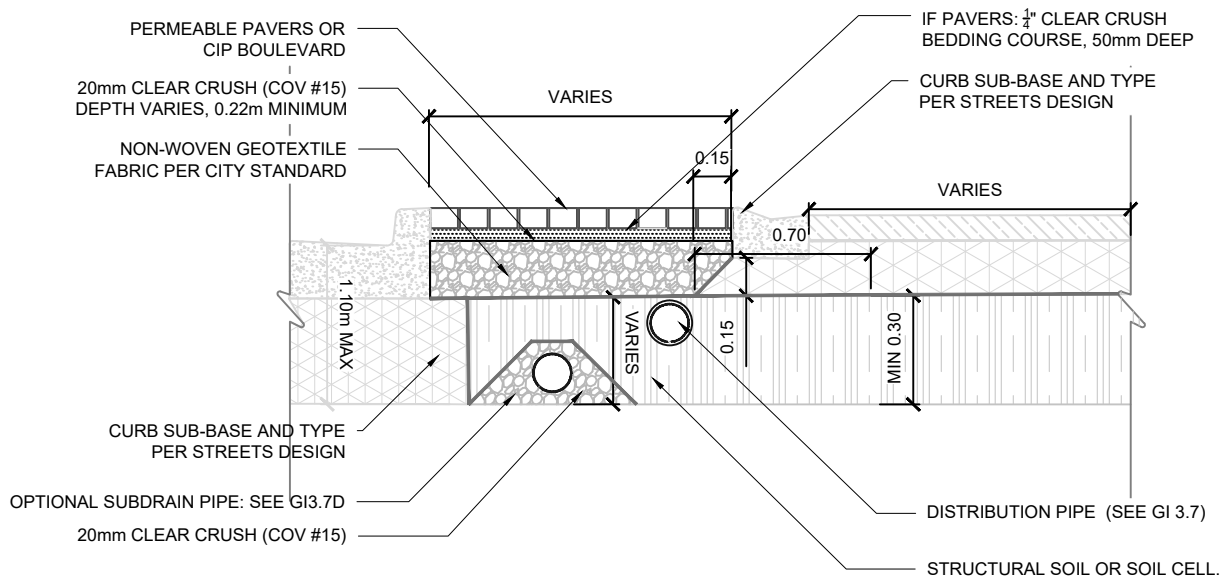
STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI5.7

VERTICAL RTT CROSS-SECTION



VERTICAL RTT CROSS-SECTION WITH STRUCTURAL SOIL



- NOTES:
1. STRUCTURAL SOIL OR SOIL CELLS UNDERNEATH SIDEWALKS OR BIKE LANES REQUIRE STREETS REVIEW AND APPROVAL.
 2. CROSS-SLOPE OF TREE TRENCH AND ADJACENT PAVED SURFACES MAY VARY DEPENDING ON SITE CONDITIONS
 3. VERTICAL EDGE SHOULD ONLY BE ALLOWED DURING SIMULTANEOUS ROAD CONSTRUCTION WHEN THE CURB BASE AND SUB-BASE CAN BE INSTALLED IN LIFTS DIRECTLY ADJACENT TO THE STRUCTURAL SOIL.
 4. ACCEPTABILITY OF VERTICAL EDGE CONDITIONS IS DEPENDENT ON A SUPPORTIVE GEOTECHNICAL SITE ASSESSMENT.

REV.	REVISION DATE	APPROVED

RAINWATER TREE TRENCHES
VERTICAL EDGE RTT CROSS-SECTIONS

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX

INFILTRATION SYSTEMS DESIGN NOTES AND GUIDANCE

PURPOSE:

INFILTRATION SYSTEMS RETAIN RAINWATER RUNOFF BY PROVIDING SURFACE STORAGE, SUBSURFACE STORAGE AND INFILTRATION INTO NATIVE SOIL. THE STORAGE IN INFILTRATION SYSTEMS CAN ALSO REDUCE THE PEAK FLOW ENTERING SEWERS AND REMOVE RAINWATER FROM ENTERING SEWERS.

DESIGNER NOTES & GUIDELINES:

1. THE DESIGNER MUST ADAPT PLAN AND SECTION DRAWINGS TO ADDRESS SITE-SPECIFIC CONDITIONS.
2. SYSTEM SURFACE AREA, PONDING DEPTH, SOIL DEPTH, AND AGGREGATE STORAGE DEPTH MUST BE SIZED TO MEET PROJECT HYDROLOGIC PERFORMANCE GOALS.
3. PONDING AND SYSTEM DRAWDOWN TIME (i.e., TIME FOR MAXIMUM SURFACE PONDING TO DRAIN THROUGH THE SYSTEM AFTER THE END OF A STORM) RECOMMENDATIONS:

☐ 24 HOUR MAXIMUM SURFACE PONDING DRAWDOWN

☐ 72 HOUR MAXIMUM DRAWDOWN FOR RTT SOIL AND AGGREGATE STORAGE
4. INFILTRATION SYSTEMS MAY BE DESIGNED USING AGGREGATE STORAGE OR PROPRIETARY STORAGE SYSTEMS. ALL PROPOSED PRODUCTS FOR USE IN RIGHT-OF-WAYS MUST MEET CITY OF VANCOUVER SPECIFICATIONS REGARDING LOADING CAPACITY OF RIGHT-OF-WAY INFRASTRUCTURE.
5. WHEN FACILITY CONSTRUCTION IMPACTS EXISTING SIDEWALK, ALL SAW CUTS MUST ADHERE TO CITY OF VANCOUVER REQUIREMENTS. SAW CUTS SHOULD BE ALONG SCORE LINES AND ANY DISTURBED SIDEWALK PANELS SHOULD BE REPLACED IN THEIR ENTIRETY.
6. GI FACILITIES IN PUBLIC RIGHT OF WAY SHALL BE DESIGNED WITH A SAFE, DESIGNATED OVERLAND FLOW PATH TO THE STREET IN THE EVENT THAT THE OVERFLOW STRUCTURE IS OBSTRUCTED OR CLOGGED. THIS FLOW PATH SHOULD BE REFLECTED IN SITE GRADING AND LABELED ON GI DRAWINGS.
7. THE DESIGNER MUST EVALUATE UTILITY SURVEYS FOR POTENTIAL UTILITY CROSSINGS OR CONFLICTS.
8. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT CITY OF VANCOUVER ASSET PROTECTION STANDARDS AND OTHER UTILITY PROVIDER REQUIREMENTS.\
9. DESIGN OF SUBSURFACE INFILTRATION FACILITIES MUST ALWAYS BE BASED ON SITE-SPECIFIC GEOTECHNICAL ANALYSIS AND MUST CONSIDER THE POTENTIAL IMPACT OF INCREASED INFILTRATION ON SURROUNDING INFRASTRUCTURE.

RELATED DETAILS		
EDGE TREATMENTS:	GI 3.5	GI 3.6
INLETS:	GI 2.1	GI 2.5
UNDERDRAINS:	GI 3.7	
MONITORING WELL	GI 3.2	
CLEANOUTS	GI 3.4	
INSPECTION CHAMBERS	GI 3.3	
CATCHBASINS	GI 3.1	GI 3.8

RELATED SPECIFICATIONS	COV SPEC NO.
- AGGREGATE STORAGE	32 11 23S
- DRAINAGE FABRIC	31 32 20S
- LINERS	33 47 13.13
- ENGINEERED SOIL	32 91 22S

LAYOUT REQUIREMENTS:

1. REFER TO THE CITY OF VANCOUVER ACCESSIBILITY STRATEGY, STANDARD DRAWINGS AND CONSTRUCTION SPECIFICATIONS FOR RIGHT-OF-WAY, PARKING SPACE, AND ACCESSIBLE PATH REQUIREMENTS.
2. LOCATE CURB CUTS AND GUTTER MODIFICATIONS TO AVOID CONFLICTS WITH ACCESSIBILITY REQUIREMENTS (E.G., LOCATE OUTSIDE OF CROSSWALKS OR PARKING LAYBYS)

DESIGNER CHECKLIST (MUST SPECIFY, AS APPLICABLE):

- ☐ SYSTEM WIDTH AND LENGTH
- ☐ DEPTH OF PONDING (IF APPLICABLE)
- ☐ DEPTH OF SYSTEM
- ☐ DEPTH AND TYPE OF AGGREGATE STORAGE
- ☐ SURFACE ELEVATION AT UPSLOPE AND DOWNSLOPE ENDS OF FACILITY
- ☐ DIMENSIONS AND DISTANCE TO EVERY MUNICIPAL SERVICE/UTILITY WITHIN 10m OF THE FACILITY
- ☐ ELEVATIONS OF EVERY INLET, OUTLET, STRUCTURE RIM AND INVERT
- ☐ TYPE AND DESIGN OF COMPONENTS (E.G., EDGE TREATMENTS, INLETS/GUTTER MODIFICATIONS, UTILITY CROSSINGS, LINER, AND PLANTING DETAILS)

VANCOUVER		ENGINEERING SERVICES - VANCOUVER, B.C.		S10.00	
SUB-SURFACE INFILTRATION SYSTEM DRAWING DESCRIPTIONS					
GI6.0A	INFILTRATION SYSTEM DESIGN NOTES	THE SUB-SURFACE INFILTRATION SYSTEMS DESIGN NOTES PROVIDE GUIDANCE TO DESIGNERS ON HOW TO USE AND ADAPT THE TEMPLATE STANDARDS IN THIS SECTION.			
GI6.0B	INFILTRATION SYSTEM DRAWING DESCRIPTIONS	THIS DRAWING DESCRIBES THE PURPOSE AND INTENDED USE OF EACH SUB-SURFACE INFILTRATION SYSTEM DRAWING.			
GI6.1	RIGHT OF WAY INFILTRATION TRENCH	THIS STANDARD DEPICTS AN INFILTRATION TRENCH BENEATH A PORTION OF ROADWAY DIRECTLY ADJACENT TO A CURB. INFILTRATION TRENCHES ARE FUNCTIONALLY SIMILAR TO TREE TRENCHES BUT ARE DESIGNED UNDER HARDSCAPES. THEY REQUIRE CATCHBASINS TO DIRECT RUNOFF INTO PERFORATED DISTRIBUTION PIPES THAT DRAIN INTO THE VOIDS OF SUBSURFACE AGGREGATE. THE INFILTRATION AREA OF A TREE TRENCH IS OFTEN CONFINED TO MINIMIZE POTENTIAL IMPACTS ON SURROUNDING INFRASTRUCTURE.			
GI6.2	RIGHT OF WAY DRY WELL	DRY WELLS DIRECT ROAD RUNOFF INTO A PERFORATED INSPECTION CHAMBER SURROUNDED BY LOOSE AGGREGATE. THESE SYSTEMS CAN ENCOURAGE INFILTRATION IN AREAS WHERE AN INFILTRATION TRENCH IS INFEASIBLE DUE TO SITE CONSTRAINTS. OVERFLOW FROM DRY WELLS IS DIRECTED INTO CITY SEWERS.			
GI6.3	BOULEVARD INFILTRATION TRENCH	THIS STANDARD DEPICTS AN INFILTRATION TRENCH BENEATH A BOULEVARD AREA. IT IS FUNCTIONALLY SIMILAR TO A ROADWAY INFILTRATION TRENCH BUT WITH ADDITIONAL OPTIONS FOR SUBSURFACE AGGREGATE AND IMPERMEABLE LINER USE.			

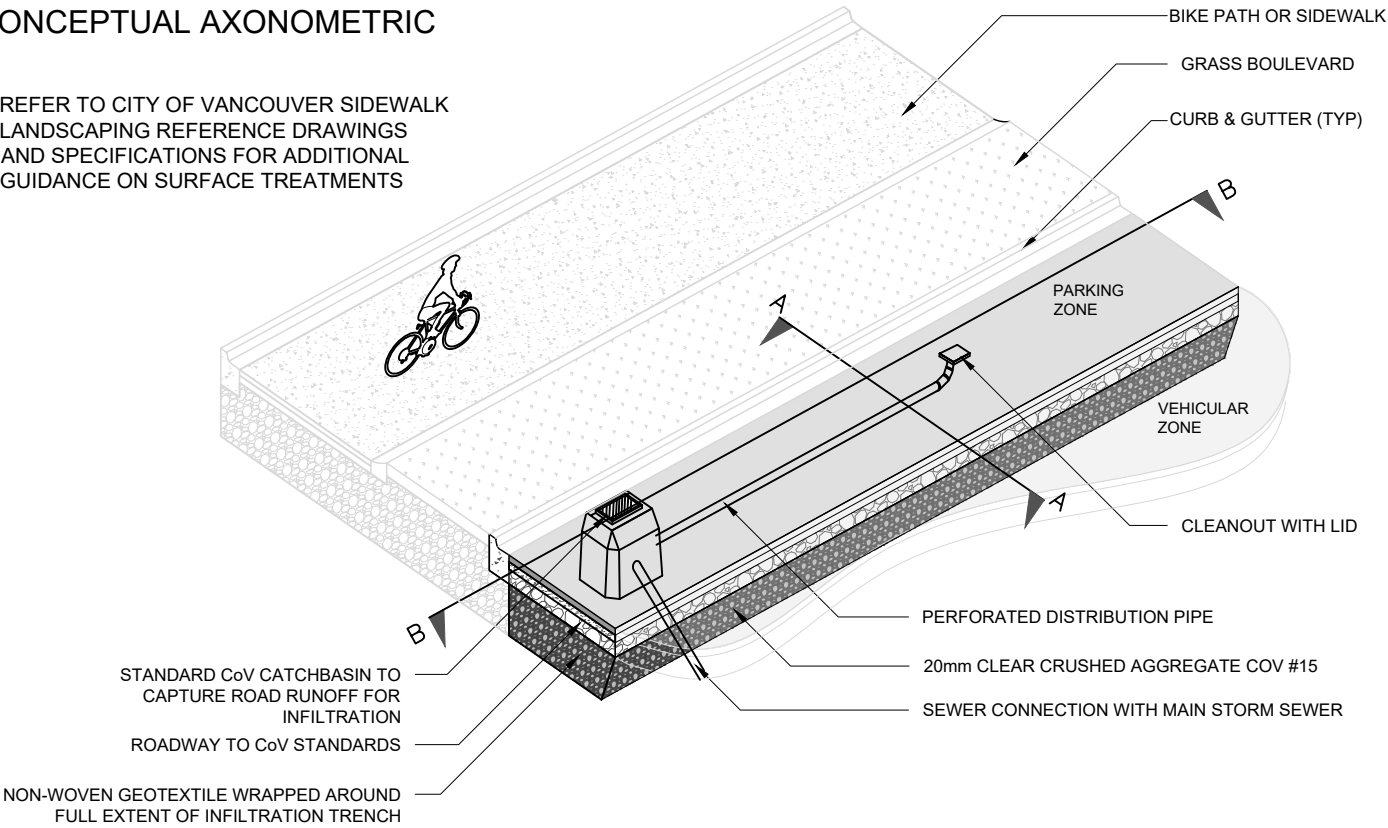


STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

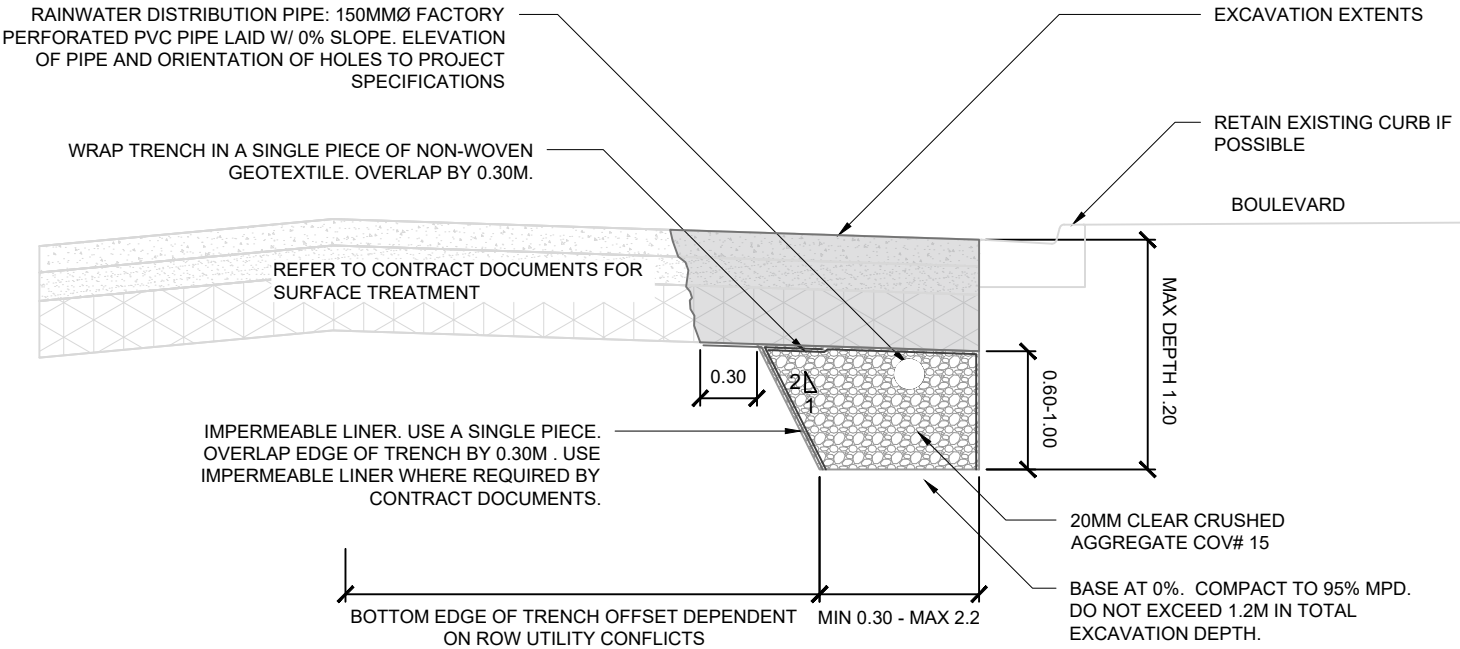
DRAWING No.
GI6.1

CONCEPTUAL AXONOMETRIC

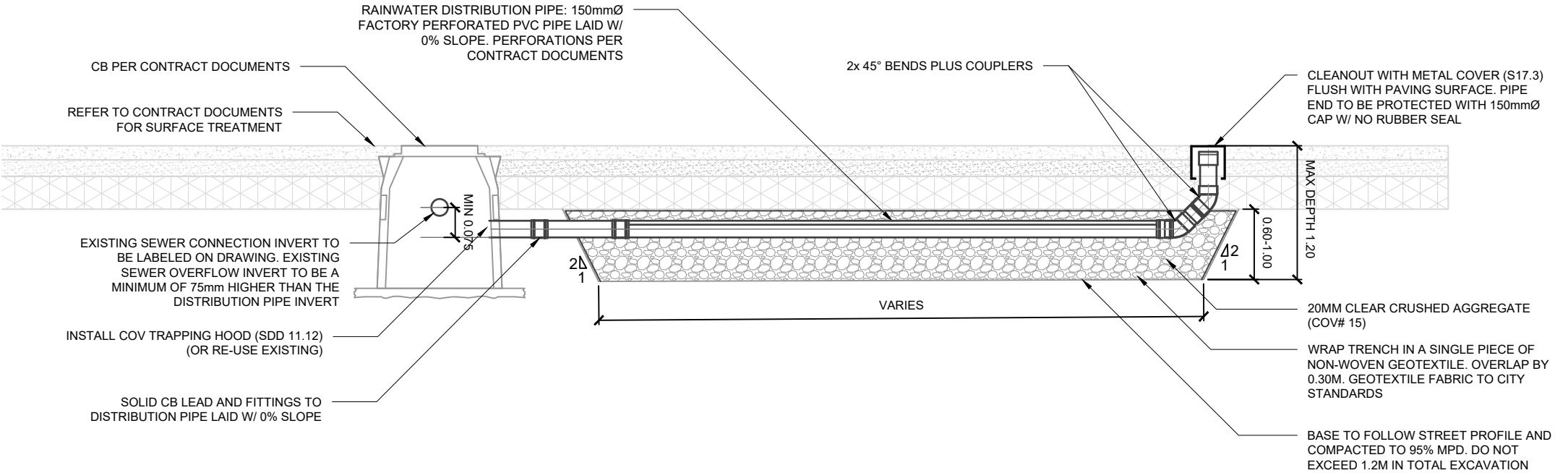
REFER TO CITY OF VANCOUVER SIDEWALK
LANDSCAPING REFERENCE DRAWINGS
AND SPECIFICATIONS FOR ADDITIONAL
GUIDANCE ON SURFACE TREATMENTS



SECTION A-A



SECTION B-B



NOTES

1. LABEL AND DISPLAY ALL UTILITIES AND/OR SERVICES THAT CROSS BELOW OR THROUGH THE INFILTRATION TRENCH ALONG WITH THEIR INVERT ELEVATIONS
2. SHOW ALL UTILITY PROTECTION MEASURES AND SETBACKS FOR SERVICES AND/OR UTILITY CONFLICTS
3. PRE-SURVEY OF THE EXISTING CATCH BASIN (CB) CONDITIONS MUST BE CONDUCTED. THE PICTURES OF CBS (INSIDE AND OUTSIDE) , WELL ORGANIZED AND CORRELATED WITH THE CB LOCATION, ARE SUFFICIENT.
4. CORE OPENING IN THE EXISTING CB WALL TO SUIT PVC PERFORATED PIPE CONNECTION. PVC PIPE IS TO BE SAND BLASTED, COATED WITH ADHESIVE AND SAND (ROUGHEN UP) PRIOR TO THE INSERTION INTO THE CORE. GROUT ANNULAR OPENING AROUND THE PIPE WITH NON-SHRINK GROUT.
5. COV REPRESENTATIVE (SEWER MAINTENANCE INSPECTOR) SHALL INSPECT AND APPROVE THE CONNECTION PRIOR TO THE PIPE BEING BURIED. CONTACT SEWERS AT 604-871-6170 TO ARRANGE FOR INSPECTION. PROVIDE AT LEAST 48 HOURS NOTIFICATION.

INFILTRATION SYSTEMS
ROADWAY INFILTRATION TRENCH

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX

REV.	REVISION DATE	APPROVED

Diagram illustrating a green infrastructure system for a parking zone, showing the integration of a dry well, bike path, grass boulevard, curb and gutter, parking zone, and vehicular zone. The system includes a dry well for water storage and a sewer connection with the main storm sewer. The diagram also shows an existing curb and gutter co-opted for green infrastructure use.

Labels in the diagram include:

- BIKE PATH OR SIDEWALK
- GRASS BOULEVARD
- CURB & GUTTER (TYP)
- PARKING ZONE
- VEHICULAR ZONE
- EXISTING CB CO-OPTED TO GI USE
- SEWER CONNECTION WITH MAIN STORM SEWER
- DRY WELL

Text at the bottom left: REFER TO CITY OF VANCOUVER SIDEWALK LANDSCAPING REFERENCE DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL GUIDANCE

Diagram illustrating the connection between a roadway, boulevard, and sewer main. The diagram shows a cross-section of the ground with the following components and labels:

- SEWER MANHOLE AND VAULT**: Located at the top right, connected to the storm sewer main.
- STORM SEWER MAIN**: A horizontal pipe running from the manhole towards the left.
- ROADWAY**: The surface area above the storm sewer main.
- EXISTING CATCH BASIN AND STORM CONNECTION**: A structure located below the roadway, connected to the storm sewer main.
- REMOVE EXISTING CURB AND GUTTER FOR LEAD CONNECTION. RESTORE TO EXISTING CURB TYPE.**: A note indicating the required work at the catch basin location.
- 150mmØ SOLID PVC DISTRIBUTION PIPE LAID W/ 2% SLOPE. BETWEEN CB AND DRY WELL**: A vertical pipe extending from the catch basin down to the boulevard.
- VARIES**: Two labels indicating variable dimensions: one for the vertical distance between the catch basin and the boulevard, and another for the horizontal distance between the catch basin and the dry well.
- BOULEVARD**: The surface area at the bottom of the diagram.
- REFER TO DRY WELL DETAIL**: A note pointing to the bottom of the vertical pipe, indicating the connection to a dry well.

[illegible]

VARIES

0.15

0.63

0.20

VARIES

0.30

0.15

COV FRAME No.13 AND COVER No.2

CONCRETE COLLAR TO SUPPORT FRAME

24" PVC CHAMBER CUT ON SITE PER CONTRACT DRAWINGS

INSERT-A-TEE CONNECTION FROM STREET CATCH BASIN. NO PERFORATIONS AROUND CONNECTION.

DRY WELL HOLE DIMENSIONS: Ø20mm WITH 100mm CLEARANCE BETWEEN HOLES AND ALTERNATE ROWS

SEDIMENT BASIN (NO PERFORATIONS)

DRILL 10mm HOLES THROUGH CHAMBER WALL JUST ABOVE LEVEL OF CONCRETE PLUG. MIN 8 HOLES EVENLY SPACED

CONCRETE PLUG

REV.	REVISION DATE	APPROVED

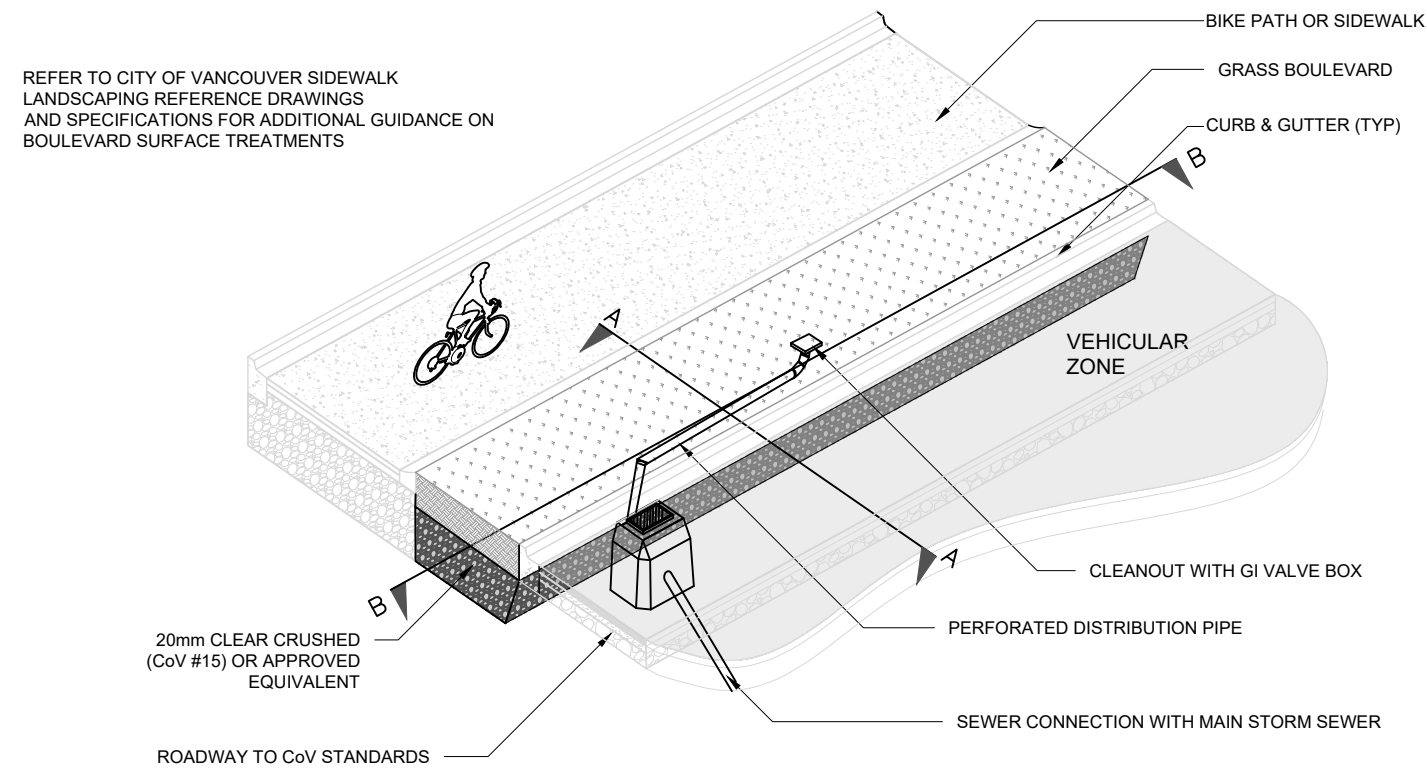
INFILTRATION SYSTEMS

BOULEVARD DRY WELL

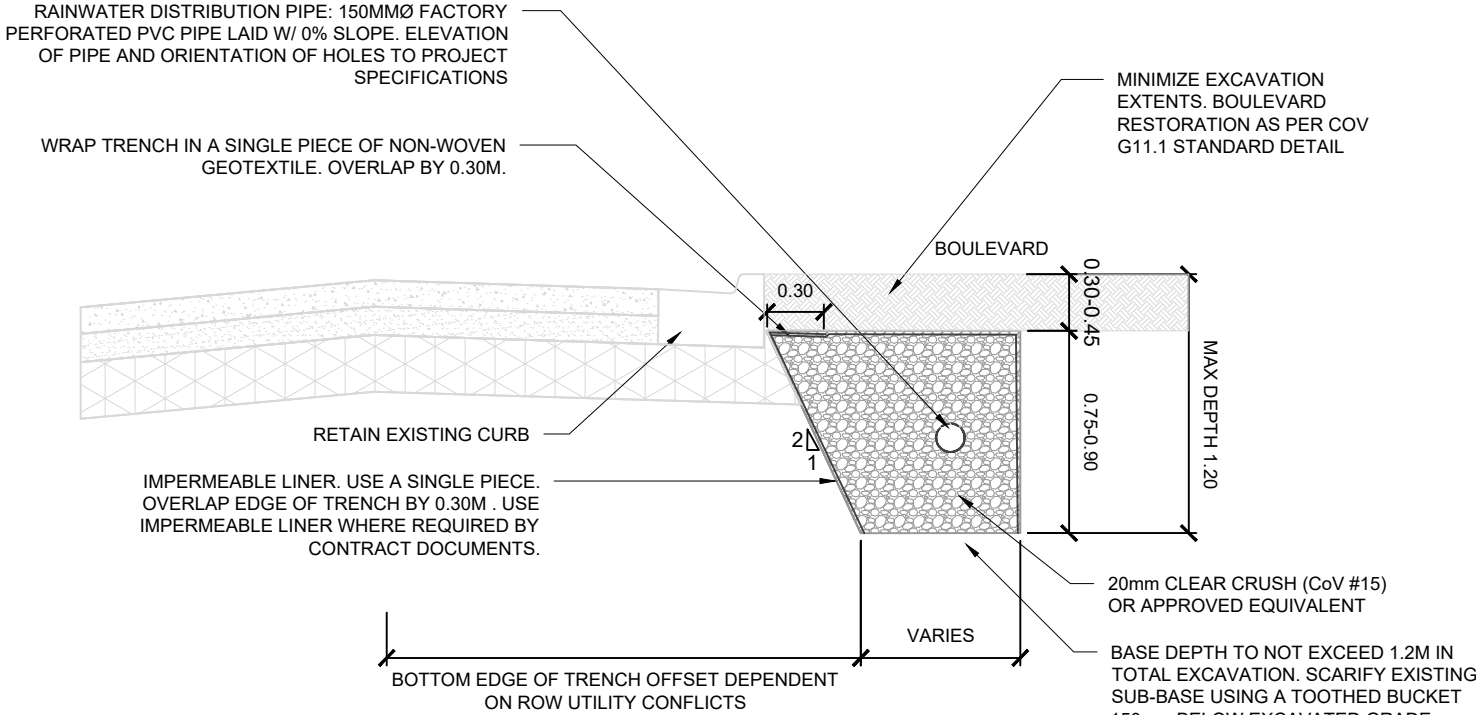
ISSUE DATE: DECEMBER 2023
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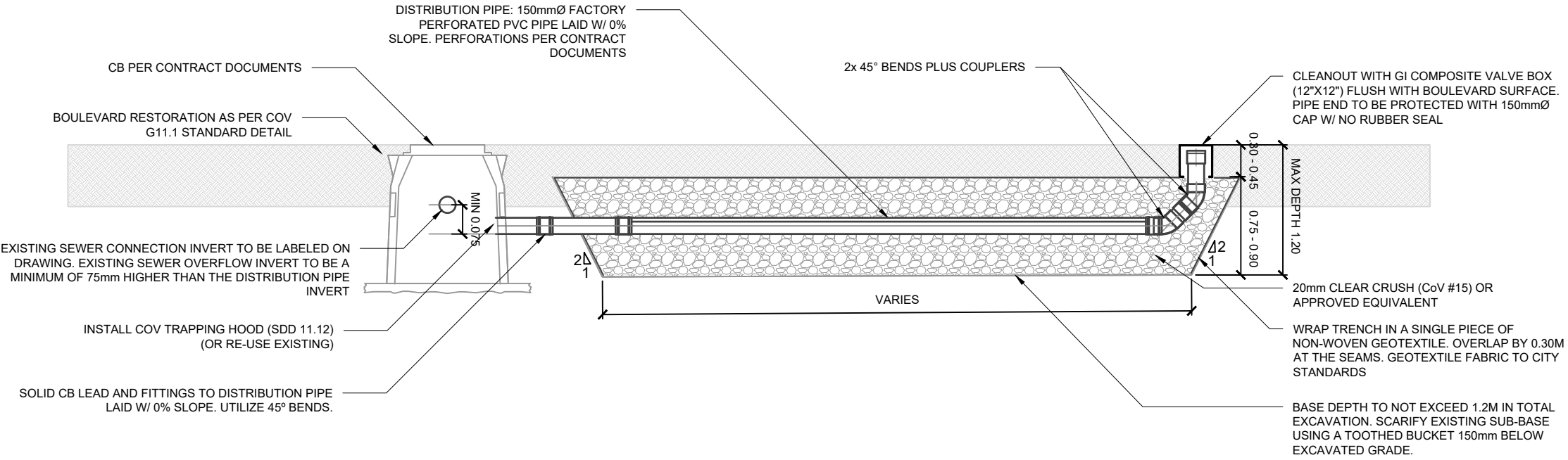
CONCEPTUAL AXONOMETRIC



SECTION A-A



SECTION B-B




NOTES

1. LABEL AND DISPLAY ALL UTILITIES AND/OR SERVICES THAT CROSS BELOW OR THROUGH THE INFILTRATION TRENCH ALONG WITH THEIR INVERT ELEVATIONS
2. SHOW ALL UTILITY PROTECTION MEASURES AND SETBACKS FOR SERVICES AND/OR UTILITY CONFLICTS
3. ECOWASTE RECYCLED GRANITE (25mm) MAY BE USED AS AN ALTERNATIVE FOR CoV #15 IN BOULEVARD INFILTRATION SYSTEMS
4. PRE-SURVEY OF THE EXISTING CATCH BASIN (CB) CONDITIONS MUST BE CONDUCTED. THE PICTURES OF CBS (INSIDE AND OUTSIDE) , WELL ORGANIZED AND CORRELATED WITH THE CB LOCATION, ARE SUFFICIENT.
5. CORE OPENING IN THE EXISTING CB WALL TO SUIT PVC PERFORATED PIPE CONNECTION. PVC PIPE IS TO BE SAND BLASTED, COATED WITH ADHESIVE AND SAND (ROUGHEN UP) PRIOR TO THE INSERTION INTO THE CORE. GROUT ANNULAR OPENING AROUND THE PIPE WITH NON-SHRINK GROUT.
6. COV REPRESENTATIVE (SEWER MAINTENANCE INSPECTOR) SHALL INSPECT AND APPROVE THE CONNECTION PRIOR TO THE PIPE BEING BURIED. CONTACT SEWERS AT 604-871-6170 TO ARRANGE FOR INSPECTION. PROVIDE AT LEAST 48 HOURS NOTIFICATION.

INFILTRATION SYSTEMS
BOULEVARD INFILTRATION TRENCH

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX

REV.	REVISION DATE	APPROVED

	STANDARD DETAIL DRAWINGS ENGINEERING SERVICES - VANCOUVER, B.C.	DRAWING No. GI7.0A
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BIOSWALE DESIGN NOTES AND GUIDANCE

PURPOSE:

BIOSWALE SYSTEMS RETAIN RAINWATER RUNOFF BY PROVIDING SURFACE STORAGE, SUBSURFACE STORAGE AND INFILTRATION INTO NATIVE SOIL. BIOSWALES CAN ALSO REDUCE THE PEAK FLOW ENTERING SEWERS AND REMOVE RAINWATER FROM ENTERING SEWERS. BIOSWALES ARE SIMILAR TO BIORETENTION SYSTEMS BUT CAN PROVIDE SOME SURFACE CONVEYANCE AND ARE GENERALLY EMPLOYED ALONG THE FULL LENGTH OF A ROADWAY. THEY ARE DISTINCT FROM INFILTRATION SYSTEMS BECAUSE THEY INCLUDE SURFACE VEGETATION.

DESIGNER NOTES & GUIDELINES:

1. WHENEVER POSSIBLE, ROAD DRAINAGE SHOULD BE ALLOWED TO DRAIN INTO ROW BIOSWALES THROUGH CURB CUTS. WHERE THIS OCCURS, REFER TO STD. GI7.2.

2. DRAWING 7.1 SHOULD BE USED WHEN NO ROAD DRAINAGE IS NOT DIRECTED TO THE BIOSWALE.

3. THE DESIGNER MUST ADAPT PLAN AND SECTION DRAWINGS TO ADDRESS SITE-SPECIFIC CONDITIONS.

4. SYSTEM SURFACE AREA, PONDING DEPTH, SOIL DEPTH, AND AGGREGATE STORAGE DEPTH MUST BE SIZED TO MEET PROJECT HYDROLOGIC PERFORMANCE GOALS.

5. PONDING AND SYSTEM DRAWDOWN TIME (i.e., TIME FOR MAXIMUM SURFACE PONDING TO DRAIN THROUGH THE SYSTEM AFTER THE END OF A STORM) RECOMMENDATIONS:

☐ 24 HOUR MAXIMUM SURFACE PONDING DRAWDOWN

☐ 72 HOUR MAXIMUM DRAWDOWN FOR RTT SOIL AND AGGREGATE STORAGE

6. BIOSWALE SYSTEMS MAY BE DESIGNED USING AGGREGATE STORAGE OR PROPRIETARY STORAGE SYSTEMS. ALL PROPOSED PRODUCTS FOR USE IN RIGHT-OF-WAYS MUST MEET CITY OF VANCOUVER SPECIFICATIONS REGARDING LOADING CAPACITY OF RIGHT-OF-WAY INFRASTRUCTURE.

7. WHEN FACILITY CONSTRUCTION IMPACTS EXISTING SIDEWALK, ALL SAW CUTS MUST ADHERE TO CITY OF VANCOUVER REQUIREMENTS. SAW CUTS SHOULD BE ALONG SCORE LINES AND ANY DISTURBED SIDEWALK PANELS SHOULD BE REPLACED IN THEIR ENTIRETY.

8. GI FACILITIES IN PUBLIC RIGHT OF WAY SHALL BE DESIGNED WITH A SAFE, DESIGNATED OVERLAND FLOW PATH TO THE STREET IN THE EVENT THAT THE OVERFLOW STRUCTURE IS OBSTRUCTED OR CLOGGED. THIS FLOW PATH SHOULD BE REFLECTED IN SITE GRADING AND LABELED ON GI DRAWINGS.

9. THE DESIGNER MUST EVALUATE UTILITY SURVEYS FOR POTENTIAL UTILITY CROSSINGS OR CONFLICTS.

10. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT CITY OF VANCOUVER ASSET PROTECTION STANDARDS AND OTHER UTILITY PROVIDER REQUIREMENTS.

RELATED DETAILS					
EDGE TREATMENTS	<table><tr><td>GI</td><td>GI</td></tr><tr><td>3.5</td><td>3.6</td></tr></table>	GI	GI	3.5	3.6
GI	GI				
3.5	3.6				
INLETS	<table><tr><td>GI</td><td>GI</td></tr><tr><td>2.1</td><td>2.6</td></tr></table>	GI	GI	2.1	2.6
GI	GI				
2.1	2.6				
UNDERDRAINS:	<table><tr><td>GI</td></tr><tr><td>3.7</td></tr></table>	GI	3.7		
GI					
3.7					
CHECK DAMS:	<table><tr><td>GI</td></tr><tr><td>4.7</td></tr></table>	GI	4.7		
GI					
4.7					
MONITORING WELL	<table><tr><td>GI</td></tr><tr><td>3.2</td></tr></table>	GI	3.2		
GI					
3.2					
CLEANOUTS	<table><tr><td>GI</td></tr><tr><td>3.4</td></tr></table>	GI	3.4		
GI					
3.4					
WEIRS AND SEDIMENT PAD	<table><tr><td>GI</td><td>GI</td></tr><tr><td>4.5</td><td>4.6</td></tr></table>	GI	GI	4.5	4.6
GI	GI				
4.5	4.6				
INSPECTION CHAMBERS	<table><tr><td>GI</td></tr><tr><td>3.3</td></tr></table>	GI	3.3		
GI					
3.3					
CATCHBASINS	<table><tr><td>GI</td><td>GI</td></tr><tr><td>3.1</td><td>3.8</td></tr></table>	GI	GI	3.1	3.8
GI	GI				
3.1	3.8				

RELATED SPECIFICATIONS	COV SPEC NO.
- AGGREGATE STORAGE	32 11 23
- DRAINAGE FABRIC	31 32 20
- LINERS	33 47 13.13
- ENGINEERED SOIL	32 91 22S
- BIORETENTION SOIL*	32 91 23S

* TEMPLATE ONLY. AVAILABLE UPON REQUEST FROM THE GII BRANCH.

LAYOUT REQUIREMENTS:

1. REFER TO THE CITY OF VANCOUVER ACCESSIBILITY STRATEGY, STANDARD DRAWINGS AND CONSTRUCTION SPECIFICATIONS FOR RIGHT-OF-WAY, PARKING SPACE, AND ACCESSIBLE PATH REQUIREMENTS.

2. LOCATE CURB CUTS AND GUTTER MODIFICATIONS TO AVOID CONFLICTS WITH ACCESSIBILITY REQUIREMENTS (E.G., LOCATE OUTSIDE OF CROSSWALKS).

DESIGNER CHECKLIST (MUST SPECIFY, AS APPLICABLE):

☐ SYSTEM WIDTH AND LENGTH

☐ DEPTH OF PONDING (IF APPLICABLE)

☐ DEPTH OF SYSTEM

☐ DEPTH AND TYPE OF AGGREGATE STORAGE

☐ SURFACE ELEVATION AT UPSLOPE AND DOWNSLOPE ENDS OF FACILITY

☐ DIMENSIONS AND DISTANCE TO EVERY MUNICIPAL SERVICE/UTILITY WITHIN 10m OF THE FACILITY

☐ ELEVATIONS OF EVERY INLET, OUTLET, STRUCTURE RIM AND INVERT,

☐ TYPE AND DESIGN OF COMPONENTS (E.G., EDGE TREATMENTS, INLETS/GUTTER MODIFICATIONS, UTILITY CROSSINGS, LINER, AND PLANTING DETAILS)

REV.	REVISION DATE	APPROVED	BIOSWALES DESIGN NOTES AND GUIDANCE		

ISSUE DATE: DECEMBER 2023

APPROVED BY: N. MEAD-FOX

DRAWING No.

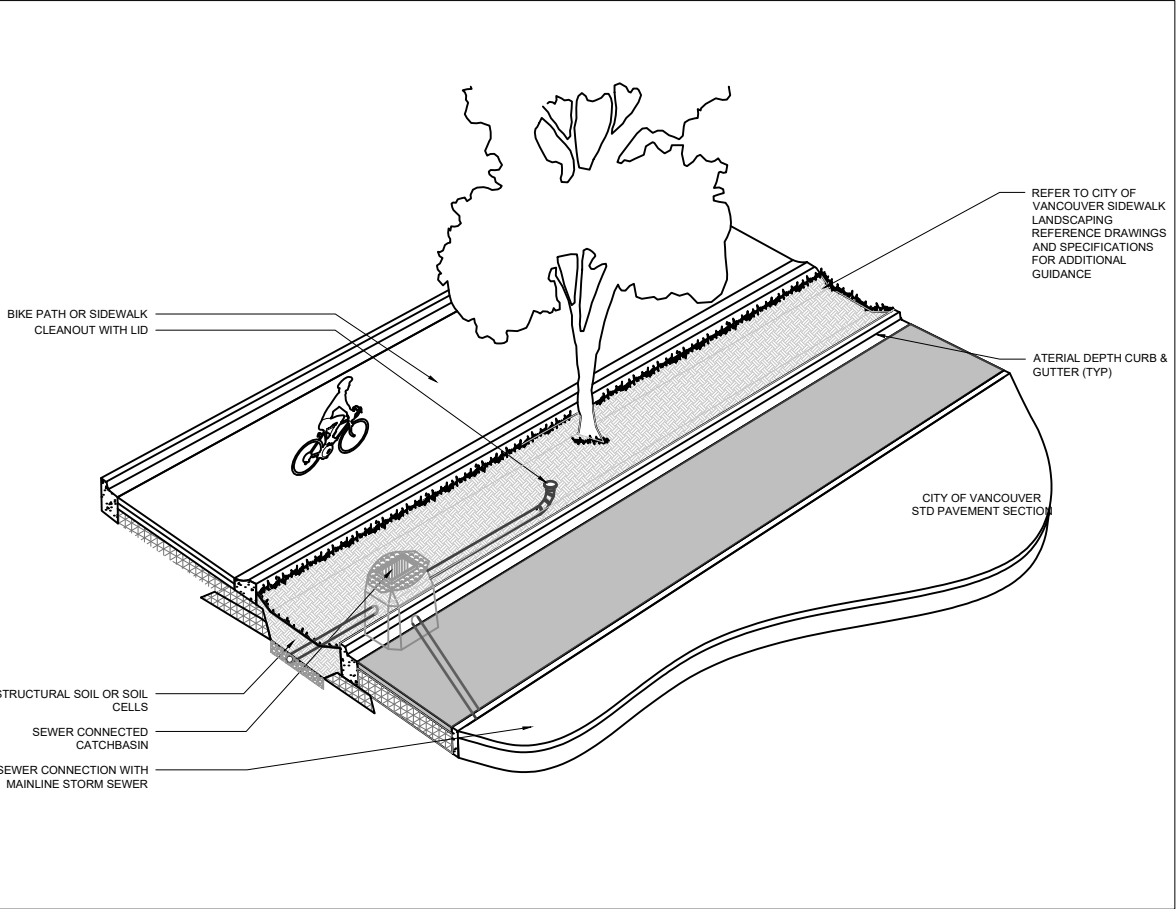
BIOSWALE DRAWING DESCRIPTIONS		
G17.0A	BIOSWALE DESIGN NOTES AND GUIDANCE	THE BIOSWALE DESIGN NOTES PROVIDE GUIDANCE TO DESIGNERS ON HOW TO USE AND ADAPT THE TEMPLATE STANDARDS IN THIS SECTION.
G17.0B	BIOSWALE DRAWING DESCRIPTIONS	THIS DRAWING DESCRIBES THE PURPOSE AND INTENDED USE OF EACH RAINWATER TREE TRENCH DRAWING
G17.1	BIOSWALE - NO ROAD DRAINAGE	G17.1 IS FOR SYSTEMS THAT ONLY RECEIVE OVERLAND DRAINAGE FROM ADJACENT SIDEWALKS, BOULEVARDS, OR BIKE LANES. THIS SYSTEM SHOULD ONLY BE USED WHEN ROADWAY DRAINAGE CAPTURE IS DEEMED INFEASIBLE OR IF THE ALLOCATED BOULEVARD SPACE IS NOT SUFFICIENT TO ACCOMMODATE ROAD RUNOFF.
G17.2	BIOSWALE - RECEIVING ROAD DRAINAGE	G17.2 IS FOR BIOSWALES THAT RECEIVE OVERLAND DRAINAGE FROM THE ROADWAY THROUGH CURB CUTS. THIS DESIGN IS PREFERRED TO G17.1 BECAUSE IT CAN CAPTURE A LARGER DRAINAGE AREA AND USES THE FULL CAPACITY OF THE SWALE.

			<div style="text-align: center;"> <h1>BIOSWALES</h1> <h2>BIOSWALE DRAWING DESCRIPTIONS</h2> </div>	ISSUE DATE: DECEMBER 2023
				APPROVED BY: <u>N. MEAD-FOX</u>
REV.	REVISION DATE	APPROVED		

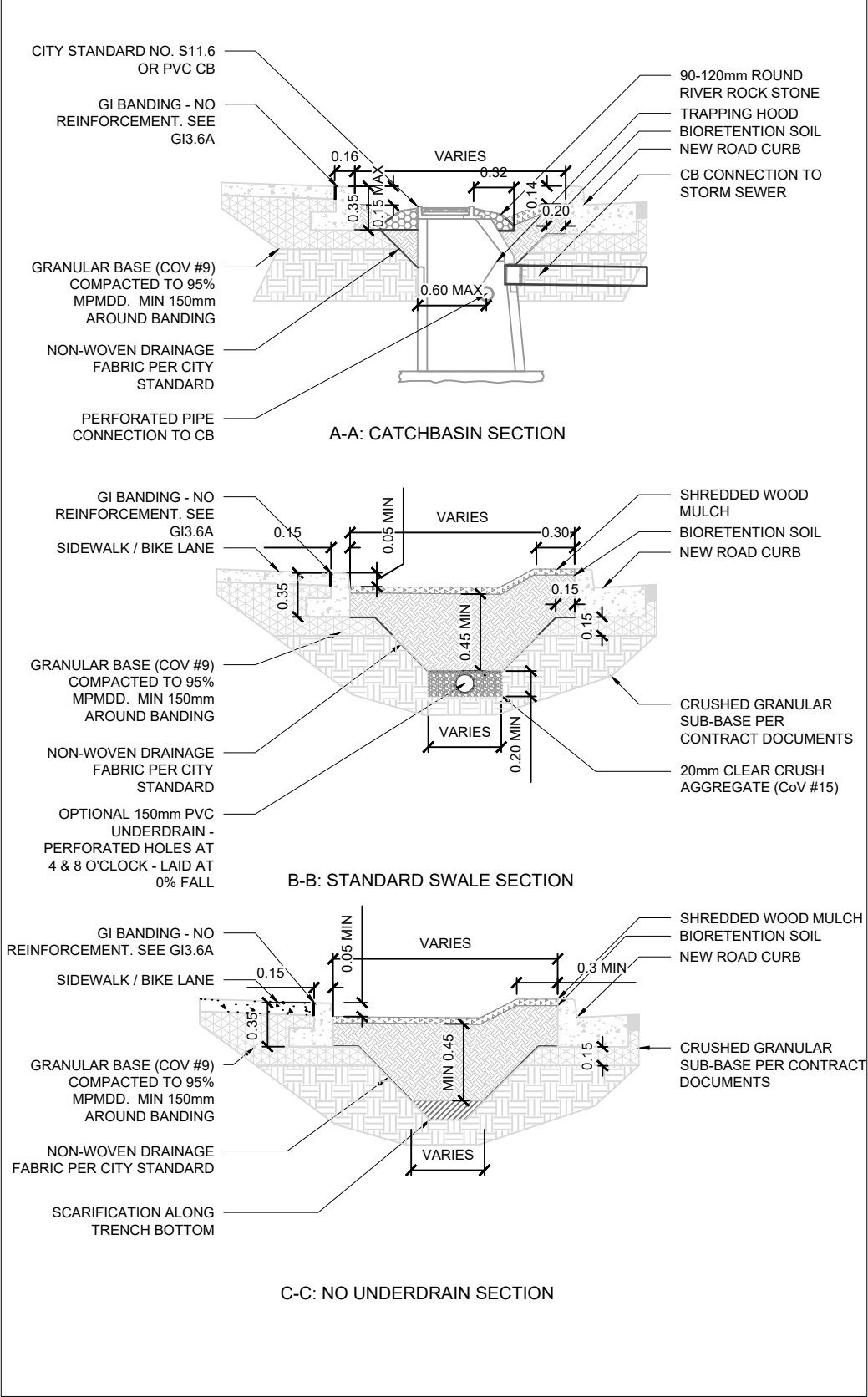
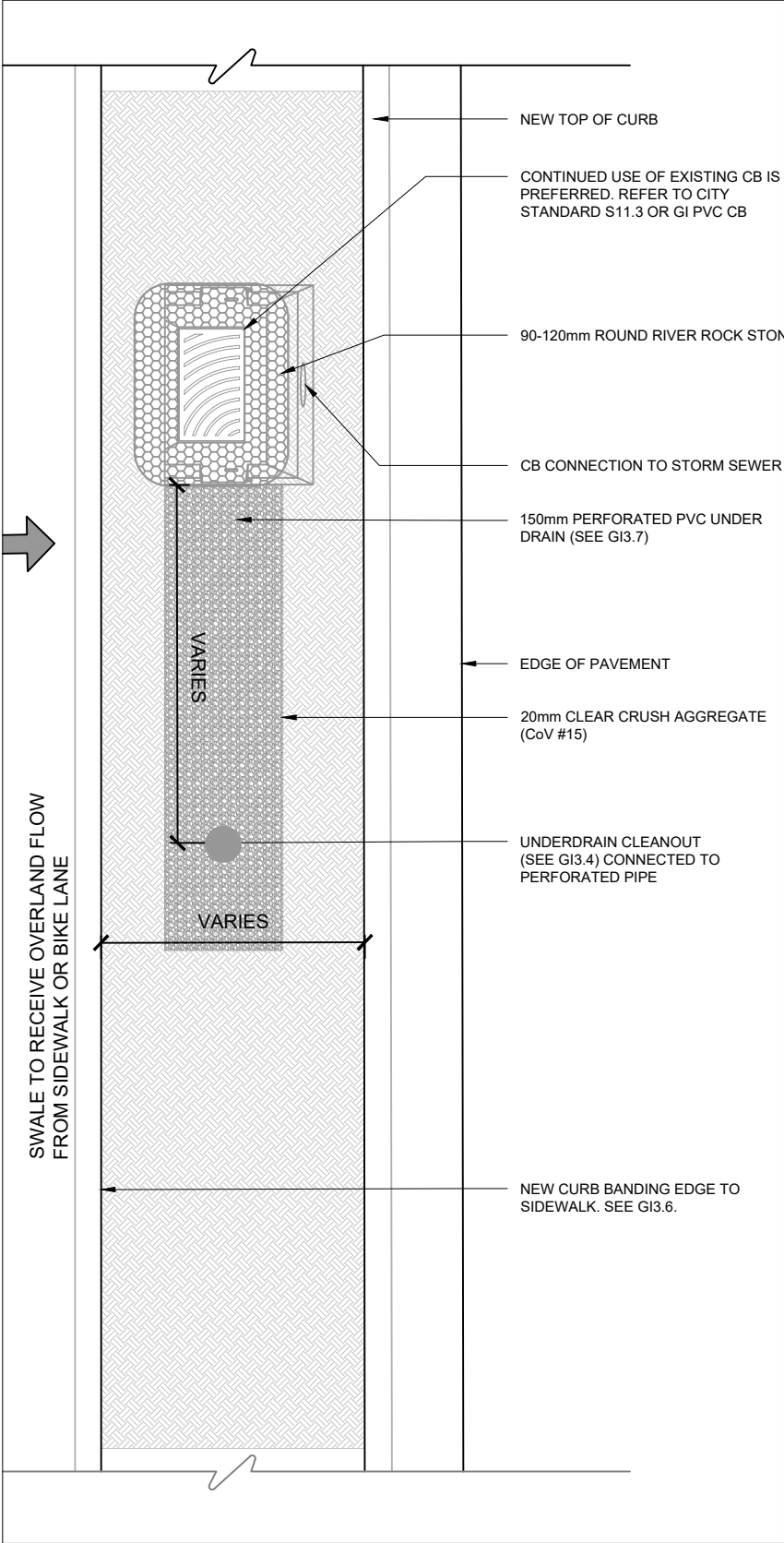


STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
G17.1



- NOTES:**
1. IF APPROVED BY PROJECT ENGINEER, CATCHBASINS MAY BE REPLACED WITH PVC CATCHBASINS (G13.8)
 2. LABEL AND DISPLAY ALL UTILITIES AND/OR SERVICES THAT CROSS BELOW OR THROUGH THE INFILTRATION TRENCH ALONG WITH THEIR INVERT ELEVATIONS
 3. SHOW ALL UTILITY PROTECTION MEASURES AND SETBACKS FOR SERVICES AND/OR UTILITY CONFLICTS
 4. PRE-SURVEY OF THE EXISTING CATCH BASIN (CB) CONDITIONS MUST BE CONDUCTED. THE PICTURES OF CBS (INSIDE AND OUTSIDE) , WELL ORGANIZED AND CORRELATED WITH THE CB LOCATION, ARE SUFFICIENT.
 5. CORE OPENING IN THE EXISTING CB WALL TO SUIT PVC PERFORATED PIPE CONNECTION. PVC PIPE IS TO BE SAND BLASTED, COATED WITH ADHESIVE AND SAND (ROUGHEN UP) PRIOR TO THE INSERTION INTO THE CORE. GROUT ANNULAR OPENING AROUND THE PIPE WITH NON-SHRINK GROUT.
 6. COV REPRESENTATIVE (SEWER MAINTENANCE INSPECTOR) SHALL INSPECT AND APPROVE THE CONNECTION PRIOR TO THE PIPE BEING BURIED. CONTACT SEWERS AT 604-871-6170 TO ARRANGE FOR INSPECTION. PROVIDE AT LEAST 48 HOURS NOTIFICATION.



REV.	REVISION DATE	APPROVED

BIOSWALES
BIOSWALE - NO ROAD DRAINAGE

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX

CURB CUT INLET

BIKE PATH OR SIDEWALK

REFER TO CITY OF VANCOUVER SIDEWALK LANDSCAPING REFERENCE DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL GUIDANCE

ARTERIAL DEPTH CURB & GUTTER (TYP)

CITY OF VANCOUVER STD PAVEMENT SECTION

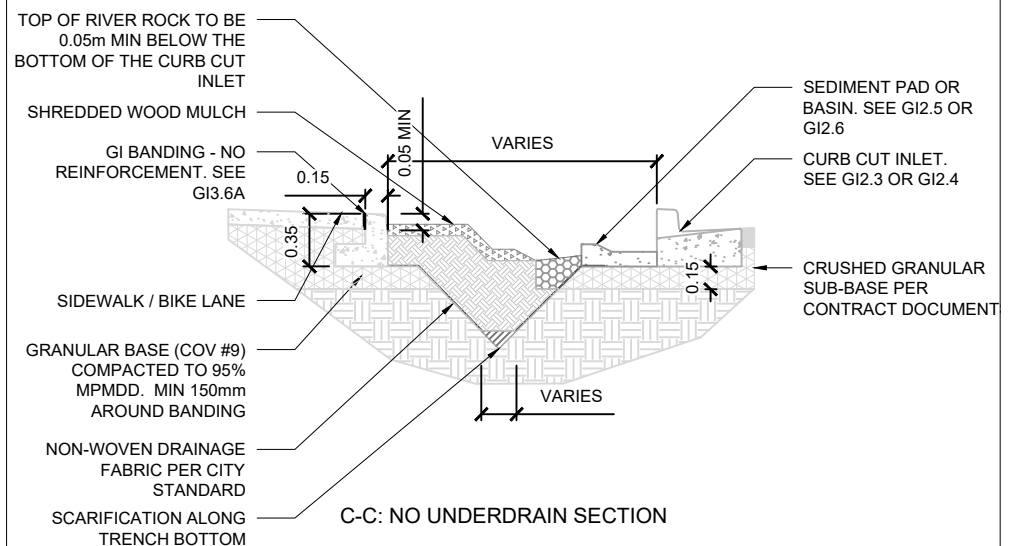
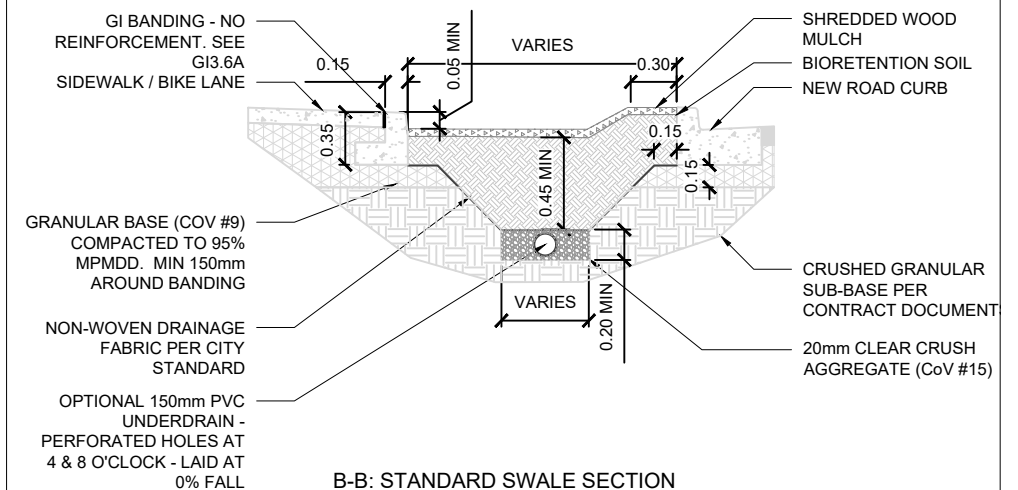
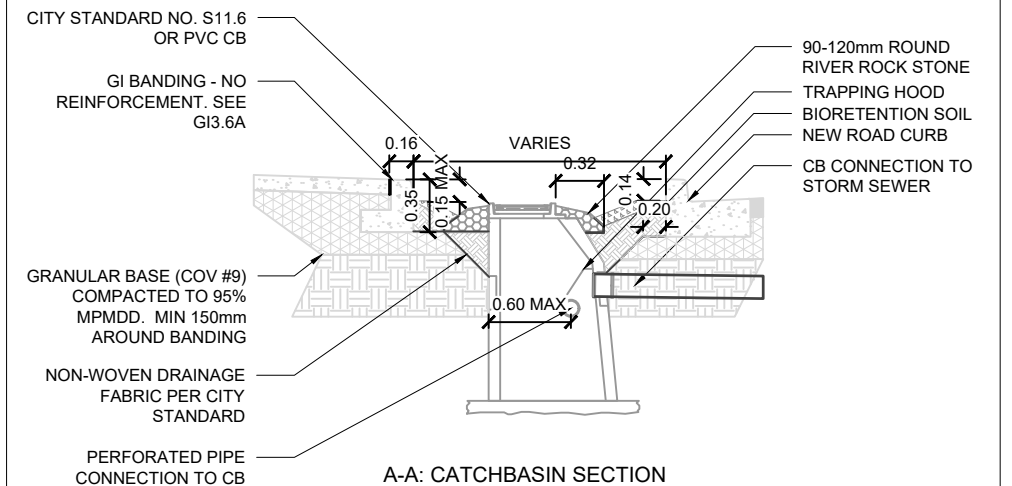
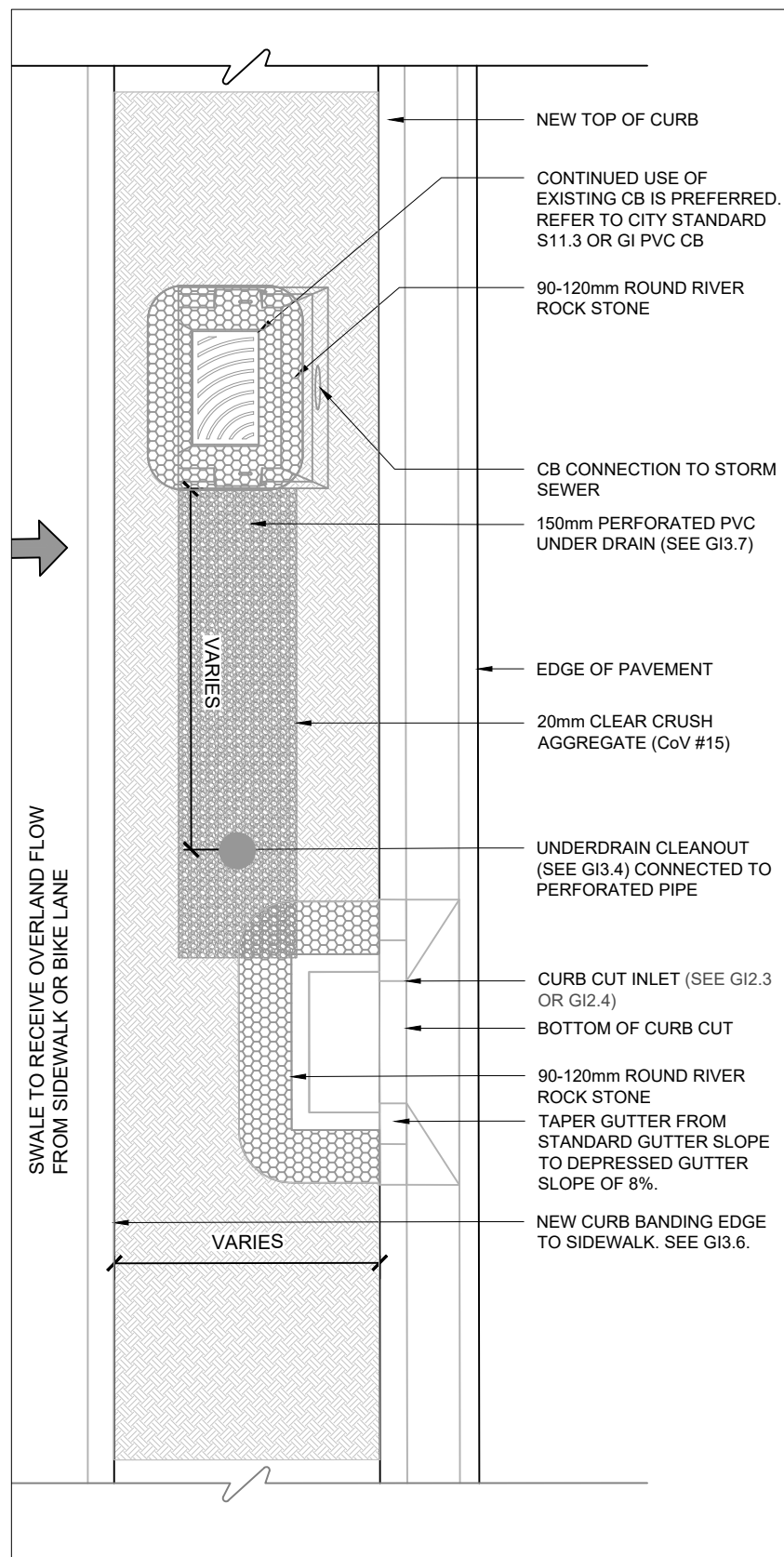
CLEANOUT WITH LID

SEWER CONNECTION WITH MAINLINE STORM SEWER

NATURAL SOIL OR SOIL CELLS

SEWER CONNECTED CATCHBASIN


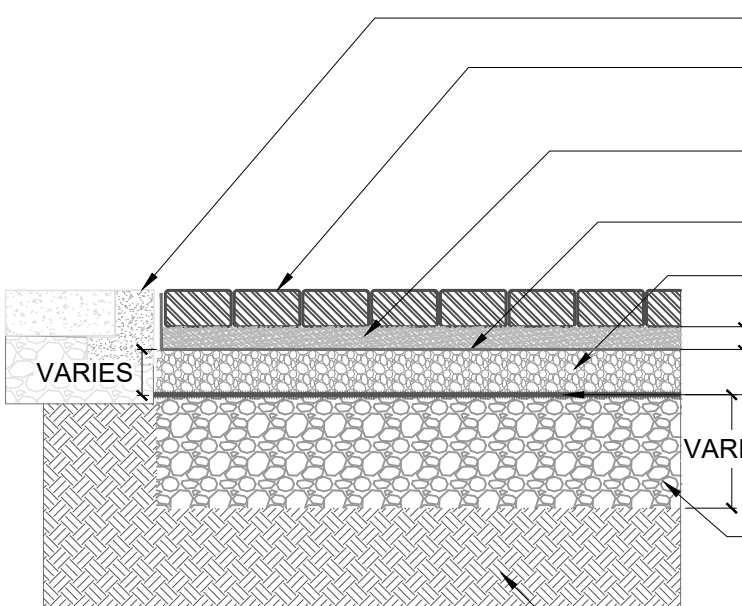
1. IF APPROVED BY PROJECT ENGINEER, CATCHBASINS MAY BE REPLACED WITH PVC CATCHBASINS (G3.8)
2. LABEL AND DISPLAY ALL UTILITIES AND/OR SERVICES THAT CROSS BELOW OR THROUGH THE INFILTRATION TRENCH ALONG WITH THEIR INVERT ELEVATIONS
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6. COV REPRESENTATIVE (SEWER MAINTENANCE INSPECTOR) SHALL INSPECT AND APPROVE THE CONNECTION PRIOR TO THE PIPE BEING BURIED. CONTACT SEWERS AT 604-871-6170 TO ARRANGE FOR INSPECTION. PROVIDE AT LEAST 48 HOURS NOTIFICATION.

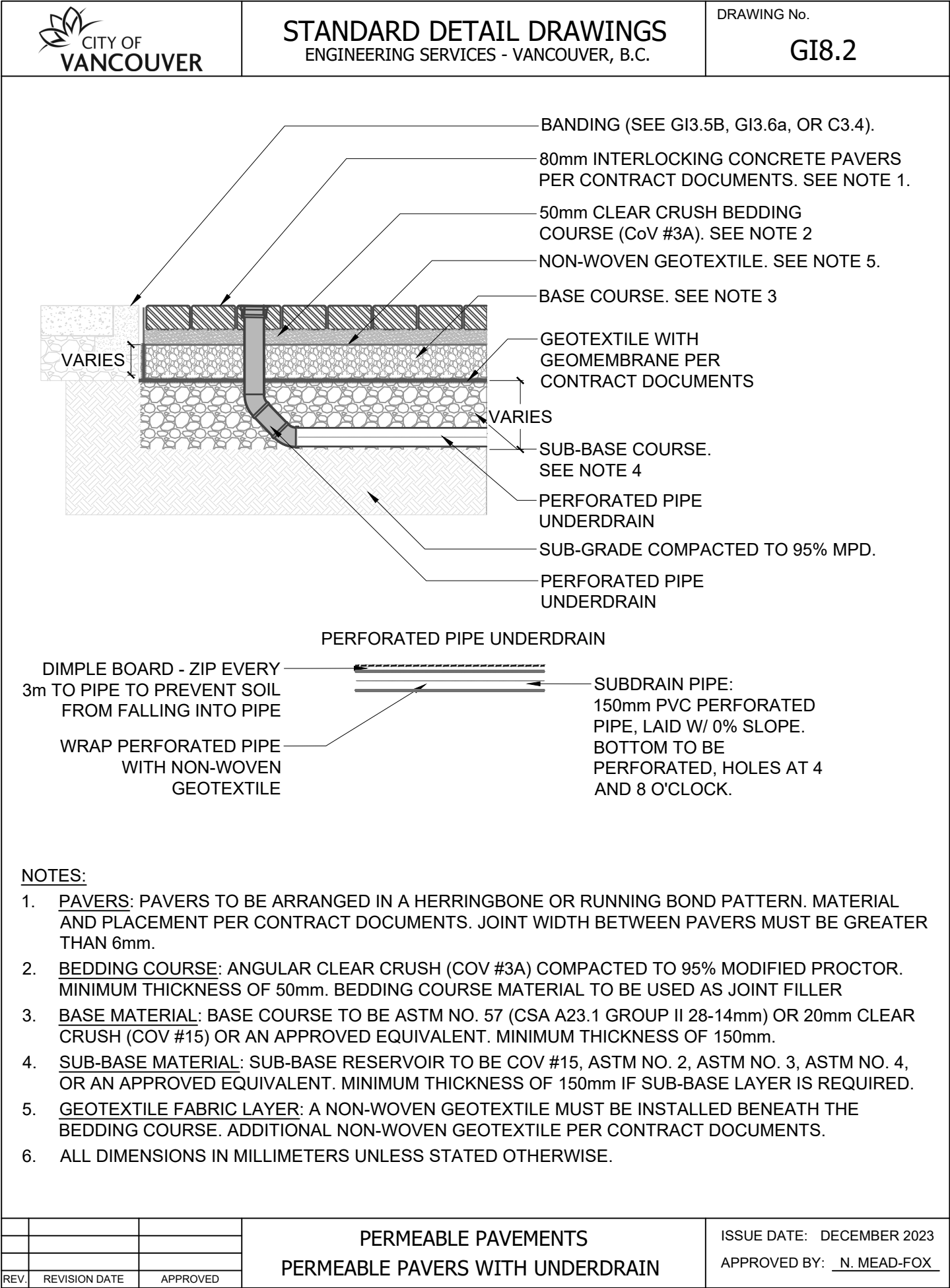



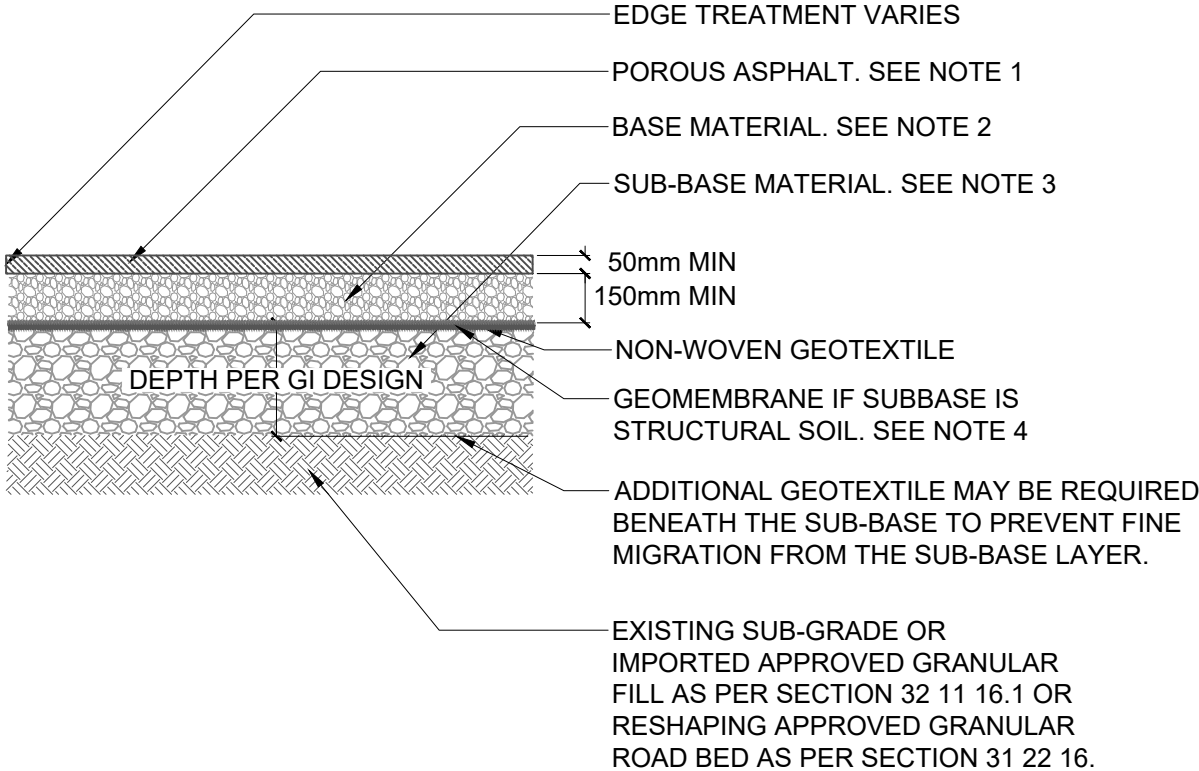
REV.	REVISION DATE	APPROVED

BIOSWALES
BIOSWALE - RECEIVING ROAD DRAINAGE

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX

		STANDARD DETAIL DRAWINGS ENGINEERING SERVICES - VANCOUVER, B.C.		DRAWING No. GI8.1												
<div><p>BANDING (SEE GI3.5B OR C3.4).</p><p>80mm INTERLOCKING CONCRETE PAVERS PER CONTRACT DOCUMENTS. SEE NOTE 1.</p><p>50mm CLEAR CRUSH BEDDING COURSE (CoV #3A). SEE NOTE 2</p><p>NON-WOVEN GEOTEXTILE. SEE NOTE 5.</p><p>BASE COURSE. SEE NOTE 3</p><p>VARIES</p><p>GEOTEXTILE WITH GEOMEMBRANE PER CONTRACT DOCUMENTS</p><p>VARIES</p><p>SUB-BASE COURSE. SEE NOTE 4</p><p>SUB-GRADE COMPACTED TO 95% MPD.</p></div>																
<p>NOTES:</p> <p>1. <u>PAVERS</u>: PAVERS TO BE ARRANGED IN A HERRINGBONE OR RUNNING BOND PATTERN. MATERIAL AND PLACEMENT PER CONTRACT DOCUMENTS. JOINT WIDTH BETWEEN PAVERS MUST BE GREATER THEN 6mm,</p> <p>2. <u>BEDDING COURSE</u>: ANGULAR CLEAR CRUSH (COV #3A) COMPACTED TO 95% MODIFIED PROCTOR. MINIMUM THICKNESS OF 50mm. BEDDING COURSE MATERIAL TO BE USED AS JOINT FILLER.</p> <p>3. <u>BASE MATERIAL</u>: BASE COURSE TO BE ASTM NO. 57 (CSA A23.1 GROUP II 28-14mm) OR 20mm CLEAR CRUSH (COV #15) OR AN APPROVED EQUIVALENT. MINIMUM THICKNESS OF 150mm.</p> <p>4. <u>SUB-BASE MATERIAL</u>: SUB-BASE RESERVOIR TO BE COV #15, ASTM NO. 2, ASTM NO. 3, ASTM NO. 4, OR AN APPROVED EQUIVALENT. DEPTH TO BE DETERMINED BY GI BRANCH. MINIMUM THICKNESS OF 300mm ON LANEWAYS</p> <p>5. <u>GEOTEXTILE FABRIC LAYER</u>: A NON-WOVEN GEOTEXTILE MUST BE INSTALLED BENEATH THE BEDDING COURSE. ADDITIONAL NON-WOVEN GEOTEXTILE PER CONTRACT DOCUMENTS.</p> <p>6. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.</p>																
<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td>REV.</td><td>REVISION DATE</td><td>APPROVED</td></tr></table>											REV.	REVISION DATE	APPROVED	PERMEABLE PAVEMENTS PERMEABLE CONCRETE PAVERS		ISSUE DATE: DECEMBER 2023 APPROVED BY: <u>N. MEAD-FOX</u>
REV.	REVISION DATE	APPROVED														

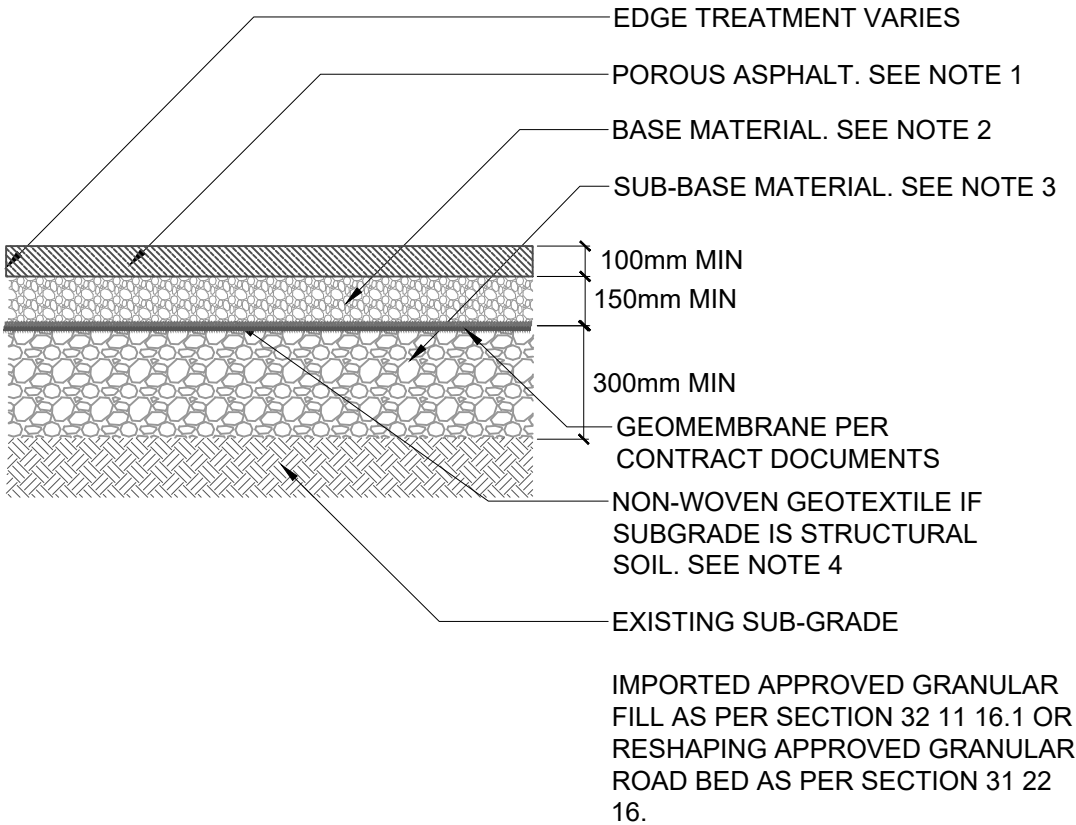


		STANDARD DETAIL DRAWINGS ENGINEERING SERVICES - VANCOUVER, B.C.		DRAWING No. GI8.3									
<div></div>													
<p>NOTES:</p> <ol style="list-style-type: none"><u>POROUS ASPHALT</u>: 50mm MIN. MATERIAL PER CONTRACT DOCUMENTS<u>BASE MATERIAL</u>: BASE COURSE TO BE ASTM NO. 57 (CSA A23.1 GROUP II 28-14mm) OR 20mm CLEAR CRUSH (COV #15) OR AN APPROVED EQUIVALENT. MINIMUM THICKNESS OF 150mm.<u>SUB-BASE MATERIAL</u>: SUB-BASE RESERVOIR IS OPTIONAL IF THE EXISTING NATIVE SUBGRADE IS APPROVED BY THE GEOTECHNICAL ENGINEER. MINIMUM THICKNESS TO BE 150mm IF SUB-BASE LAYER IS REQUIRED. ADDITIONAL DEPTH TO BE DETERMINED BY GI DESIGN REQUIREMENTS. ACCEPTABLE MATERIALS INCLUDE COV #15, STRUCTURAL SOIL, ASTM NO. 2, ASTM NO. 3, ASTM NO. 4, OR OTHER APPROVED EQUIVALENT<u>GEOTEXTILE FABRIC</u>: NON-WOVEN GEOTEXTILE PER CONTRACT DOCUMENTS.<u>GEOMEMBRANE</u>: GEOMEMBRANE IS OPTIONAL. PER CONTRACT DOCUMENTS<u>EDGE TREATMENT</u>: CONCRETE EDGE TREATMENT IS REQUIRED AT THE BOUNDARY OF ALL BIKELANES. SEE GI3.5B OR C3.4.ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.													
<table><tr><td>REV.</td><td>REVISION DATE</td><td>APPROVED</td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></table>		REV.	REVISION DATE	APPROVED							PERMEABLE PAVEMENTS POROUS ASPHALT BIKELANE		ISSUE DATE: DECEMBER 2023 APPROVED BY: <u>N. MEAD-FOX</u>
REV.	REVISION DATE	APPROVED											



STANDARD DETAIL DRAWINGS
ENGINEERING SERVICES - VANCOUVER, B.C.

DRAWING No.
GI8.4



NOTES:

- 1. POROUS ASPHALT: 100mm MIN. POROUS ASPHALT MATERIAL OR PER CONTRACT DOCUMENTS
- 2. BASE MATERIAL: BASE COURSE TO BE ASTM NO. 57 (CSA A23.1 GROUP II 28-14mm) OR 20mm CLEAR CRUSH (COV #15) OR AN APPROVED EQUIVALENT. MINIMUM THICKNESS OF 150mm.
- 3. SUB-BASE MATERIAL: SUB-BASE RESERVOIR TO BE COV #15, STRUCTURAL SOIL, ASTM NO. 2, ASTM NO. 3, ASTM NO. 4, OR AN APPROVED EQUIVALENT. MINIMUM THICKNESS OF 300mm
- 4. GEOTEXTILE FABRIC: NON-WOVEN GEOTEXTILE PER CONTRACT DOCUMENTS.
- 5. GEOMEMBRANE: GEOMEMBRANE (OPTIONAL) PER CONTRACT DOCUMENTS
- 6. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

REV.	REVISION DATE	APPROVED

PERMEABLE PAVEMENTS
POROUS ASPHALT LANEWAY

ISSUE DATE: DECEMBER 2023
APPROVED BY: N. MEAD-FOX

