PURPOSE:

PROVISION C.3 OF THE MUNICIPAL REGIONAL STORMWATER NPDES PERMIT (MRP) REQUIRES TREATMENT OF IMPERVIOUS SURFACES USING GREEN INFRASTRUCTURE FOR BOTH PUBLIC AND PRIVATE DEVELOPMENT PROJECTS. BIORETENTION AREAS ARE EXPECTED TO BE THE MOST COMMON GREEN INFRASTRUCTURE APPLICATION IN PUBLIC RIGHT-OF-WAY (ROW). THE PURPOSE OF THE BIORETENTION AREA IS TO IMPROVE WATER QUALITY BY FILTRATION THROUGH THE BIOTREATMENT SOIL AND TO CONTROL RUNOFF PEAK FLOW RATES AND VOLUMES THROUGH STORAGE AND INFILTRATION.

NOTES & GUIDELINES:

1. THE DESIGNER SHALL ADAPT PLAN AND SECTION DRAWINGS TO ADDRESS SITE-SPECIFIC CONDITIONS.
2. BIORETENTION AREA SHALL BE SIZED TO MEET THE REQUIREMENTS OF MRP PROVISION C.3 SIZING.
3. 48 HOUR MAXIMUM FACILITY DRAWDOWN TIME (TIME FOR MAXIMUM SURFACE PONDING TO DRAIN THROUGH THE BIOTREATMENT SOIL AFTER THE END OF A STORM). REFER TO C.3 TECHNICAL GUIDANCE MANUAL (ACCWP) FOR DRAINAGE CONSIDERATIONS.
4. AN AGGREGATE STORAGE LAYER IS REQUIRED UNDER THE BIOTREATMENT SOIL. REFER TO C.3 TECHNICAL GUIDANCE MANUAL (ACCWP) FOR SPECIFICATIONS AND TO DETAIL **GI-3A** NOTE 4 FOR OPTIONS.
5. BIORETENTION VERTICAL WALL SLOPES ARE TYPICALLY DESIGNED TO MATCH THE LONGITUDINAL SLOPE OF THE ADJACENT ROADWAY/SIDEWALK. CHECK DAMS SHALL BE USED FOR HIGHER-SLOPED INSTALLATIONS TO TERRACE FACILITIES TO PROVIDE SUFFICIENT PONDING AND MINIMIZE LARGE ELEVATION DROPS FROM ADJACENT SURFACES. DESIGNER MUST SPECIFY CHECK DAM HEIGHT AND SPACING. REFER TO DETAIL **GI-7** FOR GUIDANCE ON CHECK DAM DESIGN.
6. DEPENDING ON THE DEPTH OF THE BIORETENTION AREA, ADDITIONAL STRUCTURAL CONSIDERATIONS MAY BE REQUIRED TO ADDRESS HORIZONTAL LOADING. REFER TO DETAIL **GI-5** FOR GUIDANCE ON EDGE TREATMENTS.
7. WHEN FACILITY CONSTRUCTION IMPACTS EXISTING SIDEWALK, ALL SAW CUTS SHALL ADHERE TO CITY STANDARDS. SAW CUTS SHALL BE ALONG SCORE LINES OR ALONG CONSTRUCTION JOINTS, AS DETERMINED BY THE CITY ENGINEER, AND ANY DISTURBED SIDEWALK FLAGS SHALL BE REPLACED IN THEIR ENTIRETY.
8. BIORETENTION AREAS IN PUBLIC RIGHT OF WAY SHALL BE DESIGNED WITH AN EMERGENCY OVERFLOW. IN THE EVENT THE BIORETENTION AREA OVERFLOW DRAIN IS OBSTRUCTED OR CLOGGED, THE INUNDATION AREA SHALL BE CONTAINED WITHIN THE STREET AND SHALL NOT BE WITHIN ADJACENT PRIVATE PROPERTIES.
9. BIORETENTION AREA VEGETATION SHALL BE SPECIFIED BY LANDSCAPE DESIGN PROFESSIONAL. SEE C.3 TECHNICAL GUIDANCE MANUAL (ACCWP) FOR PLANT LIST AND VEGETATION GUIDANCE.
10. THE ENGINEER SHALL EVALUATE THE NEED FOR EROSION PROTECTION AT ALL INLET LOCATIONS. ALL COBBLES USED FOR ENERGY DISSIPATION SHALL BE GROUTED. ENGINEER TO CONSIDER MAINTENANCE REQUIREMENTS TO FACILITATE EASY SEDIMENT REMOVAL AND ADEQUATE VECTOR CONTROL.
11. THE PROJECT PLANS SHALL SHOW ALL EXISTING UTILITIES AND INDICATE POTENTIAL UTILITY CROSSINGS OR CONFLICTS.
12. CHECK WITH CITY DPW FOR UTILITY CROSSING PROVISIONS.
13. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES SHALL CONFORM TO CURRENT CITY STANDARDS AND OTHER UTILITY PROVIDER REQUIREMENTS.
14. VERTICAL SIDEWALLS EXTENDING INTO EXISTING STORM DRAIN PIPE TRENCH BACKFILL SHALL BE DESIGNED WITH A CONCRETE BACKFILL ACCEPTABLE TO THE CITY ENGINEER.
15. OVERFLOW RISER MUST BE FORMED SUCH THAT IT IS A MINIMUM OF 6" ABOVE THE TOP OF MULCH, OR AS DESIGNED. PLACE STRUCTURE ADJACENT TO PEDESTRIAN EDGE TO ALLOW FOR MONITORING ACCESS.
16. DETAILS WERE ADAPTED FROM SFPUC GI TYPICAL DETAILS AND SPECIFICATION, UNLESS OTHERWISE NOTED.
17. WHEN THE PROJECT AREA DOES NOT DRAIN TO AN EXISTING FULL TRASH CAPTURE SYSTEM, BIORETENTION MUST BE DESIGNED TO PROVIDE FULL TRASH CAPTURE PER REGIONAL WATER BOARD REQUIREMENTS OR A SEPARATE CERTIFIED FULL TRASH CAPTURE SYSTEM SHALL BE PROVIDED FOR THE PROJECT.
18. ENSURE THAT ALL GSI DEISGNS CONFORM TO THE CITY OF OAKLAND STORM DRAINAGE DESIGN STANDARDS: https://www.oaklandca.gov/Community/Community-Development/Sustainability-Environment/Creeks-Watershed-and-Stormwater/Storm-Drainage-Design-Standards AND THE CITY'S STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION: https://www.oaklandca.gov/Public-Safety-Streets/Engineering-Public-Infrastructure-Permits/Standard-Details-for-Public-Works-Construction

ENGINEER CHECKLIST (SHALL SPECIFY, AS APPLICABLE):

- ☐ BIORETENTION AREA WIDTH AND LENGTH
- ☐ DEPTH OF PONDING
- ☐ DEPTH OF FREEBOARD
- ☐ DEPTH OF BIOTREATMENT SOIL (18" MIN)
- ☐ UNDERDRAIN SPECIFICATIONS AND LOCATION (IF FACILITY IS LINED PLACE UNDERDRAIN AT BOTTOM OF FACILITY)
- ☐ BIORETENTION SURFACE ELEVATION (TOP OF BIOTREATMENT SOIL) AT UPSLOPE AND DOWNSLOPE ENDS OF FACILITY
- ☐ CONTROL POINTS AT EVERY BIORETENTION WALL CORNER AND POINT OF TANGENCY
- ☐ DIMENSIONS AND DISTANCE TO EVERY INLET, OUTLET, CHECK DAM, SIDEWALK NOTCH, ETC.
- ☐ ELEVATIONS OF EVERY INLET, OVERFLOW RISER, STRUCTURE RIM AND INVERT, CHECK DAM, BIORETENTION AREA WALL CORNER, AND SIDEWALK NOTCH
- ☐ TYPE AND DESIGN OF BIORETENTION AREA COMPONENTS (E.G., EDGE TREATMENTS, INLETS/GUTTER MODIFICATIONS, UTILITY CROSSINGS, LINER, AND PLANTING DETAILS)
- ☐ DEPTH AND TYPE OF MULCH (NON-FLOATING; ORGANICALLY-DERIVED; NOT BARK OR GORILLA HAIR; 3" MIN)

RELATED TECHNICAL GUIDANCE	SOURCE
BIORETENTION: - BIOTREATMENT SOIL MIX - CALTRANS CLASS II PERM LAYER STORAGE - PERFORATED UNDERDRAIN - NON-FLOATING MULCH	C.3 TECHNICAL GUIDANCE MANUAL (ACCWP)

NOT FOR CONSTRUCTION

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATION. THE SIGNED CITY OF OAKLAND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION IS AVAILABLE FOR PURCHASE FROM THE CONTRACT ADMINISTRATION DEPARTMENT

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

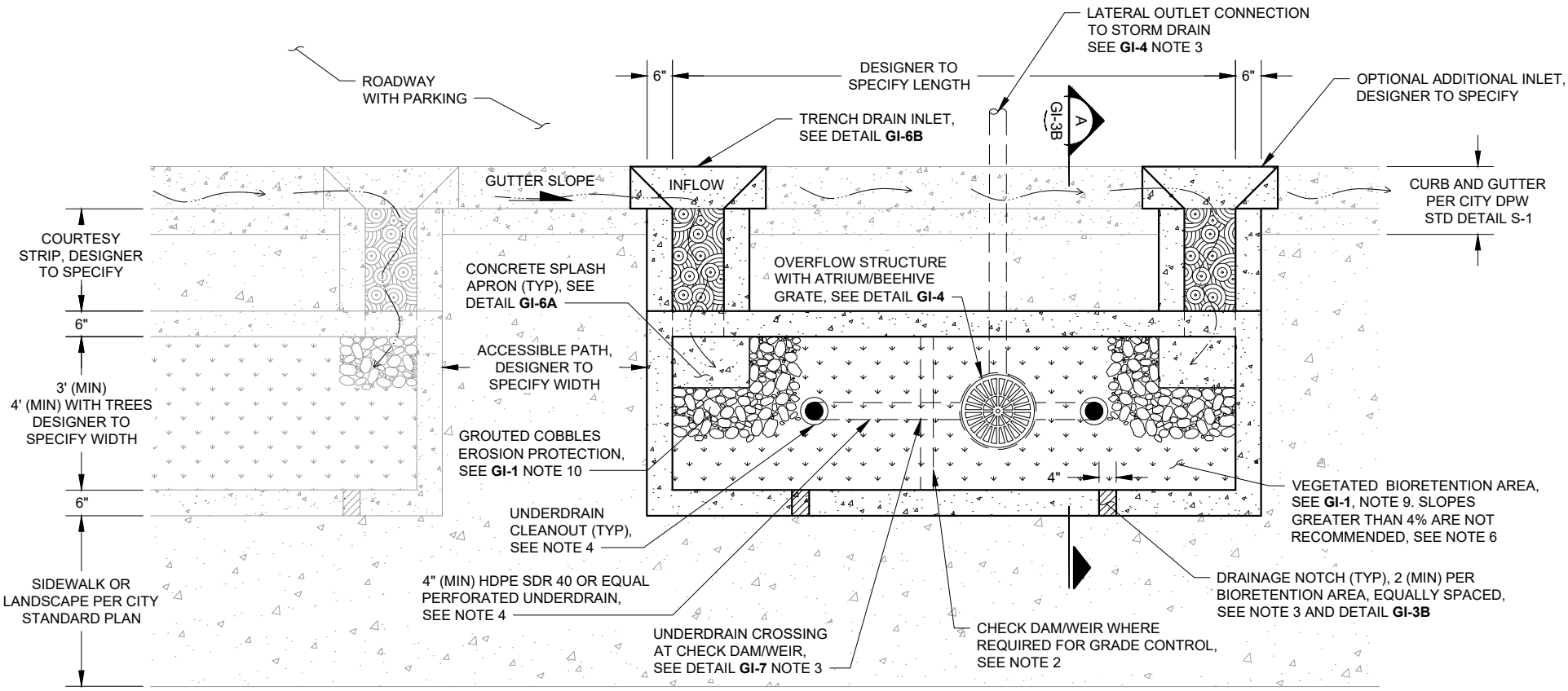
BIORETENTION AREA: NOTES

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-1



NOT FOR CONSTRUCTION

NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. CHECK DAMS/WEIRS SHALL BE LOCATED WHERE REQUIRED TO PROVIDE GRADE CONTROL AND PONDING PER SITE SPECIFIC DESIGN (SEE DETAIL **GI-7**).
3. LAY OUT DRAINAGE NOTCHES TO PREVENT PONDING BEHIND BIORETENTION AREA WALL WITH 5' MAXIMUM SPACING BETWEEN NOTCHES.
4. PROVIDE ONE UNDERDRAIN CLEANOUT PER BIORETENTION (MIN) FOR FACILITIES WITH UNDERDRAINS. CLEANOUT REQUIRED AT UPSTREAM END AND PIPE ANGLE POINTS EXCEEDING 45 DEGREES. LONGITUDINAL SLOPE OF PIPE SHALL BE 0.5% (MIN). UNDERDRAIN SHALL NOT BE USED TO CONVEY FLOOD FLOWS.
5. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT CITY STANDARDS. COORDINATE WITH ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
6. CONSULTATION WITH A GEOTECHNICAL ENGINEER IS RECOMMENDED WHEN THE SLOPE OF THE TOTAL FACILITY IS OVER 4%.

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

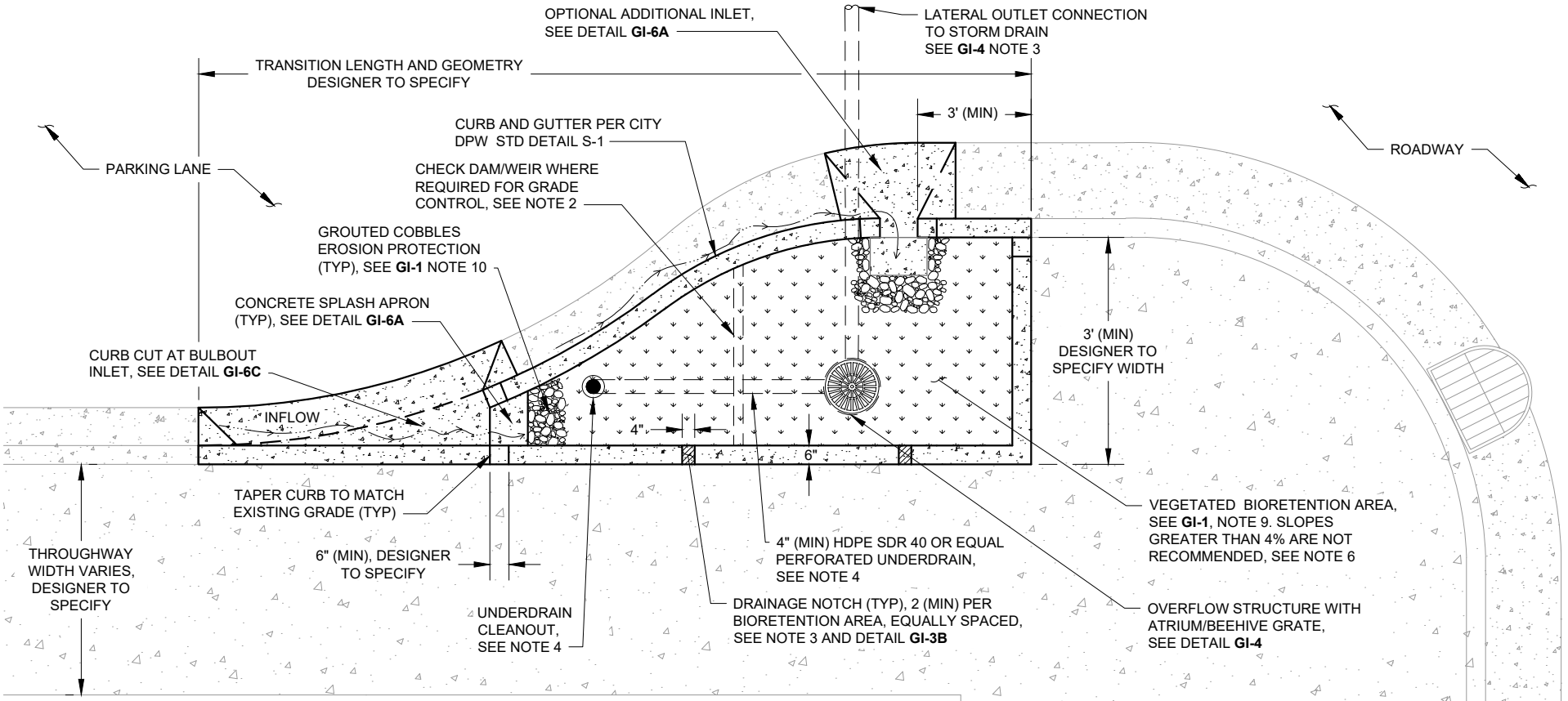
BIORETENTION AREA: PLAN VIEW WITH STREET

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-2A



NOT FOR CONSTRUCTION

NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. CHECK DAMS/WEIRS SHALL BE LOCATED WHERE REQUIRED TO PROVIDE GRADE CONTROL AND PONDING PER SITE SPECIFIC DESIGN (SEE DETAIL **GI-7**).
3. LAY OUT DRAINAGE NOTCHES TO PREVENT PONDING BEHIND BIORETENTION AREA WALL WITH 5' MAXIMUM SPACING BETWEEN NOTCHES.
4. PROVIDE ONE UNDERDRAIN CLEANOUT PER BIORETENTION (MIN) FOR FACILITIES WITH UNDERDRAINS. CLEANOUT REQUIRED AT UPSTREAM END AND PIPE ANGLE POINTS EXCEEDING 45 DEGREES. LONGITUDINAL SLOPE OF PIPE SHALL BE 0.5% (MIN). UNDERDRAIN SHALL NOT BE USED TO CONVEY FLOOD FLOWS.
5. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT CITY STANDARDS. COORDINATE WITH ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
6. CONSULTATION WITH A GEOTECHNICAL ENGINEER IS RECOMMENDED WHEN THE SLOPE OF THE TOTAL FACILITY IS OVER 4%.

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

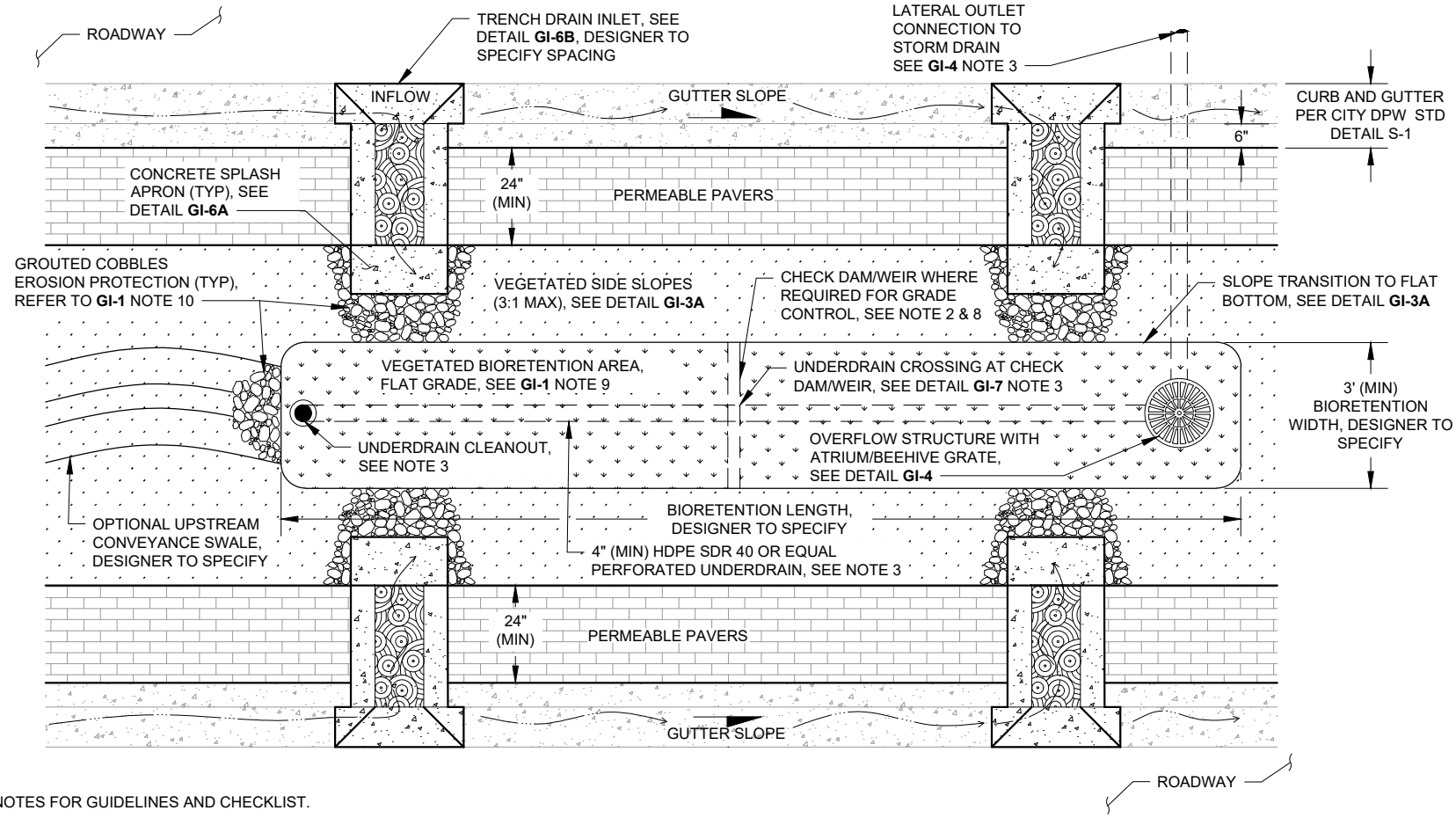
BIORETENTION AREA: BULBOUT PLAN VIEW

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-2B



NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. CHECK DAMS/WEIRS SHALL BE LOCATED WHERE REQUIRED TO PROVIDE GRADE CONTROL AND PONDING PER SITE SPECIFIC DESIGN (SEE DETAIL **GI-7**).
3. PROVIDE ONE UNDERDRAIN CLEANOUT PER BIORETENTION AREA (MIN) FOR FACILITIES WITH UNDERDRAINS. CLEANOUT REQUIRED AT UPSTREAM END AND PIPE ANGLE POINTS EXCEEDING 45 DEGREES. LONGITUDINAL SLOPE OF PIPE SHALL BE 0.5% (MIN). UNDERDRAIN SHALL NOT BE USED TO CONVEY FLOOD FLOWS.
4. DESIGNERS TO REFERENCE AASHTO ROADSIDE SAFETY DESIGN REQUIREMENTS AND CONSIDER USE OF MEDIAN BIORETENTION AREAS IN RELATION TO STREET CLASSIFICATION AND STREET SPEEDS.
5. A STORAGE VOLUME SAFETY FACTOR OF 1.5 SHALL BE INCLUDED IN THE DESIGN OF MEDIAN BIORETENTION AREAS TO PREVENT FLOODING.
6. SLOPED SIDES (**GI-3A**) DEPICTED IN PLAN VIEW ABOVE, REFER TO **GI-3B** IF VERTICAL SIDE WALLS ARE USED.
7. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT CITY STANDARDS. COORDINATE WITH ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
8. WITHIN ANY BIORETENTION AREA, SLOPES GREATER THAN 4% ARE NOT RECOMMENDED. CONSULTATION WITH A GEOTECHNICAL ENGINEER IS RECOMMENDED WHEN THE SLOPE OF THE TOTAL FACILITY IS OVER 4%.
9. DRAWING **GI-2C** WAS MODIFIED FROM ACCWP C.3 TECHNICAL GUIDANCE MANUAL GREEN INFRASTRUCTURE EXAMPLE DETAIL GI-2C.

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

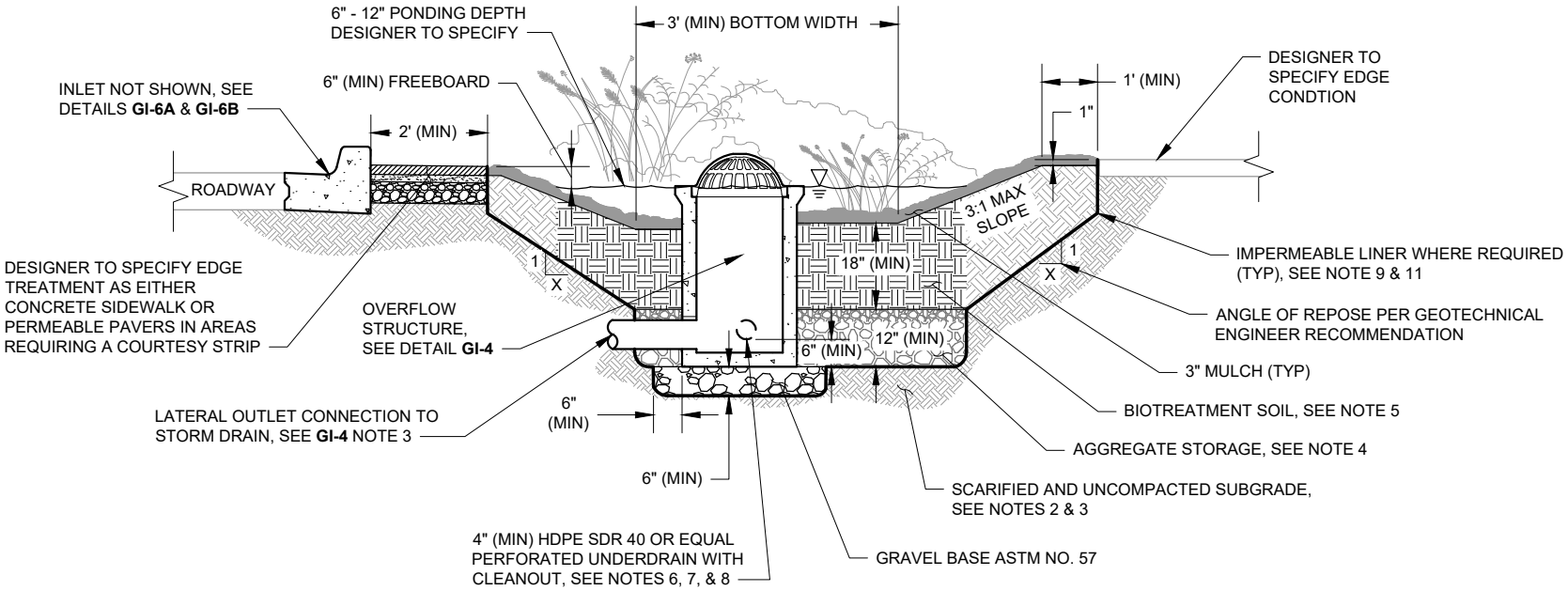
BIORETENTION AREA: STREET MEDIAN

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-2C



NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. FOR UNLINED BASINS ONLY, AVOID COMPACTION OF EXISTING SUBGRADE BELOW BASIN.
3. FOR UNLINED BASINS ONLY, SCARIFY SUBGRADE TO A DEPTH OF 3" (MIN) IMMEDIATELY PRIOR TO PLACEMENT OF AGGREGATE STORAGE LAYER AND BIORETENTION SOIL MATERIALS.
4. AGGREGATE STORAGE LAYER COMPRISED OF 12" (MIN) CALTRANS CLASS 2 PERMEABLE MATERIAL OR 12" (MIN) LAYER COMPRISED OF 3"-4" OF ASTM NO.9 (WASHED) CHOKING COURSE UNDERLAIN BY ASTM NO.7 (WASHED) RESERVOIR COURSE.
5. REFER TO C.3 TECHNICAL GUIDANCE MANUAL (ACCWP) FOR BIOTREATMENT SOIL MIX SPECIFICATIONS. PRIOR TO PROJECT APPROVAL, TEST THE INSTALLED SYSTEM'S INFILTRATION RATE FOR CONFORMANCE WITH BSM SPECIFICATIONS. INSTALL BIOTREATMENT SOIL AT 85% COMPACTION FOLLOWING BASMAA INSTALLATION GUIDE. BIOTREATMENT SOIL MIX REQUIRED ONLY BELOW EXTENTS OF DESIGN PONDED WATER LEVEL.
6. UNDERDRAIN REQUIRED FOR ALL FACILITIES WITH IMPERMEABLE LINER. IN FACILITIES WITHOUT AN IMPERMEABLE LINER, UNDERDRAINS SHOULD BE ELEVATED 6" (MIN) WITHIN THE AGGREGATE STORAGE LAYER TO PROMOTE INFILTRATION. IN FACILITIES WITH AN IMPERMEABLE LINER, THE UNDERDRAIN SHOULD BE PLACED AT THE BOTTOM OF THE AGGREGATE STORAGE LAYER. PERFORATED/SLOT DRAINS SHOULD BE DOWNWARD FACING TO FACILITATE BETTER STORAGE IN THE GRAVEL LAYER. UNDERDRAIN SHALL NOT BE USED TO CONVEY FLOOD FLOWS.
7. PROVIDE ONE CLEANOUT PER BIORETENTION FACILITY (MIN) FOR FACILITIES WITH UNDERDRAINS.
8. THE UNDERDRAIN IN ALL FACILITIES LOCATED IN THE PUBLIC RIGHT-OF-WAY SHALL BE VIDEO RECORDED AND PROVIDED TO THE CITY FOR REVIEW PRIOR TO PROJECT ACCEPTANCE.
9. PRIOR TO PLACEMENT OF IMPERMEABLE LINER, THE SUBGRADE SHALL BE PREPARED AND CONTOURED AS NECESSARY TO PROVIDE A SMOOTH SURFACE, VOID OF SHARP ROCKS/DEBRIS. NO VOID SPACES SHALL BE PRESENT BETWEEN THE LINER AND THE SUBGRADE. GEOTEXTILE FABRIC MAY BE INSTALLED BETWEEN THE SUBGRADE AND THE LINER TO PROTECT THE LINER FROM SHARP AGGREGATE PRESENT IN THE SUBGRADE. ENGINEER SHALL INSPECT/APPROVE THE PREPARED BASIN SUBGRADE PRIOR TO THE INSTALLATION OF ANY OVERLAYING GEOTEXTILE MATERIAL.
10. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT CITY STANDARDS. COORDINATE WITH ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
11. IMPERMEABLE LINER IS REQUIRED WHEN THERE IS LESS THAN 5' OF SEPARATION BETWEEN THE BOTTOM OF THE FACILITY AND SEASONAL HIGH GROUNDWATER LEVEL.

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

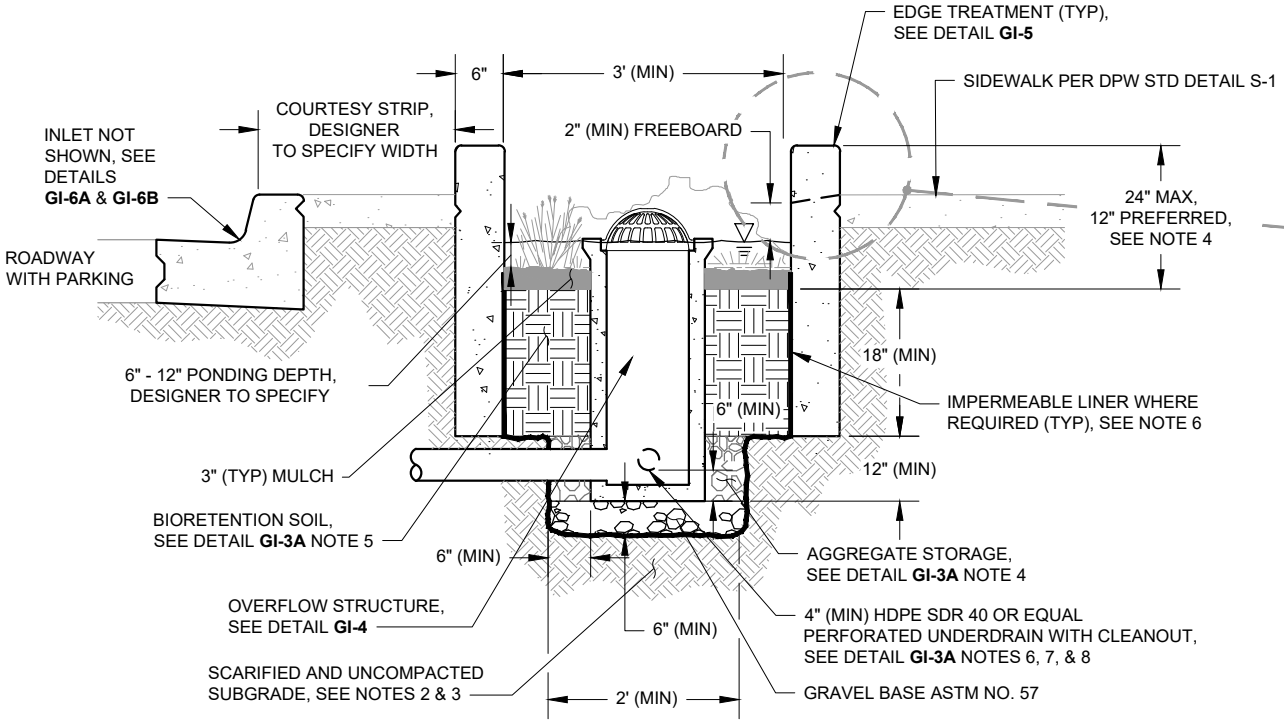
BIORETENTION AREA: SLOPED SIDES CROSS SECTION

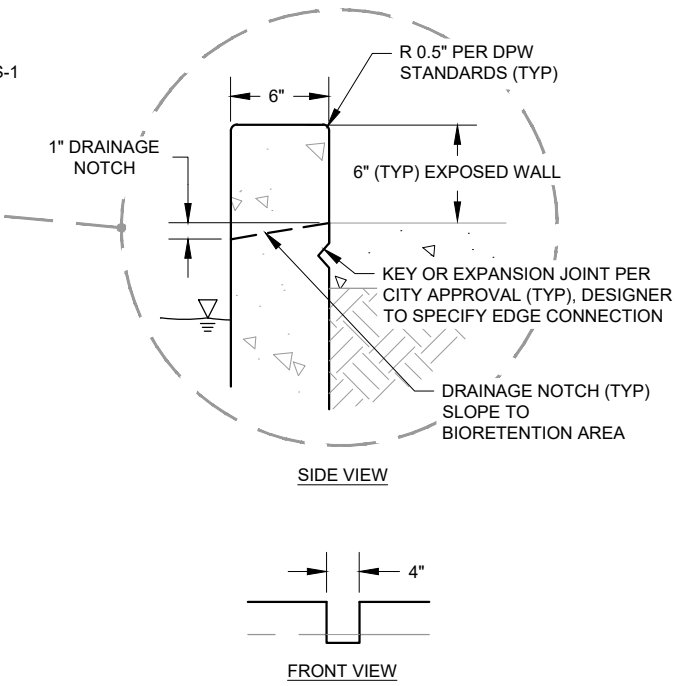
ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-3A





TYPICAL DRAINAGE NOTCH DETAIL

NOT FOR CONSTRUCTION

NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. FOR UNLINED FACILITIES ONLY, AVOID COMPACTION OF EXISTING SUBGRADE BELOW BIORETENTION AREA DURING CONSTRUCTION.
3. FOR UNLINED FACILITIES ONLY, SCARIFY SUBGRADE TO A DEPTH OF 3" (MIN) IMMEDIATELY PRIOR TO PLACEMENT OF AGGREGATE STORAGE AND BIORETENTION SOIL MATERIAL.
4. MAXIMUM DROP FROM TOP OF CURB/WALL TO TOP OF BIORETENTION SOIL SHALL INCLUDE CONSIDERATIONS FOR BIORETENTION SOIL SETTLEMENT. 30" DROP REQUIRES GUARD RAIL.
5. SLOPE TOP OF BIORETENTION WALL TO MATCH LONGITUDINAL SLOPE OF ADJACENT SURFACE.
6. PRIOR TO PLACEMENT OF IMPERMEABLE LINER, THE SUBGRADE SHALL BE PREPARED AND CONTOURED AS NECESSARY TO PROVIDE A SMOOTH SURFACE, VOID OF SHARP ROCK/DEBRIS. NO VOID SPACES SHALL BE PRESENT BETWEEN THE LINER AND THE SUBGRADE. GEOTEXTILE FABRIC MAY BE INSTALLED BETWEEN THE SUBGRADE AND THE LINER TO PROTECT THE LINER FROM SHARP AGGREGATE PRESENT IN THE SUBGRADE. ENGINEER SHALL INSPECT/APPROVE THE PREPARED BASIN SUBGRADE PRIOR TO THE INSTALLATION OF ANY OVERLYING GEOTEXTILE MATERIAL.

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

BIORETENTION AREA: VERTICAL SIDE WALL CROSS SECTION

ENGINEERING DESIGN MANAGER

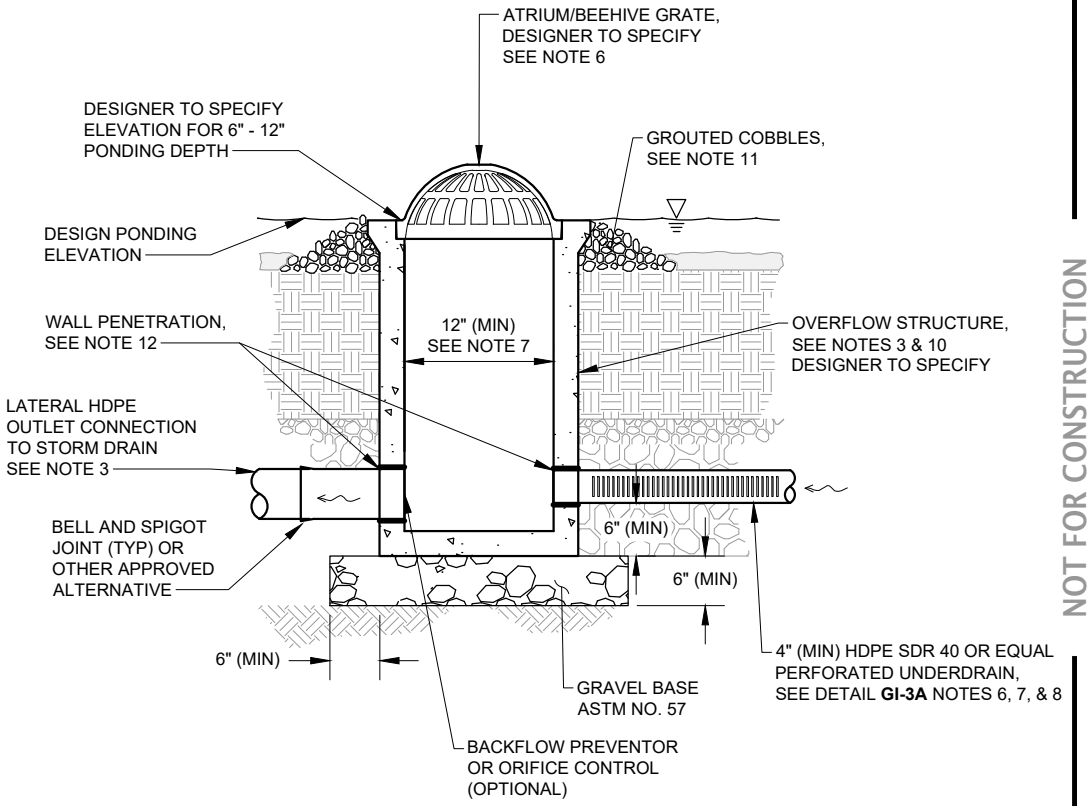
DATE : OCTOBER 2025

REV. DATE :

DWG. GI-3B

NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. ALL MATERIAL AND WORKMANSHIP FOR OVERFLOW STRUCTURES SHALL CONFORM TO CITY STANDARDS.
3. DESIGN OVERFLOW WEIR AND OUTLET PIPE TO CONVEY 10-YR, 24-HR STORM FLOW OR DESIGN INLET TO DIVERT FLOWS LARGER THAN THE DESIGN STORM DIRECTLY TO THE STORM DRAIN. LOCATE ALL OVERFLOW PIPES AT THE ELEVATION HIGHER THAN THE STORM SEWER HYDRAULIC GRADE LINE TO PREVENT BACKFLOW INTO THE BIORETENTION FACILITY.
4. STORM DRAIN OUTLET PIPES SHALL BE SIZED TO MEET THE HYDRAULIC REQUIREMENTS WITH APPROPRIATE COVER DEPTH AND PIPE MATERIAL.
5. PERFORATED UNDERDRAINS WITH CLEANOUT PIPES ARE REQUIRED. PERFORATED/SLOT DRAINS SHOULD BE DOWNWARD FACING TO FACILITATE BETTER STORAGE IN THE GRAVEL LAYER.
6. SIZE OF ATRIUM/BEEHIVE GRATE SHALL MATCH SIZE OF RISER SPECIFIED IN PLANS, SHALL BE REMOVABLE TO PROVIDE MAINTENANCE ACCESS, AND SHALL BE BOLTED IN PLACE OR OUTFITTED WITH APPROVED TAMPER-RESISTANT LOCKING MECHANISM. MAXIMUM GRATE OPENING SHALL BE 2". ATRIUM/BEEHIVE GRATE SHALL BE DURABLE AND MEDIUM DUTY TRAFFIC-RATED (MIN).
7. WHEN BACK FLOW PREVENTION IS REQUIRED, RISER WIDTH MUST ACCOMMODATE BACK FLOW PREVENTOR OR ORIFICE DEVICE.
8. IF INTERIOR DEPTH OF OVERFLOW STRUCTURE EXCEEDS 5', A PERMANENT BOLTED LADDER AND MINIMUM CLEAR SPACE OF 30" BY 30" SHALL BE PROVIDED FOR MAINTENANCE ACCESS.
9. MAINTENANCE ACCESS IS REQUIRED FOR ALL OUTLET STRUCTURES AND CLEANOUT FACILITIES. 12" (MIN) CLEARANCE WITHIN OVERFLOW STRUCTURE SHALL BE PROVIDED FOR MAINTENANCE/10" VACTOR HOSE ACCESS.
10. DESIGNER TO SPECIFY WATERTIGHT OVERFLOW STRUCTURE MATERIAL, MODEL AND SIZE. BARREL/BOX AND BASE OF CATCH BASIN MAY BE PRE-CAST WITH REINFORCING STEEL PER MANUFACTURER'S RECOMMENDATIONS, POURED IN PLACE CONCRETE WITHOUT STEEL PER CITY STANDARD PLANS AND SPECIFICATIONS, OR NYLOPLAST DRAIN BASIN (2812AG OR EQUAL).
11. MINIMUM DIAMETER OF OPTIONAL GROUTED COBBLES SHALL BE LARGER THAN MAXIMUM GRATE OPENING.
12. GROUT ALL PENETRATIONS, CRACKS, SEAMS, AND JOINTS WITH CLASS "C" MORTAR.



NOT FOR CONSTRUCTION

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

BIORETENTION COMPONENTS: OUTLET DETAIL

ENGINEERING DESIGN MANAGER

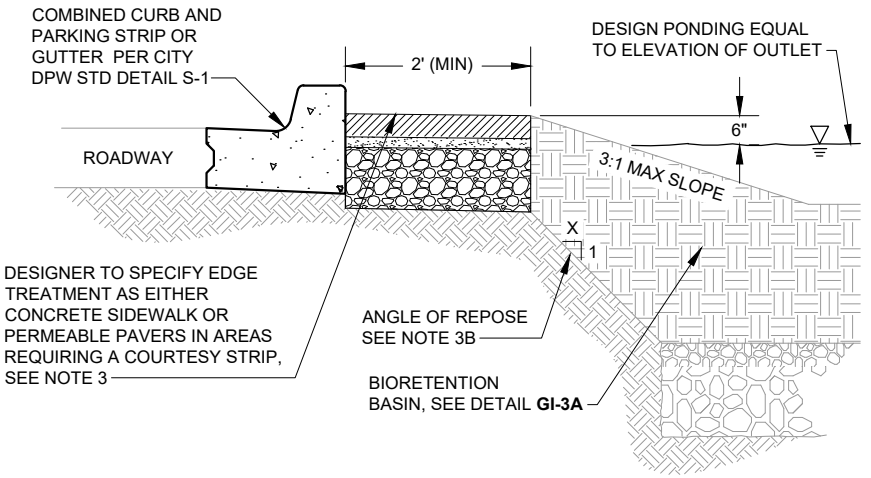
DATE : OCTOBER 2025

REV. DATE :

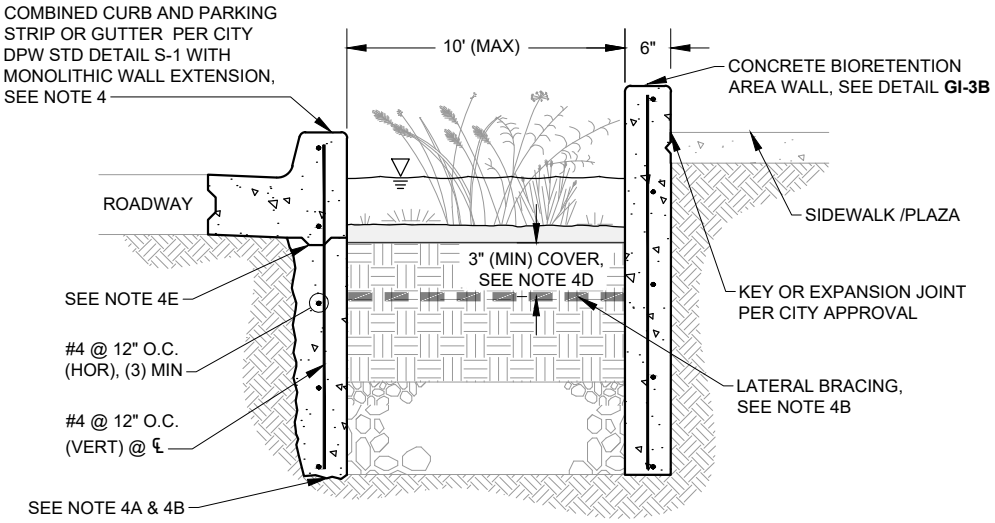
DWG. GI-4

NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. THE DESIGNER SHALL ADAPT EDGE TREATMENT DESIGN TO ADDRESS SITE SPECIFIC CONSTRAINTS TO EFFECTIVELY STABILIZE ADJACENT PAVEMENT AND MINIMIZE LATERAL MOVEMENT OF WATER.
3. STANDARD CURB EDGE (WHEN SPACE AVAILABLE):
   A. REFER TO CITY STD DETAIL S-1 FOR CURB AND SIDEWALK DETAILS.
   B. ANGLE OF REPOSE VARIES PER GEOTECHNICAL ENGINEERS RECOMMENDATIONS.
4. VERTICAL SIDE WALLS (WHEN SPACE LIMITED):
   A. ALL BIORETENTION AREA WALLS SHALL EXTEND TO BOTTOM OF AGGREGATE STORAGE LAYER OR DEEPER. MINIMUM DEPTHS SHALL BE DESIGNED TO PREVENT LATERAL SEEPAGE INTO THE ADJACENT PAVEMENT SECTION.
   B. FOOTING AND/OR LATERAL BRACING SHALL SHALL BE DESIGNED BY THE ENGINEER TO WITHSTAND ANTICIPATED LOADING ASSUMING NO REACTIVE FORCES FROM THE UNCOMPACTED BIOTREATMENT SOIL.
   C. BIORETENTION AREA WALLS EXTENDING MORE THAN 36" BELOW ADJACENT LOAD-BEARING SURFACE, OR WHEN LOCATED ADJACENT TO PAVERS, SHALL HAVE FOOTING OR LATERAL BRACING. FOOTING OR LATERAL BRACING MAY BE EXCLUDED ONLY IF THE ENGINEER DEMONSTRATES THAT THE PROPOSED WALL DESIGN MEETS LOADING REQUIREMENTS. WALL SHALL NOT ENCROACH INTO TREATMENT AREA.
   D. CONTRACTOR TO PROVIDE 3" MINIMUM COVER OVER ALL LATERAL BRACING FOR PLANT ESTABLISHMENT.
   E. ALL CONSTRUCTION COLD JOINTS SHALL INCORPORATE EPOXY, DOWEL/TIE BAR, KEYWAY, OR WATER STOP.
5. ALL MATERIAL AND WORKMANSHIP FOR EDGE TREATMENTS SHALL CONFORM TO CITY STANDARD PLANS, SPECIFICATIONS, AND CODES.



STANDARD CURB EDGE AT BIORETENTION BASIN (1)



EXTENDED BIORETENTION WALL WITH LATERAL BRACING (2)

NOT FOR CONSTRUCTION

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATION. THE SIGNED CITY OF OAKLAND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION IS AVAILABLE FOR PURCHASE FROM THE CONTRACT ADMINISTRATION DEPARTMENT

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

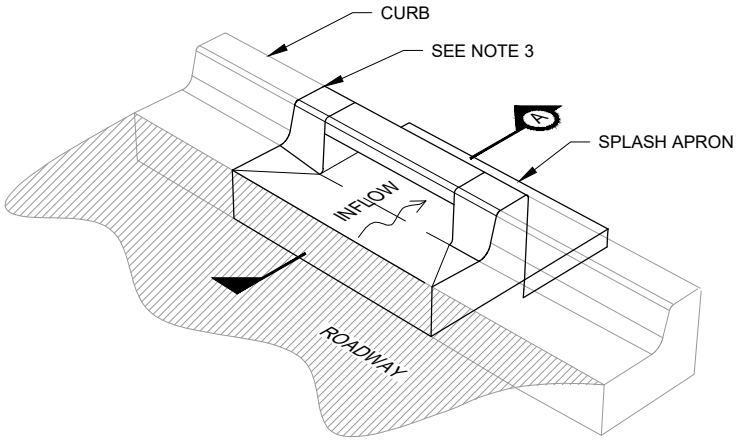
BIORETENTION COMPONENTS: EDGE TREATMENT DETAIL

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-5



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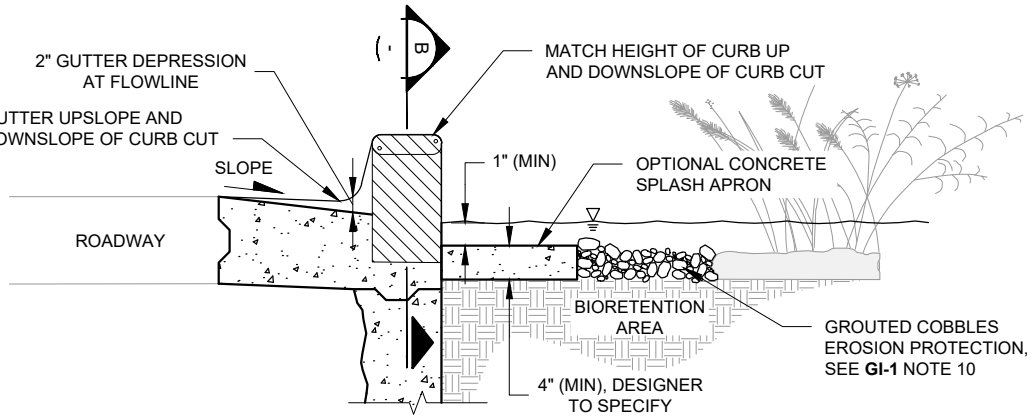
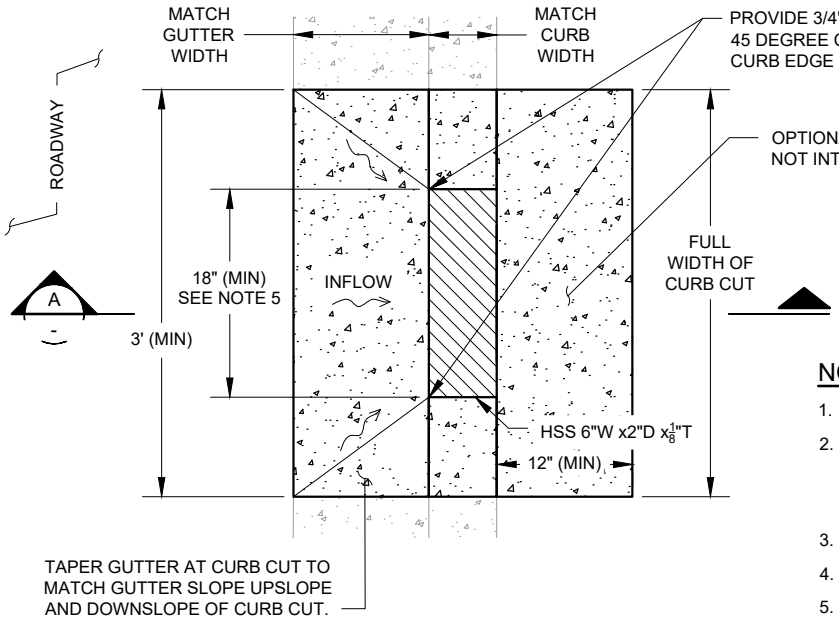
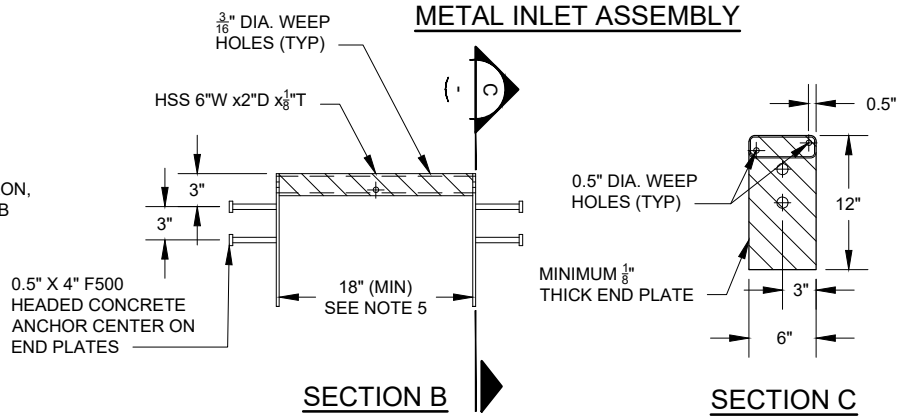


SECTION A



PLAN

METAL INLET ASSEMBLY



SECTION B

SECTION C

NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. CURB CUT INLETS SHALL BE ADEQUATELY SIZED, SPACED, AND SLOPED TO MEET HYDRAULIC REQUIREMENTS. THE CURB CUT OPENING WIDTH SHALL BE SIZED BASED ON THE CATCHMENT AREA, LONGITUDINAL SLOPE ALONG THE CURB, AND THE CROSS SLOPE OF THE GUTTER OR ADJACENT PAVEMENT AT THE INLET. SEE SIZING EQUATIONS AND NOMOGRAPHS FOR CURB OPENING INLETS IN THE U.S. DEPARTMENT OF TRANSPORTATION HYDRAULIC ENGINEERING CIRCULAR NO. 27.
3. BOND NEW CURB AND GUTTER TO EXISTING CURB AND GUTTER WITH EPOXY AND DOWEL CONNECTION.
4. METAL INLET ASSEMBLY SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A-123.
5. FOR SMALLER FACILITIES A 12" WIDTH MAY BE ALLOWED SUBJECT TO MUNICIPAL APPROVAL.

NOT FOR CONSTRUCTION

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

BIORETENTION COMPONENTS: GUTTER CURB CUT INLET DETAIL

ENGINEERING DESIGN MANAGER

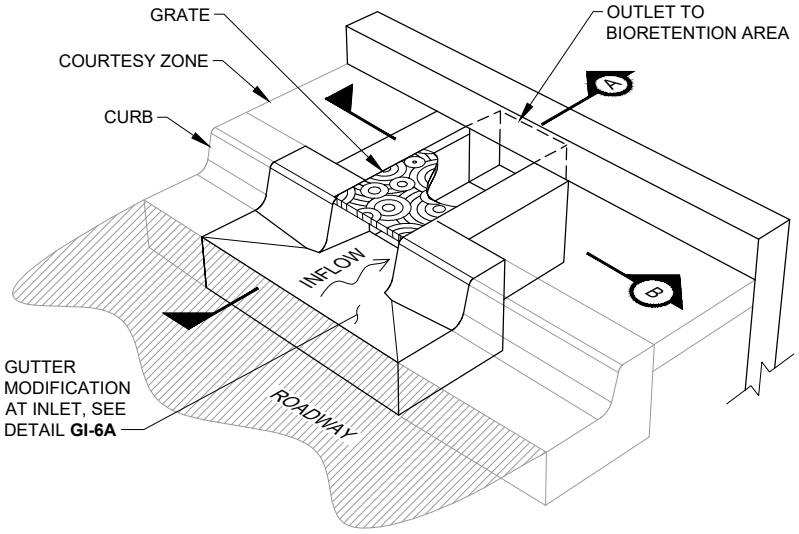
DATE : OCTOBER 2025

REV. DATE :

DWG. GI-6A

NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. MUNICIPAL PRE-APPROVAL REQUIRED PRIOR TO IMPLEMENTATION. ALL MATERIAL AND WORKMANSHIP FOR TRENCH DRAIN ASSEMBLY SHALL CONFORM TO CITY STANDARD SPECIFICATIONS AND APPLICABLE CODES PER CITY DPW.
3. TRENCH DRAIN INLETS SHALL BE ADEQUATELY SIZED, SPACED, AND SLOPED TO MEET HYDRAULIC REQUIREMENTS. SEE DETAIL **GI-6A** NOTE 2 FOR REFERENCE.
4. SLOPE TO PROVIDE AT LEAST 1" DROP OVER LENGTH OF CHANNEL OR A MINIMUM OF 2%, WHICHEVER IS LARGER.
5. ALL TRENCH GRATES SHALL BE REMOVABLE, RATED PER THE ANTICIPATED LOADING, AND BOLTED IN PLACE OR OUTFITTED WITH APPROVED TAMPER-RESISTANT LOCKING MECHANISM, FLUSH OR RECESSED IN GRATE.
6. BOND NEW CURB AND GUTTER TO EXISTING CURB AND GUTTER WITH EPOXY AND DOWEL CONNECTION.
7. HORIZONTAL CONTROL JOINTS SHALL BE PROVIDED EVERY 10' (LINEAR), OR PER MANUFACTURER'S RECOMMENDATIONS.
8. APPLY EPOXY BONDING AGENT AT ALL TRENCH DRAIN CONSTRUCTION COLD JOINTS.
9. INLET CURB CUT AND CONCRETE CHANNEL WIDTH SHALL BE SIZED TO ACCOUNT FOR CATCHMENT AREA AND GUTTER SLOPE AND BE NO LESS THAN 16" ON GUTTER SLOPES ≥ 5%.



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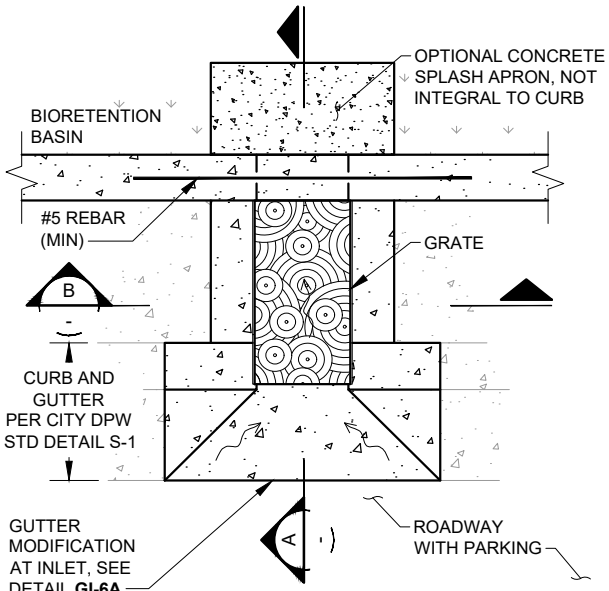
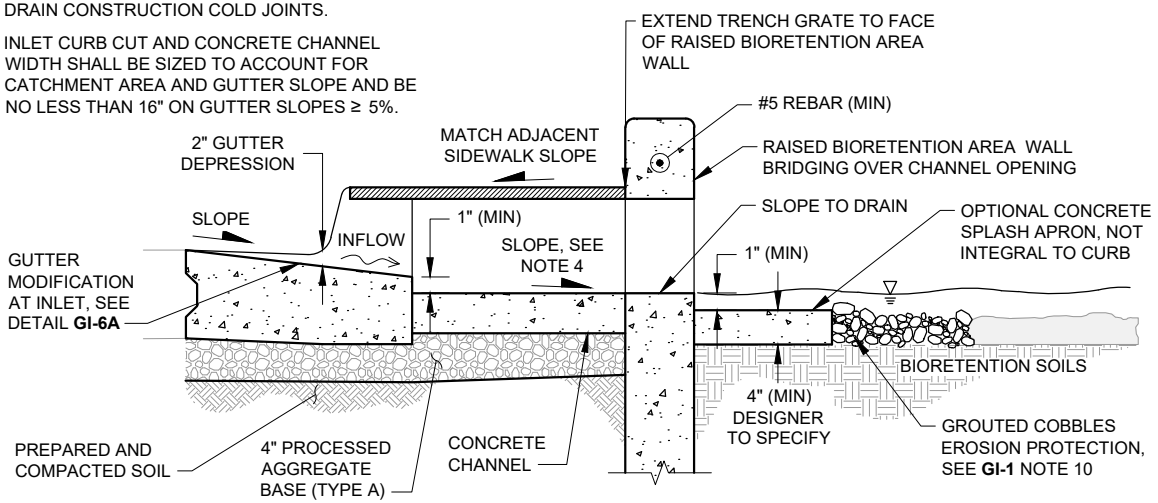
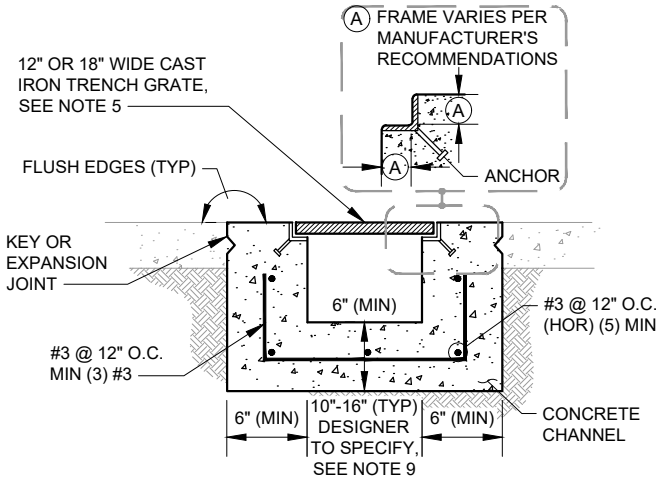


PLAN



SECTION A



SECTION B

NOT FOR CONSTRUCTION

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATION. THE SIGNED CITY OF OAKLAND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION IS AVAILABLE FOR PURCHASE FROM THE CONTRACT ADMINISTRATION DEPARTMENT

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

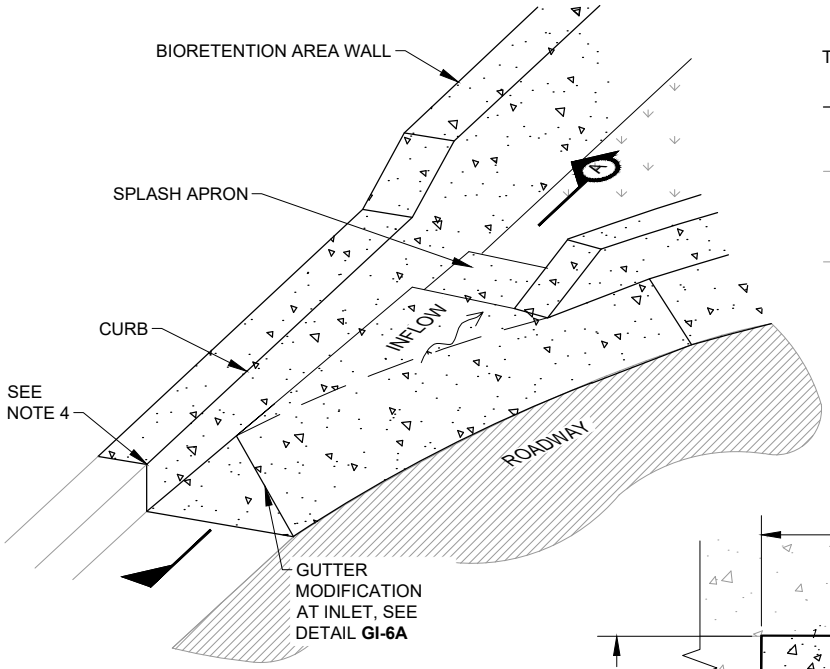
BIORETENTION COMPONENTS: TRENCH DRAIN CURB CUT INLET DETAIL

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-6B



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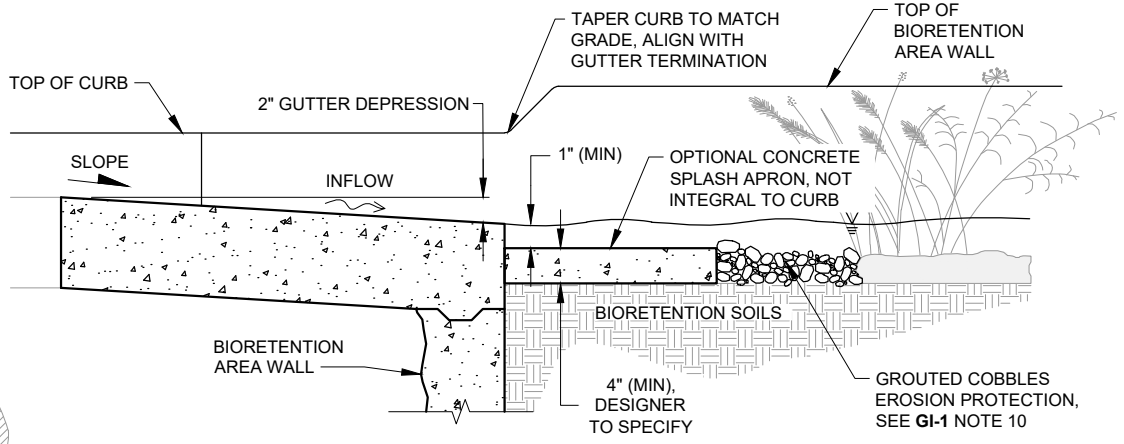
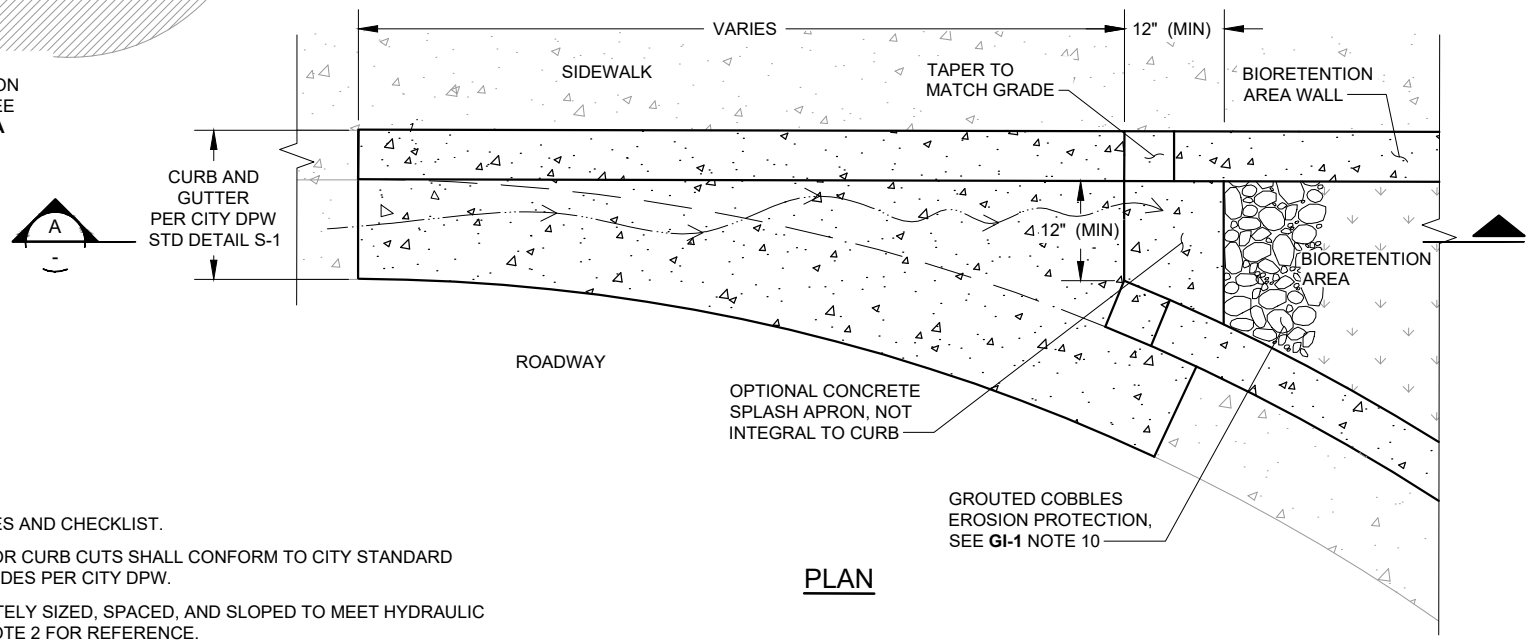


SECTION A



PLAN

NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. ALL MATERIAL AND WORKMANSHIP FOR CURB CUTS SHALL CONFORM TO CITY STANDARD SPECIFICATIONS AND APPLICABLE CODES PER CITY DPW.
3. CURB CUT INLETS SHALL BE ADEQUATELY SIZED, SPACED, AND SLOPED TO MEET HYDRAULIC REQUIREMENTS. SEE DETAIL **GI-6A** NOTE 2 FOR REFERENCE.
4. BOND NEW CURB AND GUTTER TO EXISTING CURB AND GUTTER WITH EPOXY AND DOWEL CONNECTION.

NOT FOR CONSTRUCTION

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CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

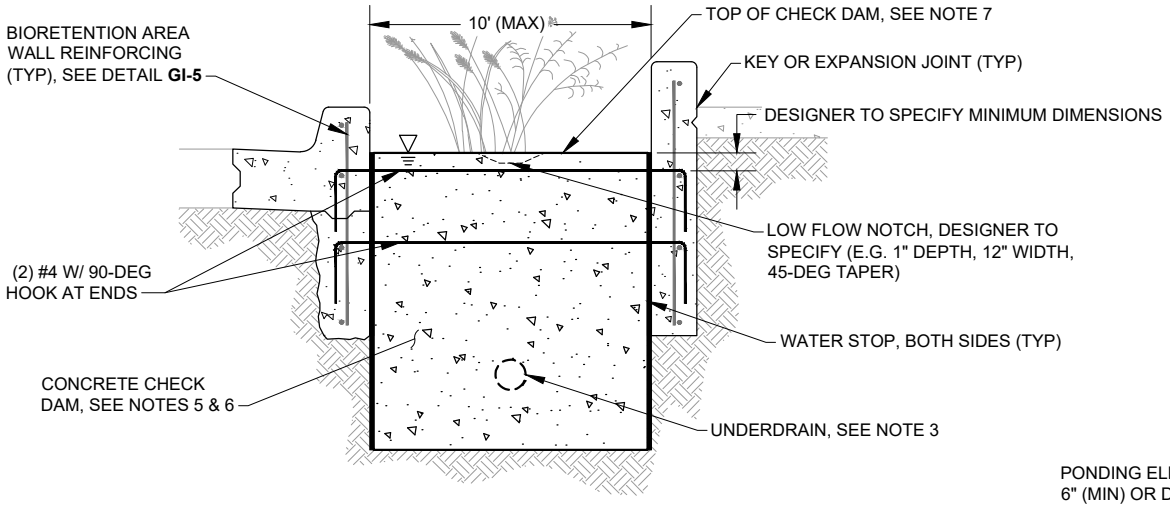
BIORETENTION COMPONENTS: CURB CUT AT BULBOUT INLET DETAIL

ENGINEERING DESIGN MANAGER

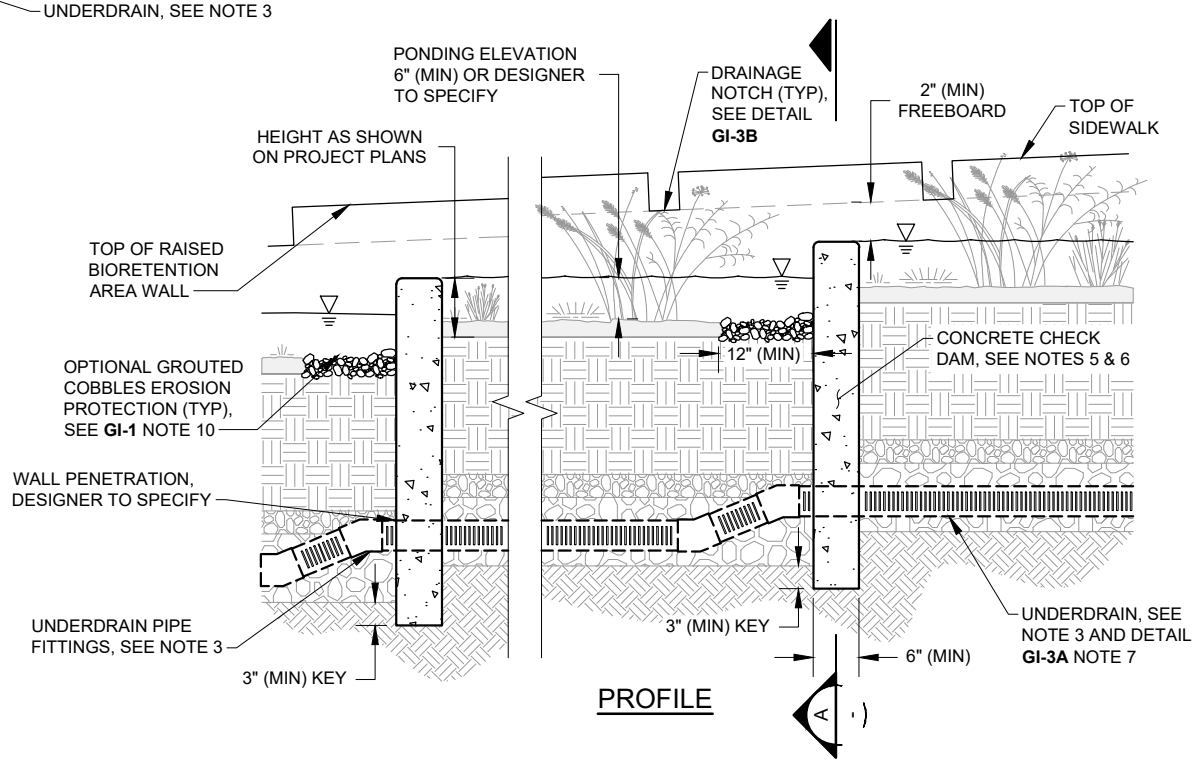
DATE : OCTOBER 2025

REV. DATE :

DWG. GI-6C



SECTION A



PROFILE

NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. ALL MATERIAL AND WORKMANSHIP FOR CHECK DAM ASSEMBLY SHALL CONFORM TO CITY STANDARD SPECIFICATIONS AND APPLICABLE CODES PER CITY DPW.
3. UNDERDRAIN TO PASS THROUGH CHECK DAM IN NON-PERFORATED PIPE. PIPE FITTINGS SHALL BE USED TO ACCOMMODATE CHANGES IN GRADE, AS NEEDED.
4. HEIGHT AND SPACING OF CHECK DAMS SHALL BE ESTABLISHED BASED ON THE PONDING DEPTH REQUIRED TO MEET THE PROJECT HYDROLOGIC PERFORMANCE GOALS AND THE MAXIMUM DESIRED DROP FROM THE SURROUNDING GRADE TO THE FACILITY BOTTOM.
5. CONCRETE CHECK DAM SHALL BE CONTINUOUS (NO JOINTS) AND REINFORCED WITH #4 BAR, PLACED AT 18" ON CENTER, EACH WAY.
6. CONCRETE CHECK DAM SHALL MEET STRUCTURAL REQUIREMENTS FOR LATERAL BRACING WHEN USED AS LATERAL BRACING. COORDINATE WITH ENGINEER.
7. TOP OF CHECK DAM TO MATCH PONDING ELEVATION UNLESS NOTCH SIZED TO CONVEY DESIGN FLOWS PROVIDED.
8. GROUT ALL PENETRATIONS, CRACKS, SEAMS, AND JOINTS WITH CLASS "C" MORTAR.
9. CHECK DAMS SHOULD BE PLACED FOR EVERY 4" TO 6" OF ELEVATION CHANGE.

NOT FOR CONSTRUCTION

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

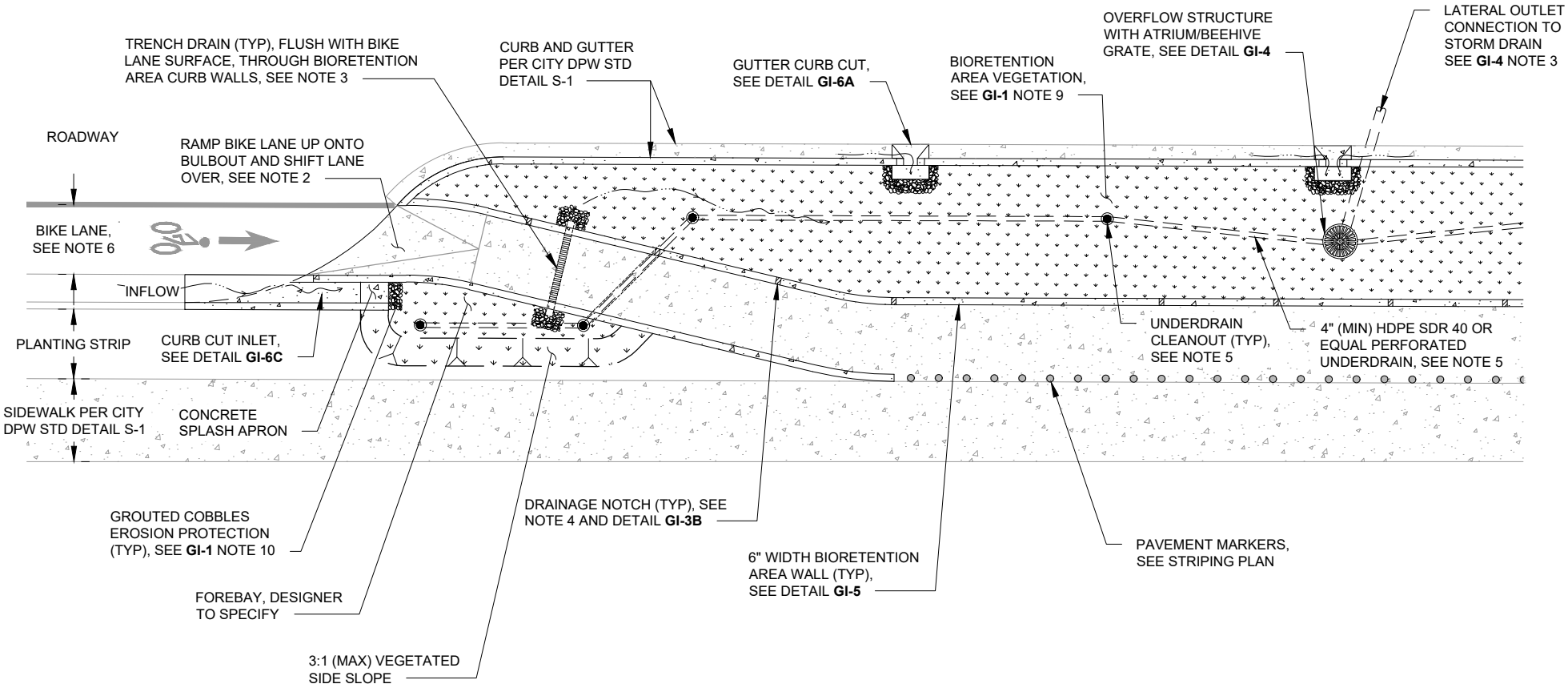
BIORETENTION COMPONENTS: CHECK DAM DETAIL

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-7



NOT FOR CONSTRUCTION

NOTES:

1. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.
2. FOR HORIZONTAL BIKE LANE SHIFT, PROVIDE MAXIMUM 1:12 HORIZONTAL TRANSITION RATE. ADHERE TO ALL LOCAL AND FEDERAL ACCESSIBILITY REQUIREMENTS FOR THE SIDEWALK AND CURB RAMP DESIGNS.
3. HYDRAULIC CONNECTION OF SEPARATED BIORETENTION AREAS PROVIDED BY TRENCH DRAINS. ENGINEER TO SPECIFY, FOLLOWING FLOW AND STRUCTURAL REQUIREMENTS.
4. LAY OUT DRAINAGE NOTCHES AS APPLICABLE TO PREVENT PONDING BEHIND BIORETENTION AREA WALL WITH 5' MAXIMUM SPACING BETWEEN NOTCHES.
5. PROVIDE ONE UNDERDRAIN CLEANOUT PER BIORETENTION AREA (MIN) FOR FACILITIES WITH UNDERDRAINS. CLEANOUT REQUIRED AT UPSTREAM END AND PIPE ANGLE POINTS EXCEEDING 45 DEGREES. LONGITUDINAL SLOPE OF PIPE SHALL BE 0.5% (MIN). PIPE SLEEVES REQUIRED FOR UNDERDRAINS TRANSITIONING BETWEEN BIORETENTION AREAS. UNDERDRAIN SHALL NOT BE USED TO CONVEY FLOOD FLOWS.
6. BIKE LANE SYMBOL, ARROW, AND STRIPING PER OakDOT AND CALTRANS STANDARDS.
7. DRAWING **GI-8** WAS MODIFIED FROM THE BASMAA URBAN GREENING BAY AREA TYPICAL GI DETAILS FIGURE C-1.4.

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

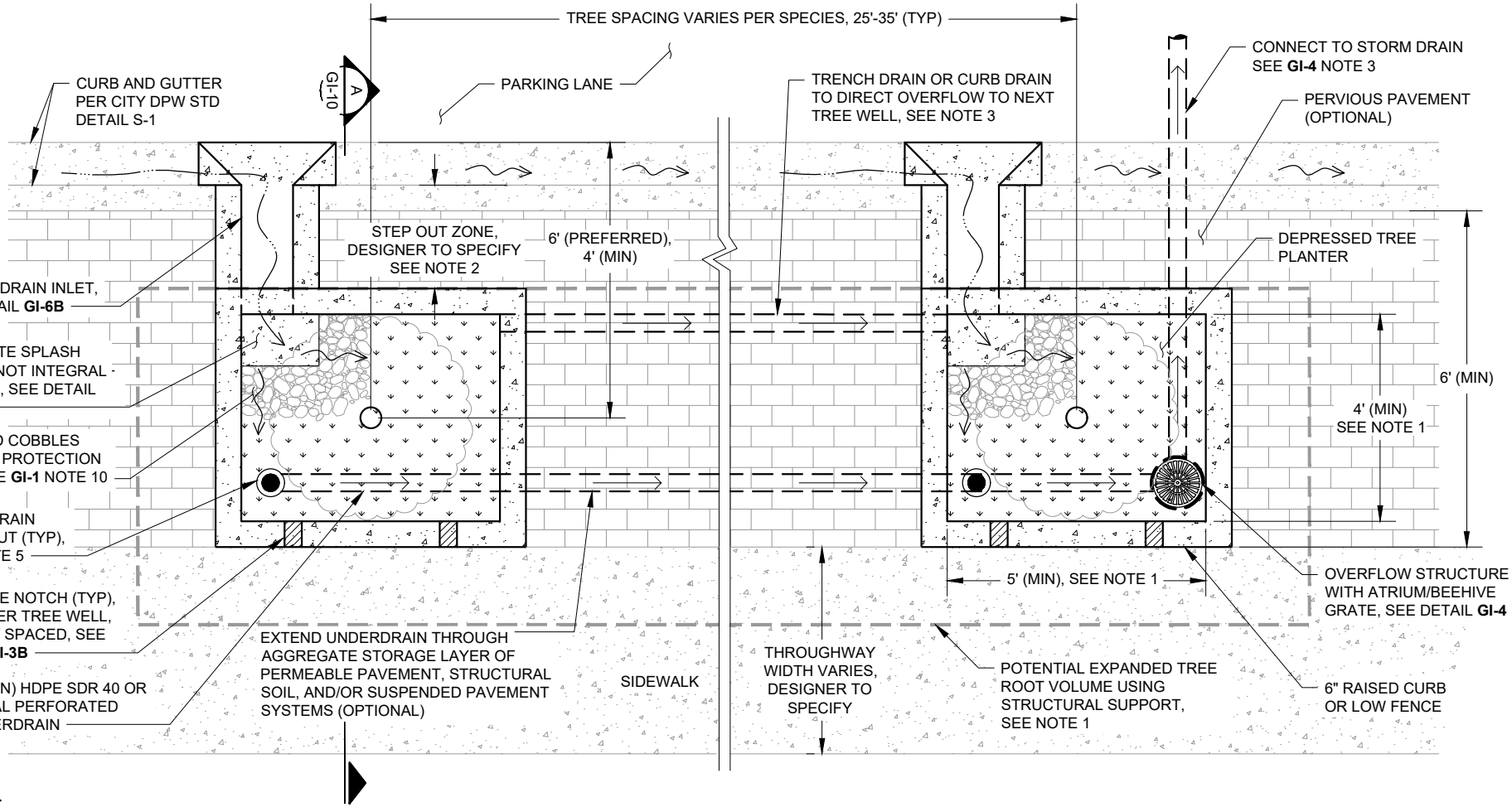
BIORETENTION AREA: WITH BIKE LANE PLAN VIEW

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-8



NOT FOR CONSTRUCTION

NOTES:

1. PREFERRED TREE WELL OPENING SIZE IS 6 FEET BY 6 FEET, BUT CONSTRAINED SITES CAN REDUCE WIDTH TO 4 FEET PROVIDED THEY CAN ACCOMMODATE MINIMUM REQUIRED TREE ROOT VOLUME BY INCREASING LENGTH AND/OR USING STRUCTURAL SOIL, PERVIOUS PAVEMENT, AND/OR SUSPENDED PAVEMENT SYSTEMS UNDER ADJACENT SIDEWALK. IF ADJACENT TO LANDSCAPED AREAS, EXTEND THE BOUNDARY TO BACK OF SIDEWALK TO ALLOW TREE ROOTS TO ACCESS ADJACENT LANDSCAPED AREAS WITH NATIVE SOIL.
2. DESIGNER TO SPECIFY MINIMUM SIDEWALK WIDTH BEHIND AND STEP-OUT ZONE IN FRONT OF TREE WELL THAT COMPLIES WITH ALL APPLICABLE AGENCY AND ADA REQUIREMENTS. STEP-OUT ZONE CAN BE ELIMINATED IF PARKING IS PROHIBITED ALONG CURB.
3. IF CURB DRAIN, I.E. SHALLOW PIPES, ARE USED TO CONVEY SURFACE WATER BETWEEN TREE WELLS, 3 INCH CAST IRON PIPES SHALL BE INSTALLED AND A MINIMUM COVER OF 1-1/2 INCHES OF CONCRETE OVER PIPES SHALL BE PROVIDED. IF TRENCH DRAIN IS USED, THE GRATE SHALL BE PER PUBLIC WORKS STANDARDS, ADA COMPLIANT, AND HAVE A NON-SLIP SURFACE.
4. DRAWING **GI-9** WAS MODIFIED FROM SAN MATEO COUNTY GREEN INFRASTRUCTURE TYPICAL DETAIL TW 1.2.
5. PROVIDE ONE UNDERDRAIN CLEANOUT PER TREE WELL (MIN) FOR FACILITIES WITH UNDERDRAINS. CLEANOUT REQUIRED AT UPSTREAM END AND PIPE ANGLE POINT EXCEEDING 45 DEGREES. LONGITUDINAL SLOPE OF PIPE SHALL BE 0.5% (MIN). UNDERDRAIN SHALL NOT BE USED TO CONVEY FLOOD FLOWS.
6. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

TREE WELL: PLAN VIEW

ENGINEERING DESIGN MANAGER

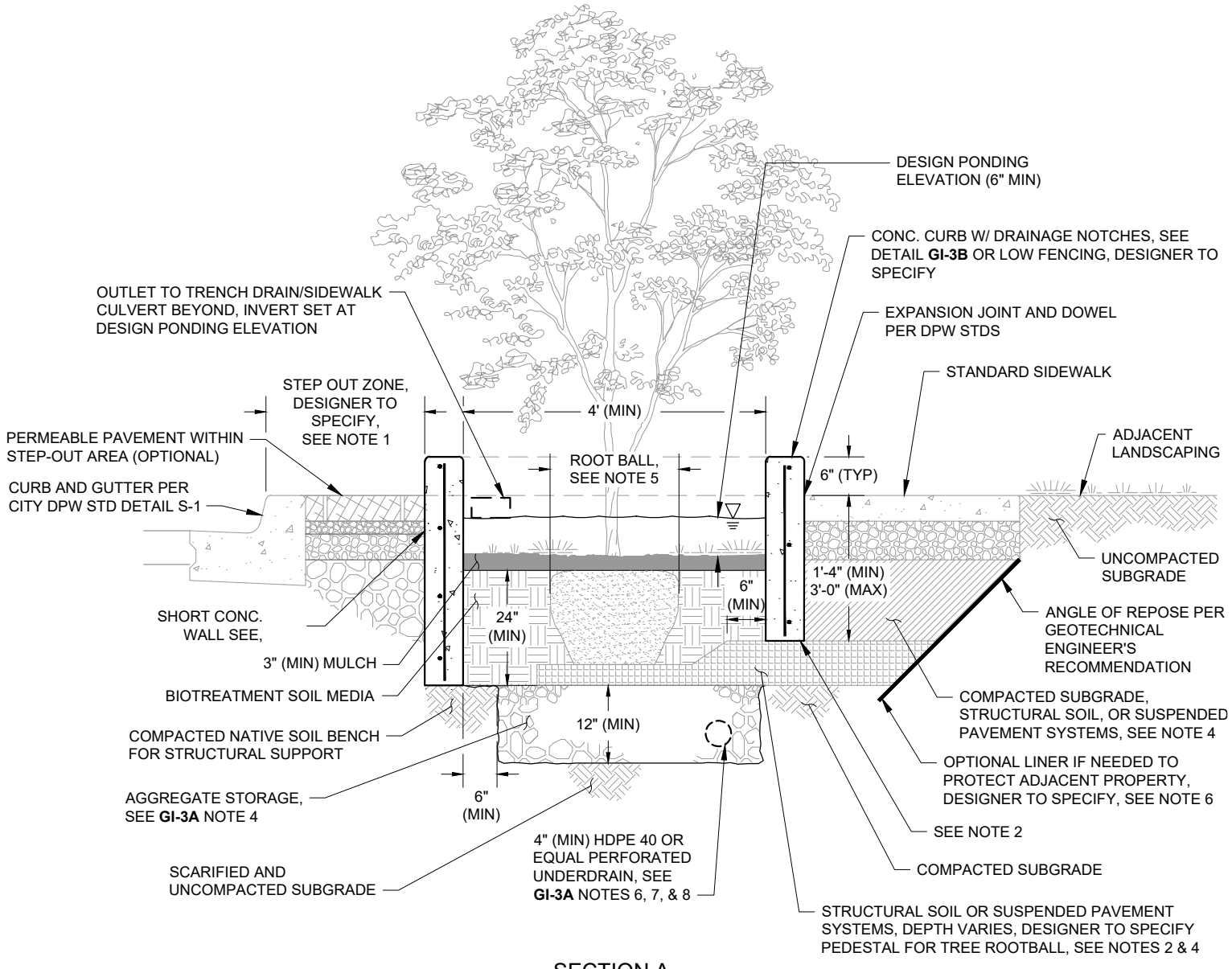
DATE : OCTOBER 2025

REV. DATE :

DWG. GI-9

NOTES:

1. STEP-OUT WIDTH SHALL COMPLY WITH ALL APPLICABLE AGENCY AND ADA STANDARDS.
2. IF STRUCTURAL SOIL AND/OR OTHER METHODS ARE NOT USED TO EXPAND TREE ROOT VOLUME BEYOND TREE PLANTER, EDGE RESTRAINT SHALL BE EXTENDED TO BOTTOM OF BIOTREATMENT SOIL.
3. IF TREE WELL LENGTH EXCEEDS 6 FEET, LATERAL BRACING AND/OR FOOTINGS MAY BE REQUIRED. DESIGNER TO SPECIFY.
4. IF ADDITIONAL ROOTABLE SOIL VOLUME IS NEEDED, DESIGNER MAY SPECIFY THE USE OF ADDITIONAL STRUCTURAL SOIL OR SUSPENDED PAVEMENT SYSTEMS UNDER THE SIDEWALK BASE IF ALLOWED BY PUBLIC WORKS.
5. ROOT BALL SIZE TO BE SPECIFIED BY THE DESIGNER AND APPROVED BY THE CITY ARBORIST IF WITHIN PUBLIC RIGHT-OF-WAY.
6. IF POSSIBLE, DO NOT USE A LINER IF SUSPENDED PAVEMENT SYSTEMS ARE USED. THE LINER WILL NOT ALLOW TREE ROOTS TO GROW INTO THE NATIVE SOIL BEHIND THE SIDEWALK.
7. FOR ADDITIONAL PLANTING AND IRRIGATION REFER TO PUBLIC WORKS REQUIREMENTS. TREES MUST BE IRRIGATED.
8. DRAWING **GI-10** WAS MODIFIED FROM SAN MATEO COUNTY GREEN INFRASTRUCTURE TYPICAL DETAIL TW 1.3.



SECTION A

NOT FOR CONSTRUCTION

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CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

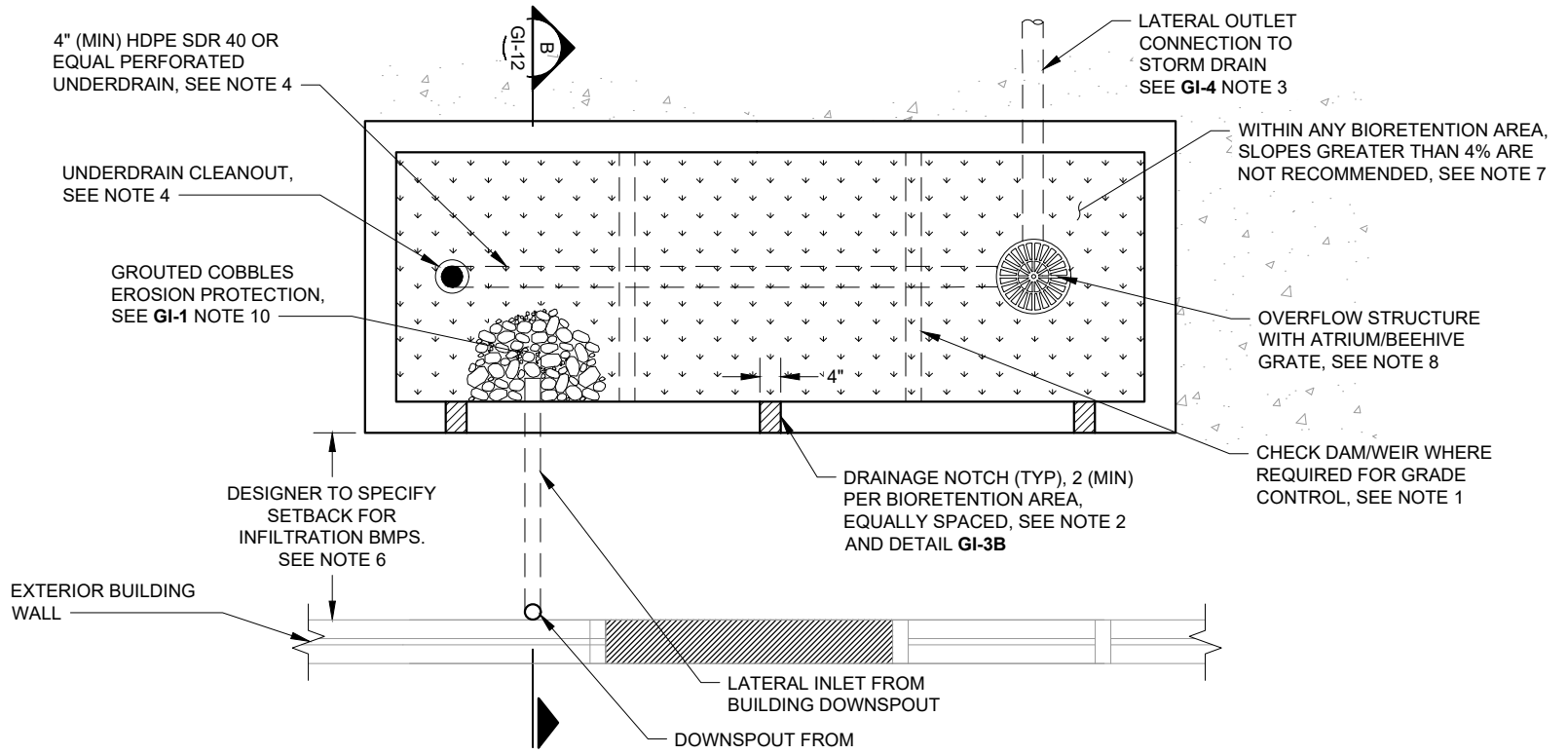
TREE WELL: CROSS SECTION

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-10



PLAN - ALTERNATIVE 1 (1)

NOTES:

1. CHECK DAMS/WEIRS SHALL BE LOCATED WHERE REQUIRED TO PROVIDE GRADE CONTROL AND PONDING PER SITE SPECIFIC DESIGN (SEE DETAIL **GI-7**).
2. LAY OUT DRAINAGE NOTCHES TO PREVENT PONDING BEHIND PLANTER WALL WITH 5' MAXIMUM SPACING BETWEEN NOTCHES.
3. WATERPROOFING AND/OR LINER SYSTEM TO BE DESIGNED AND INSTALLED BY A WATERPROOFING PROFESSIONAL.
4. PROVIDE ONE UNDERDRAIN CLEANOUT PER BIORETENTION (MIN) FOR FACILITIES WITH UNDERDRAINS. CLEANOUT REQUIRED AT UPSTREAM END AND PIPE ANGLE POINTS EXCEEDING 45 DEGREES. LONGITUDINAL SLOPE OF PIPE SHALL BE 0.5% (MIN). UNDERDRAIN SHALL NOT BE USED TO CONVEY FLOOD FLOWS.
5. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT CITY STANDARDS. COORDINATE WITH ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
6. BUILDING SETBACKS SHALL CONFORM TO CURRENT CITY STANDARDS.
7. CONSULTATION WITH A GEOTECHNICAL ENGINEER IS RECOMMENDED WHEN THE SLOPE OF THE TOTAL FACILITY IS OVER 6%.
8. FOR PARCEL PROJECTS, OVERFLOW STRUCTURES SHALL BE SIZED TO MEET DBI PLUMBING CODE REQUIREMENTS, 4 INCHES MINIMUM DIAMETER. THE SIZING OF ALL OVERFLOW STRUCTURES SHALL CONSIDER MAINTENANCE ACCESS COMPATIBLE GRATE SIZES, LOCATION, AND GENERAL AESTHETICS.
9. REFER TO **GI-1** NOTES FOR GUIDELINES AND CHECKLIST.

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

BIORETENTION PLANTER: PARCEL PLANTER PLAN

ENGINEERING DESIGN MANAGER

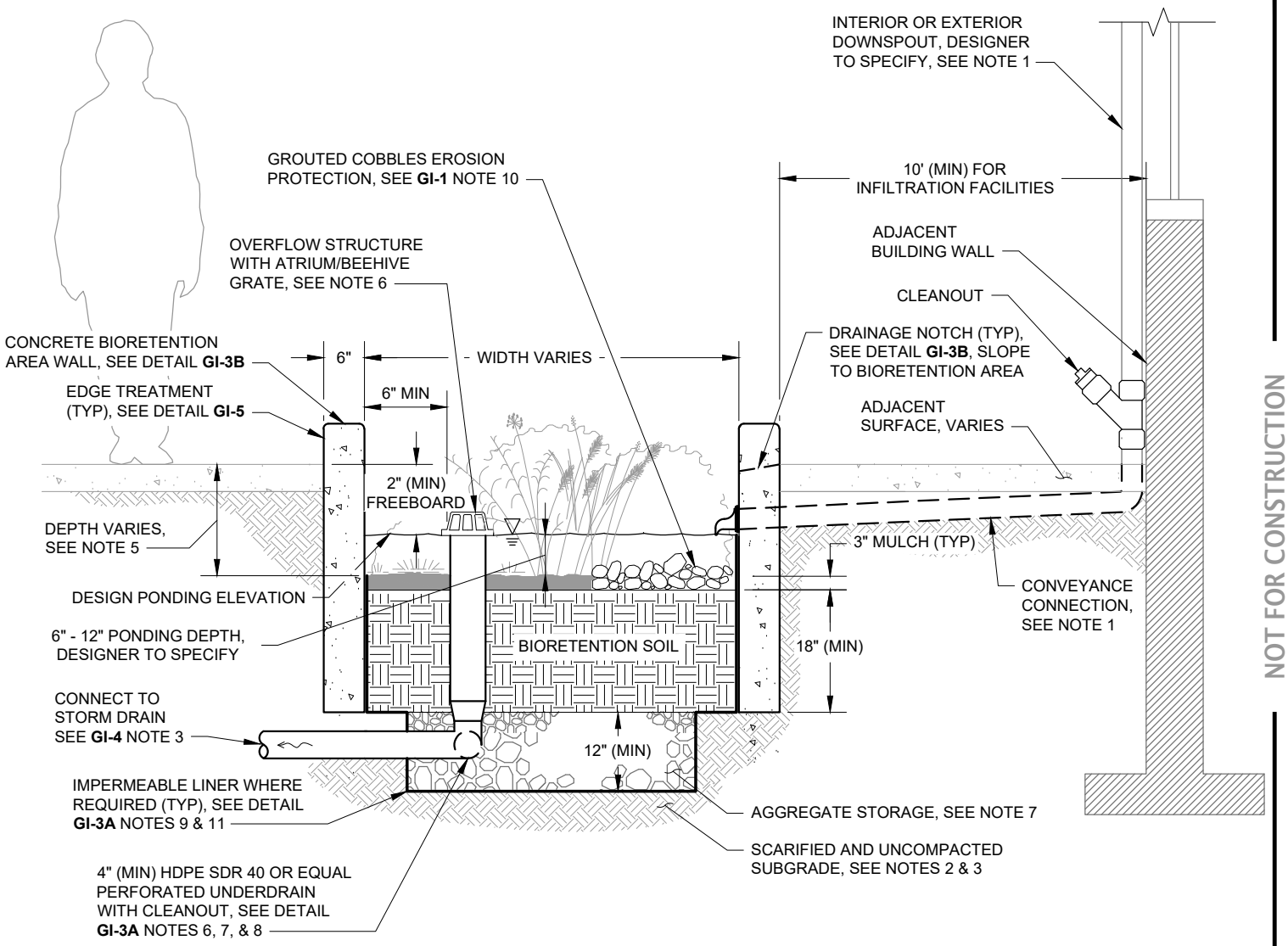
DATE : OCTOBER 2025

REV. DATE :

DWG. GI-11

NOTES:

1. INSTALL DOWNSPOUTS AND OTHER CONVEYANCE CONNECTIONS (E.G. SCUPPER, CHANNEL, OVERHEAD RUNNEL, TRENCH DRAIN) FROM BUILDING TO DRAIN ABOVE DESIGN PONDING ELEVATION. INCLUDE CLEANOUT AT DOWNPIPE CONNECTION FOR HORIZONTAL PIPE CONVEYANCE.
2. FOR UNLINED BASINS ONLY, AVOID COMPACTION OF EXISTING SUBGRADE BELOW BASIN.
3. FOR UNLINED BASINS ONLY, SCARIFY SUBGRADE TO A DEPTH OF 3 INCHES (MIN) IMMEDIATELY PRIOR TO PLACEMENT OF AGGREGATE STORAGE LAYER AND BIORETENTION SOIL MATERIALS.
4. UNDERDRAIN AND LINER REQUIRED WITHIN 10 FEET OF BUILDING ENVELOPE UNLESS APPROVED PER DESIGNER.
5. MAXIMUM DROP FROM TOP OF WALKING SURFACE TO TOP OF MULCH SHALL INCLUDE CONSIDERATIONS FOR SOIL SETTLEMENT. 30 INCH DROP REQUIRES GUARD RAIL.
6. FOR PARCEL PROJECTS, OVERFLOW STRUCTURES SHALL BE SIZED TO MEET DBI PLUMBING CODE REQUIREMENTS, 4 INCHES MINIMUM DIAMETER. THE SIZING OF ALL OVERFLOW STRUCTURES SHALL ALSO CONSIDER MAINTENANCE ACCESS COMPATIBLE GRATE SIZES, LOCATION, AND GENERAL AESTHETICS.
7. AGGREGATE STORAGE LAYER COMPRISED OF 12" (MIN) CALTRANS CLASS 2 PERMEABLE MATERIAL OR 12" (MIN) LAYER COMPRISED OF 3"-4" OF ASTM NO.9 (WASHED) CHOKING COURSE UNDERLAIN BY ASTM NO.7 (WASHED) RESERVOIR COURSE.
8. IF CONSTRUCTED OF PRECAST OR FABRICATED, PLANTER BOXES SHALL HAVE THEIR JOINTS SEALED WITH BUTYL RUBBER TAPE WHEN PRECAST PIECES ARE BEING SET. APPLYING ONLY MORTAR AND/OR NON-SHRINK GROUT TO UNSEALED JOINTS AFTER INSTALLATION IS NOT AN ACCEPTABLE MEANS OF WATERPROOFING THE PLANTER BOX.



SECTION - SURFACE BIORETENTION PLANTER B

NOT FOR CONSTRUCTION

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CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

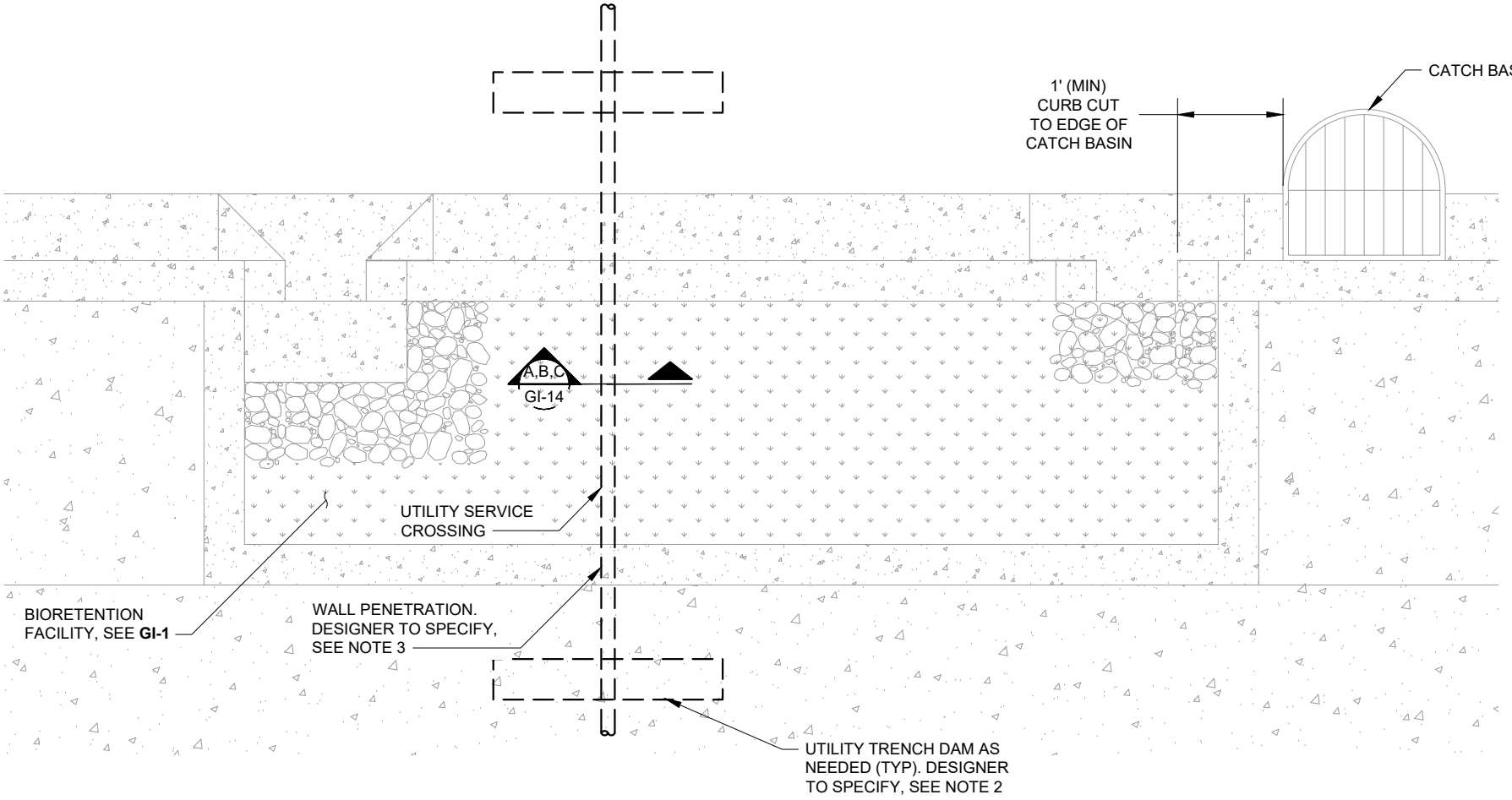
BIORETENTION PLANTER: PARCEL PLANTER AT-GRADE PLANTER SECTION

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-12



NOT FOR CONSTRUCTION

NOTES:

1. ABANDONED UTILITIES WITHIN FOOTPRINT OF FACILITY AND OBSERVED DURING CONSTRUCTION MUST BE REMOVED. COORDINATE WITH MUNICIPAL OR PRIVATE OWNER AND ENGINEER.
2. PROVIDE UTILITY TRENCH DAM OR EQUIVALENT MEASURE OUTSIDE OF THE INFILTRATION FACILITY AT PIPE PENETRATIONS TO PREVENT PREFERENTIAL FLOW FROM INFILTRATION GALLERY INTO UTILITY TRENCHES. COORDINATE WITH ENGINEER.
3. GROUT ALL PENETRATIONS, CRACKS, SEAMS, AND JOINTS WITH CLASS "C" MORTAR.
4. NEW UTILITY LINES AND SERVICES SHALL BE LOCATED AND ROUTED TO AVOID STORMWATER FACILITIES.
5. NO SEWER LINES OR LATERALS ARE ALLOWED IN THE BIORETENTION AREA.

CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

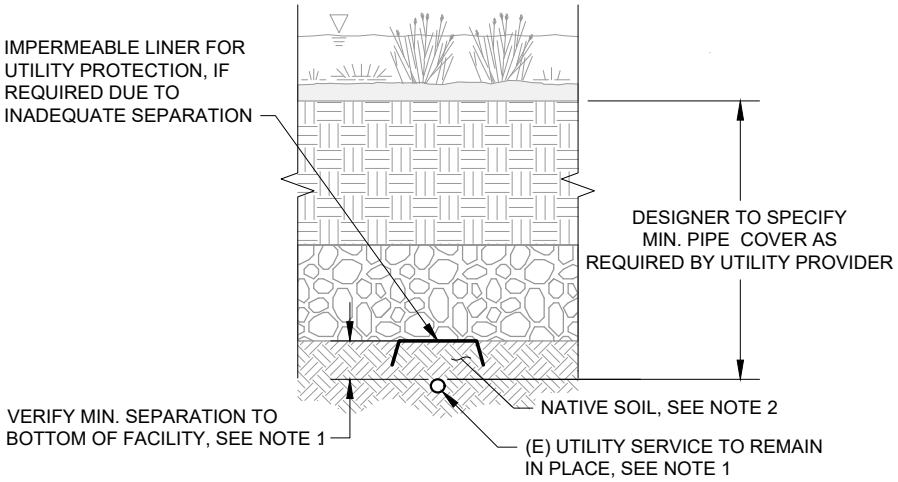
BIORETENTION COMPONENTS: UTILITY CROSSINGS

ENGINEERING DESIGN MANAGER

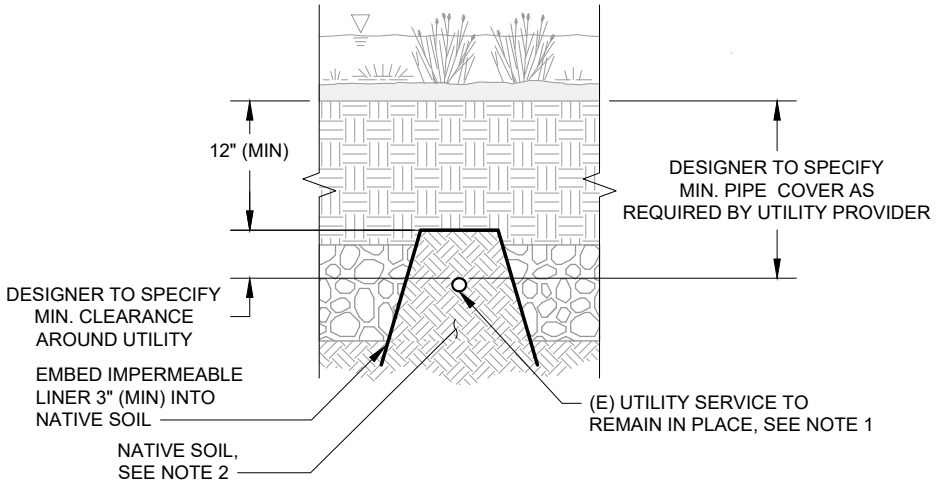
DATE : OCTOBER 2025

REV. DATE :

DWG. GI-13



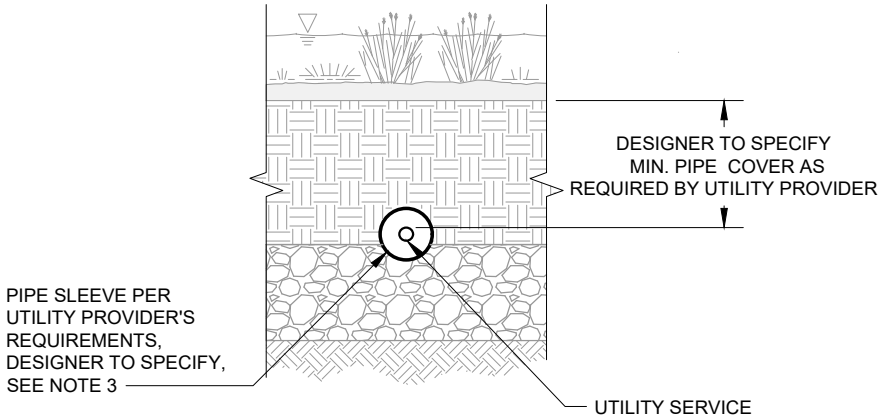
SHALLOW UTILITY SERVICE UNDER BIORETENTION FACILITY — A



SHALLOW UTILITY SERVICE WITHIN BIORETENTION FACILITY — B

NOTES:

1. CONTRACTOR SHALL LOCATE AND DETERMINE DEPTH OF EXISTING UTILITY WITHIN THE FOOTPRINT OF THE BIORETENTION FACILITY WHILE LIMITING THE AMOUNT OF DISTURBANCE TO THE SOIL/BACKFILL MATERIAL OVER AND AROUND THE UTILITY PIPE. IF ELECTROMAGNETIC UTILITY LOCATING, POTHOLING, OR OTHER METHOD REVEALS THAT THE UTILITY PIPE DOES NOT MEET THE REQUIRED CLEARANCE FROM THE BOTTOM OF THE BIORETENTION FACILITY, THE UTILITY PROVIDER MAY REQUIRE THAT PROTECTION MEASURES, SUCH AS THOSE SHOWN ON THIS PLAN, BE IMPLEMENTED PER THEIR STANDARDS. ANY DISCREPANCIES BETWEEN THE EXISTING UTILITIES SHOWN IN THE DESIGN DRAWINGS AND THE ACTUAL FIELD CONDITIONS SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY.
2. EXISTING UTILITIES AND NATIVE SOIL AROUND EXISTING UTILITIES SHOULD REMAIN IN PLACE WHERE POSSIBLE. IF A PORTION OR ALL OF THE UTILITY IS UNCOVERED DURING EXCAVATION OR EXISTING SOIL WITHIN 1 FOOT OF THE KNOWN EXISTING UTILITY IS SCARIFIED, NATIVE SOIL OR APPROVED ENGINEERED BACKFILL SHALL BE CAREFULLY PLACED AND COMPACTED AROUND THE UTILITY PER THE UTILITY PROVIDER'S REQUIREMENTS.
3. UTILITY PROVIDER MAY ALLOW UTILITY SERVICES TO BE LEFT IN PLACE AND WRAPPED WITH A WATERTIGHT WRAP OR TAPE IN LIEU OF A SLEEVE. THIS MUST BE APPROVED PRIOR TO THE START OF CONSTRUCTION.



SLEEVED UTILITY SERVICE WITHIN BIORETENTION FACILITY — C

NOT FOR CONSTRUCTION

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CITY OF OAKLAND | DESIGN AND CONSTRUCTION SERVICES DEPARTMENT

BIORETENTION COMPONENTS: UTILITY CROSSINGS SECTIONS

ENGINEERING DESIGN MANAGER

DATE : OCTOBER 2025

REV. DATE :

DWG. GI-14