**CITY OF KIRKLAND**
LWHS PED BIKE IMPROVEMENTS
**JOB NO: 31-24-PW NO. NMC3000030**
**ADDENDUM NO. 1**

**TO THE PLANS, SPECIFICATIONS, PROPOSAL, AND CONTRACT**

| | |
|---|---|
| Issued This Date: | June 28, 2024 |
| Bid Opening: | **Unchanged – July 17, 2024** |
| Place of Opening: | City Hall, Council Chambers, posted online |

**Notice to All Plan holders:**
This Addendum No. 1, containing the following revisions, additions, and/or Clarifications, is hereby made part of the Plan and Contract Documents for the above named project. Bidders shall take this Addendum into consideration when preparing and submitting their bids and it shall be attached to the Contract Documents.

Contractors shall acknowledge receipt of this Addendum in the place provided on Proposal Page 6. Failure to do so may disqualify the Bidder from consideration of its bid.

This addendum contains 102 pages, including this page.

All other requirements of the contract documents remain in effect.

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CONTRACT DOCUMENTS

**ITEM NO. 1: Adjustment of Bid Quantities (Bid Item 13)**

Estimated Quantities have been changed for the following Bid Schedule Items to match the Contract details:

- Item No. 13, “Crushed Surfacing Top Course” Estimated Quantity has been changed to 130 tons.

**ITEM NO. 2: Modification of Invitation to Bid**

The “Invitation to Bid” opening date is now July 17, 2024 at 10am – see attached revision.

**ITEM NO. 3: Prevailing Wage Rates**

Description: Provide link to complete list of prevailing wages in King County, Washington – see attached revision.

**ITEM NO. 4: Appendix B: Pre-Approved Plans**

Description: Provide City of Kirkland and WSDOT Pre-Approved Plans – see attached revision.

**ITEM NO. 5: Appendix C: Stormwater TIR**

Description: Provide Approved Stormwater TIR – see attached revision.

**ITEM NO. 6: Revision of General Table of Contents**

Description: To remove Appendix D: Stormwater Pollution Prevention Plan from Appendix list – see attached revision.

**Sincerely,**

**Tiffany Tillison, P.E., Project Engineer**

**Rod Steitzer, P.E., Capital Project Manager**

## CITY OF KIRKLAND
## BID SCHEDULE (Update with project-specific Bid Schedule)

### LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS
JOB NO. 31-24-PW

Note: Unit prices for all items, all extensions, and the total amount of the bid must be shown. All entries must be typed or entered in ink.

| Item No. | Item Description | Spec. Ref. | Est. Qty | Unit | Unit Price | Amount |
|---|---|---|---|---|---|---|
| 1 | Minor Change | 1-04 | EST | LS | | |
| 2 | Roadway Surveying | 1-05 | 1 | LS | | |
| 3 | Record Drawings (MINIMUM BID $2,000 ) | 1-05 | 1 | LS | | |
| 4 | SPCC Plan | 1-07 | 1 | LS | | |
| 5 | Mobilization | 1-09 | 1 | LS | | |
| 6 | Project Temporary Traffic Control | 1-10 | 1 | LS | | |
| 7 | Clearing and Grubbing | 2-01 | 1 | LS | | |
| 8 | Removal of Structures and Obstructions | 2-02 | 1 | LS | | |
| 9 | Removal/Abandon Storm System | 2-02 | 1 | LS | | |
| 10 | Asphalt Conc. Pavement Removal | 2-02 | 1220 | SY | | |
| 11 | Cement Conc. Pavement Removal | 2-02 | 40 | SY | | |
| 12 | Roadway Excavation Incl. Haul | 2-03 | 1 | LS | | |
| 13 | Crushed Surface Top Course | 4-04 | 130 | TN | | |
| 14 | HMA CL. 1/2" PG 64-22 | 5-04 | 150 | TN | | |
| 15 | Headwall | 6-02 | 1 | LS | | |
| 16 | Solid Wall PVC Storm Sewer Pipe 6 In. Diam. | 7-04 | 30 | LF | | |
| 17 | Solid Wall PVC Storm Sewer Pipe 12 In. Diam. | 7-04 | 610 | LF | | |
| 18 | Solid Wall PVC Storm Sewer Pipe 18 In. Diam. | 7-04 | 250 | LF | | |
| 19 | Catch Basin Type 1 | 7-05 | 9 | EA | | |
| 20 | Catch Basin Type 1 Thru Curb | 7-05 | 1 | EA | | |
| 21 | Catch Basin Type 1L | 7-05 | 5 | EA | | |
| 22 | Frame and Vane Grate | 7-05 | 13 | EA | | |
| 23 | Open Curb Face Frame and Grate | 7-05 | 1 | EA | | |

# INVITATION TO BID

Notice is hereby given that the City of Kirkland will receive sealed bids in the office of the Purchasing Agent, City Hall, 123 Fifth Avenue, Kirkland, Washington, at 10am, local time on July 17th 2024, for the project hereinafter referred to as:

**LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS**
**CIP NO. NMC3000030**
**PROJECT JOB NO. 31-24-PW**

At said time all bids will be opened and publicly read aloud. Each bid shall be accompanied by a bid proposal deposit in the form of a cashier's check or a bond issued on a form acceptable to your surety made payable to the City of Kirkland for a sum of not less than five percent (5%) of the total bid amount. No bid shall be considered unless accompanied by such bid proposal deposit. Incomplete proposals and proposals received after the time stated above will not be considered. Faxed or emailed responses are not acceptable.

The work to be performed under these specifications consists of furnishing all labor, tools, materials, and equipment necessary for constructions of the **LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS.** Specific work includes, but is not limited to 1150 feet of new curb, gutter, sidewalk, and storm drainage along the east side of 116th Ave NE between NE 73rd Street and NE 75th Place, a new RRFB at the intersection of NE 80th Street and 124th Ave NE. The estimated cost for this project is in the range of $1,250,000 to $1,500,000 based on the base bid, Schedule A.

The City will not sell bid packages. Plans, specifications, and addenda may be viewed and obtained online at *www.bxwa.com*. Click on: "Posted Projects"; "Public Works", "City of Kirkland". The Bidders List is maintained by the Builder's Exchange of Washington, Inc. Registration for the bidder's list may be made online, by phoning (425) 258-1303, or at Builder's Exchange of Washington located at 2607 Wetmore Ave, Everett, WA.

The City of Kirkland in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 USC 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-Assisted Programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises as defined at 49 CFR Part 26 will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

Questions regarding this project shall be submitted in writing to Tiffany Tillison via email at ttillison@kirklandwa.gov. Questions via phone will not be accepted. Bidders shall submit questions no later than 5pm. on July 11th, 2024.

The City reserves the right to reject any and all bids, and to waive any informalities in the bidding, and to make the award to the lowest, responsive, responsible bidder as best serves the interests of the City.

No bids may be withdrawn within forty-five (45) after the actual date of the bid opening.

Published: Daily Journal of Commerce, Seattle Times – June 27th, 2024: July 3rd, 2024

# PREVAILING WAGES

City of Kirkland

# PREVAILING WAGE RATES

Prevailing wage rates can be found at:
www.lni.wa.gov/tradeslicensing/prevwage/wagerates

Use July 17, 2024 rates
(published date - use bid date)

King County

A copy of the applicable wage rates is available for viewing in our office:

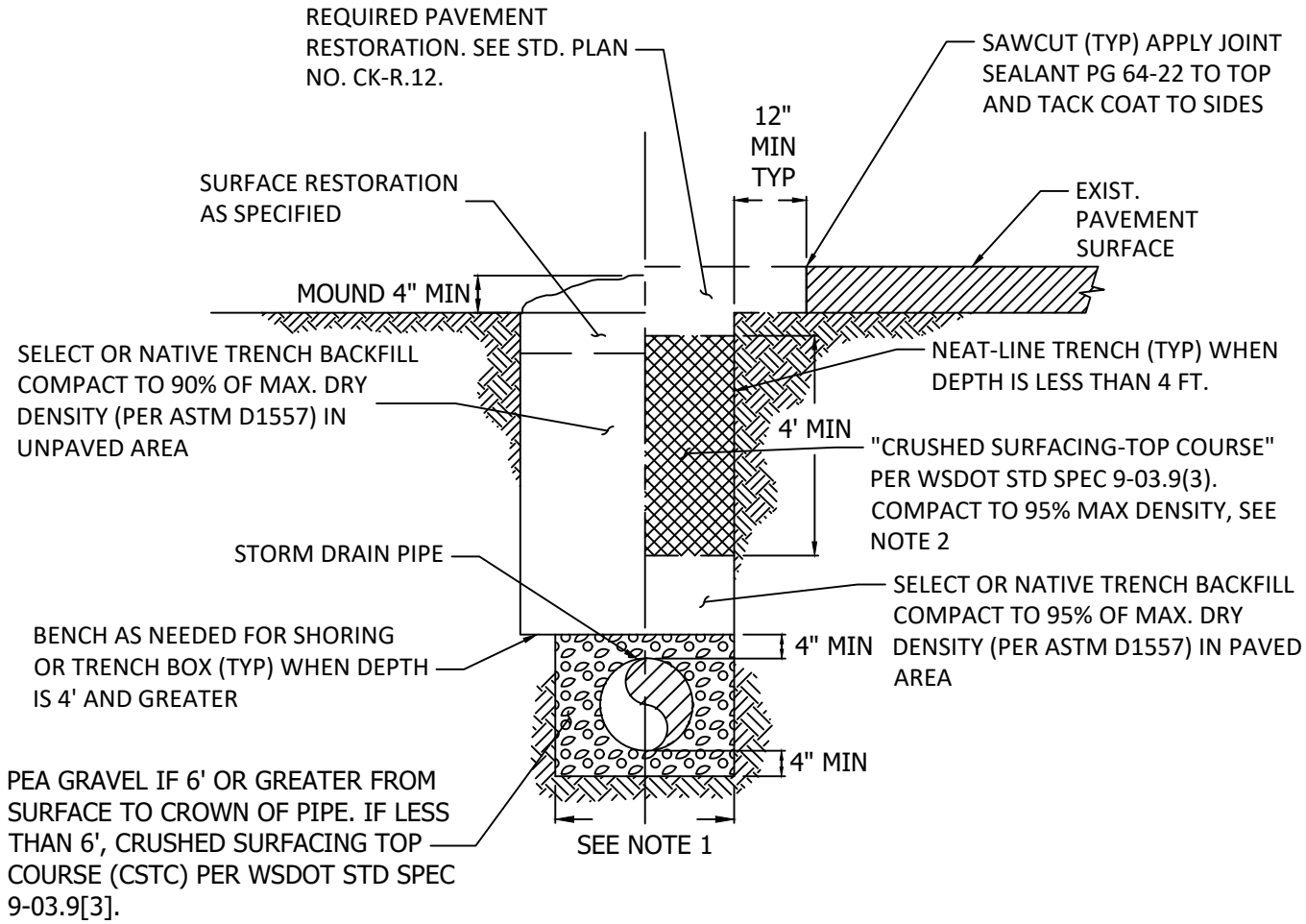
City Hall Annex
310 1st Street
Kirkland, WA 98033

The City of Kirkland will mail a hard copy of the applicable wage rates upon request.
Send your request to the Project Engineer, or jvandervaart@kirklandwa.gov.

# APPENDIX B: PRE-APPROVED PLANS

City of Kirkland

LAST REVISED: 07/2021




UNPAVED AREAS PAVED AREAS

NOTES:

1. MAXIMUM WIDTH OF TRENCH AT TOP OF PIPE
   * 30" FOR PIPE UP TO AND INCLUDING 12" NOMINAL DIAMETER.
   * OD PLUS 16" FOR PIPE LARGER THAN 12" NOMINAL DIAMETER.

2. WHERE TRENCH IS PERPENDICULAR TO TRAVELED LANES, BACKFILL FULL DEPTH WITH CRUSHED SURFACING–TOP COURSE. WHERE TRENCH IS PARALLEL TO TRAVELED LANES, BACKFILL THE TOP 4' OF TRENCH TO SUBGRADE WITH CRUSHED SURFACING–TOP COURSE. SUITABLE EXCAVATED MATERIAL MAY BE USED PROVIDED 95% MAX. COMPACTION DENSITY (ASTM D1557) CAN BE ACHIEVED.

3. SEE OVERLAY POLICY R–7.

4. USE OF RECYCLED CONCRETE IS PROHIBITED, UNLESS APPROVED BY THE CITY. SEE POLICY D-16.

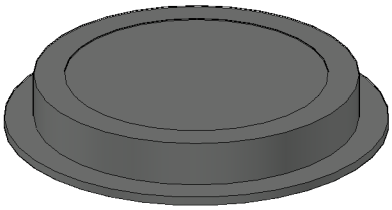
CITY OF KIRKLAND

PLAN NO. CK - D.02

CITY OF KIRKLAND WASHINGTON

STORM TRENCH DETAIL

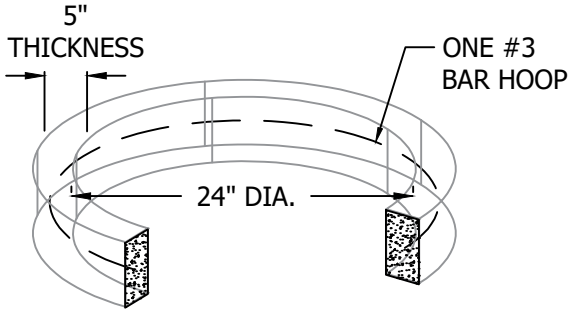
LAST REVISED: 07/2021



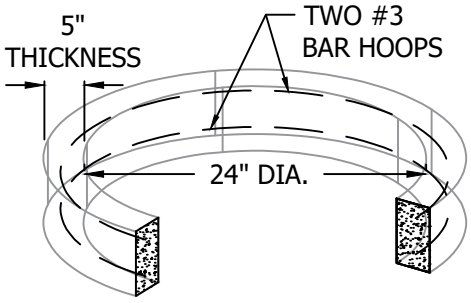
FRAME AND GRATE
(SEE STANDARD DETAILS
D.18 AND D.18A)

NOTES:

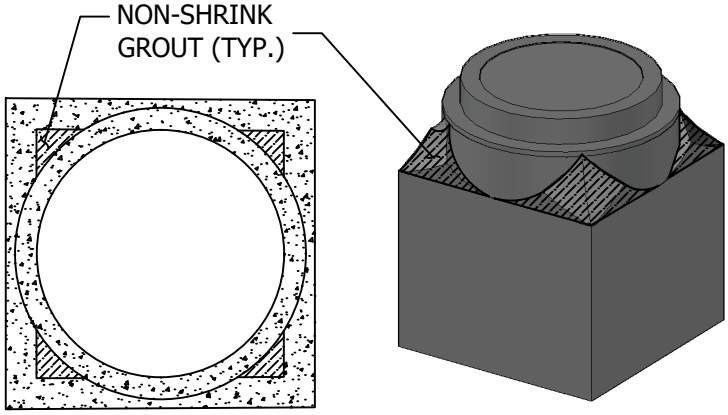
1. GROUT SHALL BE APPLIED BETWEEN ALL MATING SURFACES TO ENSURE A WATER TIGHT SEAL AND STRONG BOND.
2. COMMERCIALLY AVAILABLE CONVERTER FROM RECTANGULAR STRUCTURE TO CIRCULAR RISER MAY BE USED IF APPROVED BY PUBLIC WORKS DEPARTMENT.
3. 1", 2", AND 4" RISERS ACCEPTED AS NEEDED.




6" RISER SECTION




12" RISER SECTION




TRANSITION DETAIL
2-D PLAN VIEW

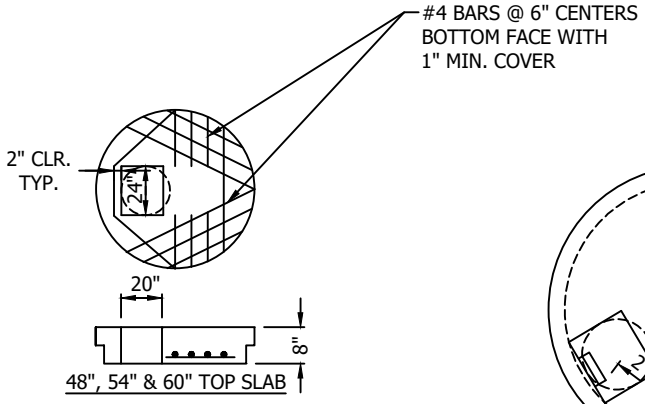
TRANSITION DETAIL
3-D CONCEPTUAL
VIEW

CITY OF KIRKLAND

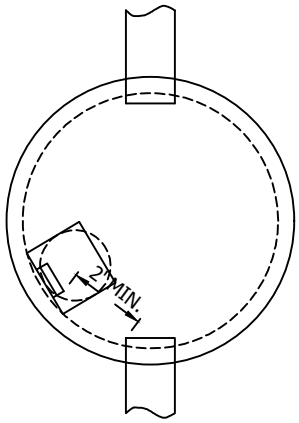
PLAN NO. CK - D.07A

CIRCULAR RISER AND TRANSITION FOR TYPE 1 AND 1-L CB

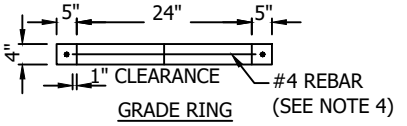
LAST REVISED: 07/2021



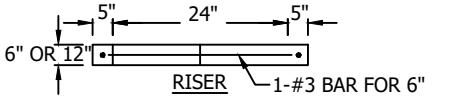
48", 54" & 60" TOP SLAB



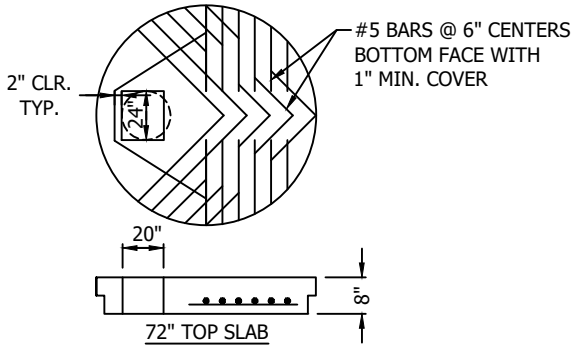
TYPICAL ORIENTATION
FOR ACCESS AND STEPS



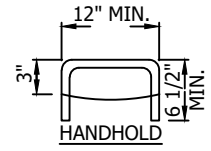
GRADE RING



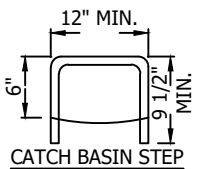
RISER



72" TOP SLAB

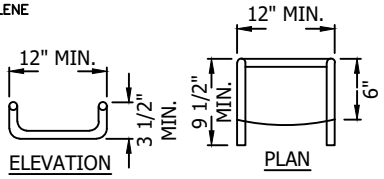


HANDHOLD



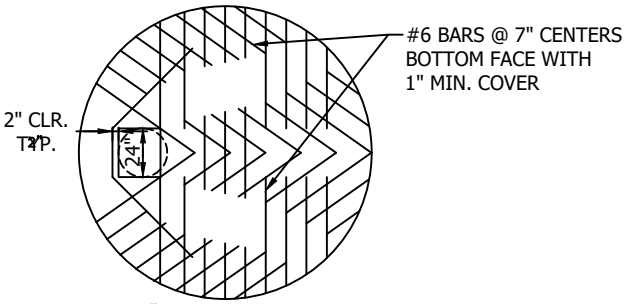
CATCH BASIN STEP

*ALL STEPS COPLOYMER PROPYLENE



ELEVATION
PLAN

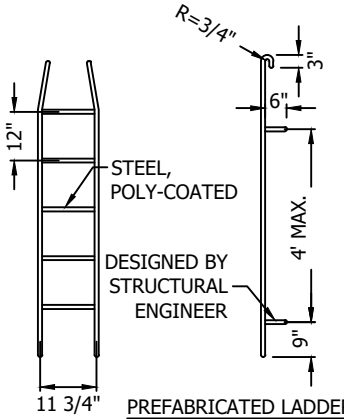
DROP RUNG
CATCH BASIN STEP



96" TOP SLAB

NOTES:

1. PROPRIETARY CATCH BASIN HANDHOLDS AND STEPS ARE ACCEPTABLE, PROVIDED THAT THEY CONFORM TO SEC. R, ASTM C478, AASHTO M-199 AND MEET ALL WISHA REQUIREMENTS. RETRO-REFLECTIVE MARKERS REQUIRED AT EACH END OF STEPS AND HAND-HOLDS.
2. CATCH BASIN STEP/HANDHOLD LEGS SHALL BE PARALLEL OR APPROXIMATELY RADIAL AT THE OPTION OF THE MANUFACTURER, EXCEPT THAT ALL STEPS IN ANY CATCH BASIN SHALL BE SIMILAR. PENETRATION OF OUTER WALL BY A LEG IS PROHIBITED.
3. HANDHOLDS AND STEPS SHALL HAVE "DROP" RUNGS AS SHOWN ON DETAIL OR PROTUBERANCES TO PREVENT SIDEWAYS SLIP.
4. SLAB OPENING MAY BE 24" X 20" RECTANGLE FOR CATCH BASIN OR 24" DIAM. CIRCLE FOR MANHOLE.
5. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497.
6. LADDERS OR STEPS SHALL EXTEND TO WITHIN 16" OF BOTTOM OF CATCH BASIN.
7. HANGING LADDERS SHALL BE PERMANENTLY FASTENED AT TOP BY HANGING ON STEP AND BY BOLTING.
8. ADDITIONAL SAFETY FEATURES MAY BE REQUIRED IN VERY DEEP OR UNUSUAL STRUCTURES.



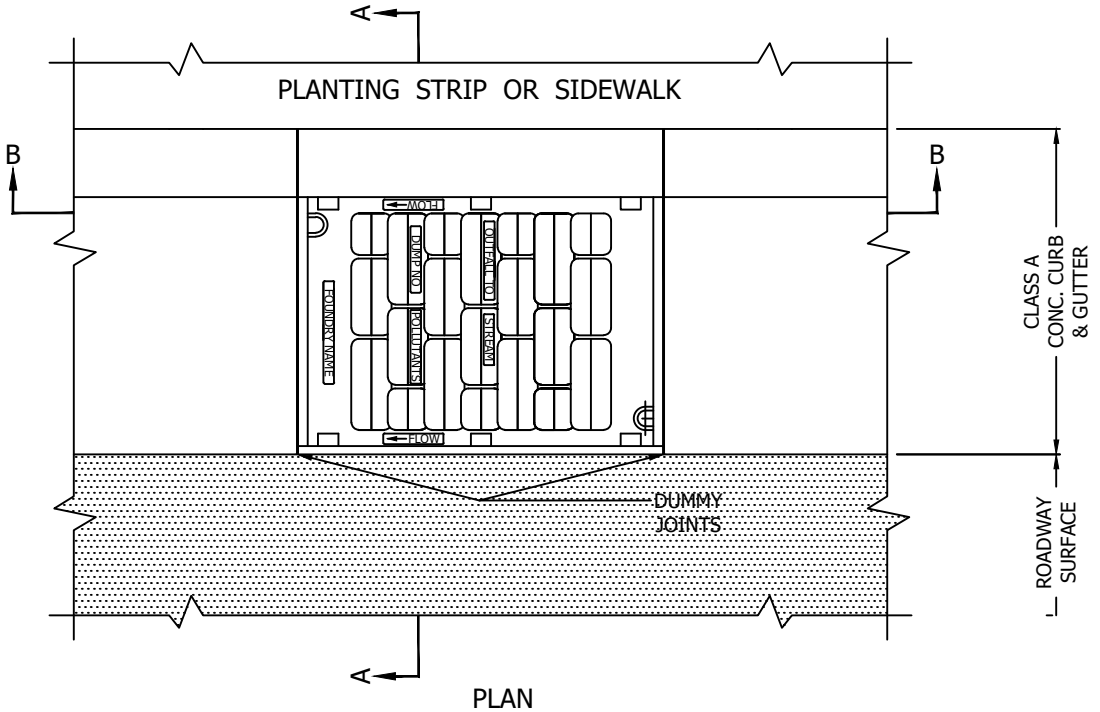
PREFABRICATED LADDER

# CITY OF KIRKLAND

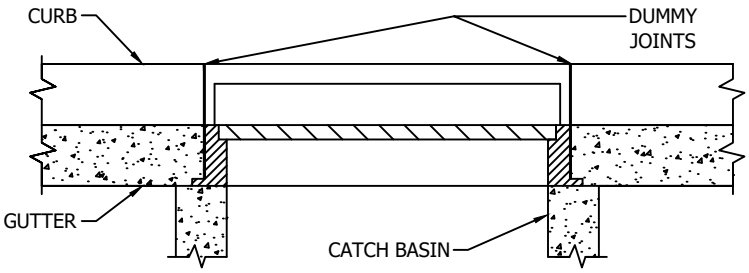
## PLAN NO. CK - D.12

## CATCH BASIN INLET PRECAST COVER AND EXTENSION UNITS

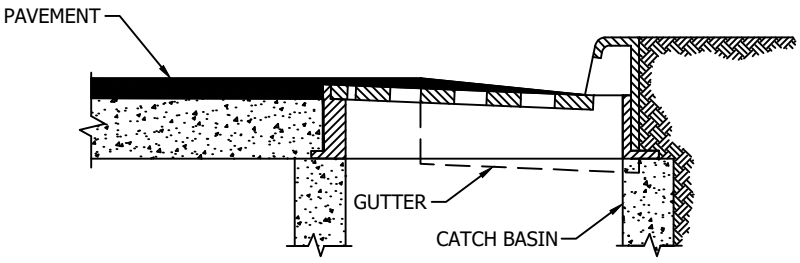
LAST REVISED: 07/2021




PLAN




SECTION B-B




SECTION A-A

NOTES:

1. FRAME AND COVER SHALL BE EAST JORDAN IRON WORKS OR EQUAL, SUBJECT TO APPROVAL BY CITY. SEE CK-D.15.
2. PATTERN ON TOP SHALL SPECIFY FISH LOGO AND DUMP NO POLLUTANTS (NO DIAMOND PATTERN).
3. CASTING MUST BE SET 0.5" BELOW FINAL ROAD/GUTTER GRADE.
4. HOOD SHALL MATCH TOP OF CURB ELEVATION.
5. NO HORIZONTAL CROSS BAR IN THE OPENING.
6. TROWELED EDGE MUST BE IN CONTACT WITH FRAME (RATHER THAN EXPANSION JOINT).
7. MUST BE MADE IN THE USA.

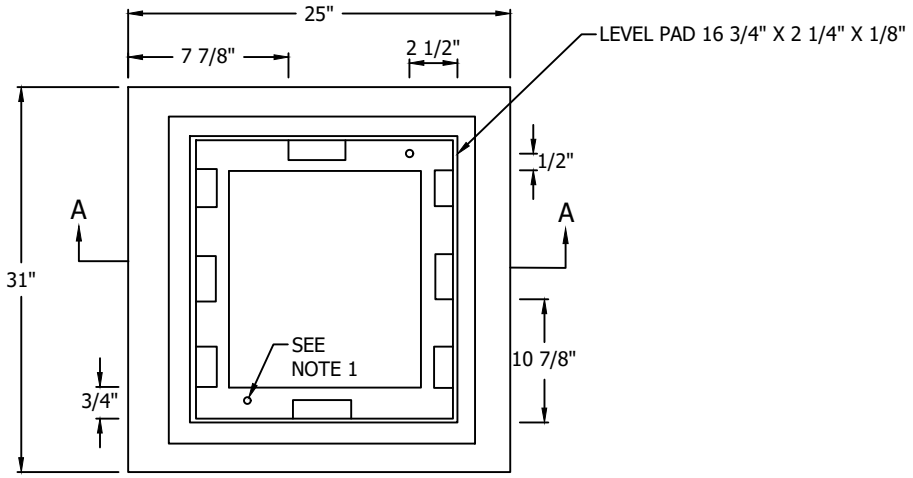
# CITY OF KIRKLAND

## PLAN NO. CK - D.16

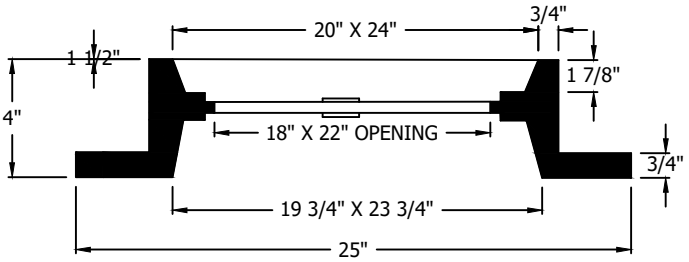
CITY OF KIRKLAND WASHINGTON

THROUGH-CURB INLET
FRAME AND GRATE WITH
VERTICAL CURB INSTALLATION

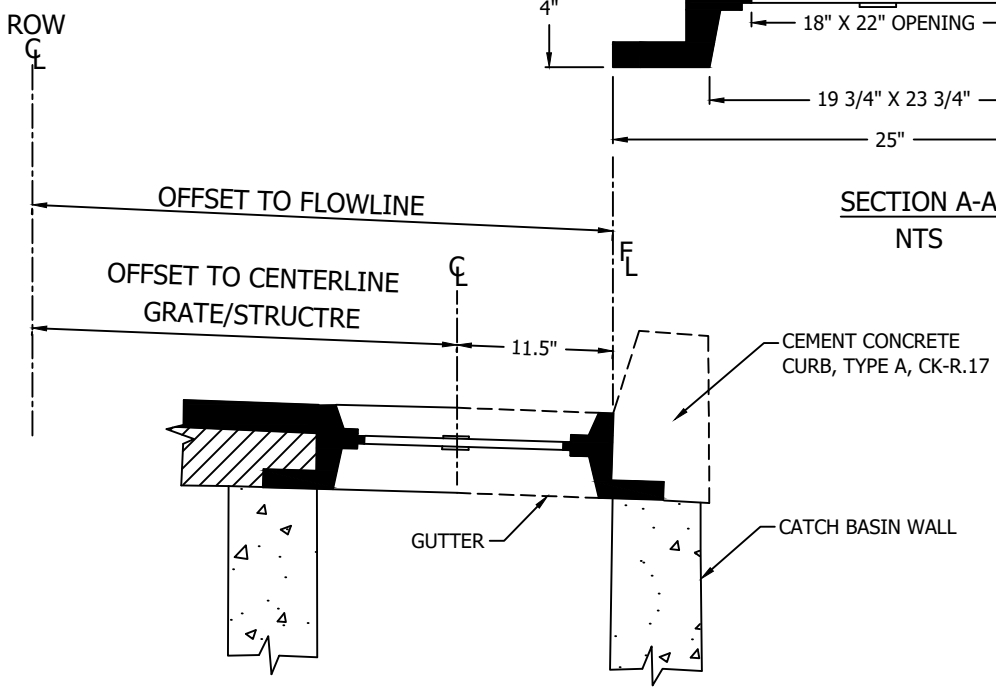
LAST REVISED: 07/2021




PLAN VIEW
NTS




SECTION A-A
NTS




TYPE 1 CATCH BASIN ALIGNMENT CROSS SECTION
NTS

NOTE:

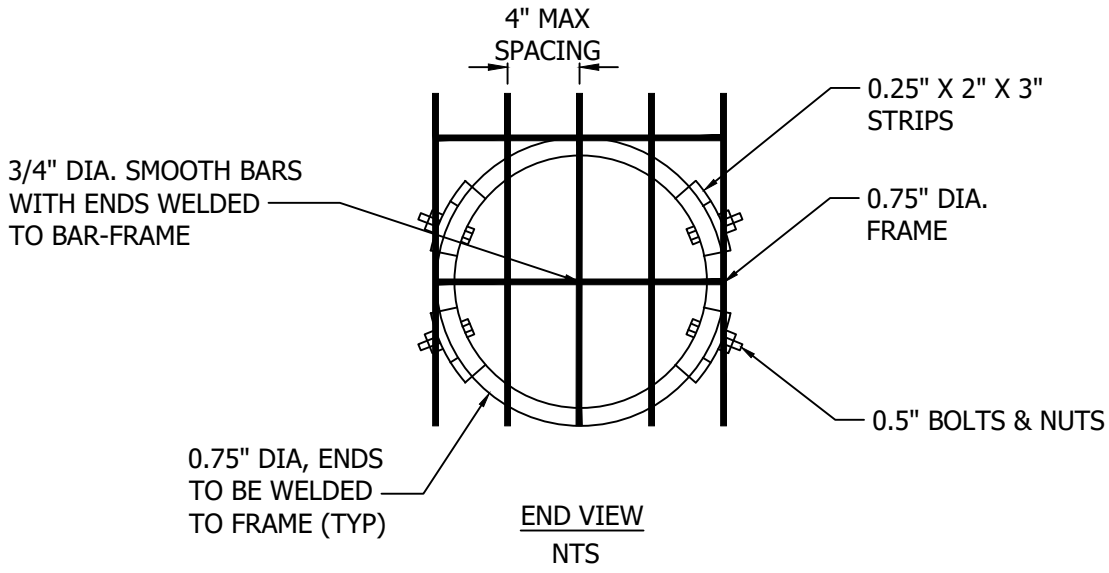
1. FRAME MATERIAL IS CAST IRON PER ASTM A48 CLASS 30.
2. SET FRAME TO GRADE AND CONSTRUCT ROAD AND GUTTER TO BE FLUSH WITH FRAME.
3. BACK OF FRAME SHALL BE IN FLOWLINE OF GUTTER.
4. MUST BE MADE IN THE USA.

CITY OF KIRKLAND

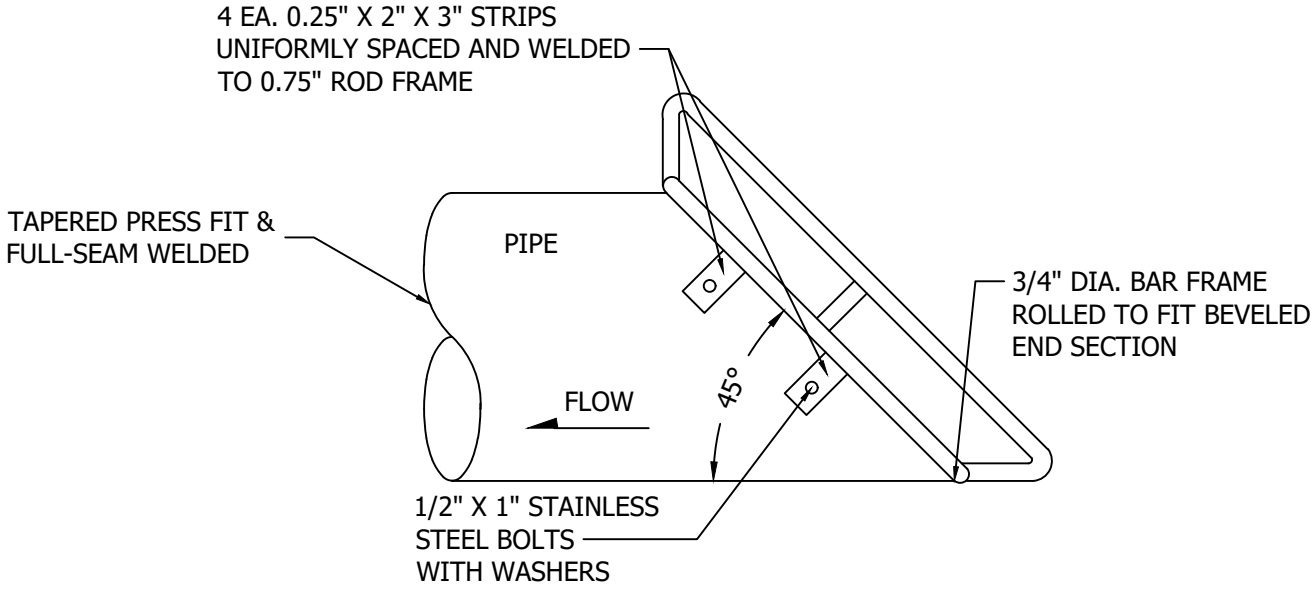
PLAN NO. CK - D.16A

STANDARD FRAME WITH CURB INSTALLATION

LAST REVISED: 07/2021




END VIEW
NTS

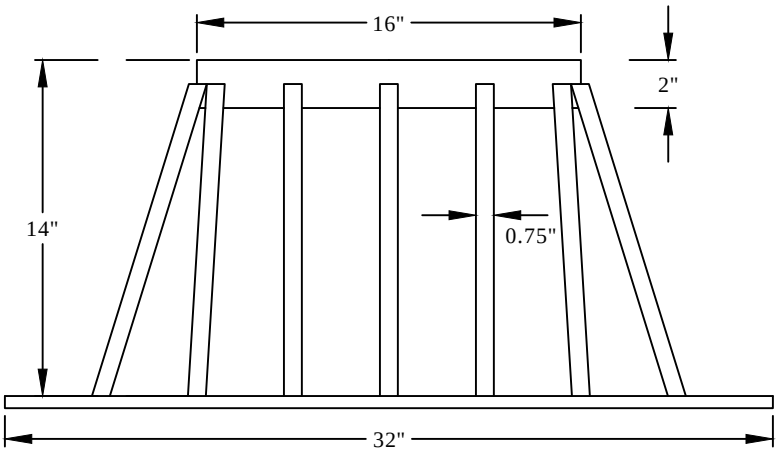



NOTES:

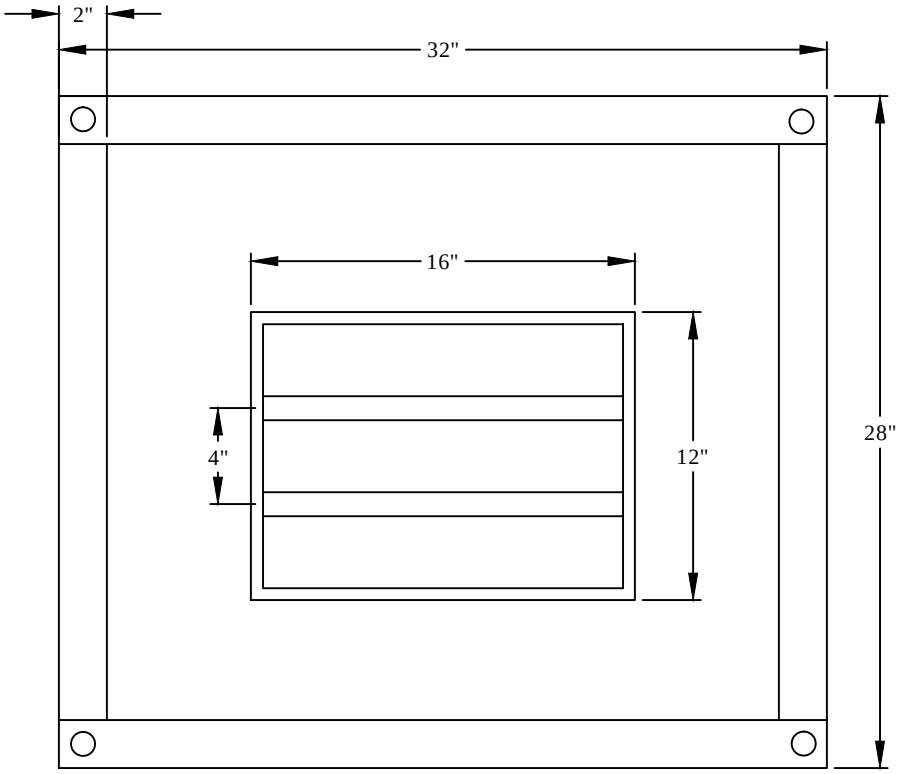
1. ATWOOD FABRICATION OR APPROVED EQUAL.
2. REQUIRED FOR ANY PIPE 8" OR LARGER.
3. DEBRIS BARRIER MUST BE ALL ALUMINUM.
4. DEBRIS BARRIER NOT ALLOWED ON OUTLET END.
5. ALL BOLT HARDWARE SHALL BE STAINLESS STEEL.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK - D.27 | |
| CITY OF KIRKLAND WASHINGTON | TYPICAL DEBRIS BARRIER |

CREATED: 1/2019




DETAIL
NTS




PLAN
NTS

NOTES

1. TO BE PLACED ON TOP OF VERTICAL OVERFLOW STRUCTURES, I.E., WITHIN BIORETENTION CELLS
2. 3/8" x 2 FLAT BAR
3. 3/4" ROUND BAR
4. 4-5/8" HOLE FOR MOUNTING
5. ALL MATERIAL 6061 ALUMINUM
6. MUST BE ANCHORED TO CONCRETE IN REMOVABLE FASHION WITH CORROSION-RESISTANT HARDWARE
7. PRODUCT: ATWOOD FABRICATION OR EQUAL

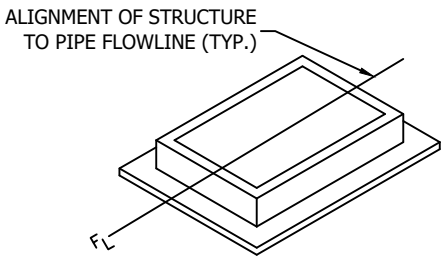
CITY OF KIRKLAND

PLAN NO. CK- D.44

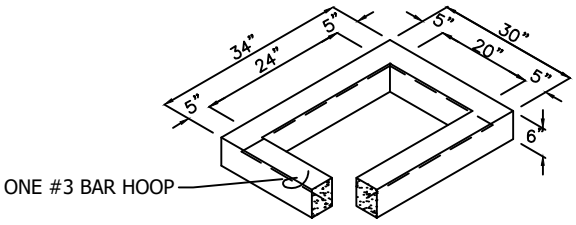
CITY OF KIRKLAND WASHINGTON

# TYPE 1 CB
# DEBRIS (BIRD) CAGE

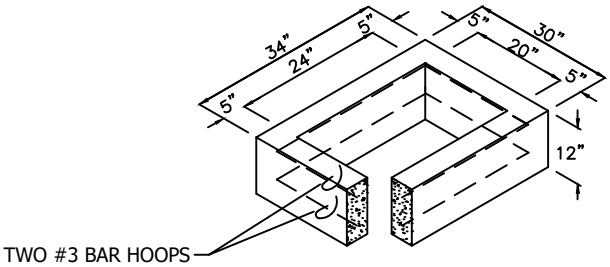
LAST REVISED: 01/2023



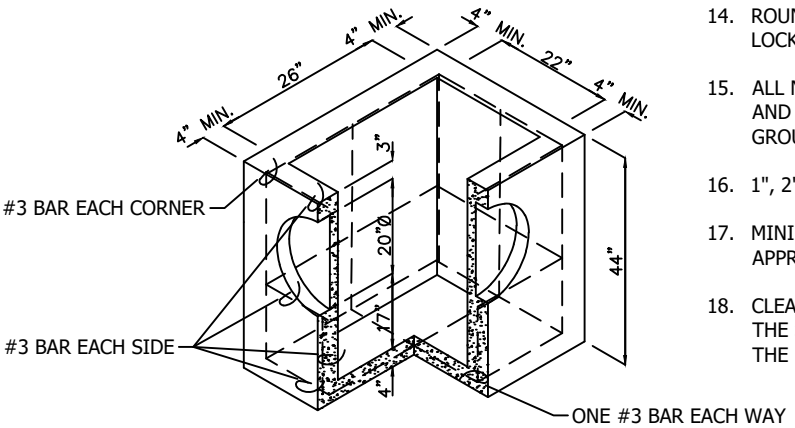

FRAME AND GRATE
(SEE STANDARD DETAILS D.11 THROUGH D.16A)




6" RISER SECTION




12" RISER SECTION




PRECAST BASE SECTION
(MEASUREMENT AT THE TOP OF THE BASE)

NOTES:

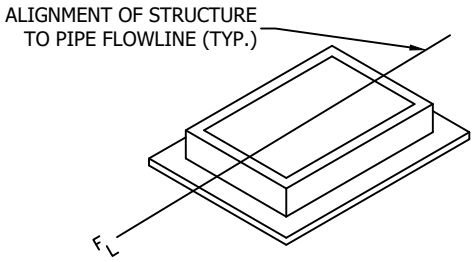
1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX. DIAM. OF 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
8. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2" PER FOOT.
9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
10. FRAME AND GRATE SHALL BE INSTALLED WITH FLANGE DOWN.
11. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
12. ACCEPTABLE PIPE SIZES ARE 8", 12" OR 15". 6" PIPE IS ONLY ACCEPTABLE ON PRIVATE SYSTEMS.
13. ROUND SOLID LIDS REQUIRED WHENEVER CATCH BASIN DOES NOT COLLECT SURFACE WATER. SEE CK-D.18 AND CK-D.18A FOR REFERENCE.
14. ROUND CONCRETE RISERS ARE REQUIRED FOR ROUND SOLID LOCKING LIDS.
15. ALL NEW PVC PIPES SHALL BE INSTALLED WITH SAND COLLARS AND A NON-SHRINK GROUT. JETSET OR SPEED CRETE RED LINE GROUT NOT ALLOWED.
16. 1", 2", AND 4" RISERS ACCEPTED AS NEEDED.
17. MINIMUM 10' FROM ADJACENT TREES, UNLESS OTHERWISE APPROVED.
18. CLEAN SURFACE AND BOTTOM AREA. PROVIDE UNIFORM CONTACT. THE SURFACE AREA OF THE BASE SECTION MUST BE MORTARED TO THE BOTTOM AREA OF THE RISER SECTION.

# CITY OF KIRKLAND

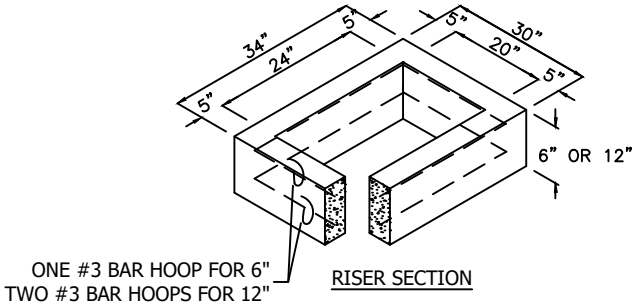
## PLAN NO. CK - D.07

## CATCH BASIN TYPE 1

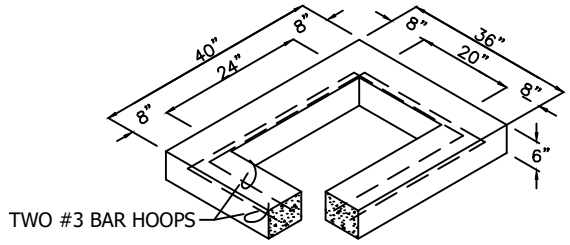
LAST REVISED: 01/2023



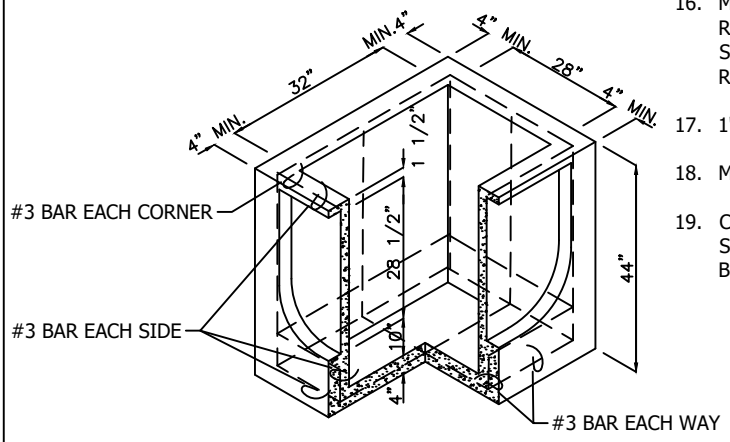

FRAME AND GRATE (SEE APPLICABLE STANDARD DETAILS CK-D.11 THROUGH D.16)




RISER SECTION




6" REDUCING SECTION




PRECAST BASE SECTION
(MEASUREMENT AT THE
TOP OF THE BASE)

NOTES

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
5. KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
6. KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM. OF 28". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
7. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2" PER FOOT.
8. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
9. FRAME AND GRATE SHALL BE INSTALLED WITH FLANGE DOWN.
10. MAX. DEPTH FROM FINISHED GRADE TO PIPE INVERT SHALL BE 5'-0".
11. EDGE OF REDUCING SECTION OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
12. ACCEPTABLE PIPE SIZES ARE 8", 12", 15" OR 18". 6" PIPE IS ONLY ACCEPTABLE ON PRIVATE SYSTEMS.
13. ROUND SOLID LOCKING LIDS REQUIRED WHENEVER CATCH BASIN DOES NOT COLLECT SURFACE WATER, OR WHEN LOCATED IN SIDEWALK AND PLANTER AREAS. SEE CK-D.18 AND CK-D.18A FOR REFERENCE.
14. ROUND CONCRETE RISERS ARE REQUIRED FOR ROUND SOLID LOCKING LIDS.
15. ALL NEW PVC PIPES SHALL BE INSTALLED WITH SAND COLLARS AND A NON-SHRINK GROUT. JETSET OR SPEED CRETE RED LINE GROUT NOT ALLOWED.
16. MAXIMUM RISE OF 20" X 24" RISER THROAT SHALL BE 12". IF MORE RISE IS NEEDED IT SHALL BE PROVIDED WITH AN ADDITIONAL RISER SECTION(S) BENEATH THE REDUCING SLAB, IF REDUCING SLAB IS REQUIRED.
17. 1", 2", AND 4" RISERS ACCEPTED AS NEEDED.
18. MINIMUM 10' FROM ADJACENT TREES, UNLESS OTHERWISE APPROVED.
19. CLEAN SURFACE AND BOTTOM AREA. PROVIDE UNIFORM CONTACT. THE SURFACE AREA OF THE BASE SECTION MUST BE MORTARED TO THE BOTTOM AREA OF THE RISER SECTION.

# CITY OF KIRKLAND

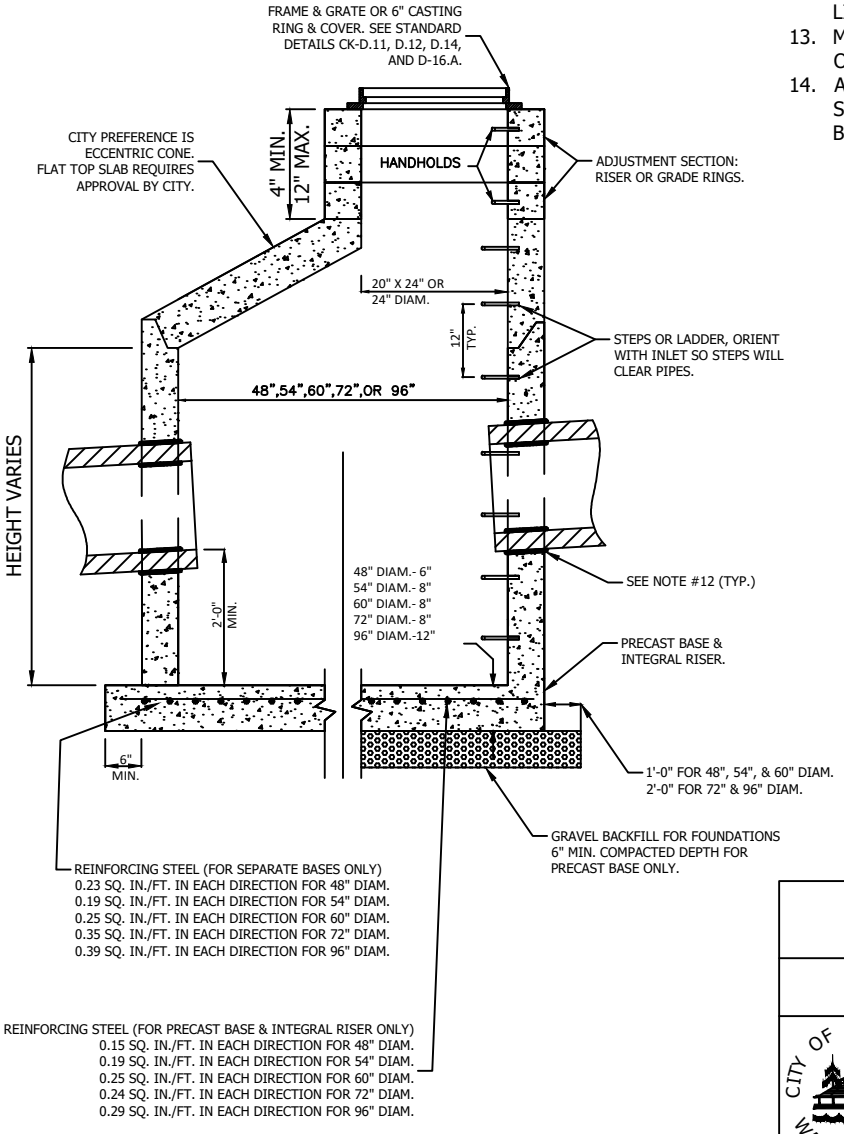
## PLAN NO. CK - D.08

## CATCH BASIN TYPE 1-L

LAST REVISED: 01/2023

NOTES:

1. CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M199) AND ASTM C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
2. HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN CATCH BASIN SHALL HAVE 6" MIN. CLEARANCE. SEE STD. DTL. NO. CK-D.12, CATCH BASIN DETAILS. HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND TOP OF THE FINISHED GRADE.
3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2" MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. CATCH BASIN FRAMES AND GRATES OR COVERS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
6. ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MIN. CLEARANCE.
7. MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT.
8. FOR DETAILS SHOWING LADDER, STEPS, HANDRAILS AND TOP SLABS, SEE STD. DTLS. NO. CK-D.12 AND CK-S.14.
9. ALL MANHOLE JOINTS SHALL USE A CONFINED RUBBER GASKET AND GROUTED (INSIDE AND OUT) TO MEET ASTM C-443 SPECIFICATIONS.
10. ROUND SOLID LOCKING LIDS REQUIRED WHENEVER CATCH BASIN DOES NOT COLLECT SURFACE WATER, OR WHEN LOCATED IN SIDEWALK AND PLANTER AREAS. SEE CK-D.18, CK-D.18A, AND CK-D.18B FOR REFERENCE.
11. ROUND CONCRETE RISERS ARE REQUIRED FOR ROUND SOLID LOCKING LIDS.
12. ALL NEW PIPES SHALL BE INSTALLED WITH EITHER A KOR-N-SEAL BOOT, OR SAND COLLARS AND A NON-SHRINK GROUT. JETSET OR SPEED CRETE RED LINE GROUT NOT ALLOWED.
13. MINIMUM 10' FROM ADJACENT TREES, UNLESS OTHERWISE APPROVED.
14. ALL RISERS WILL BE WET SET IN GROUT, AND SMOOTHED INSIDE AND OUT PRIOR TO BEING BURIED.




ACCEPTABLE PIPE SIZES:

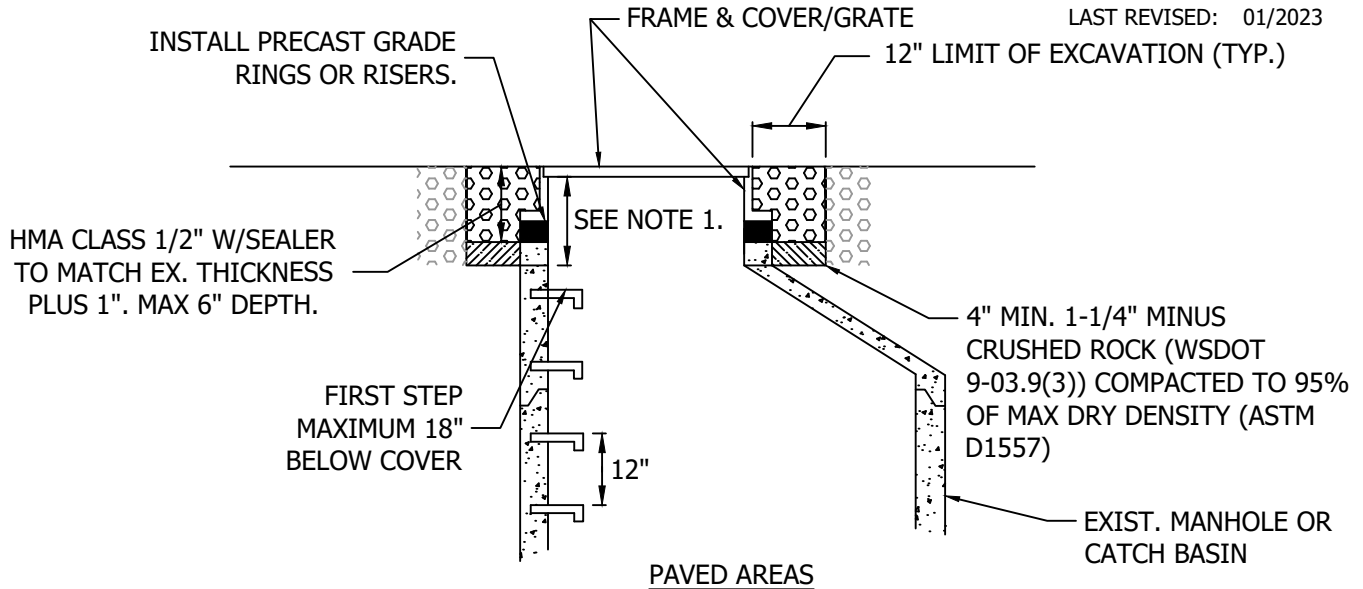
| | Pipe Size | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Basin Type | 6" | 8" | 12" | 15" | 18" | 24" | 30" | 36" | 48" |
| Type II-48" CB | X | X | X | X | X | X | X | | |
| Type II-54" CB | X | X | X | X | X | X | X | X | |
| Type II-60" CB | X | X | X | X | X | X | X | X | |
| Type II-72" CB | X | X | X | X | X | X | X | X | X |
| Type II-96" CB | X | X | X | X | X | X | X | X | X |

# CITY OF KIRKLAND

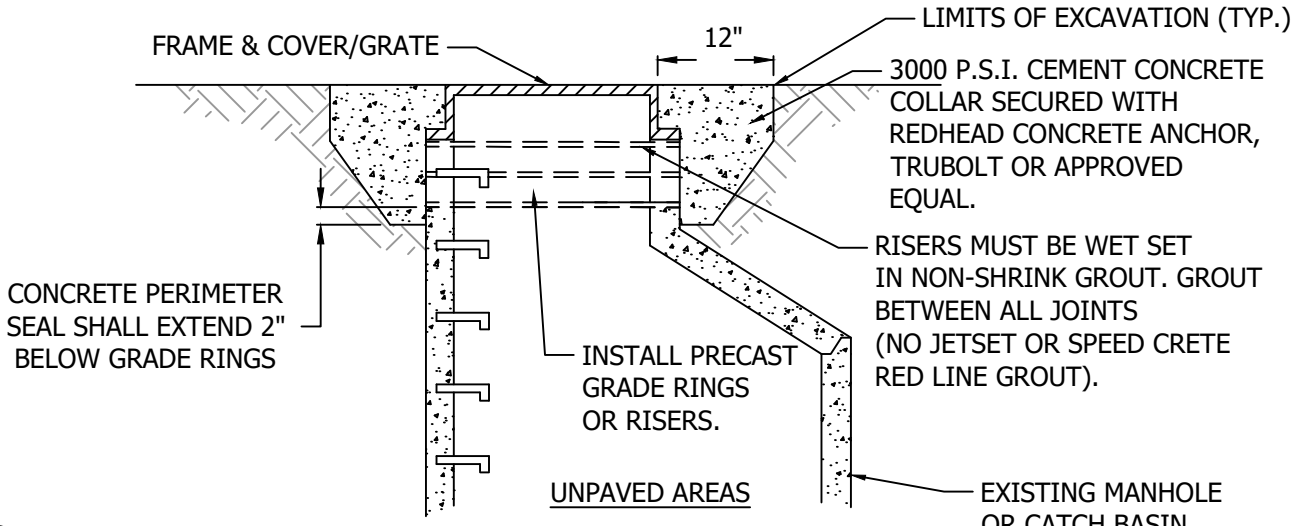
## PLAN NO. CK - D.09

## CATCH BASIN TYPE 2 48",54",60",72",96"

LAST REVISED: 01/2023




PAVED AREAS




UNPAVED AREAS

NOTES:

1. WHERE DEPTH OF NECK EXCEEDS 18 INCHES (INCLUDING FRAME AND COVER), ADJUST MANHOLE/CATCH BASIN TO GRADE BY INSERTING NEW BARREL SECTION BETWEEN THE CONE/SLAB AND EXISTING BARREL.

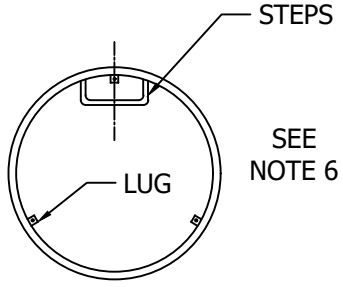
2. GRADE RINGS, RISERS AND FRAME SHALL BE SET IN 3/4" NON-SHRINK GROUT, GROUT BETWEEN ALL JOINTS. ALL SURFACES MUST BE CLEAN OF DEBRIS AND DIRT, AND WETTED PRIOR TO GROUTING. GROUT SMOOTH INSIDE AND OUTSIDE SURFACES PRIOR TO BACKFILL.

3. STEPS OR HAND HOLDS SHALL BE ADDED PER ASTM C478.

4. PRECAST GRADE RINGS AND RISERS MUST BE CAST WITH GROOVE TO ALLOW FIELD INSTALLATION OF SAFETY STEP WHEN RISER IS 4" OR HIGHER.

5. REPLACE EXISTING FRAME AND COVER/GRATE IF NOT MEETING CURRENT SPECIFICATIONS.

6. IF REQUIRED: LOCKING MH SHALL BE POSITIONED WITH ONE LUG CENTERED OVER STEPS, UNLESS USING CK-D.18A CASTING.



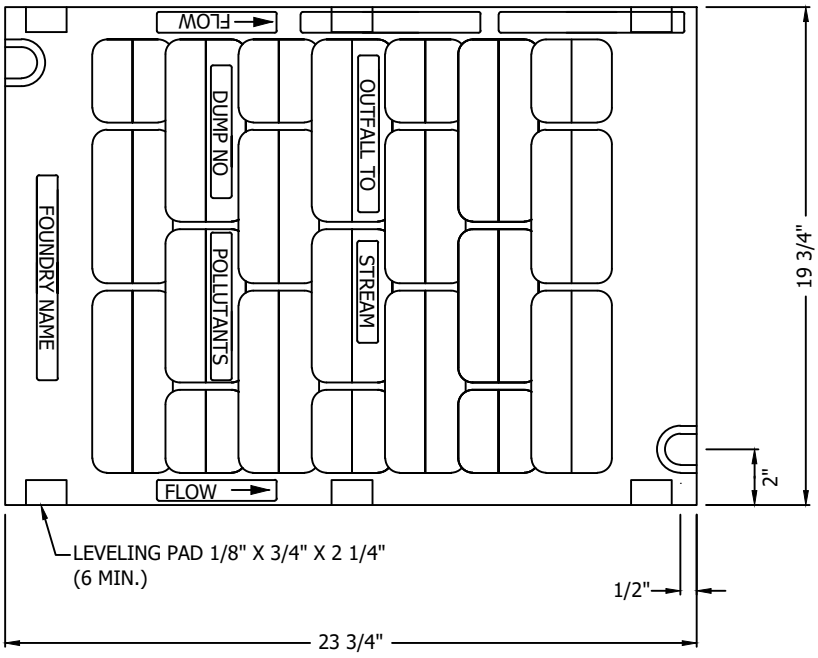

LOCKING MH FRAME
PLAN VIEW

CITY OF KIRKLAND

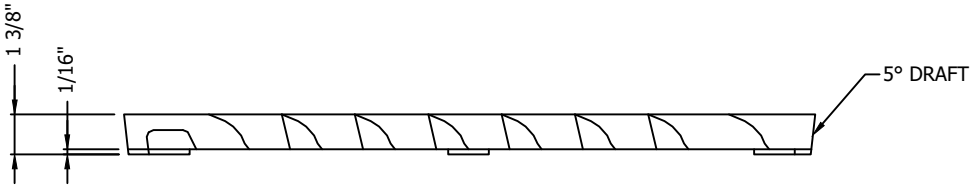
PLAN NO. CK - D.11

MANHOLE/CB
FRAME AND GRATE
ADJUSTMENT

LAST REVISED: 01/2023




PLAN




ELEVATION

NOTES:

1. USE EAST JORDAN IRON WORKS OR EQUAL TWO BOLT LOCK CAPABILITY THAT MEETS WSDOT SPEC. MANUFACTURER SUBJECT TO APPROVAL BY CITY.
2. USE WITH TWO LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) BOLTS, 2" LONG. FRAMES SHALL INCLUDE THREADS AS DROP-OUT REPLACEABLE NUTS.
3. MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80-55-06.
4. "OUTFALL TO STREAM DUMP NO POLLUTANTS" MAY BE LOCATED ON BORDER AREA.
5. SHALL CONFORM TO SEC. 7.05 OF THE STANDARD SPECIFICATIONS.
6. WELDING IS NOT PERMITTED.
7. EDGES SHALL HAVE 0.125" RADIUS, 0.125" CHAMBER OR COMPLETE DEBURRING.
8. USE A BI-DIRECTIONAL VANED GRATE AT ANY LOW POINT OR WHEN FLOWS COME FROM MULTIPLE DIRECTIONS.
9. NO EXPANSION MATERIAL IN THE FLOW LINE, WHERE CONCRETE COMES TO FRAME.
10. FRAME AND COVER SHALL BE H-20 LOADING RATED IF INSTALLED IN ROADWAY.
11. MUST BE MADE IN USA.

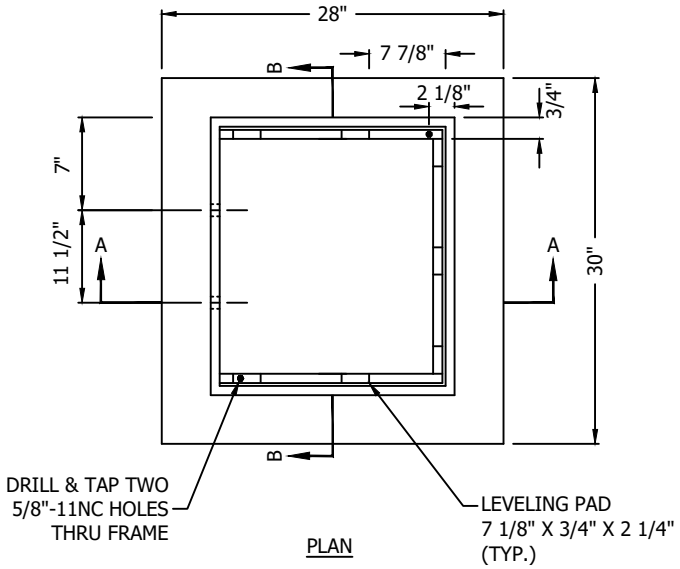
CITY OF KIRKLAND

PLAN NO. CK - D.14

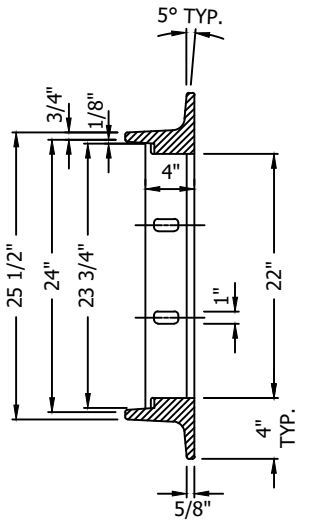
CITY OF KIRKLAND WASHINGTON

# VANED GRATE FOR CATCH BASIN AND INLET

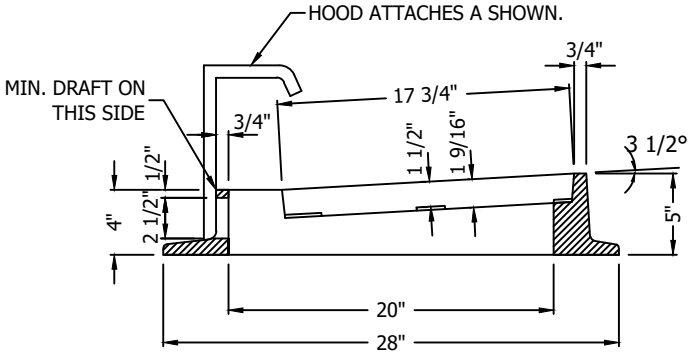
LAST REVISED: 01/2022



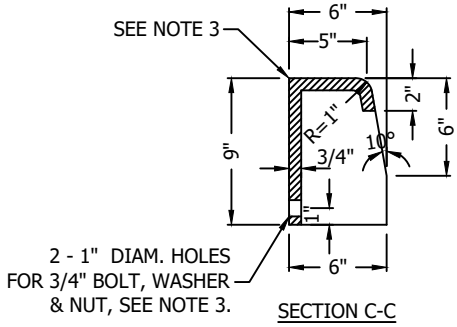

PLAN




SECTION B-B



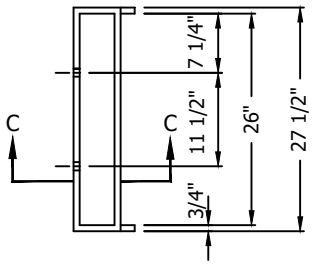

SECTION A-A




SECTION C-C

NOTES:

1. FRAME AND COVER SHALL BE EAST JORDAN IRON WORKS OR EQUAL, SUBJECT TO APPROVAL BY CITY. MATERIAL SHALL CONFORM TO SECTION 9-05.15(2) OF THE STANDARD SPECIFICATION.
2. PATTERN ON TOP SURFACE SHALL SPECIFY THE FISH LOGO AND DUMP NO POLLUTANTS (NO DIAMOND PATTERN).
3. BOLT, WASHER, AND NUT SHALL BE GALVANIZED OR CORROSION RESISTANT. BOLTS SHALL BE INSERTED INTO THE FACE OF THE HOOD WITH WASHER AND NUT SECURED TO THE BACK SIDE OF THE HOOD.
4. USE APPROPRIATE GRATE DEPENDING ON THE DIRECTION OF FLOW.
5. NO HORIZONTAL CROSS BAR IN THE OPENING.
6. 18" X 24" VANED OR BI-VANED LID. APPLICATION OF THIS DETAIL NOT TO REPLACE FUNCTION OF CK-D.14.
7. MUST BE MADE IN THE USA.
8. TROWELED EDGE MUST BE IN CONTACT WITH FRAME (RATHER THAN EXPANSION JOINT).



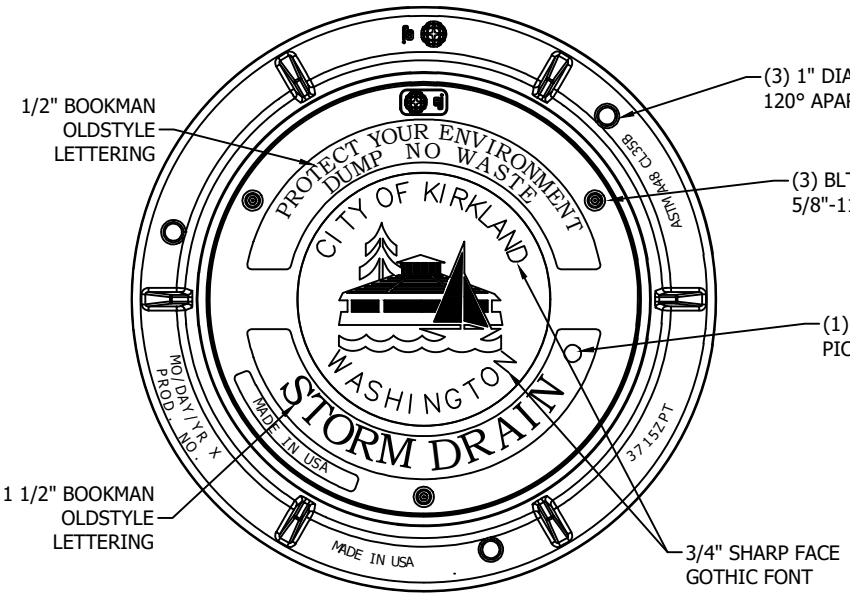

HOOD DETAIL

# CITY OF KIRKLAND

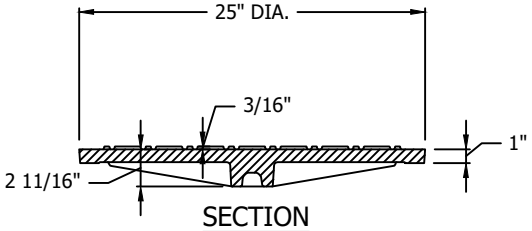
## PLAN NO. CK - D.15

## OPEN CURB FACE FRAME AND GRATE DETAILS

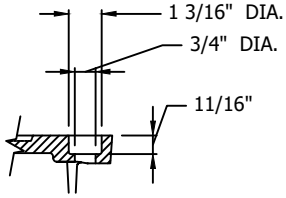
LAST REVISED: 07/2021



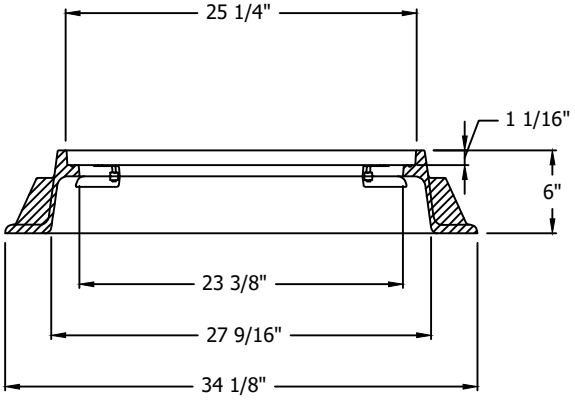

PLAN VIEW



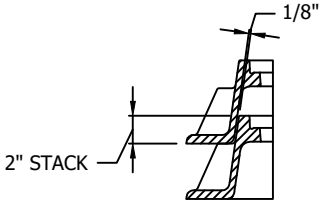

SECTION




BOLTHOLE DETAIL




SECTION




STACKING DETAIL

NOTES:

1. COVERS SHALL BE GRAY IRON, LOCKING, WITH A MINIMUM WEIGHT OF 141 LBS.
2. MINIMUM WEIGHT OF FRAME SHALL BE 134 LBS.
3. PRODUCT SUPPLIED BY EJ GROUP, INC., APPROVED EQUAL.
4. CITY OF KIRKLAND LOGO REQUIRED
5. THIS SPEC SHOULD NOT BE USED IN THE ROADWAY.
6. MUST BE MADE IN THE USA.

CITY OF KIRKLAND

PLAN NO. CK - D.18

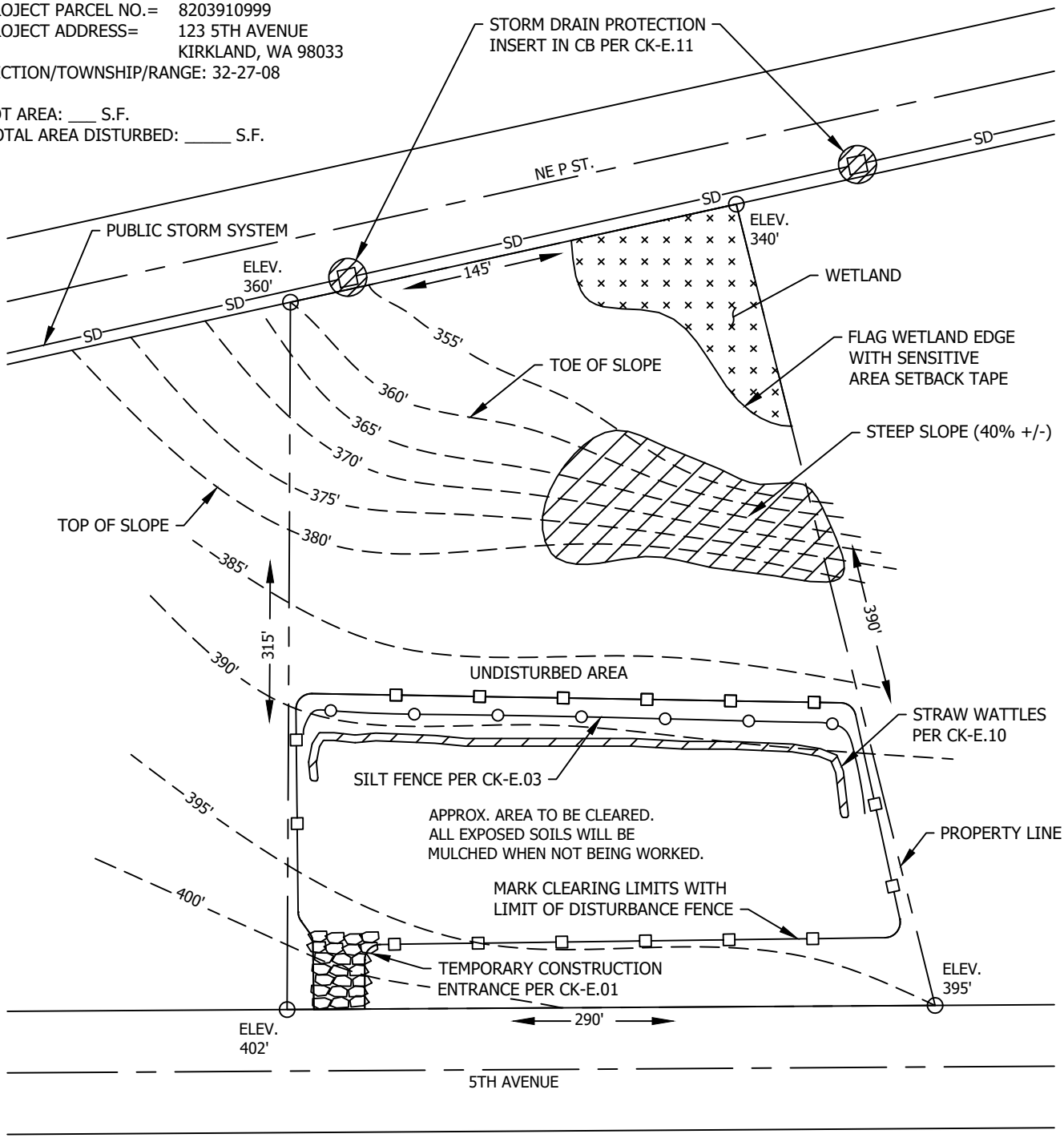
24" MANHOLE FRAME W/LOCKING COVER AND LOGO

APPLICANT: MALENE MCRESIDENT
123 5TH AVENUE
KIRKLAND, WA 98033
(425) 587-3900

LAST REVISED: 01/2020

PROJECT PARCEL NO.= 8203910999
PROJECT ADDRESS= 123 5TH AVENUE
KIRKLAND, WA 98033
SECTION/TOWNSHIP/RANGE: 32-27-08

LOT AREA: ___ S.F.
TOTAL AREA DISTURBED: _____ S.F.




EXAMPLE TESC PLAN FOR A SMALL SINGLE FAMILY RESIDENCE PROJECT ONLY

NOTES

1. IDENTIFY ALL SENSITIVE AREAS (EROSION AREAS, STEEP SLOPES, LANDSLIDE HAZARD AREAS, LAKES, STREAMS, WETLANDS).

2. REFER TO THE CURRENT VERSION OF KING COUNTY SURFACE WATER DESIGN MANUAL, CORE REQUIREMENT #5 FOR ESC STANDARDS ADOPTED BY THE CITY OF KIRKLAND. REFER TO CITY OF KIRKLAND POLICIES FOUND WITHIN THE EROSION AND SEDIMENT CONTROL PRE-APPROVED PLANS.

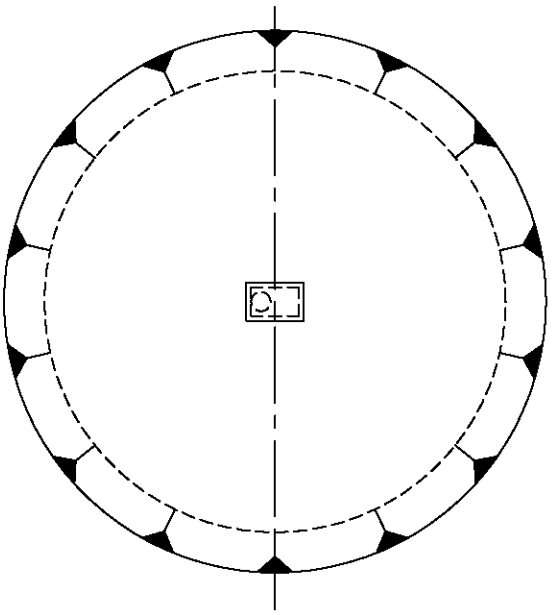
CITY OF KIRKLAND

PLAN NO. CK–E.04

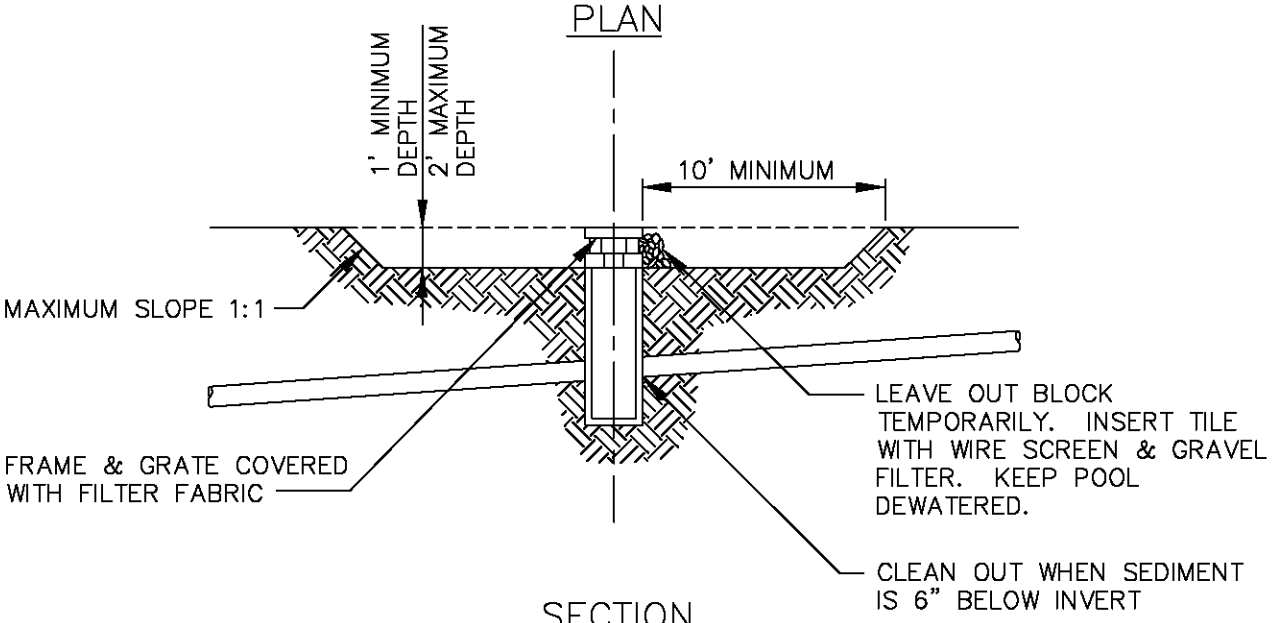
CITY OF KIRKLAND WASHINGTON

# EXAMPLE TEMP. EROSION & SEDIMENT CONTROL PLAN

LAST REVISED:04/15/12



PLAN




SECTION

NOTES

1. PROTECT INLETS DURING CONSTRUCTION. KEEP SEDIMENT OUT OF THE STORM DRAINAGE SYSTEM. USE HALF–CIRCLE BEHIND CURB INLETS DURING STREET CONSTRUCTION. MODIFY PROTECTION AS CONSTRUCTION PROGRESSES.

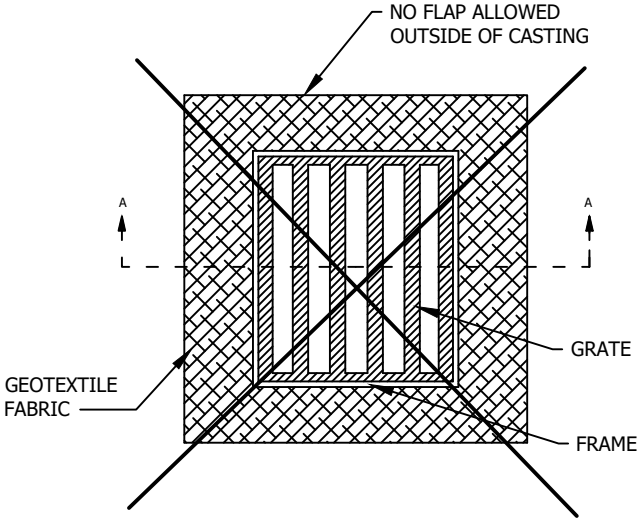
2. CIRCULAR SHAPE IS NOT ESSENTIAL; VARY SHAPE TO FIT DRAINAGE AREA AND TERRAIN. OBSERVE TO CHECK TRAP EFFICENCY AND MODIFY AS NECESSARY TO INSURE SATISFACTORY TRAPPING OF SEDIMENT. CAN BE ADAPTED TO THRU–CURB INLET.

3. ALLOW 2' MINIMUM OVERHANG OR FILTER FABRIC. FILTER FABRIC OVERHANG MUST BE COVERED WITH 1–1/4" CRUSHED ROCK.

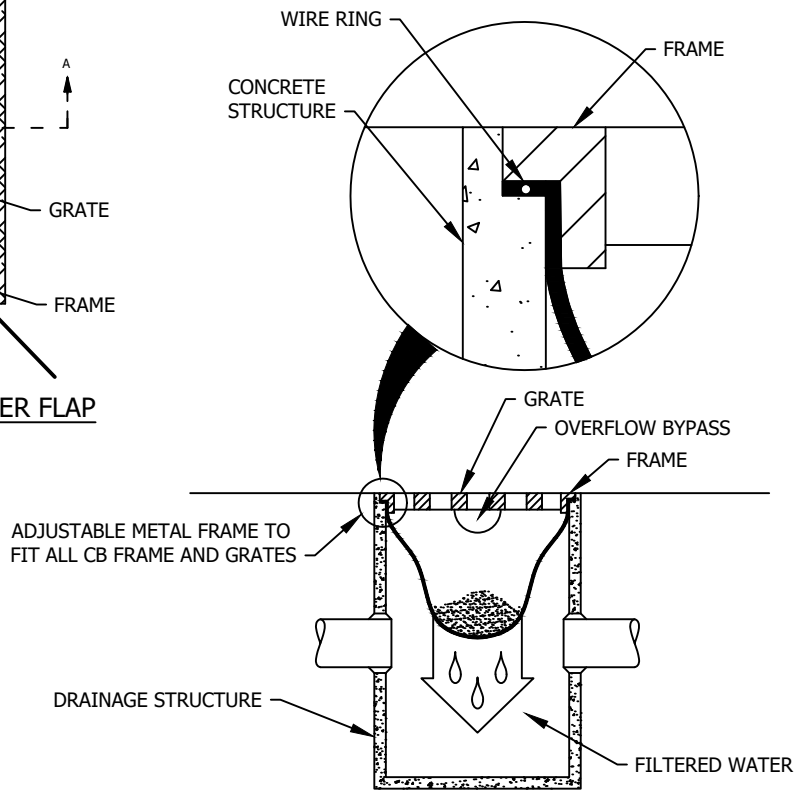
4. FILTER FENCE MAY BE REQUIRED AROUND PERIMETER OF BASIN.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK–E.08 | |
| CITY OF KIRKLAND WASHINGTON | CATCH BASIN/INLET SEDIMENTATION TRAP |

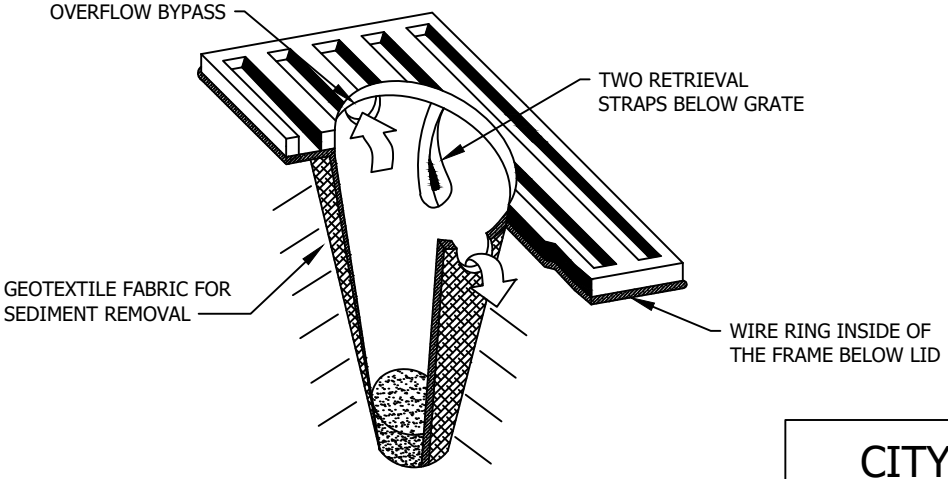
LAST REVISED: 01/2020




PROTECTION INSERSET WITH OUTER FLAP
(NOT ALLOWED)




STORM DRAIN PROTECTION
INSERT SECTION A-A



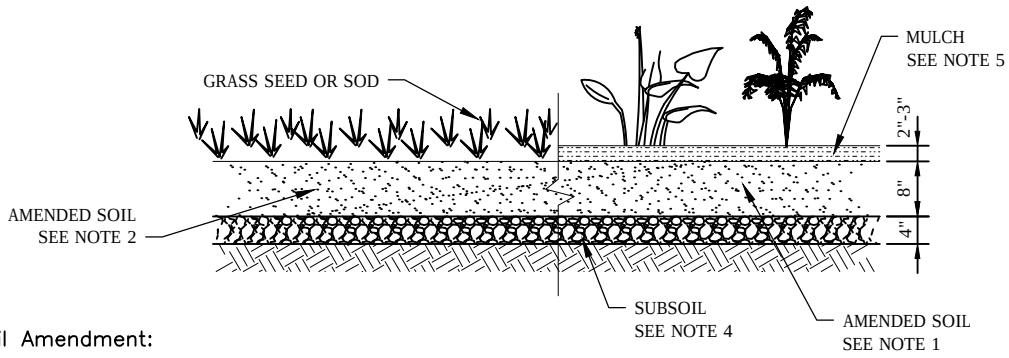

STORM DRAIN PROTECTION INSERT
ISOMETRIC VIEW (TYP.)

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK- E.11 | |
| CITY OF KIRKLAND WASHINGTON | STORM DRAIN PROTECTION INSERT |

# SOIL AMENDMENT NOTES FOR BMP T5.13

LAST REVISED: 01/2019

REFERENCE: WA STATE DEPT. OF ECOLOGY'S STORMWATER MANAGEMENT MANUAL FOR W. WA




Notes for Soil Amendment:

General:

1. For planting areas, the minimum acceptable organic matter content by dry weight is 10% (loss–on–ignition testing).
2. For turf areas, the minimum acceptable organic matter content by dry weight is 5% (loss–on–ignition testing).
3. A minimum organic–amended depth of 8 inches (except in tree protection areas) is required.
4. Subsoil shall be scarified 4 inches below amended layer to produce 12–inch depth of un–compacted soil.
5. Planting beds should be mulched after planting with 2 to 3 inches of organic material such as arborist wood chip mulch.
6. Soil amendment cannot be placed in overly saturated soils. It is recommended that the soil amendment be placed between May 1 and October 1, when soils are typically driest and less subject to compaction.
7. Prior to soil installation, applicant will submit soil test verification, including tests from either supplier or contractor (depending on option chosen) to verify organic matter content and that compost meets WAC specifications. Soil verification test method must meet ASTM D2974. The verification shall clearly state the following (at a minimum): test date, test method used, testing company, and loss–on–ignition (LOI) results.

For projects 4 lots or less – you must import amended soil meeting the requirements below:

1. For planting beds, a mix by volume of 40% compost (meeting WAC 173–350–220) with 60% mineral aggregate is pre–approved to meet the organic matter content by dry weight (loss–on–ignition test).

2. For turf areas, a mix by volume of 25% compost (meeting WAC 173–350–220) with 75% mineral aggregate is pre–approved to meet the organic matter content by dry weight (loss–on–ignition test).

For projects 5 lots or greater – you may either import amended soil meeting the requirements above or follow Option 1 or Option 2 below:

Option 1 – Amending Existing Disturbed Topsoil:

1. For planting beds, 3 inches of compost (meeting WAC 173–350–220) on 9 inches scarified or tilled soil (total amended depth of 12") is pre–approved to meet the organic matter content by dry weight (loss–on–ignition test).

2. For turf areas, 1.75 inches of compost (meeting WAC 173–350–220) on 10 inches scarified or tilled soil (total amended depth of 12") is pre–approved to meet the organic matter content by dry weight (loss–on–ignition test).

Option 2 – Amending Stockpiled Topsoil from Cleared Areas:

1. Stockpile and cover soil with 3 inches of wood chips, weed barrier, or other breathable materials that sheds moisture yet allows air transmission.

2. Test stockpile material (prior to adding compost) for organic matter content to determine whether additional compost must be tilled into the stockpiled material to meet the required organic matter content by dry weight (loss–on–ignition test).

3. After the stockpiled material has been laid, a soil sample will be taken by the applicant/contractor for every 5,000 sf or every lot (whichever is less) to test that the site meets the required organic matter content by dry weight (loss–on–ignition test).

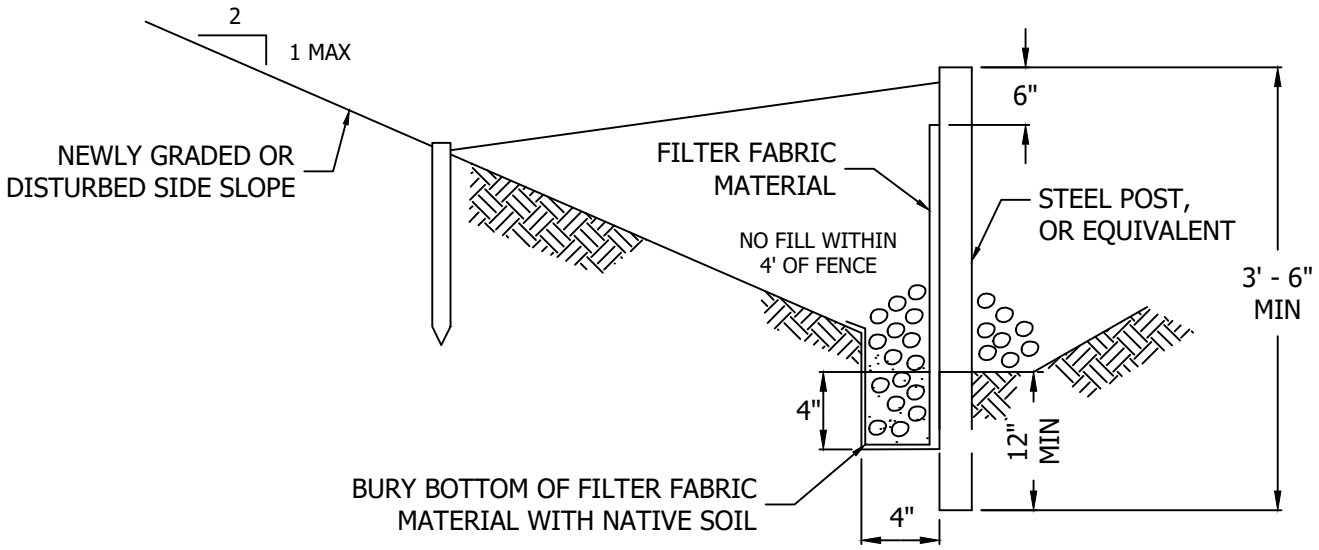
CITY OF KIRKLAND

PLAN NO. CK–E.12

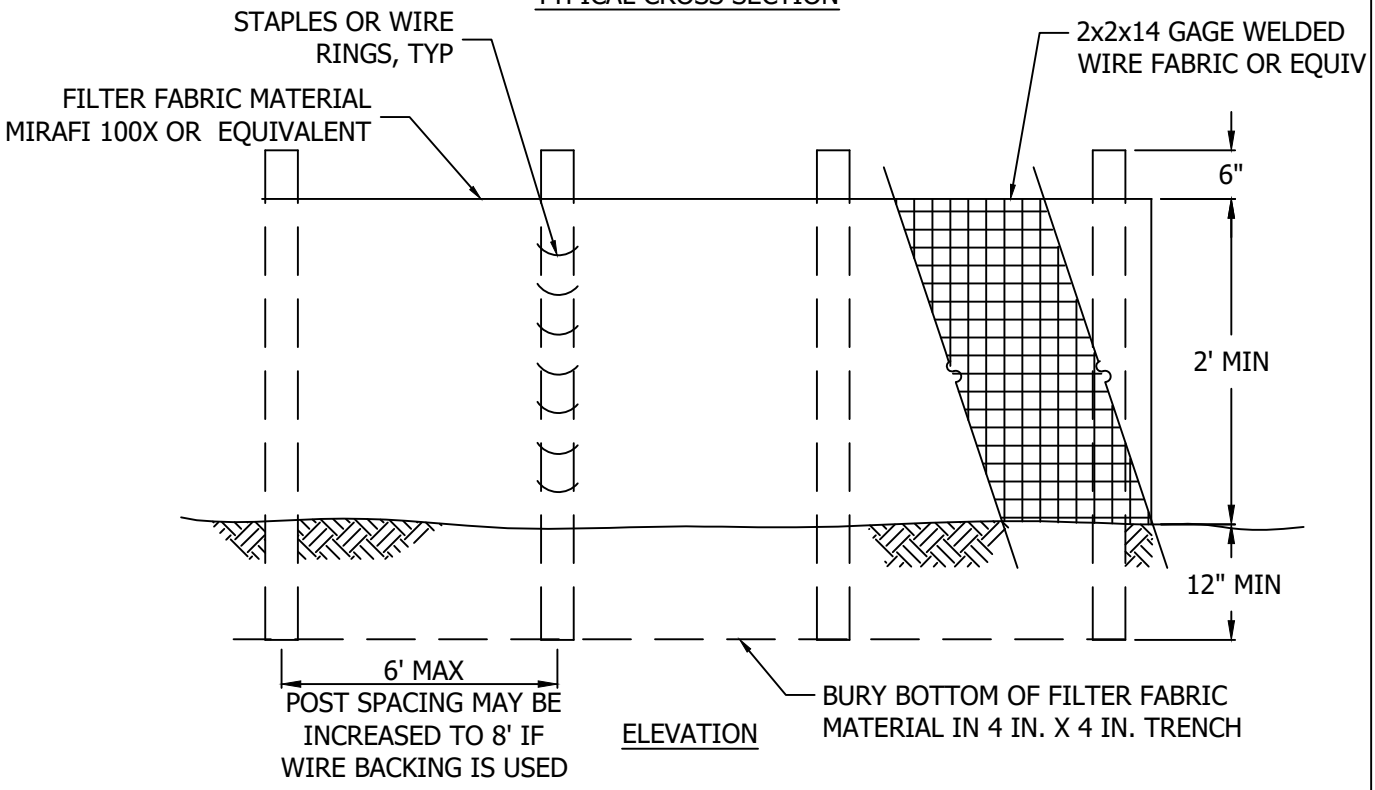
CITY OF KIRKLAND WASHINGTON

SOIL AMENDMENT

LAST REVISED: 01/2022




TYPICAL CROSS SECTION




ELEVATION

NOTES

1. PREFAB FENCE ALLOWED IF REINFORCED AND APPROVED BY CITY INSPECTOR.
2. FENCE SHALL NOT BE INSTALLED ON SLOPES STEEPER THAN 2:1.
3. JOINTS IN FILTER FABRIC SHALL BE SPLICED AT POSTS. USE STAPLES, WIRE RINGS, OR EQUIVALENT TO ATTACH FABRIC TO POSTS AND FENCE.
4. REMOVE SEDIMENT WHEN IT REACHES 1/3 FENCE HEIGHT.
5. LOCATION OF FENCING SHALL BE AS SHOWN ON APPROVED PLANS OR AS DIRECTED BY THE CITY.
6. MAXIMUM 100' SHEET OR OVERLAND FLOW PATH LENGTH TO SILT FENCE.
7. DO NOT DIRECT FLOWS GREATER THAN 0.5 CFS TO FENCE.
8. SILT FENCE SHOULD NOT BE INSTALLED IN STREAMS OR V-SHAPED DITCHES.
9. FILTER FABRIC SHOULD BE INSTALLED ALONG CONTOURS WHENEVER POSSIBLE.

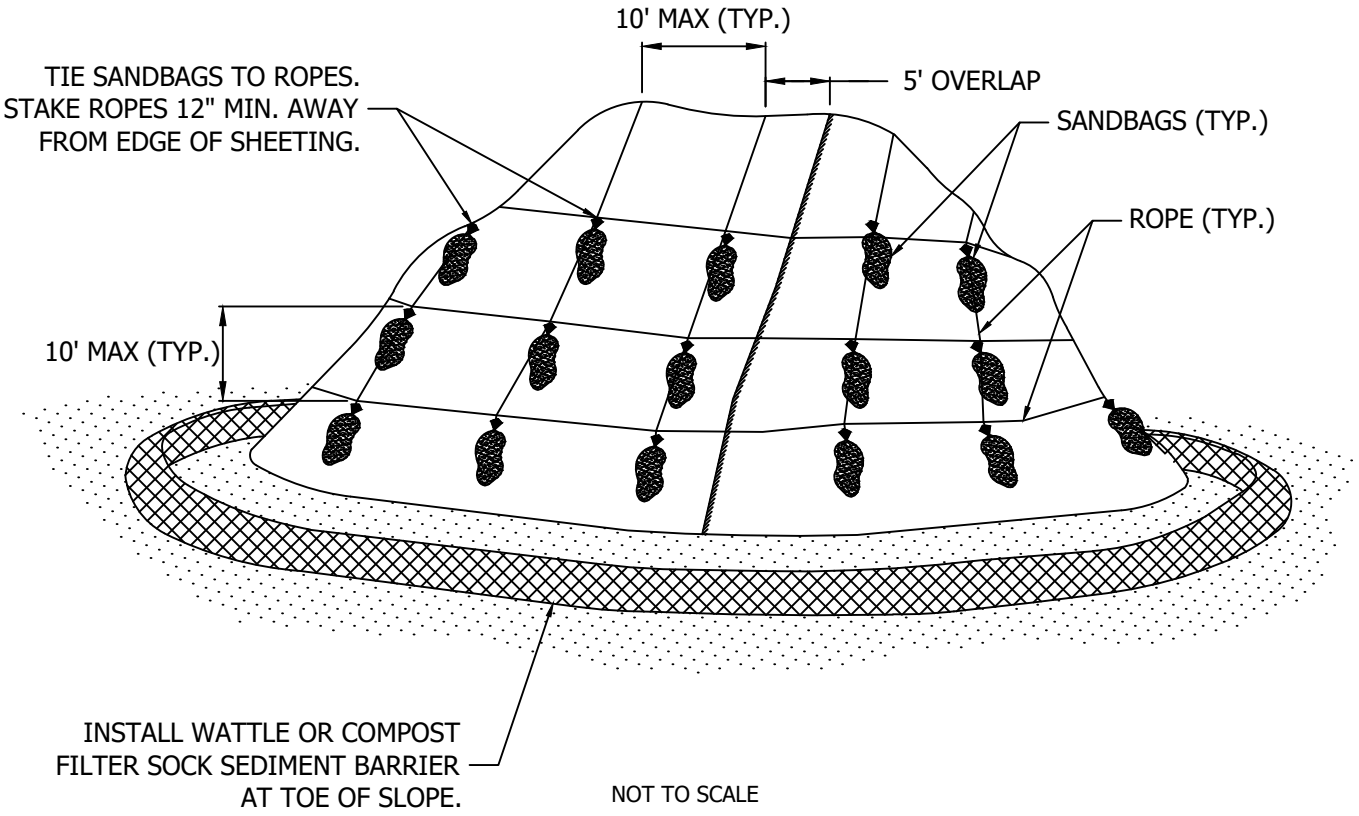
CITY OF KIRKLAND

PLAN NO. CK - E.03

CITY OF KIRKLAND WASHINGTON

SILT FENCE

LAST REVISED: 01/2022




NOT TO SCALE

NOTES

1. INSTALL PLASTIC SHEETING VERTICALLY DOWN SLOPE.
2. INSTALL PLASTIC SHEETING SO EDGES OVERLAP AND ARE SHINGLED AWAY FROM PREVAILING WINDS.
3. PLASTIC SHEETING SHALL BE BLACK MIN 6 MIL.
4. COVER MEASURES SHALL BE INSTALLED IF AN AREA IS TO REMAIN UNWORKED FOR MORE THAN SEVEN DAYS DURING THE DRY SEASON (MAY 1 TO SEPTEMBER 30) OR FOR MORE THAN TWO CONSECUTIVE WORKING DAYS DURING THE WET SEASON (OCTOBER 1 TO APRIL 30).
5. DURING THE WET SEASON, EXPOSED STOCKPILE SLOPES WITH AN INCLINE OF 3 HORIZONTAL TO 1 VERTICAL (3H:1V) OR STEEPER AND WITH MORE THAN TEN FEET OF VERTICAL RELIEF SHALL BE COVERED IF THEY ARE TO REMAIN UNWORKED FOR MORE THAN 12 HOURS.

CITY OF KIRKLAND

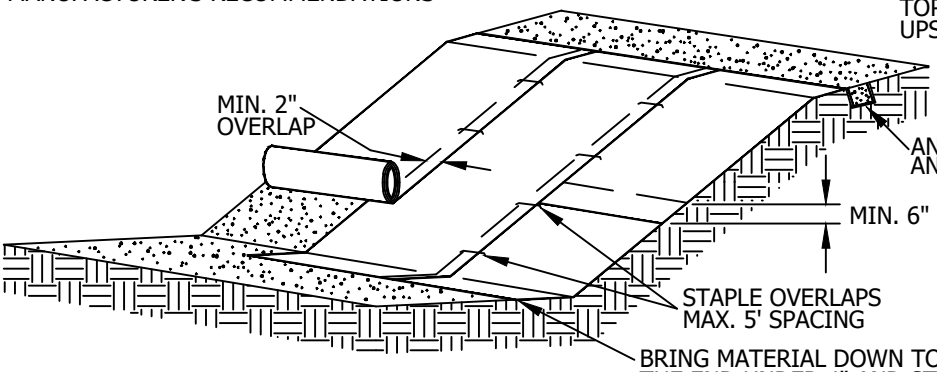
PLAN NO. CK - E.05

TEMPORARY STOCKPILE

LAST REVISED: 07/2022

SLOPE SURFACE SHALL BE SMOOTH BEFORE PLACEMENT FOR PROPER SOIL CONTACT

STAPLING PATTERN AS PER MANUFACTURER'S RECOMMENDATIONS




DO NOT STRETCH BLANKETS/MATTINGS TIGHT - ALLOW THE ROLLS TO MOLD TO ANY IRREGULARITIES

FOR SLOPES LESS THAN 3H:1V, ROLLS MAY BE PLACED IN HORIZONTAL STRIPS

LIME, FERTILIZE AND SEED BEFORE INSTALLATION. PLANTING OF SHRUBS, TREES, ETC. SHOULD OCCUR AFTER INSTALLATION.

NET & BLANKET INSTALLATION

NOT TO SCALE

NOTES:

1. IF BLANKET IS NOT LONG ENOUGH TO COVER THE ENTIRE SLOPE LENGTH, THE TRAILING EDGE OF THE UPPER BLANKET SHOULD OVERLAP THE LEADING EDGE OF THE LOWER BLANKET AND BE STAPLED.

2. MULCH IS REQUIRED FOR NETS, AND NOT REQUIRED FOR BLANKETS.

3. USE 100% BIODEGRADABLE BLANKETS IN SENSITIVE AREAS.

4. MAINTAIN GOOD CONTACT WITH THE GROUND. EROSION MUST NOT OCCUR BENEATH THE BLANKET.

5. INSPECT NETS AND BLANKETS AFTER EACH SIGNIFICANT STORM; MAINTAIN AND REPAIR PROMPTLY.

TEMPORARY STABILIZATION NOTES:

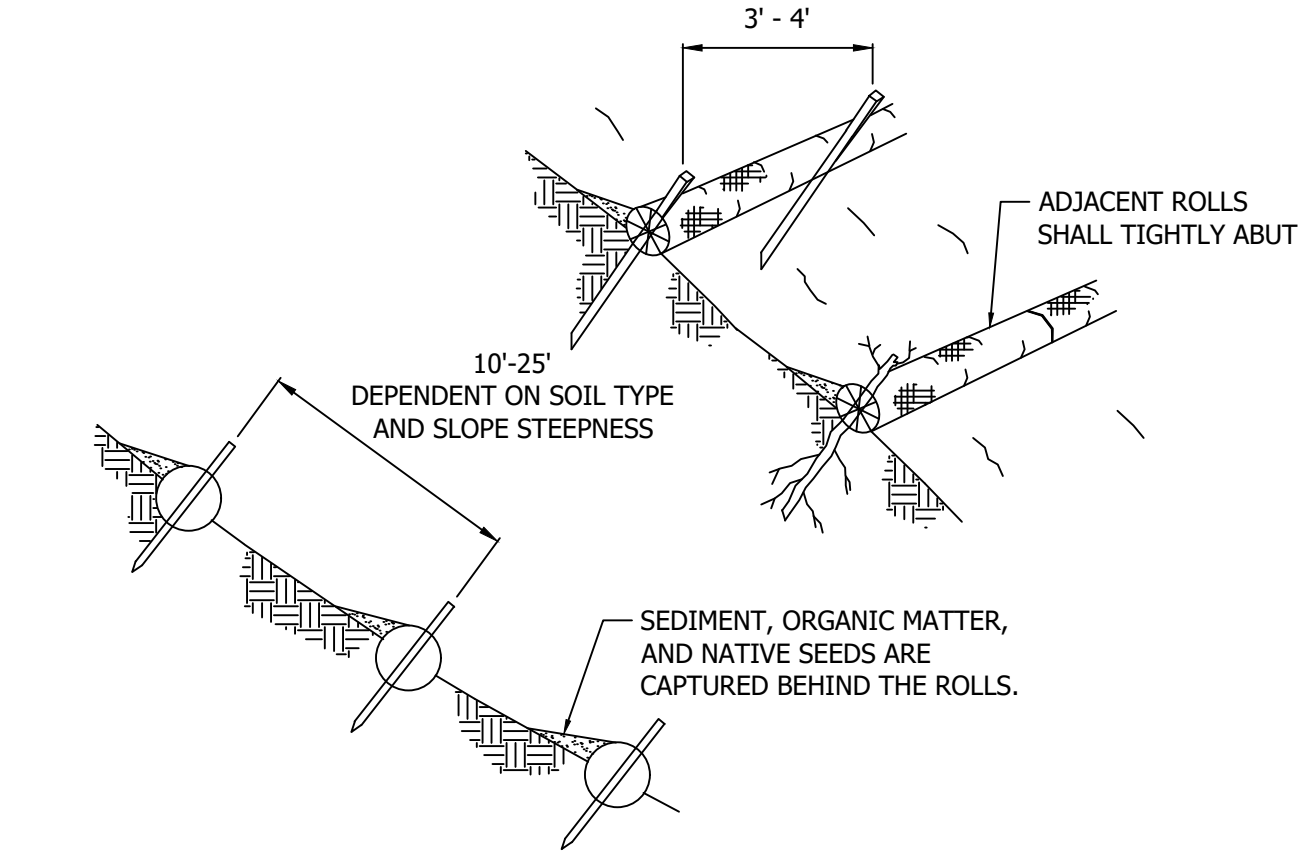
1. STRAW, WOOD FIBER CELLULOSE, COMPOST, AND CHIPPED SITE VEGETATION USED FOR TEMPORARY STABILIZATION SHALL BE PLACED AT A MINIMUM 2" THICK ACROSS THE AREA TO BE STABILIZED.

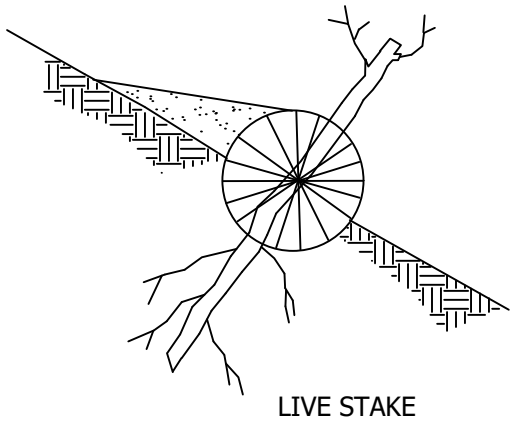
2. HYDRAULIC MATRICES SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATION.

3. SEE TABLE D.2.1.2.A IN THE 2021 KING COUNTY SURFACE WATER DESIGN MANUAL FOR MORE DETAIL.

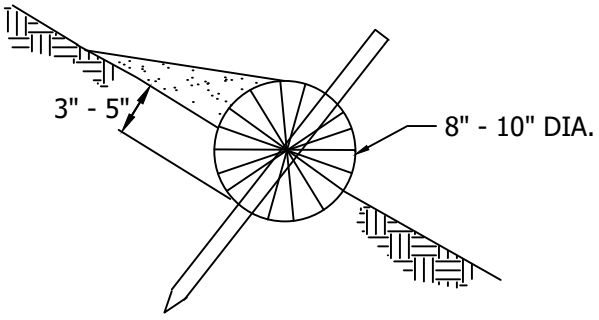
| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK– E.06 | |
| CITY OF KIRKLAND WASHINGTON | NETS, BLANKETS, TEMP. STABILIZATION |

LAST REVISED: 01/2022



LIVE STAKE




1"x1" STAKE

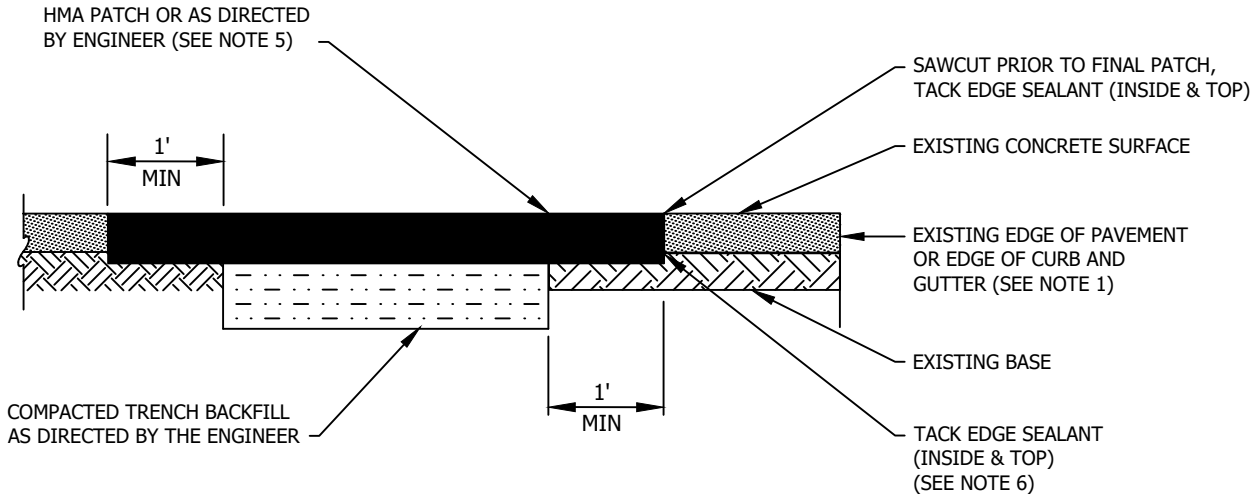
NOTES

1. STRAW ROLLS SHALL BE PLACED ALONG SLOPE CONTOURS.
2. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
3. DRIVE STAKE THROUGH MIDDLE OF WATTLE, LEAVING 2"-3" OF STAKE PROTRUDING ABOVE WATTLE.

NOT TO SCALE

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK - E.10 | |
| CITY OF KIRKLAND WASHINGTON | STRAW WATTLES |

LAST REVISED: 01/2020



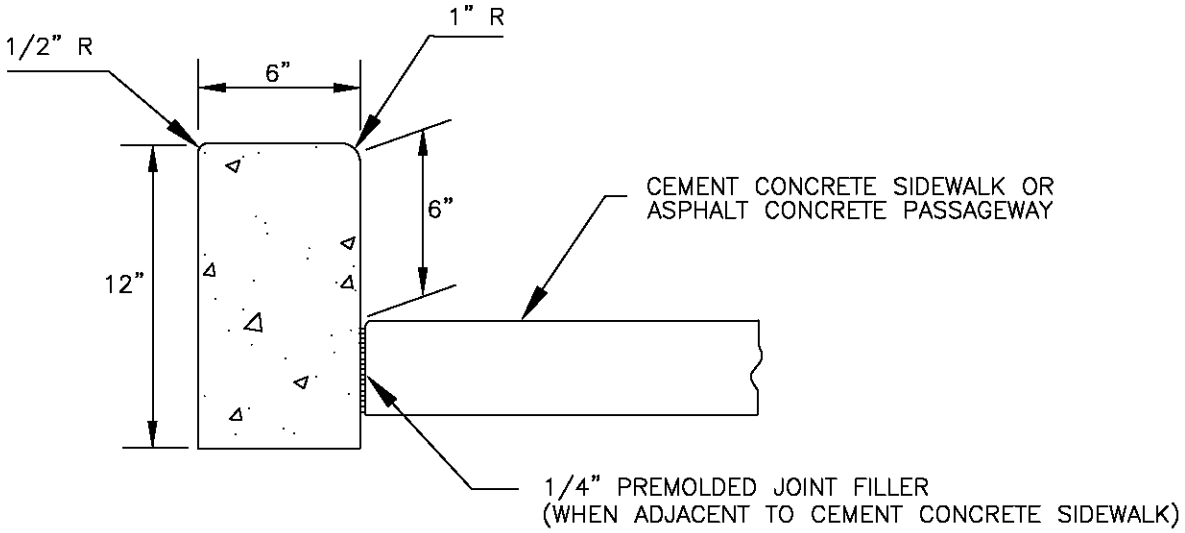

## TYPICAL PATCH FOR PAVEMENT

NOTES:

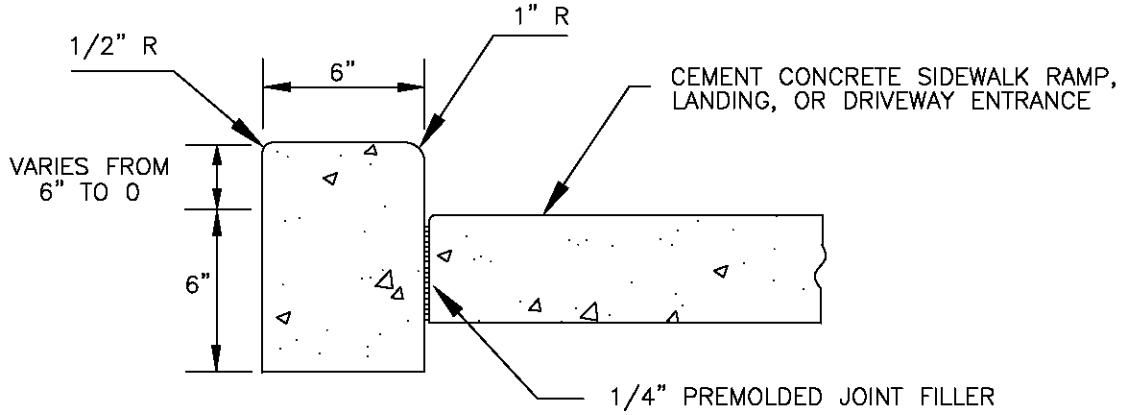
1. IF THE DISTANCE FROM THE EDGE OF PATCH TO THE EDGE OF PAVEMENT OR CURB AND GUTTER IS LESS THAN 3', THE PATCH MUST CONTINUE TO THE EXISTING EDGE; UNLESS ROADWAY IS OVERLAID WITHIN 60 DAYS.
2. HOT MIX ASPHALT SHALL BE CLASS 1/2".
3. ALL TRENCH BACKFILL SHALL BE CRUSHED SURFACING TOP COURSE MATERIAL FOR PERPENDICULAR TRENCHES, OR AS DIRECTED BY ENGINEER.
4. HMA CLASS 1/2" MAY BE USED IN LIEU OF ATB.
5. PATCH MUST ALWAYS BE 1" DEEPER THAN EXISTING ASPHALT; MAX 6" DEEP, OR AS DIRECTED BY ENGINEER.
6. TOP SEAL-USE PG 64-22 AND PROVIDE A SAND BLANKET TO ALLEVIATE TRAILING.
7. REFER TO COK STD. PLAN NO. CK-R.13C FOR REQUIREMENTS FOR GEOTECH BORING ASPHALT PATCHES.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK- R.12 | |
| CITY OF KIRKLAND WASHINGTON | RESTORATION DETAIL AND PAVEMENT PATCHING |

LAST REVISED:02/12/10




## CEMENT CONCRETE PEDESTRIAN CURB




## CEMENT CONCRETE PEDESTRIAN CURB

AT SIDEWALK RAMPS & LANDINGS, AND DRIVEWAY ENTRANCES

NOTES

1. FORMS SHALL BE STEEL AND SET TRUE TO LINE AND GRADE (INSPECTION REQUIRED PRIOR TO PLACEMENT OF CONCRETE).
2. CONCRETE SHALL BE CEMENT CONCRETE CLASS 4000.
3. BASE COURSE SHALL BE 4" OF 5/8" MINUS CRUSHED ROCK.
4. SEE CK-R.17 FOR CURB EXPANSION AND CONTRACTION JOINT SPACING.

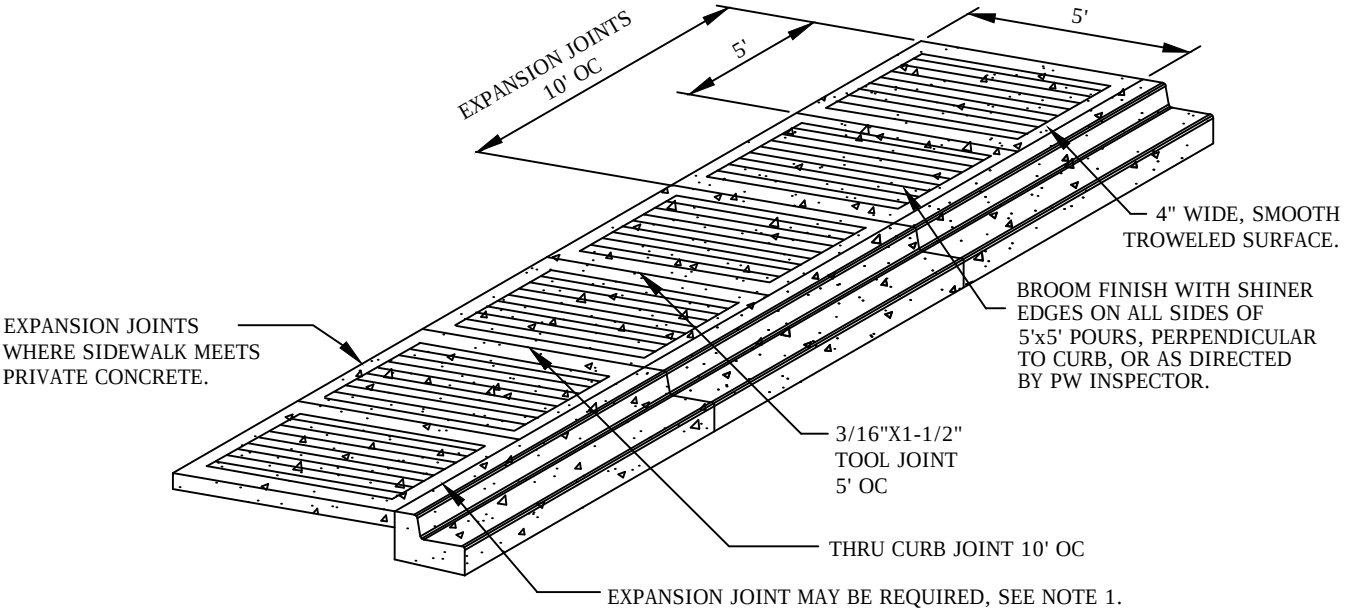
CITY OF KIRKLAND

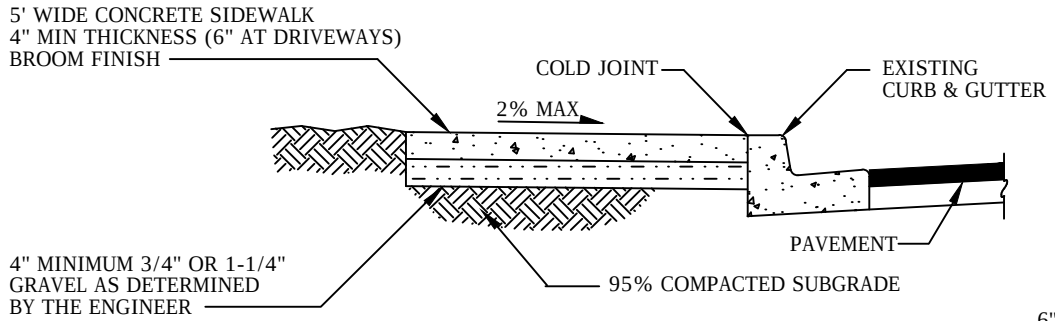
PLAN NO. CK-R.17A

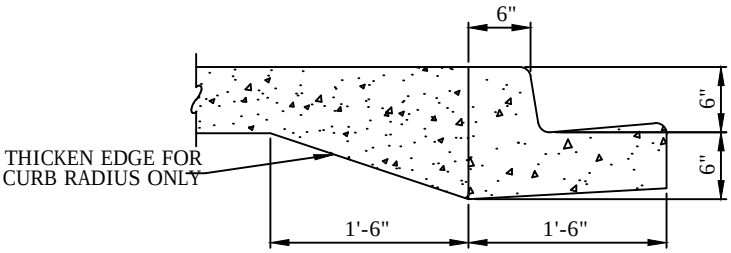
CITY OF KIRKLAND WASHINGTON

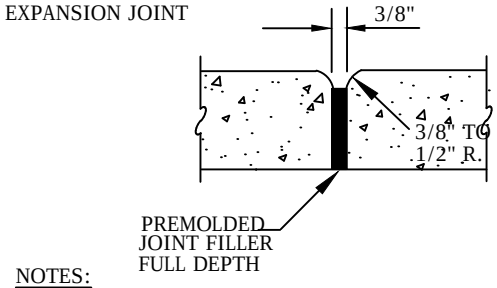
CEMENT CONCRETE PEDESTRIAN CURB

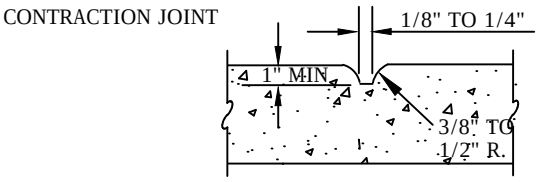
LAST REVISED: 1/1/18




NOTES:

1. SIDEWALK AND CURB & GUTTER CANNOT BE POURED MONOLITHICALLY. EXPANSION JOINT WILL BE REQUIRED WHEN CONCRETE SIDEWALK IS SURROUNDED BY OTHER HARD SURFACES (E.G., DRIVEWAY); OR AS DIRECTED BY PW INSPECTOR.
2. CONCRETE SHALL BE CEMENT CONCRETE CLASS 4000 PSI MINIMUM, WITH AIR ENTRAINMENT. NO COLOR OR TINT SHALL BE ADDED.
3. FORMS SHALL BE SET TRUE TO LINE AND GRADE AND SHALL BE STEEL UNLESS OTHERWISE APPROVED BY INSPECTOR.
4. SIDEWALK SHALL NOT BE POURED IN THE RAIN. SEE POLICY R-8, PLACING CONCRETE OR ASPHALT IN ADVERSE WEATHER CONDITIONS.

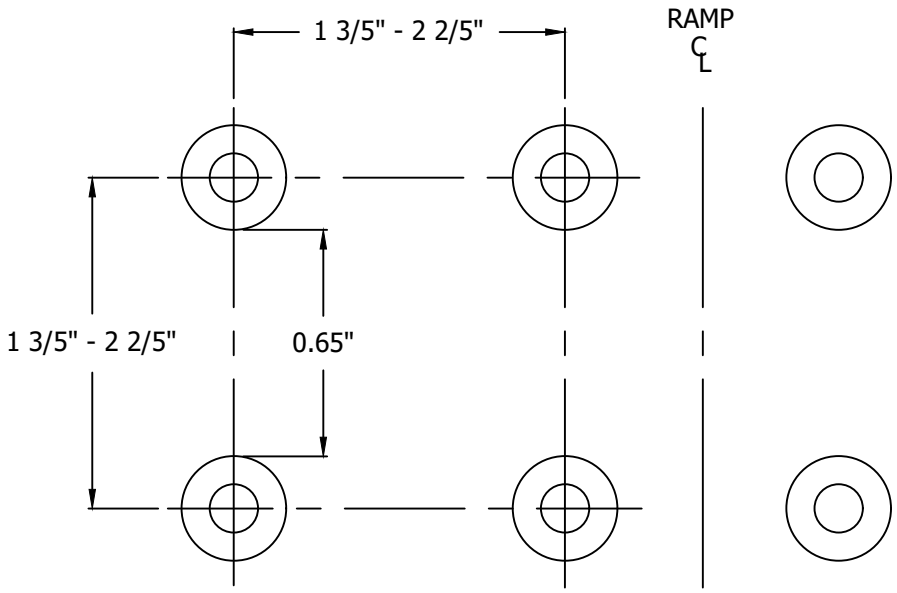
# CITY OF KIRKLAND

PLAN NO. CK- R.23

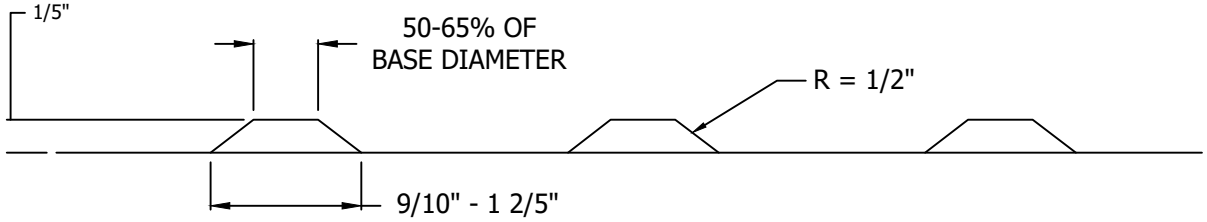
CITY OF KIRKLAND WASHINGTON

## SIDEWALK SECTION

LAST REVISED: 01/2021




PLAN




ELEVATION

NOTE:

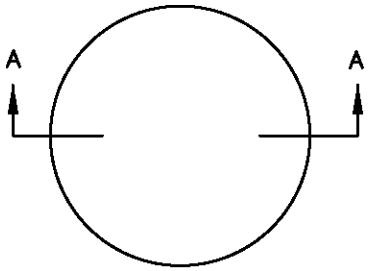
1. THE DETECTABLE WARNING PATTERN SHALL BE FORMED BY ADDING A MANUFACTURED MATERIAL BEFORE THE CONCRETE HAS CURED.
2. THE TWO-FOOT WIDE DETECTABLE WARNING PATTERN AREA ON THE RAMP SHALL BE YELLOW AND SHALL MATCH THE COLOR OF "STANDARD INTERSTATE YELLOW" PAINT AS SPECIFIED IN FORMULA K-2-83.
3. EMBOSSING THE WET CONCRETE OR INSTALLING MASONRY OF CERAMIC TILES MUST BE APPROVED BY CITY ENGINEER.

CITY OF KIRKLAND

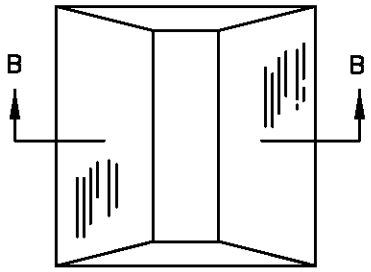
PLAN NO. CK - R.25B

TRUNCATED DOME TEXTILE WARNING SURFACE

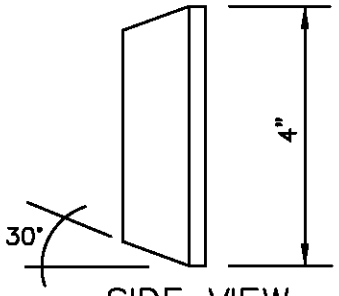
LAST REVISED: 11/30/99



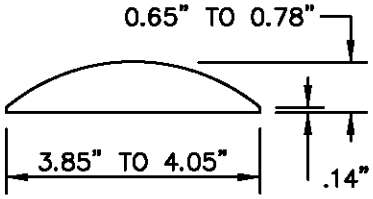

PLAN



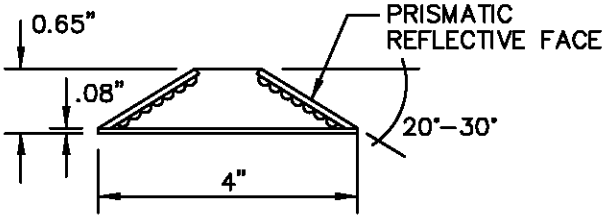

PLAN
DIRECTION OF TRAFFIC



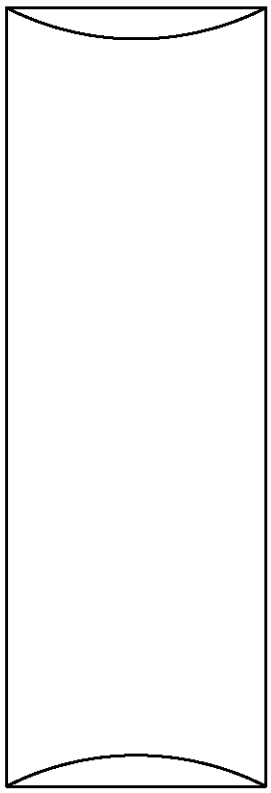

SIDE VIEW



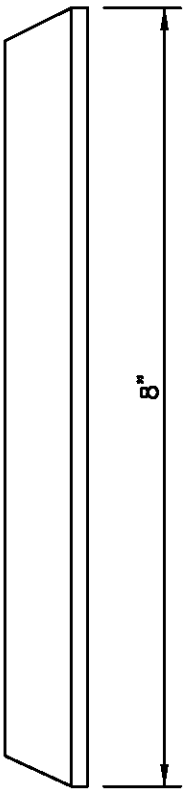

TYPE 1
SECTION A–A




TYPE 2
SECTION B–B



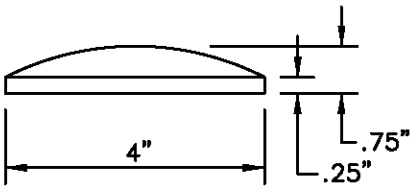
PLAN




SIDE VIEW

NOTES

1. TYPE C PAVEMENT MARKERS TO BE USED ONLY UPON APPROVAL BY TRAFFIC ENGINEER.
2. NOT TO BE USED ON EDGELINES.




TYPE C

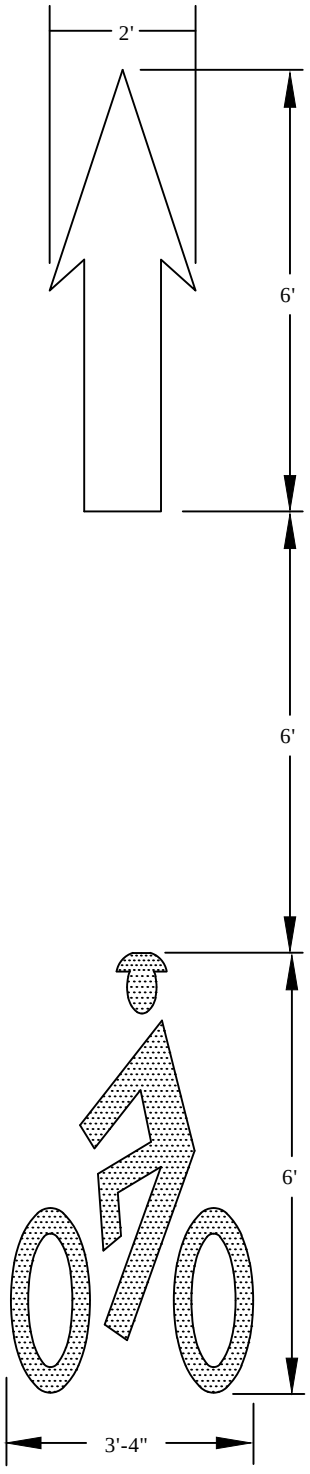
CITY OF KIRKLAND

PLAN NO. CK–R.29

CITY OF KIRKLAND WASHINGTON

LANE MARKERS
(DIMENSIONS)

LAST REVISED: 2/3/2017




NOTES:

1. BIKE LANE SYMBOLS AND ARROW MATERIAL SHALL BE 90 MILL, PREFORMED, SKID RESISTANT THERMOPLASTIC.
2. BICYCLE SYMBOL FACES ROADWAY CENTERLINE.

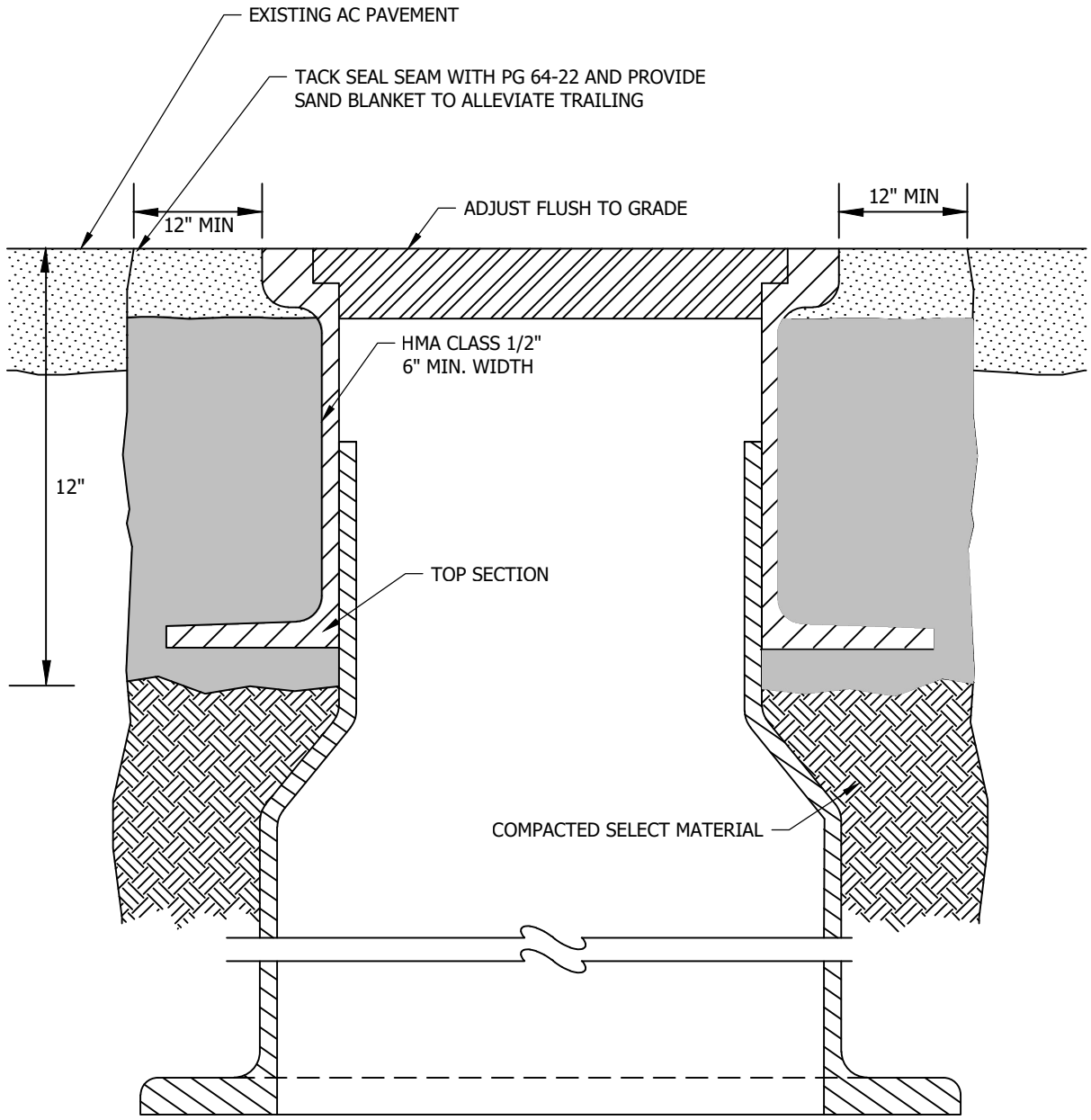
CITY OF KIRKLAND

PLAN NO. CK–R.34

CITY OF KIRKLAND WASHINGTON

# BICYCLE LANE MARKINGS

LAST REVISED: 01/2022




NOTES:

1. HMA MUST BE COMPACTED WITH PROCTOR HAMMER (PNEUMATIC BACKFILL COMPACTION TAMPER) IN 3" LIFTS.
2. LOCKING MH LIDS SHALL BE POSITIONED WITH ONE LUG CENTERED OVER STEPS.
3. SEE CK-D.18A FOR DIRECTION OF HINGED LIDS INSTALLATION.
4. WATER VALVE BOX EARS MUST POINT IN THE DIRECTION OF FLOW. CONTRACT CITY INSPECTOR IF FLOW DIRECTION CANNOT BE DETERMINED.
5. APPLY A TACK COAT TO ALL EDGES OF EXISTING ASPHALT PRIOR TO PLACEMENT OF NEW HMA. SEAL ALL JOINTS WHEN COMPLETE.

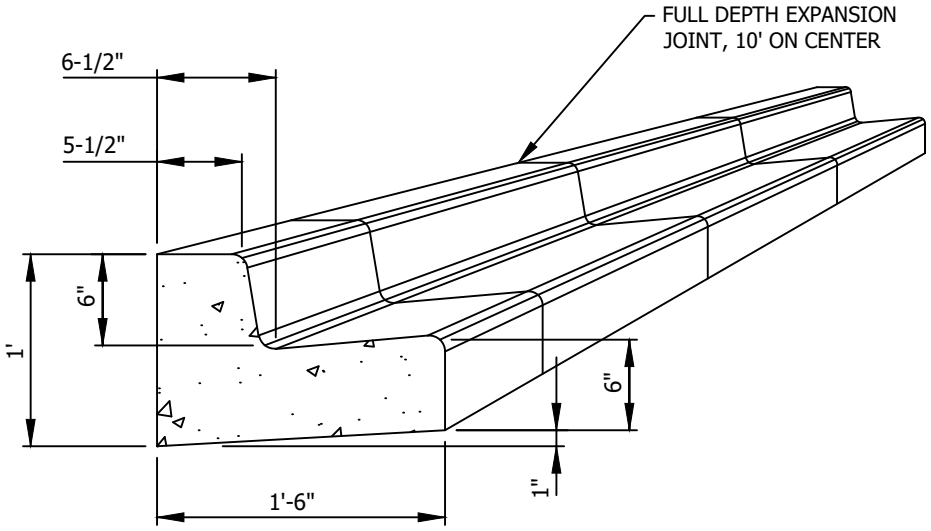
# CITY OF KIRKLAND

PLAN NO. CK- R.02

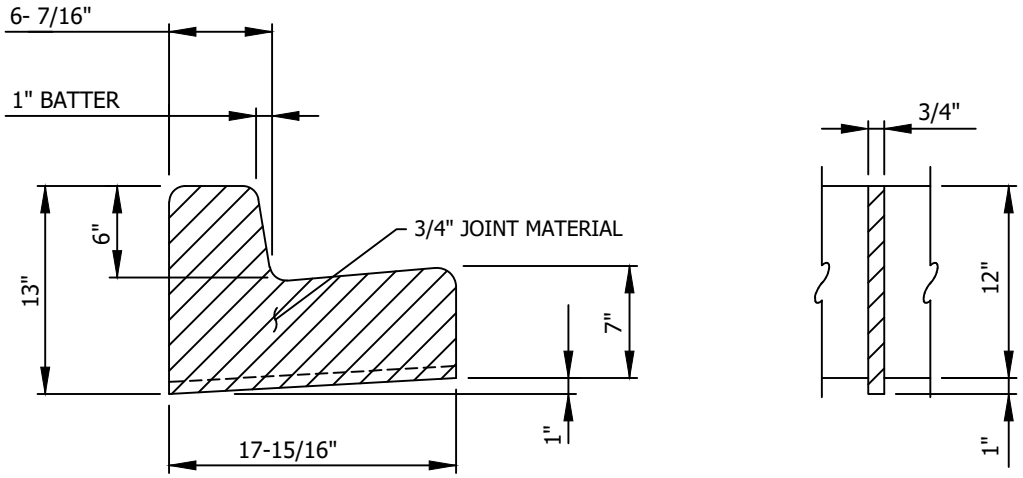
CITY OF KIRKLAND WASHINGTON

## GENERAL UTILITY ADJUSTMENT H.M.A. PAVEMENT

LAST REVISED:01/2023




## TYPICAL SECTION FOR CURB & GUTTER, TYPE A



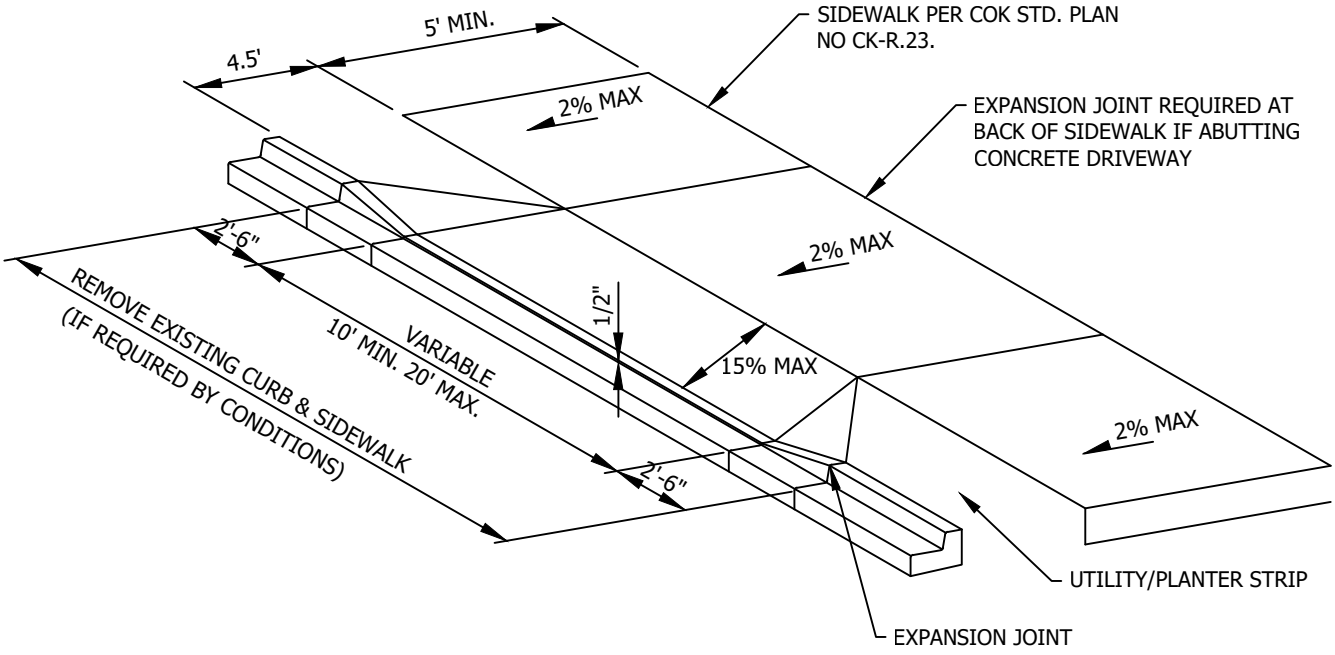

## JOINT DETAIL

NOTES:

1. FORMS SHALL BE STEEL AND SET TRUE TO LINE AND GRADE (INSPECTION IS REQUIRED PRIOR TO PLACEMENT OF CONCRETE) UNLESS SPECIFIED DIFFERENTLY BY CITY PROJECT ENGINEER.
2. CONCRETE SHALL BE CEMENT CONCRETE CLASS 4000.
3. BASE COURSE SHALL BE 4" OF 5/8" MINUS CRUSHED ROCK.
4. SURVEY REQUIRED FOR CURB ALIGNMENT.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK–R.17 | |
| CITY OF KIRKLAND WASHINGTON | CONCRETE CURB AND GUTTER, TYPE "A" |

LAST REVISED:01/2022




SINGLE FAMILY DRIVEWAY WITH PLANTER STRIP

NOTES:

1. ALL DRIVEWAYS AND WHEEL CHAIR RAMPS MUST BE DESIGNED TO MEET ADA STANDARDS. USE WSDOT STANDARD PLANS FOR LAYOUTS NOT SHOWN ON THIS PLAN WITH CLASS 4,000PSI CONCRETE FOR ALL STANDARD PLANS.

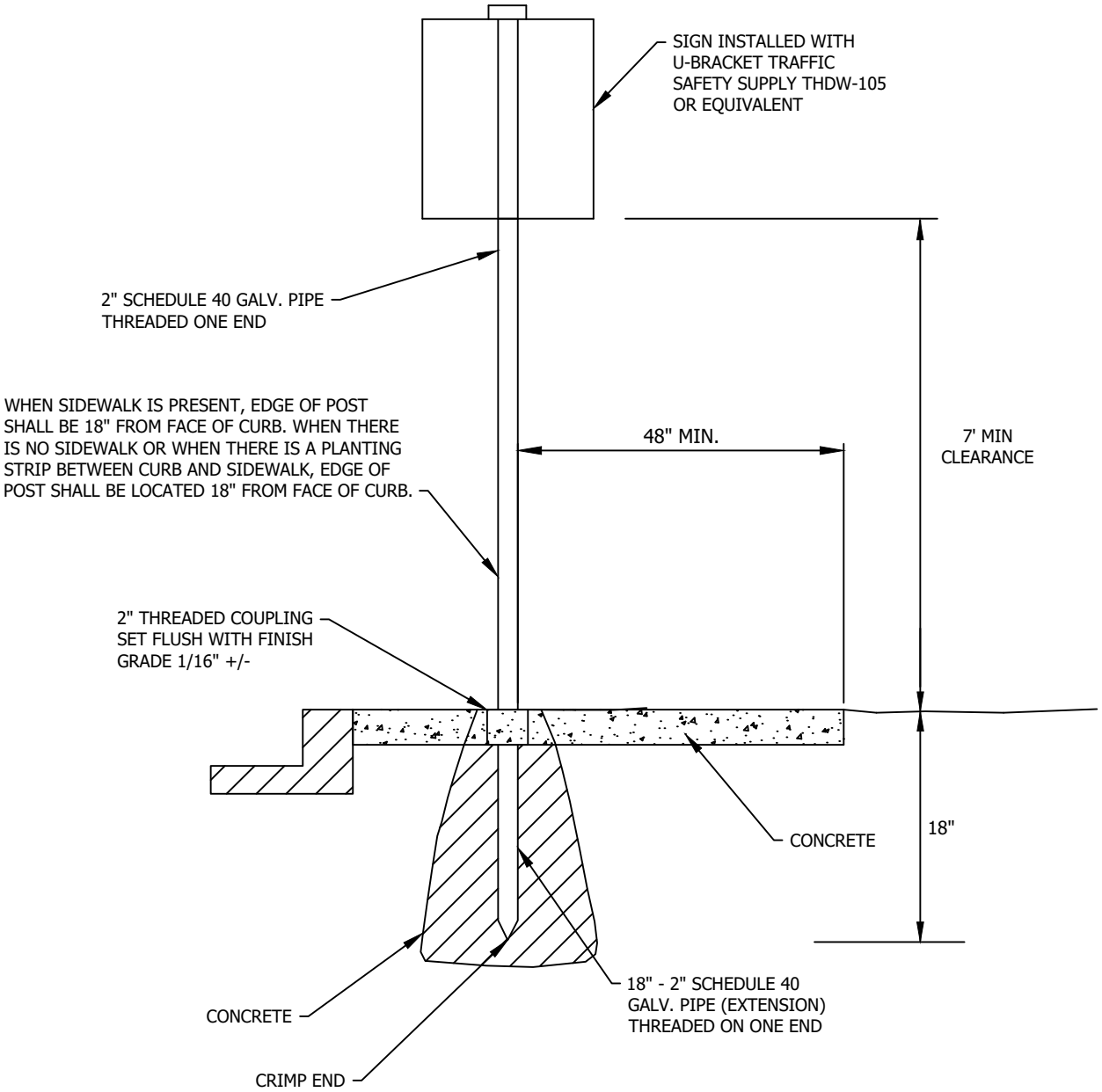
   WWW.WSDOT.WA.GOV/DESIGN/STANDARDS/PLANS.HTM

2. LANDING SHALL BE A MINIMUM OF 5' BY 5'.

3. EXPANSION JOINT SPACING NOT TO EXCEED 10'.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK–R.21 | |
| CITY OF KIRKLAND WASHINGTON | DRIVEWAYS AND WHEEL CHAIR RAMPS |

LAST REVISED:01/2024




NOTES:

1. IF SIGN MUST BE PLACED IN EXISTING CONCRETE, CORE HOLE SHALL BE 8" DIAMETER.
2. S1-1 SIGNS SHALL BE BLACK ON FLUORESCENT GREEN.
3. W11-2 SIGNS SHALL BE BLACK ON YELLOW.
4. ALL SIGNS SHALL HAVE ANTI-GRAFFITI COATING. SEE CONTACT SPECIAL PROVISIONS FOR MORE INFORMATION.

CITY OF KIRKLAND

PLAN NO. CK–R.43

CITY OF KIRKLAND WASHINGTON

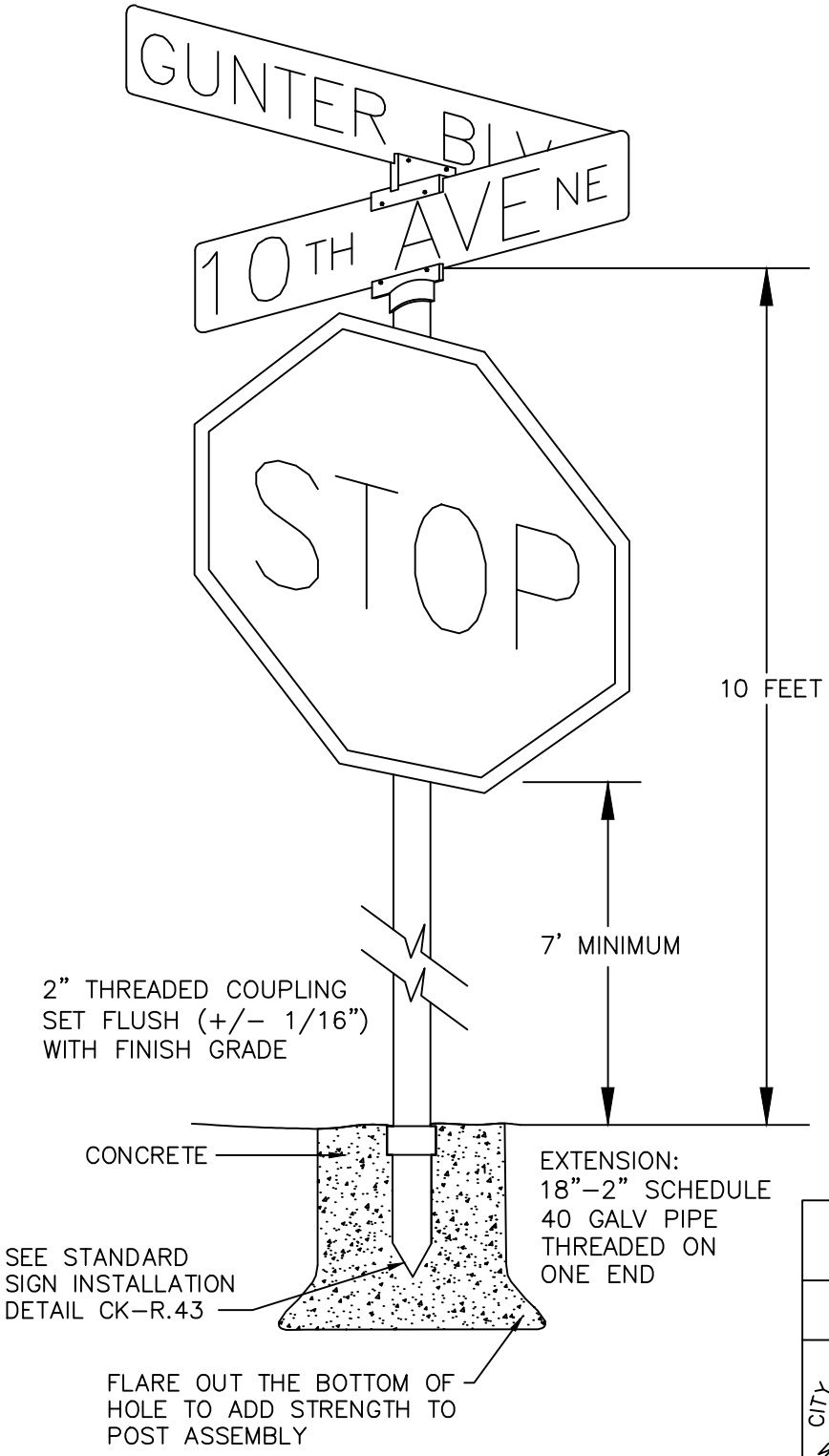
# STANDARD SIGN INSTALLATION

LAST REVISED: 01/2024


SIGN:
6"x24" SHEET ALUMINUM 0.080" THICK

BACKGROUND:
GREEN REFLECTIVE SHEETING, OR BLUE FOR PRIVATE ROADS WITH 3/8" WHITE BORDER. SHEETING SHALL MEET MUTCD REQUIREMENTS FOR REFLECTIVITY.

LETTERS
4" UC C SERIES, EXCEPT SUFFIXES AND PREFIXES 3" UC C SERIES




STREET SIGN MOUNTING
HARDWARE:
TRAFFIC SAFETY SUPPLY 16503925
OR EQUIVALENT

STOP SIGN MOUNTING
HARDWARE:
TRAFFIC SAFETY SUPPLY
THDW-105 U BRACKET
OR EQUIVALENT

POST:
10'x2" SCHEDULE 40
GALVANIZED STEEL PIPE

SIGN:
R1-1 30"x30"
HIGH INTENSITY PRISMATIC

NOTES:
1. IF SIGN MUST BE PLACED IN EXISTING CONCRETE, CORE HOLE SHALL BE 8" DIAMETER.
2. ALL SIGNS SHALL HAVE ANTI-GRAFFITI COATING. SEE CONTRACT SPECIAL PROVISIONS FOR MORE INFORMATION.

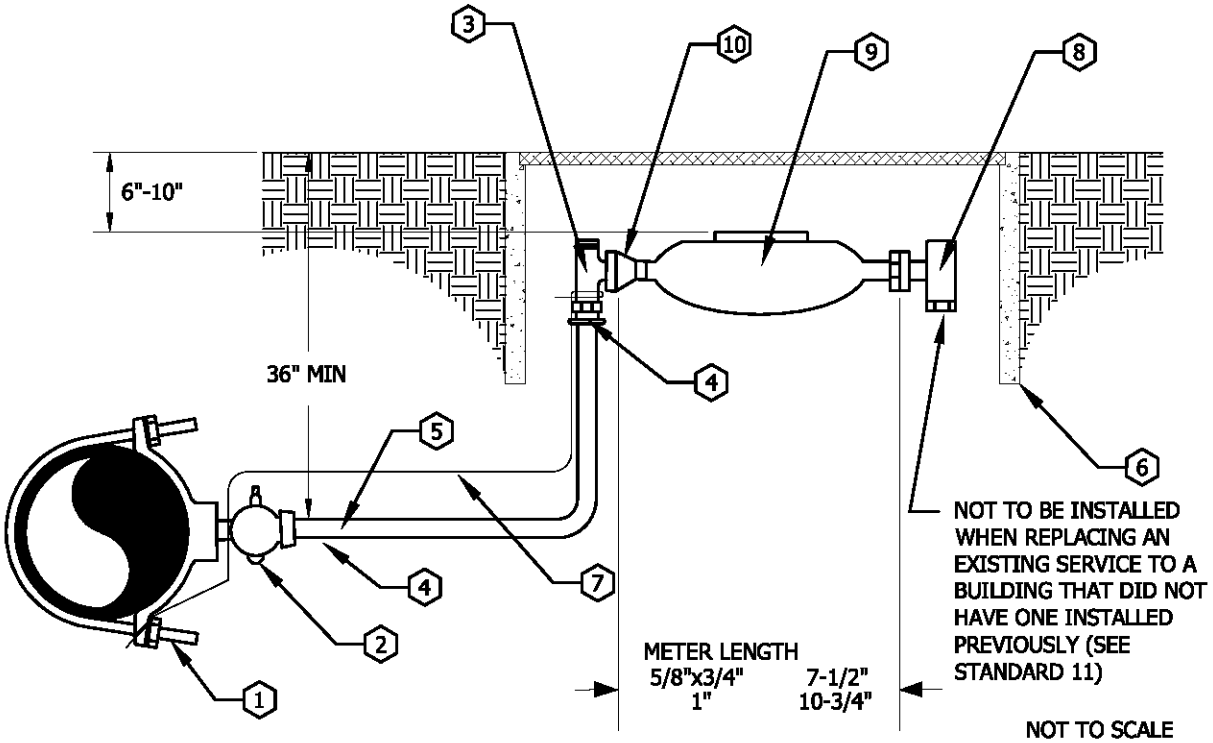
CITY OF KIRKLAND

PLAN NO. CK-R.44

CITY OF KIRKLAND WASHINGTON

STREET NAME
SIGN STANDARD

LAST REVISED:10/15/19




WATER SERVICE STANDARDS

| DESCRIPTION | MAKER OR TYPE | 1" |
|---|---|---|
| 1. SINGLE STRAP SADDLE | STAINLESS ROMAC OR EQUAL | 101 1PT |
| 2. CORP STOP | FORD OR EQUAL | FB1101-4-G-NL |
| 3. ANGLE STOP | FORD OR EQUAL | BA63-444W-G-NL |
| 4. INSERTS | FORD OR EQUAL | #72 STAINLESS STEEL |
| 5. POLY PIPE | POLYETHYLENE ASTM D2239 | IPS-SDR-7(PE3408) |
| 6. METER BOX | CARSON OR EQUAL | CK-W.21 (OR W.23 W/APPROVAL) |
| 7. TRACER WIRE | CU SOLID WIRE | 14 GAUGE |
| 8. CHECK VALVE | --------- | CITY TO INSTALL* |
| 9. METER | --------- | CITY TO INSTALL* |
| 10. 1" x 3/4" METER ADAPTOR (FOR 5/8 x 3/4" MTR) | FORD OR EQUAL #A24 | CITY TO INSTALL UNLESS A CIP PROJECT |
| 11. 1" METER | FORD OR EQUAL L31-44 | CONTRACTOR TO INSTALL |
| 3/4" METER | FORD OR EQUAL L31-24 | |

*UNLESS A CIP PROJECT

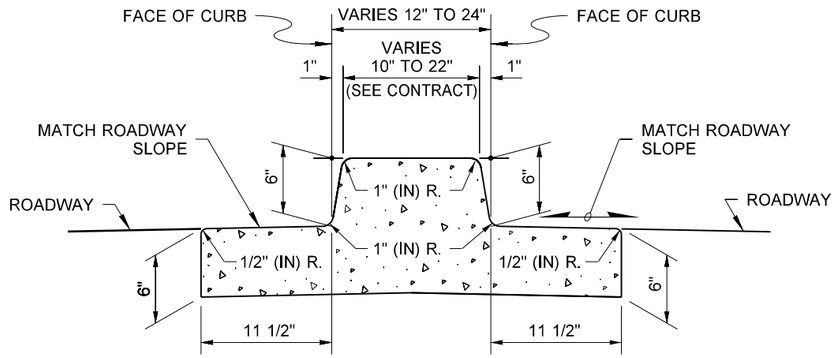
NOTES:
1. ALL FITTINGS MUST BE FORD OR EQUAL.
2. TRACER WIRE FROM MAIN TO SERVICE METER MUST BE INSTALLED IN ALL INSTALLATIONS. WIRE MUST BE WRAPPED AROUND ANGLE STOP AND THE CORPORATION STOP, WITH LAST 8" STRIPPED.
3. POLY SERVICE LINE IS TO BE CONTINUOUS FROM MAIN TO METER-NO SPLICES OF ANY KIND.
4. POLY PIPE TO BE 1" FROM MAIN TO METER.
5. METERS SHALL NOT BE LOCATED IN CONCRETE OR ASPHALT PAVING UNLESS UNAVOIDABLE.
6. THE ANGLE STOP SHALL BE IN A POSITION THAT RESULTS IN THE METER BEING CENTERED DIRECTLY BENEATH THE METER READING LID.

CITY OF KIRKLAND

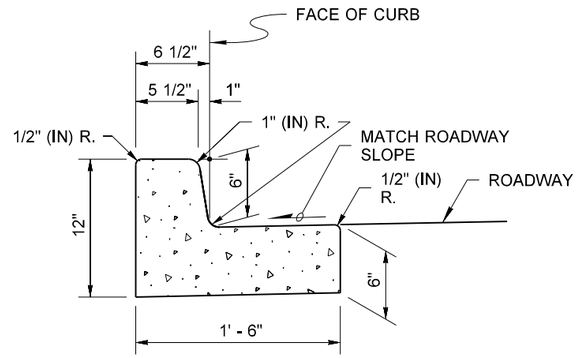
PLAN NO. CK– W.18

CITY OF KIRKLAND WASHINGTON

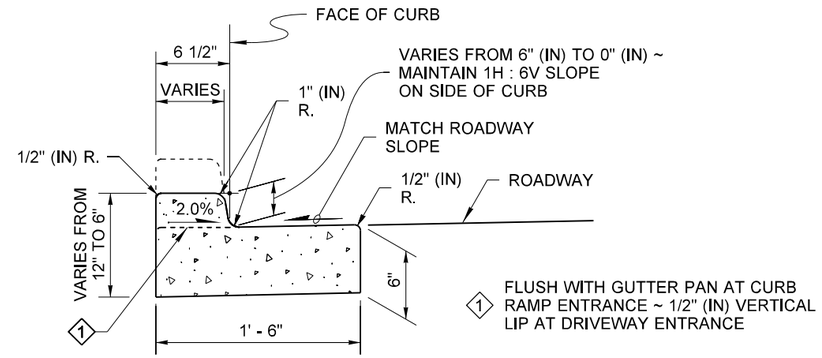
# 5/8"x3/4" & 1" WATER METER SERVICE INSTALLATION




**DUAL-FACED CEMENT CONCRETE TRAFFIC CURB AND GUTTER**



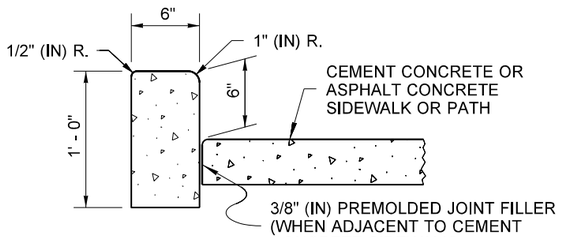

**CEMENT CONCRETE TRAFFIC CURB AND GUTTER**



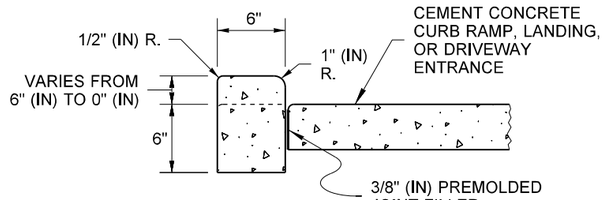

**DEPRESSED CURB AND GUTTER SECTION**

**AT CURB RAMPS AND DRIVEWAY ENTRANCES**

DRAWN BY: FERN LIDDELL




**CEMENT CONCRETE PEDESTRIAN CURB**

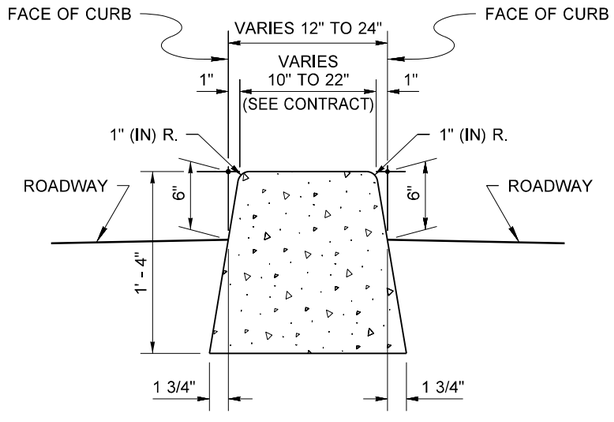



**CEMENT CONCRETE PEDESTRIAN CURB**

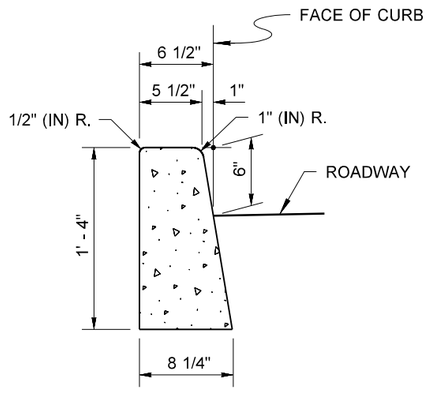
**AT CURB RAMPS, LANDINGS, AND DRIVEWAY ENTRANCES**

**NOTE**

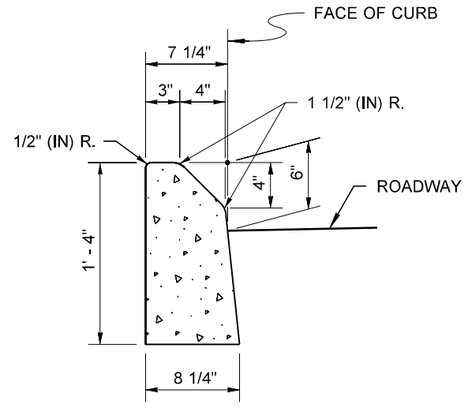
1. See **Standard Plan F-30.10** for Curb Expansion and Contraction Joint spacing. See **Standard Specification, Sections 8-04 and 9-04** for additional requirements.




**DUAL-FACED CEMENT CONCRETE TRAFFIC CURB**




**CEMENT CONCRETE TRAFFIC CURB**




**MOUNTABLE CEMENT CONCRETE TRAFFIC CURB**


Michael S Fleming

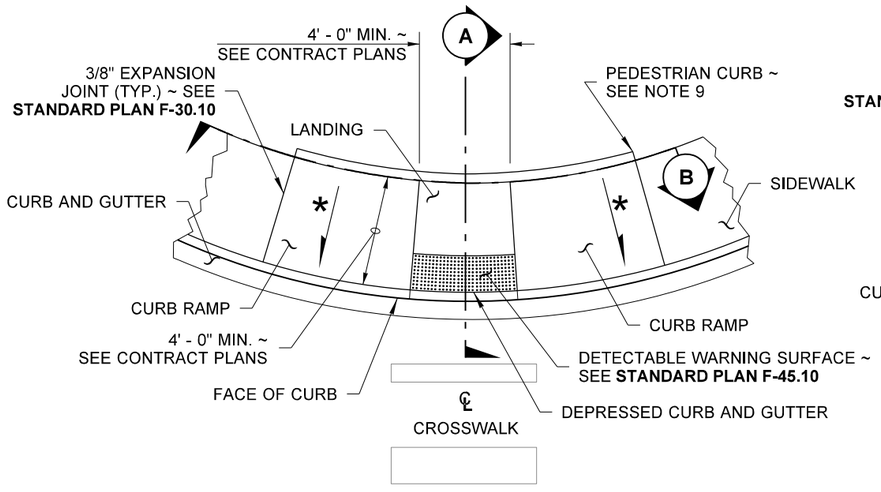
Digitally signed by Michael S Fleming
Date: 2020.09.24 07:39:38 -07'00'

**CEMENT CONCRETE CURBS**

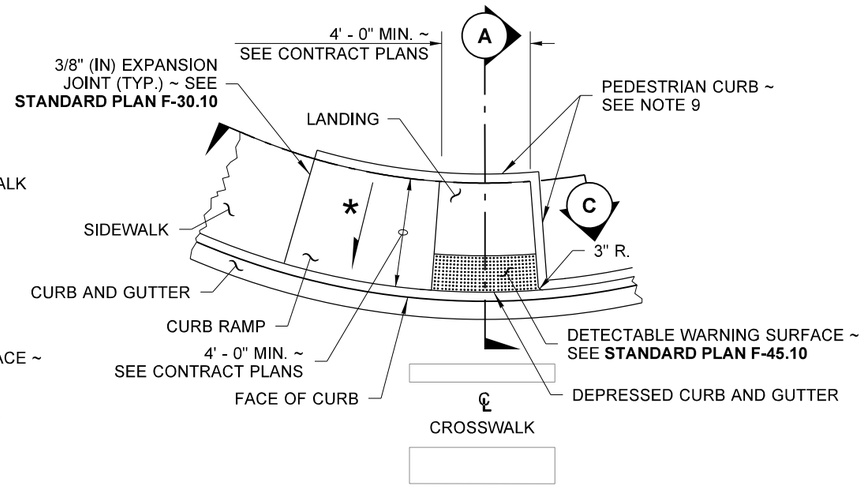
**STANDARD PLAN F-10.12-04**

SHEET 1 OF 1 SHEET

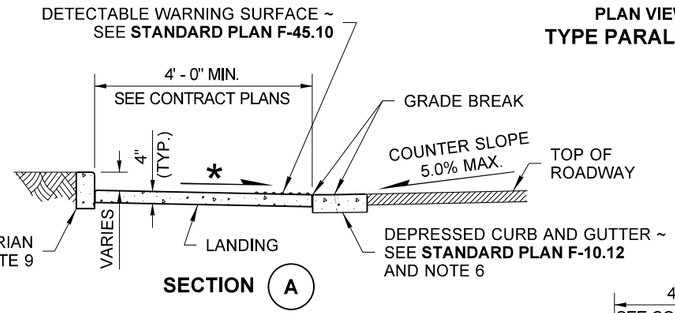
APPROVED FOR PUBLICATION
Date: 2020.09.24 07:57:43 -07'00'
STATE DESIGN ENGINEER
Washington State Department of Transportation




**PLAN VIEW**
**TYPE PARALLEL A**

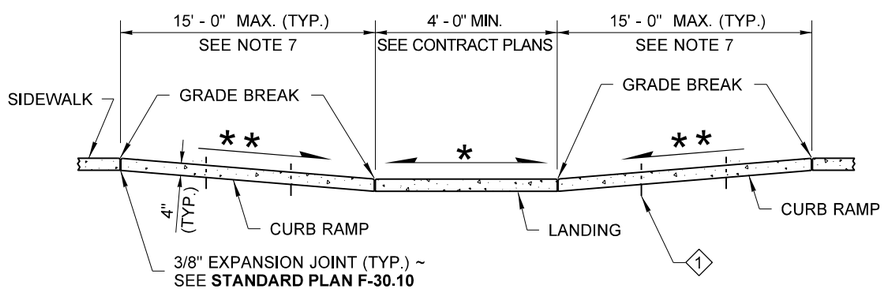



**PLAN VIEW**
**TYPE PARALLEL B**



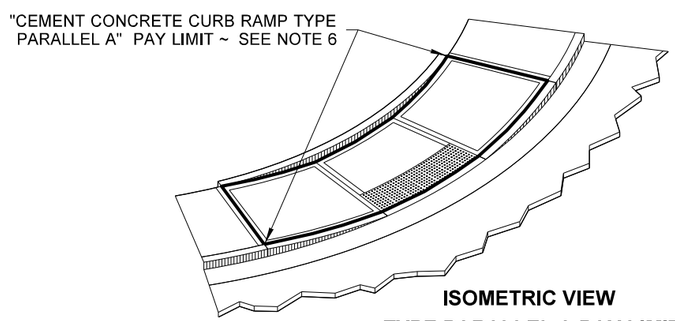

**SECTION (A)**

① CONTRACTION JOINT (TYP.) ~ SEE **STANDARD PLAN F-30.1** FOR CURB RAMP LENGTHS GREATER THAN 8' - 0"PROVIDE CONTRACTION JOINT EQUALLY SPACED 4' - 0" MIN. OC.

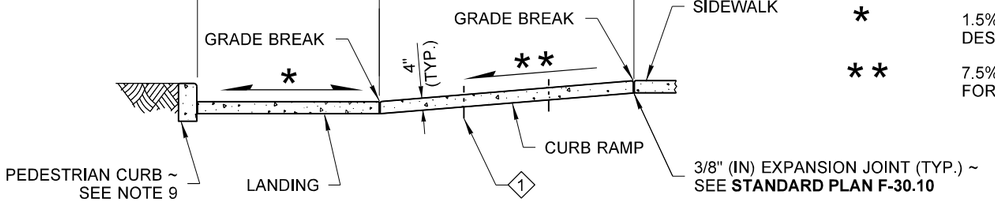



**SECTION (B)**

(ALONG INSIDE RADIUS AT BACK OF WALKWAY)

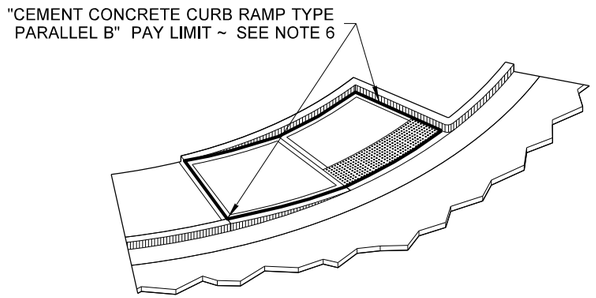



**ISOMETRIC VIEW**
**TYPE PARALLEL A PAY LIMIT**




**SECTION (C)**

(ALONG INSIDE RADIUS AT BACK OF WALKWAY)




**ISOMETRIC VIEW**
**TYPE PARALLEL B PAY LIMIT**

## NOTES

1. At marked crosswalks, the connection between the landing and the roadway must be contained within the width of the crosswalk markings.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
3. Do not place Gratings, Junction Boxes, Access Covers, or other appurtenances on any part of the Curb Ramp or Landing, or in the Depressed Curb and Gutter where the Landing connects to the roadway.
4. See Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb, Curb and Gutter, Depressed Curb and Gutter, and Pedestrian Curb details.
5. See **Standard Plan F-30.10** for Cement Concrete Sidewalk Details. See Contract Plans for width and placement of sidewalk.
6. The Bid Item "Cement Concrete Curb Ramp Type __" does not include the adjacent Curb, Curb and Gutter, Depressed Curb and Gutter, Pedestrian Curb, or Sidewalks.
7. The Curb Ramp length is not required to exceed 15 feet (unless otherwise shown in the Contract Plans). When applying the 15-foot max. length, the running slope of the curb ramp is allowed to exceed 8.3%. Use a single constant slope from bottom of ramp to top of ramp to match into the sidewalk over a horizontal distance of 15 feet. Do not include abutting landing(s) in the15-foot max. measurement. When a ramp is constructed on a radius, the 15-foot max. length is measured on the inside radius along the back of the walkway.
8. Curb Ramps and Landings shall receive a broom finish. See **Standard Specifications 8-14.**
9. Pedestrian Curb may be omitted if the ground surface at the back of the Curb Ramp and/or Landing will be at the same elevation as the Curb Ramp or Landing and there will be no material to retain.

**LEGEND**

SLOPE IN EITHER DIRECTION

* 1.5% OR FLATTER RECOMMENDED FOR DESIGN/FORMWORK (2% MAX.)

** 7.5% OR FLATTER RECOMMENDED FOR DESIGN/ FORMWORK (8.3% MAX.) ~ SEE NOTE 7

DRAWN BY: FERN LIDDELL

R. SCOTT ZELLER
STATE OF WASHINGTON
28680
REGISTERED
PROFESSIONAL ENGINEER

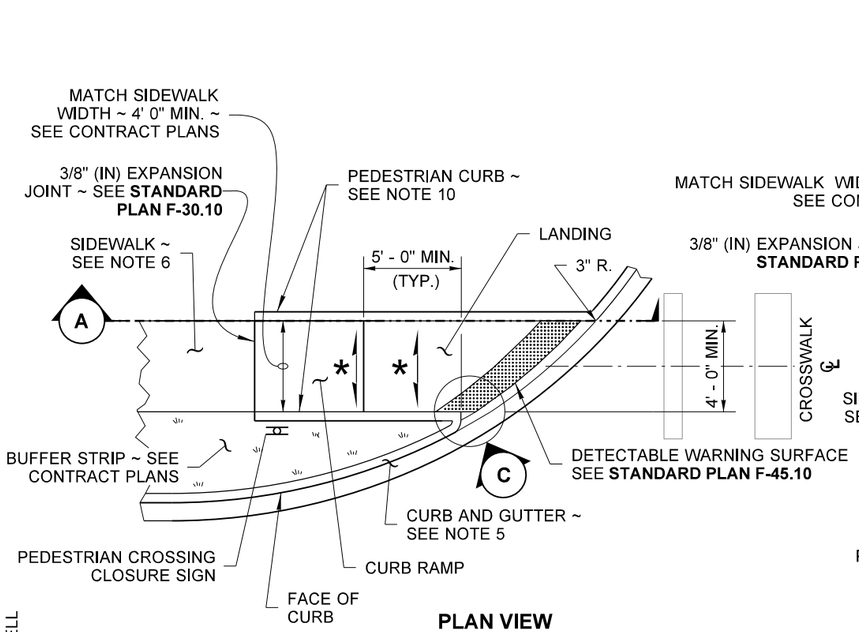
Zeller, Scott
Jun 24 2016 7:19 AM

# PARALLEL CURB RAMP

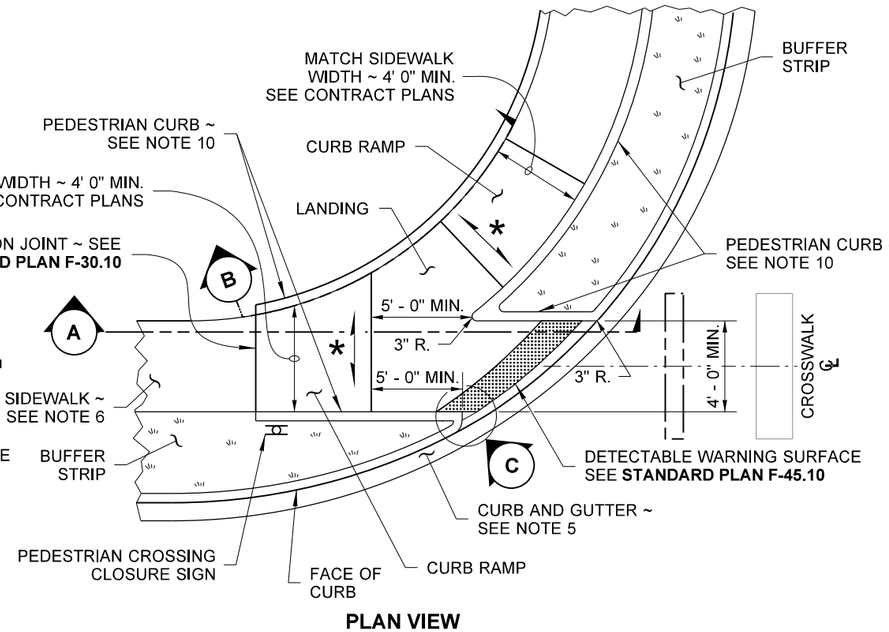
# STANDARD PLAN F-40.12-03

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Carpenter, Jeff
Jun 29 2016 2:27 PM
STATE DESIGN ENGINEER
Washington State Department of Transportation

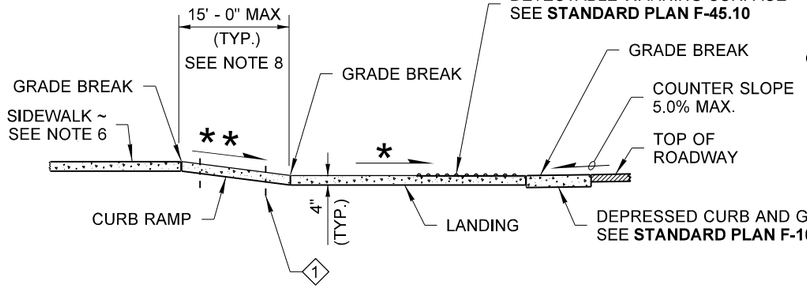



**PLAN VIEW**
**TYPE SINGLE DIRECTION A**

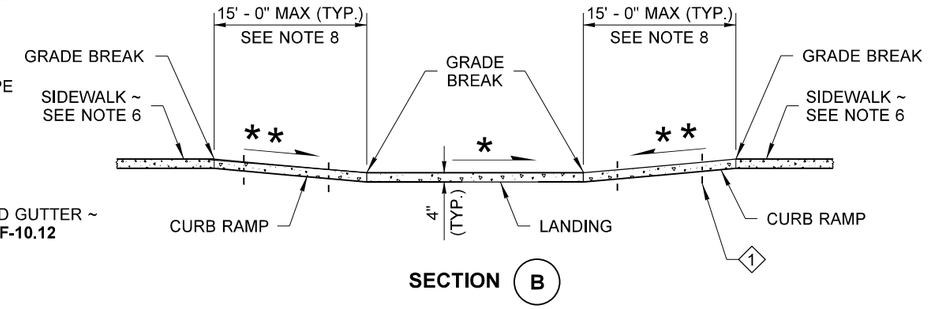



**PLAN VIEW**
**TYPE SINGLE DIRECTION B**

DRAWN BY: FERN LIDDELL



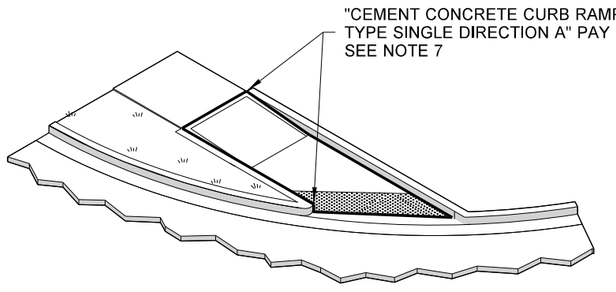

**SECTION (A)**



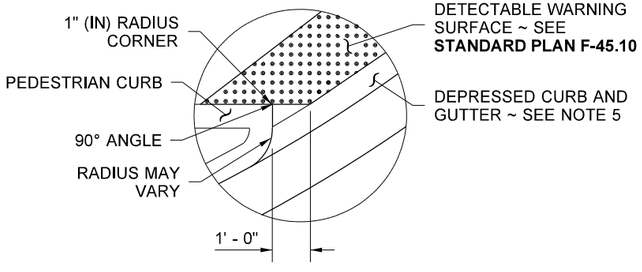

**SECTION (B)**

1 CONTRACTION JOINT (TYP.) ~ SEE **STANDARD PLAN F-30.10** FOR CURB RAMP LENGTHS GREATER THAN 8' - 0" PROVIDE CONTRACTION JOINT EQUALLY SPACED 4' - 0" MIN. OC.

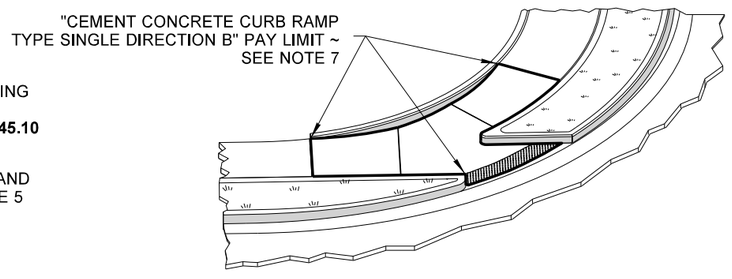
(ALONG INSIDE RADIUS AT BACK OF WALKWAY)




**ISOMETRIC VIEW**
**TYPE SINGLE DIRECTION A**
**PAY LIMIT**




**DETAIL (C)**




**ISOMETRIC VIEW**
**TYPE SINGLE DIRECTION B**
**PAY LIMIT**

**NOTES**

1. This plan is to be used where pedestrian crossing in one direction is not permitted.
2. At marked crosswalks, the connection between the Landing and the roadway must be contained within the width of the crosswalk markings.
3. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
4. Do not place Gratings, Junction Boxes, Access Covers, or other appurtenances on any part of the Curb Ramp or Landing or in the Depressed Curb and Gutter where the Landing connects to the roadway.
5. See Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb, Curb and Gutter, Depressed Curb, Gutter and Pedestrian Curb details.
6. See **Standard Plan F-30.10** for Cement Concrete Sidewalk Details. See Contract Plans for width and placement of sidewalk.
7. The Bid Item "Cement Concrete Curb Ramp Type __" does not include the adjacent Curb, Curb and Gutter, Depressed Curb and Gutter, Pedestrian Curb, or Sidewalks.
8. The Curb Ramp length is not required to exceed 15 feet (unless shown otherwise in the Contract Plans). When applying the 15-foot max. length (measured from back of sidewalk) the running slope of the curb ramp is allowed to exceed 8.3%. Use a single constant slope from bottom of ramp to top of ramp to match into the sidewalk over a horizontal distance of 15 feet.
9. Curb Ramps and Landings shall receive a broom finish. See **Standard Specifications 8-14.**
10. Pedestrian Curb may be omitted if the ground surface at the back of the Curb Ramp and/or Landing will be at the same elevation as the Curb Ramp or Landing and there will not be material to retain.

**LEGEND**

| | |
|---|---|
| ⟷ | SLOPE IN EITHER DIRECTION |
| * | 1.5 OR FLATTER RECOMMENDED FOR DESIGN/FORMWORK (2% MAX.) |
| * * | 7.5% OR FLATTER RECOMMENDED FOR DESIGN/FORMWORK (8.3% MAX.) SEE NOTE 7 |

R. SCOTT ZELLER
STATE OF WASHINGTON
28680
REGISTERED
PROFESSIONAL ENGINEER

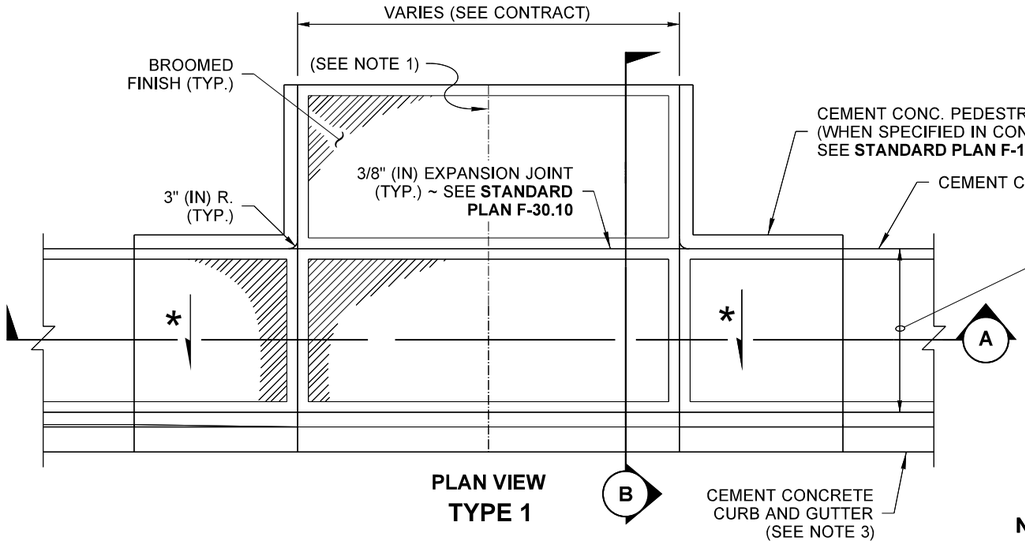
Zeller, Scott
Jun 24 2016 7:21 AM

# SINGLE DIRECTION CURB RAMP

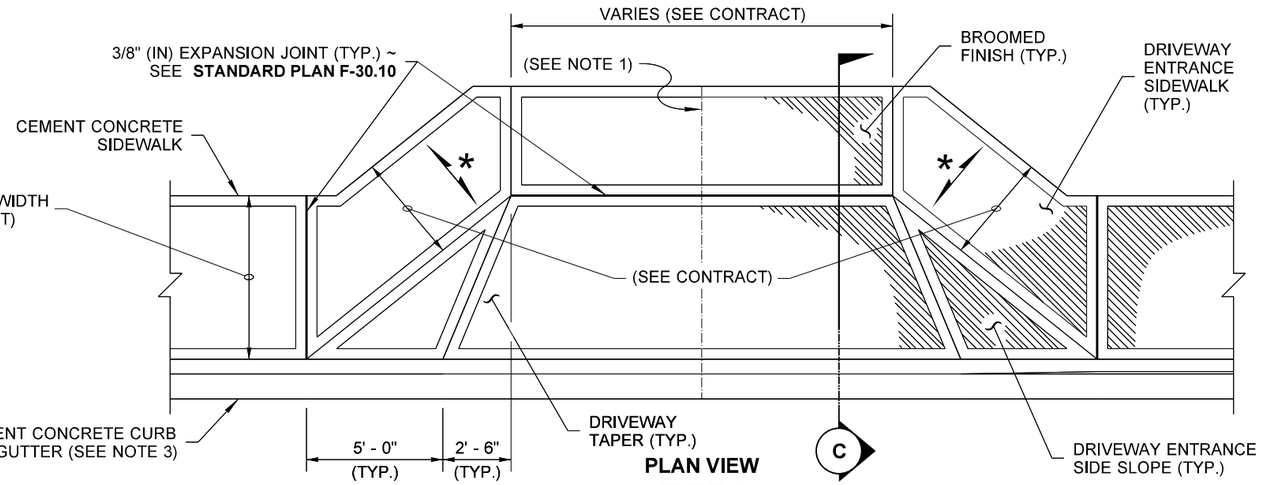
# STANDARD PLAN F-40.16-03

SHEET 1 OF 1 SHEET

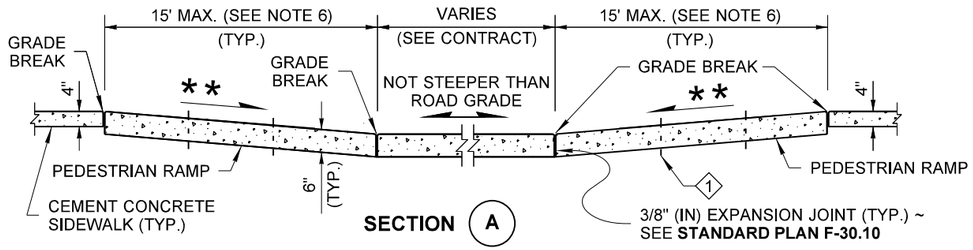
APPROVED FOR PUBLICATION
Carpenter, Jeff
Jun 29 2016 2:29 PM
STATE DESIGN ENGINEER
Washington State Department of Transportation



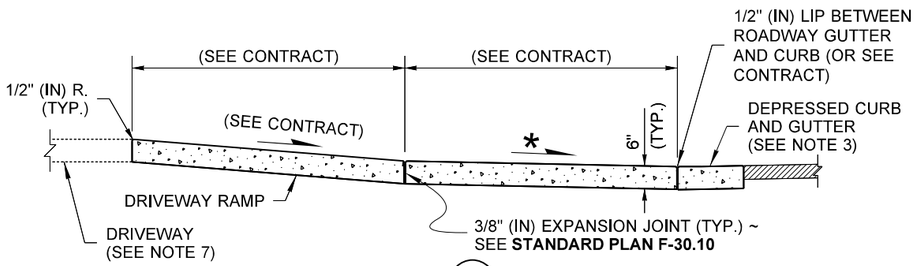

**PLAN VIEW**
**TYPE 1**



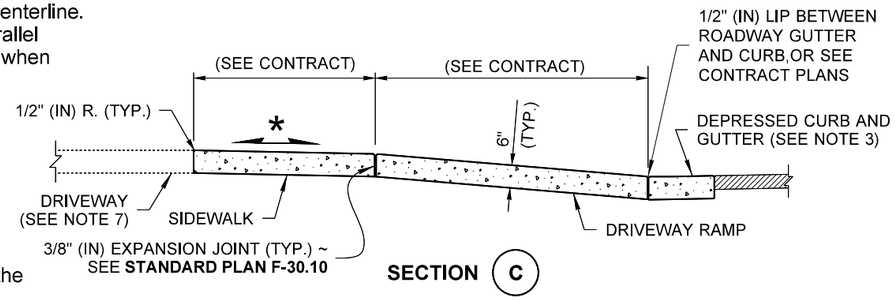

**PLAN VIEW**
**TYPE 2**




**SECTION A**




**SECTION B**




**SECTION C**

## NOTES

1. When the driveway width exceeds 15' (ft), construct a full depth expansion joint with 3/8" (in) joint filler along the driveway centerline. See **Standard Plan F-30.10.** Construct expansion joints parallel with the centerline as required at 15' (ft) maximum spacing when driveway widths exceed 30' (ft).
2. See **Standard Plan F-30.10** for sidewalk details.
3. Curb and Gutter shown; see the Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb Details.
4. Avoid placing drainage structures, junction boxes or other obstructions in front of driveway entrances.
5. Where "GRADE BREAK" is called out, the entire length of the line between the two adjacent surface planes shall be flush.
6. The Pedestrian Ramp length is not required to exceed15 feet (unless otherwise shown in the Contract Plans). When applying the 15-foot max. length (measured from back of sidewalk) the running slope of the pedestrian ramp is allowed to exceed 8.3%. Use a single constant slope from bottom of ramp to top of ramp to match into the sidewalk over a horizontal distance of 15 feet.
7. Beyond limits shown. Pay item does not include driveway. See Contract Plans.

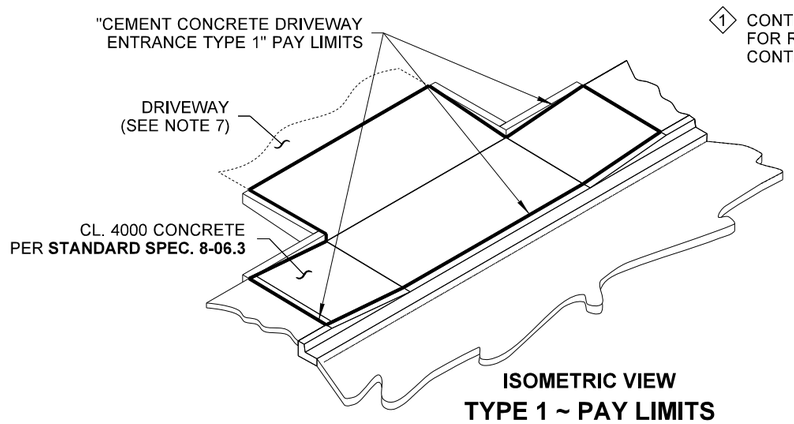
## LEGEND

SLOPE IN EITHER DIRECTION

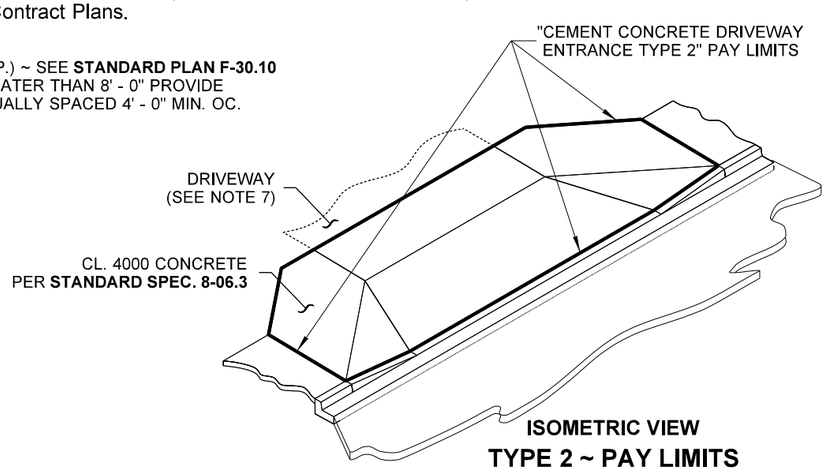
* 1.5% OR FLATTER RECOMMENDED FOR DESIGN/FORMWORK (2% MAX.)

** 7.5% OR FLATTER RECOMMENDED FOR DESIGN/FORMWORK (8.3% MAX.) (SEE NOTE 6)

1 CONTRACTION JOINT (TYP.) ~ SEE **STANDARD PLAN F-30.10** FOR RAMP LENGTHS GREATER THAN 8' - 0" PROVIDE CONTRACTION JOINT EQUALLY SPACED 4' - 0" MIN. OC.




**ISOMETRIC VIEW**
**TYPE 1 ~ PAY LIMITS**

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**TYPE 2 ~ PAY LIMITS**

DRAWN BY: FERN LIDDELL

R. SCOTT ZELLER — STATE OF WASHINGTON — 28680 — REGISTERED PROFESSIONAL ENGINEER

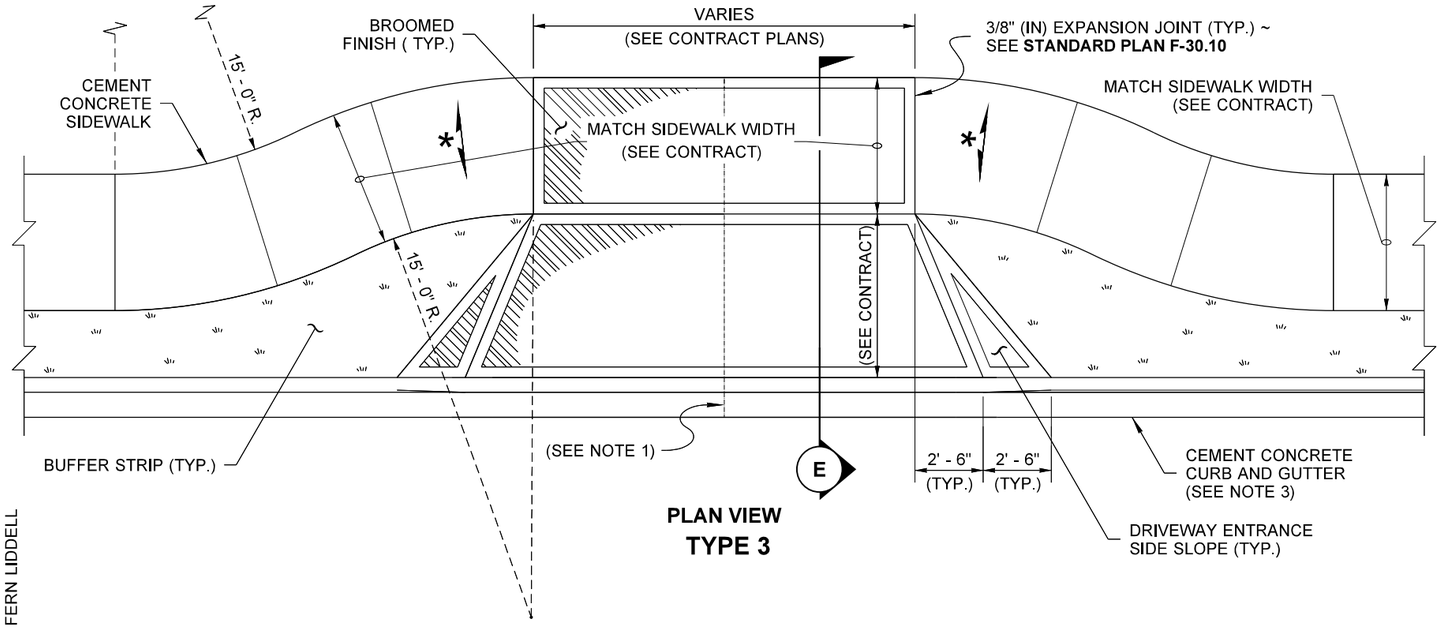
Zeller, Scott
Jul 12 2016 4:26 PM

# CEMENT CONCRETE DRIVEWAY ENTRANCE TYPES 1, 2, 3, & 4

# STANDARD PLAN F-80.10-04

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION
Carpenter, Jeff
Jul 15 2016 2:27 PM
STATE DESIGN ENGINEER
Washington State Department of Transportation

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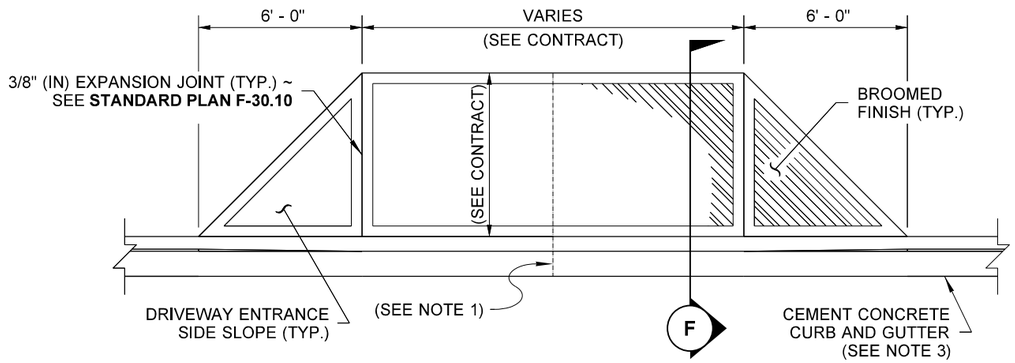


**PLAN VIEW**
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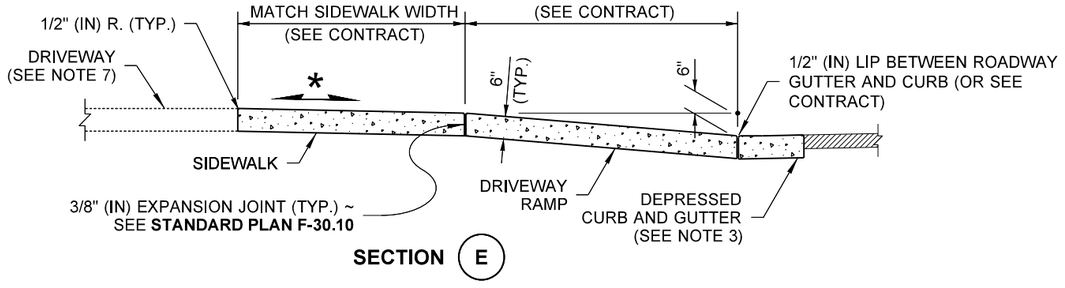
✳ THIS ENTRANCE TYPE SHALL NOT BE USED ALONG A PEDESTRIAN ROUTE

DRAWN BY: FERN LIDDELL

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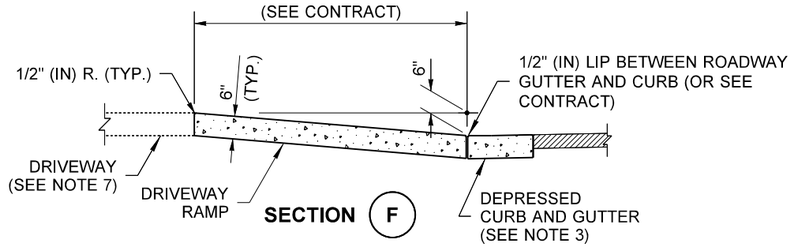


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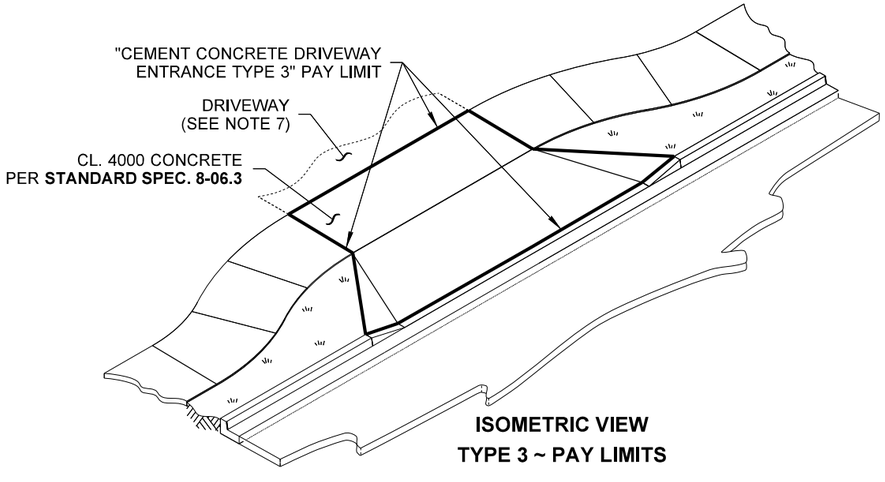


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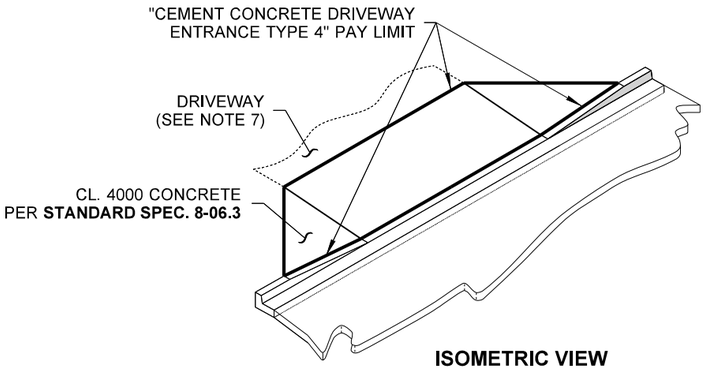


**ISOMETRIC VIEW**
**TYPE 4 ~ PAY LIMITS**

R. SCOTT ZELLER
STATE OF WASHINGTON
28680
REGISTERED
PROFESSIONAL ENGINEER

Zeller, Scott
Jul 18 2016 7:07 AM

# CEMENT CONCRETE DRIVEWAY ENTRANCE TYPES 1, 2, 3, & 4

# STANDARD PLAN F-80.10-04

SHEET 2 OF 2 SHEETS

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Carpenter, Jeff
Carpenter, Jeff
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Washington State Department of Transportation

# APPENDIX C:
# STORMWATER TIR

City of Kirkland

**FINAL**

# STORMWATER TECHNICAL INFORMATION REPORT

# LAKE WASHINGTON SCHOOL ROUTE ENHANCEMENTS 116TH AVE. NE AND NE 80TH ST./124TH AVE. NE IMPROVEMENTS

**PREPARED FOR:**

**CITY OF KIRKLAND, WA**

**PREPARED BY:**

**WHPACIFIC, INC., an NV5 COMPANY**

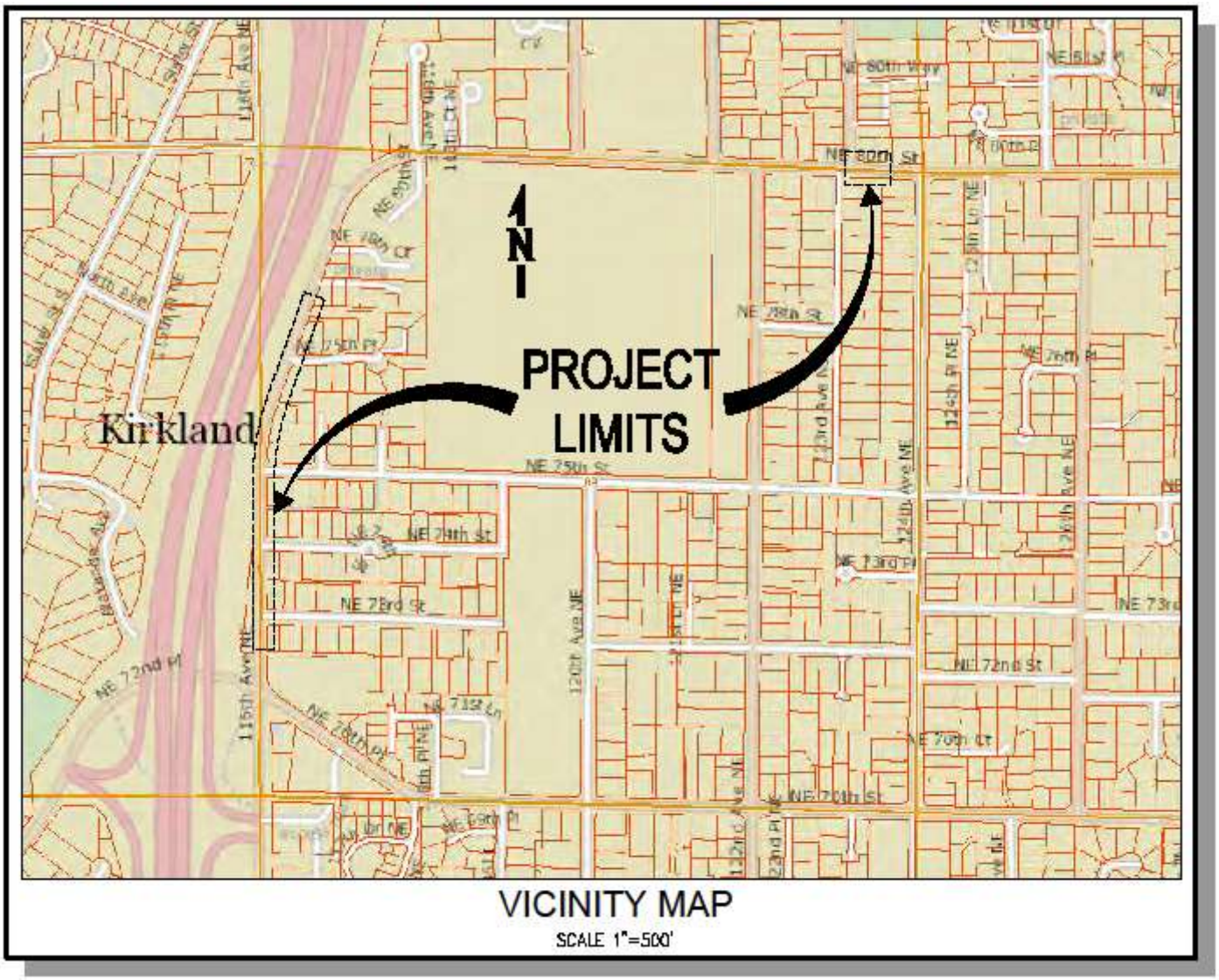
## Table of Contents

# 1 Project Overview

The proposed *Lake Washington School Route Enhancement project* is part of the City of Kirkland's Safer Routes to School Plan. This project includes pedestrian and bicycle improvements along 116th Ave NE and NE 80th Street that serve the surrounding neighborhoods, parks, private school (Holy Family), and Lake Washington High School. The project would complete the pedestrian connection on the east side of 116th Avenue by constructing sidewalks and ADA curb ramps from NE 73rd Street to NE 75th Place. A Rectangular Rapid Flashing Beacon (RRFB) will be constructed at the intersection of NE 80th Street and 124th Avenue NE. The project site areas including Threshold Discharge Areas (TDAs) and Vicinity Map are shown in Figure 1 and Figure 2 below.


**Figure 1A: Overall Project Sites**

**Figure 2B: Overall Project Sites/Vicinity Map**




1.1 Existing Conditions:

116th Avenue NE is a collector road, the existing roadway consists of two lanes and bike lanes on both sides, with paved asphalt roadway width ranging from 43 feet to 50 feet. The existing right-of-way (ROW) is 30' on both sides for a total ROW width of 60 feet. There is no existing sidewalk on the west side of 116th Ave but there are existing intermittent sidewalks on the east side.

The existing roadway has a crown section except at the horizontal curve segment located north of NE 75th Street which is superelevated with flow direction towards the east. In general, the stormwater runoff from the project area drains north and then to the west through storm pipes across 116th Avenue NE. The storm water flows along the eastern edge of pavement where it is collected by shallow ditches/swales which drain to existing inlets and storm pipes. See the following photos, Figures 3A, 3B and 4, showing the existing edge of pavement conditions at two locations along the project site.

**Threshold Drainage Areas (TDAs)**

The project site areas along 116th Avenue NE flow to Moss Bay Basin. See TDA 1 and TDA 2 exhibits below. While the north and the south side area of 124th Avenue/NE 80th Street intersection flow in different directions, they both contribute to the Forbes Creek basin downstream. See TDA 3 below.

**TDA 1 (116th Ave. NE)**

The surface runoff from NE 73rd St. project area is collected through roadside ditches and catch basins, and then conveyed through pipes varying in size from 12" to 18" diameter. The drainage flows north through 18" pipe for approximately 100 feet and then flows west underneath 116th Avenue and discharges to a ditch/pond on the east side of Interstate Highway (I-405). The storm water is conveyed across I-405 through a 30" culvert. The drainage system ultimately discharges to a ditch along Alexander Avenue.

**TDA 2 (116th Ave. NE)**

TDA 2 consists of the drainage area from approximately 150 feet south of NE 74th Street to the end of the proposed improvements about 200 feet north of NE 75th Place. The surface runoff flows to roadside ditches and a series of catch basins that relate to storm drain pipes varying in size from 12" to 18" diameter. The flows are conveyed across NE 116th Avenue through 18" pipes at four locations (75 feet south of NE 75th St., 10 feet north of NE 75th St., 200 feet north of NE 75th St., and at NE 78th Ct.). The four pipes discharge to a ditch along the east side of I-405 that flows north and then northwest across I-405 though a 24" pipe. The drainage connects to the drainage system along Kirkland Avenue.

**TDA 3 (124th Avenue/NE 80th Street)**

The surface runoff from the north side of 124th Ave./80th St. intersections flows north along 124th Ave. NE through catch basins and 12" pipes. The south side drains west though catch basins and pipes and then flows north along 122nd Avenue NE. The two drainage systems combine into one storm pipe (30" RCP) at the intersection of 122nd Avenue NE and NE 85th Street.


**Figure 3A: TDA 1**

**Figure 4B: TDA 2**


**Figure 5C: TDA 3**


**Figure 6A: 116th Avenue NE Looking south (Project area is on left side of picture)**


**Figure 7B: 116th Avenue NE Looking north (Project area is on right side of picture)**

**Figure 8: NE 80th Street/124th Avenue, Looking west (Project area is the crosswalk crossing)**

## 1.1 Soils Description:

According to the USDA Natural Resource Conservation Service's (NRCS) Soil Survey, the project area soils are Alderwood gravelly sandy loam (AgC).

No Geotechnical/Soil investigation was conducted for the project. A Flow Control BMP Soil Report is required any time a project triggers flow control BMPs per the 2021 KCSWDM and can't meet the criteria for full dispersion, is located within a steep slope hazard area (>40% slope) or landslide hazard area OR does not trigger flow control BMPs but is planning to fully infiltrate all the stormwater runoff on the project site (i.e. there is no overflow for the infiltration BMP).

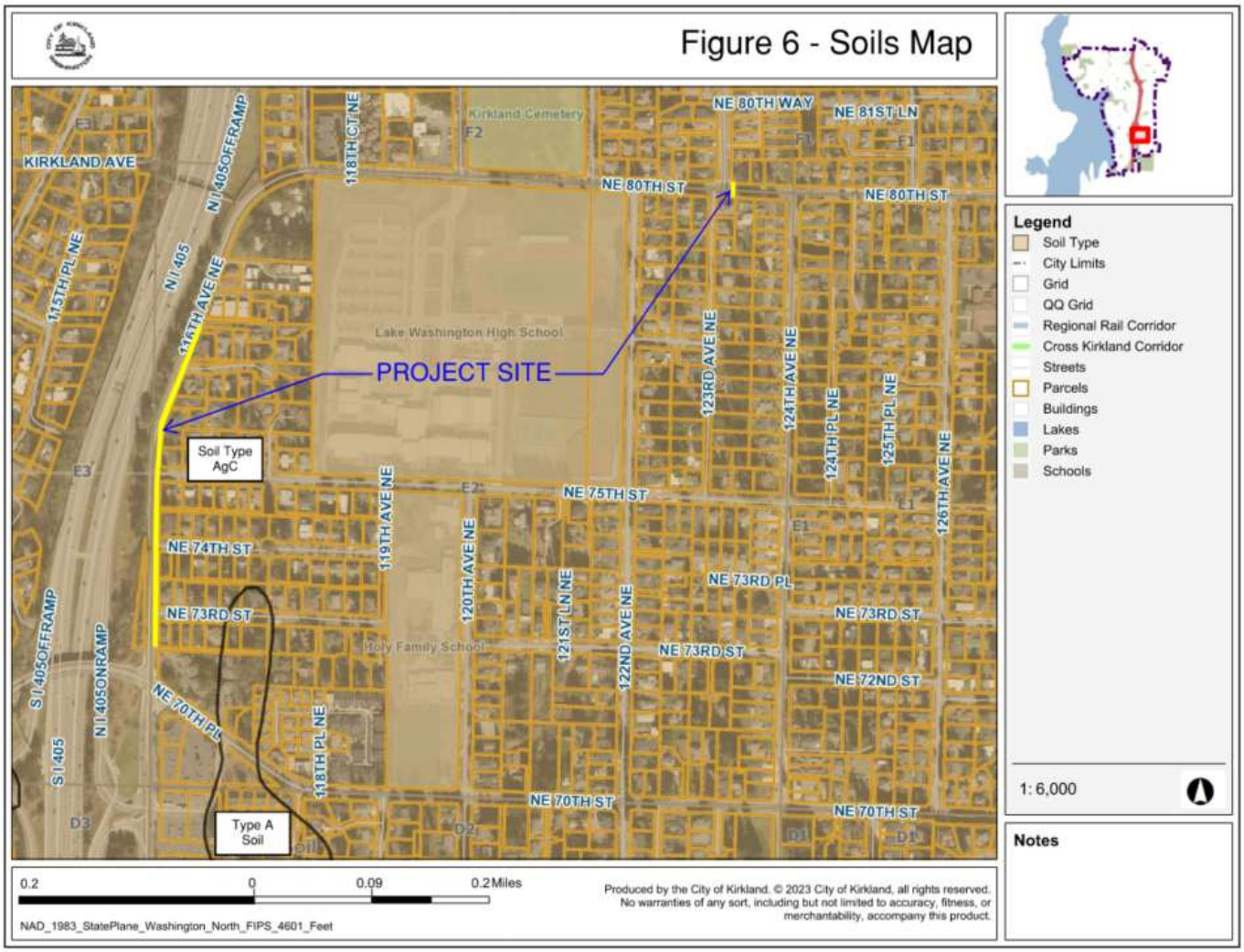



**Figure 5: Soil Map**

## 1.2 Proposed Improvements:

The proposed project consists of constructing cement concrete curb and gutter, sidewalk, ADA compliant curb ramps, asphalt roadway, driveway connections, and new storm sewer system along the east side 116th Avenue NE. The goal of the project is to provide a continuous safe pedestrian walkway along the east side of 116th Avenue NE by filling the gaps where no sidewalks exist. The NE 80th Street/124th Avenue intersection improvement includes construction of pedestrian refuge island on the east side leg and installation of Rectangular Rapid Flashing Beacon (RRFB) for pedestrian safety.

Typical project improvements will consist of installing new standard curb and gutter, asphalt roadway to have 18' of paved width from centerline to face of curb, 5 ft. wide sidewalk and a 4.5-foot-wide planter strip. Drainage improvements will require the addition of several new catch basins and conveyance piping. The resulting impervious and pervious areas due to the proposed improvements are shown in Table 1 below.

The proposed drainage system will be designed to match the existing drainage flow pattern.

**Table 1: Project Area Surfaces** (refer to pavement area exhibit in Appendices)

| TDA ID | New NPGIS | New PGIS | NPGPS | Replaced PGIS |
|---|---|---|---|---|
| TDA 1 | 360 sq. ft. (0.008 acres) | 0 sq. ft. (0.000 acres) | 552 sq. ft. (0.013 acres) | 1,960 sq. ft. (0.045 acres) |
| TDA 2 | 2,509 sq. ft. (0.058 acres) | 0 sq. ft. (0.000 acres) | 3,805 sq. ft. (0.087 acres) | 6,789 sq. ft. (0.156 acres) |
| TDA 3 | 0 sq. ft. (0.000 acres) | 0 sq. ft. (0.000 acres) | 0 sq. ft. (0.000 acres) | 881 sq. ft. (0.02 acres) |

# 2 Conditions and Requirements Summary

Stormwater elements for the project shall comply with the 2021 King County Surface Water Design Manual (KCSWDM) as adopted and amended by the City of Kirkland's (COK) Policy D-10, Addendum to the 2021 King County Surface Water Design Manual dated 07/2022 and updated on 01/2023.

Per City of Kirkland Policy D-3, this project will require a full drainage review. Accordingly, this Report must address all the KCSWDM nine Core Requirements and five Special Requirements. These stormwater requirements are listed below, with discussion of how the proposed site improvements comply with each one.

## 2.1 Core Requirement #1: Discharge at the Natural Location

The project site storm water will discharge to the same location as the existing drainage system. The 116th Avenue NE project areas discharge through 18" diameter pipes to the ditch located on the west side on 116th Avenue NE. The NE 80th St. and NE 124th Ave. project area drains to the existing inlets and discharges to the existing manholes.

## 2.2 Core Requirement #2: Offsite Analysis

Per KCSWDM, Section 1.2.2, Level 1 Downstream Analysis is required. The downstream analysis must consider the existing conveyance system(s) for a minimum flow path distance downstream of one-quarter mile and beyond that, as needed, to reach a point where the project site area constitutes less than 15% of the tributary area. The Offsite Analysis is described in Section 3.

## 2.3 Core Requirement #3: Flow Control

Per KCSWDM, Table 1.1.2.A, this requirement has exceptions or thresholds that may preclude or limit their application to a specific project.

The total project new and replaced impervious surface is in excess of 5,000 square feet, and will therefore utilize exception #2 for conservation flow control areas.

TDAs 1 and 2 have new impervious area which will be modeled in the WWHM. The model will demonstate that the new impervious area does not result in a 100-year peak flow increase of more than 0.15-cfs when modeled using 15 minute time steps. Refer to Appendix F for the WWHM report.

TDA 3 features no new impervious area and therefore will not increase the 100-year peak flow.

## 2.4 Core Requirement #4: Conveyance System

Based on KCSWDM, Section 1.2.4.1, new pipe systems shall be designed with sufficient capacity to convey and contain (at minimum) the 25-year peak flow, assuming developed conditions for onsite tributary areas and existing conditions for any offsite tributary areas.

The calculations for the conveyance pipes are described in Section 4.

## 2.5 Core Requirement #5: Construction Stormwater Pollution Prevention

Per the KCSWDM, Section 1.2.5, erosion, and sediment control (ESC) measures and stormwater pollution prevention and spill control (SWPPS) measures that are appropriate to the project site must be applied through a comprehensive construction stormwater pollution prevention (CSWPP) plan. Preliminary ESC plan has been completed and is included in the plan set.

## 2.6 Core Requirement #6: Maintenance and Operations

All stormwater improvements will be constructed within the City of Kirkland right-of-way. It will be the responsibility of the city to maintain the proposed system per their Operations and Maintenance Standard Procedures.

## 2.7 Core Requirement #7: Financial Guarantees and Liability

City of Kirkland provides the necessary financial guarantee and liability after construction is finalized and accepted.

## 2.8 Core Requirement #8: Water Quality

Per KCSWDM, Table 1.1.2.A, this requirement has exemptions or thresholds that may preclude or limit their application to a specific project. The KCSWDM Surface Exemption for Transportation Redevelopment Project is listed below.

**Exemption**

A proposed transportation redevelopment project or any threshold discharge area within the site of such a project is exempt if it meets all the following criteria:

a) The total new impervious surface within the project limits is less than 50% of the existing impervious surface, AND

b) Less than 5,000 square feet of new PGIS will be added, AND

c) Less than ¾ acre of new PGPS will be added.

TDAs 1, 2, and 3 meet the exemption requirements above and therefore Water Quality is not required. See Table 1 for Project Area Surfaces and Drainage Exhibit, Appendix B.

## 2.9 Core Requirement #9: Flow Control BMPs

Per the KCSWDM, Section 1.2.9, all pervious areas will meet the soil amendment requirements per Pre-Approved Plan COK.E-12.

The following flow control BMPs were evaluated for their feasibility within the public ROW for each TDA.

**TDA 1**

1. Slope Sidewalk – There is insufficient room to drain a 5' sidewalk to a 4.5' landscape strip. There is an existing drainage ditch running along the ROW which requires the sidewalk to be located directly adjacent to the street.
2. Bioretention – This BMP is infeasible due to constrained space within the ROW limits
3. Pervious Concrete – This BMP is not applicable
4. Limited Infiltration – This BMP is not feasible due to no feasible location within the ROW limits.

**TDA 2**

1. Slope Sidewalk – Where possible, the proposed sidewalk drains to a landscape strip.
2. Bioretention – This BMP is infeasible due to constrained space within the ROW limits
3. Pervious Concrete – This BMP is not applicable
4. Limited Infiltration – This BMP is not feasible due to no feasible location within the ROW limits.

**TDA 3**

1. Slope Sidewalk – Where possible, the proposed replaced sidewalk drains to a landscape strip.
2. Bioretention – This BMP is infeasible due to constrained space within the ROW limits
3. Pervious Concrete – This BMP is not applicable
4. Limited Infiltration – This BMP is not feasible due to no feasible location within the ROW limits.

## 2.10 Special Requirement #1: Other Adopted Area-Specific Requirements

The site is not within any special treatment or hazard areas per City of Kirkland mapping. There appear to be no additional specific requirements for this site other then what has been included herein.

## 2.11 Special Requirement #2: Flood Hazard Area Delineation

Flood hazard areas have been checked and is not applicable to this site.

## 2.12 Special Requirement #3: Flood Protection Facilities

There are no special flood protection facilities within this project site.

## 2.13 Special Requirement #4: Source Controls

City of Kirkland is responsible for source control through their on-going control and maintenance programs.

## 2.14 Special Requirement #5: Oil Control

This requirement is not applicable for this project site.

# 3 Offsite Analysis

This is a Level 1 Downstream Analysis as per KCSWDM Section 1.2.2.1. The existing drainage system described in this report is based on the information obtained from the City of Kirkland online GIS maps.

In general, the stormwater surface runoff from the 116th Avenue NE project areas are conveyed through 18" pipes. The pipes discharge to a ditch along the east side of Interstate 5 (I-5) located west of 116th Avenue NE.

The 116th Ave NE project areas are divided into two TDAs as described in Section 1.1 – Existing Conditions. The stormwater from TDA 1 is conveyed across I-405 through a 30" culvert. It continues to flow west to the ditch along Alexander Avenue, then through a dual pipe consisting of 18" and 12" pipes across Slater Street. TDA2 is conveyed across I-405 through a 24" culvert and it continues to flow west through 24" drainage pipes before discharging to the ditch on the south side of Kirkland Ave. An 18" culvert was installed under the driveway was that connects to 24" pipes along Slater Street. TDA 1 and TDA 2 contribute to Moss Creek basin. The north side and south side of the 124th Avenue/NE 80th Street intersection flow in different directions but they combine downstream and flows to Forbes Creek. See Appendix D,

Refer to drainage plan/map exhibit in Section 10.4, Appendix D, Downstream Analysis, for the extent and location of the ¼ mile Downstream Analysis, additional details including site photos of the drainage system within ¼ mile downstream of the project site discharge points.

# 4 Conveyance System Analysis and Design

The analysis, design and pipe sizing/capacity calculations for the proposed pipes are shown in Appendix C. Rational method was used to determine the design storm and and backwater calculations was performed to calculate the pipe size and capacity.

Copies of the storm drain plan and profile sheets are included in Appendix A.

# 5 Special Reports and Studies

(To be determined and coordinated with the city if Downstream Analysis Report and Geotechnical Investigation Report will be required.)

# 6 Other Permits

Not Applicable

# 7 CSWPP Plan Analysis and Design

## 7.1 ESC Plan Analysis and Design (Part A)

A preliminary Erosion and Sediment Control (ESC) Plan general plan has been prepared and included in the project plan set and attached in this report (Appendix E). Site specific CSWPP plans are the responsibility of the Contractor to prepare, including site specific ESC plans showing his proposed BMPs per his construction schedule and work areas.

## 7.2 SWPPS Plan Design (Part B)

This plan is the responsibility of the Contractor to prepare as site specific for his construction work area.

# 8 Bond Quantities, Facility Summaries, and Declaration of Covenant

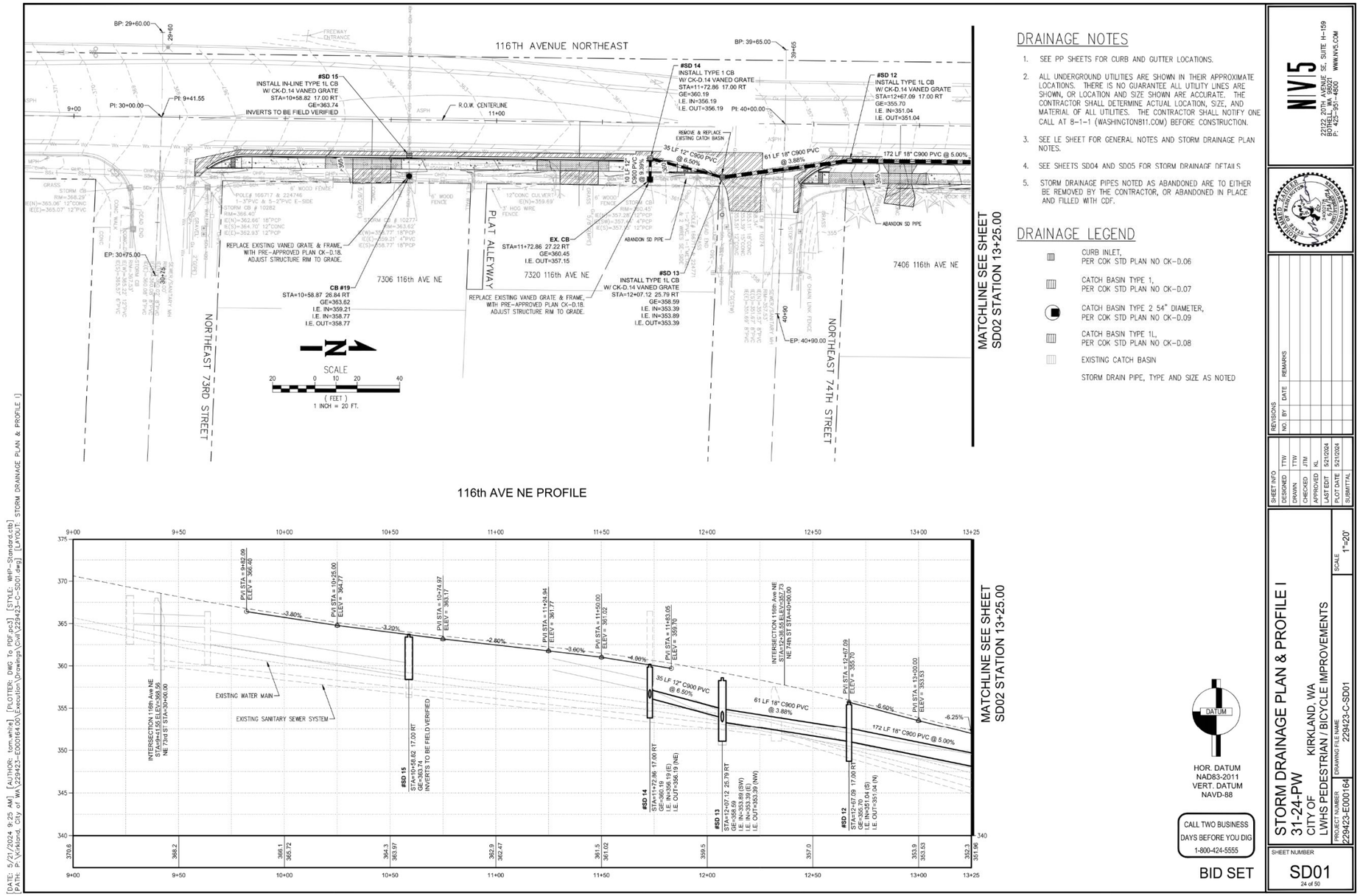
Not applicable.

# 9 Operations and Maintenance Manual.

Operations and maintenance of the storm drainage system is part of the City of Kirkland's standard operating procedures.

# 10 Appendix

## 10.1 Appendix A: Storm Drain Plan and Profile




### DRAINAGE NOTES

1. SEE PP SHEETS FOR CURB AND GUTTER LOCATIONS.
2. ALL UNDERGROUND UTILITIES ARE SHOWN IN THEIR APPROXIMATE LOCATIONS. THERE IS NO GUARANTEE ALL UTILITY LINES ARE SHOWN, OR LOCATION AND SIZE SHOWN ARE ACCURATE. THE CONTRACTOR SHALL DETERMINE ACTUAL LOCATION, SIZE, AND MATERIAL OF ALL UTILITIES. THE CONTRACTOR SHALL NOTIFY ONE CALL AT 8-1-1 (WASHINGTON811.COM) BEFORE CONSTRUCTION.
3. SEE LE SHEET FOR GENERAL NOTES AND STORM DRAINAGE PLAN NOTES.
4. SEE SHEETS SD04 AND SD05 FOR STORM DRAINAGE DETAILS.
5. STORM DRAINAGE PIPES NOTED AS ABANDONED ARE TO EITHER BE REMOVED BY THE CONTRACTOR, OR ABANDONED IN PLACE AND FILLED WITH CDF.

### DRAINAGE LEGEND

- CURB INLET, PER COK STD PLAN NO CK-D.06
- CATCH BASIN TYPE 1, PER COK STD PLAN NO CK-D.07
- CATCH BASIN TYPE 2 54" DIAMETER, PER COK STD PLAN NO CK-D.09
- CATCH BASIN TYPE 1L, PER COK STD PLAN NO CK-D.08
- EXISTING CATCH BASIN
- STORM DRAIN PIPE, TYPE AND SIZE AS NOTED

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STORM DRAINAGE PLAN & PROFILE I
31-24-PW
CITY OF KIRKLAND, WA
LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS

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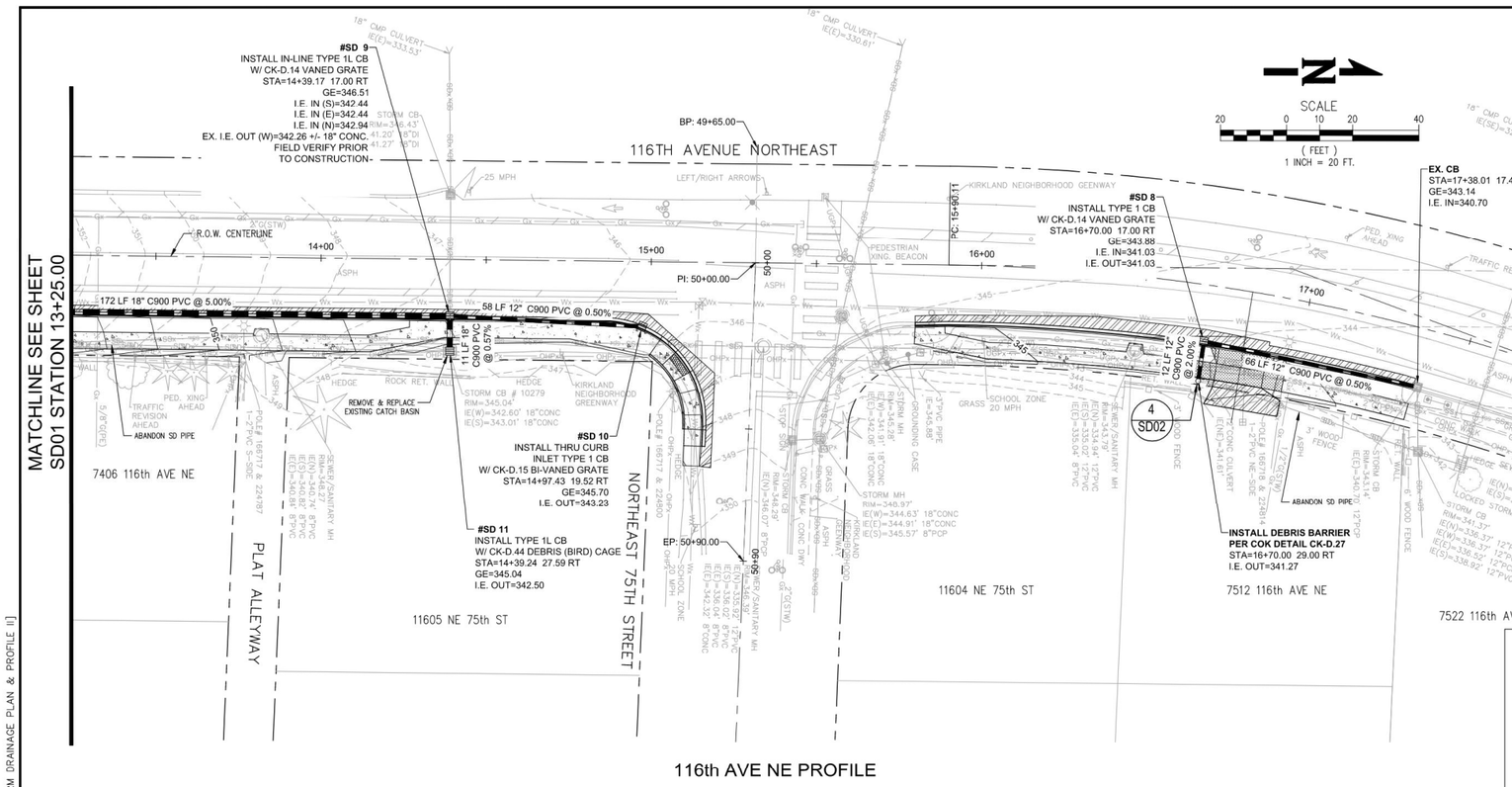


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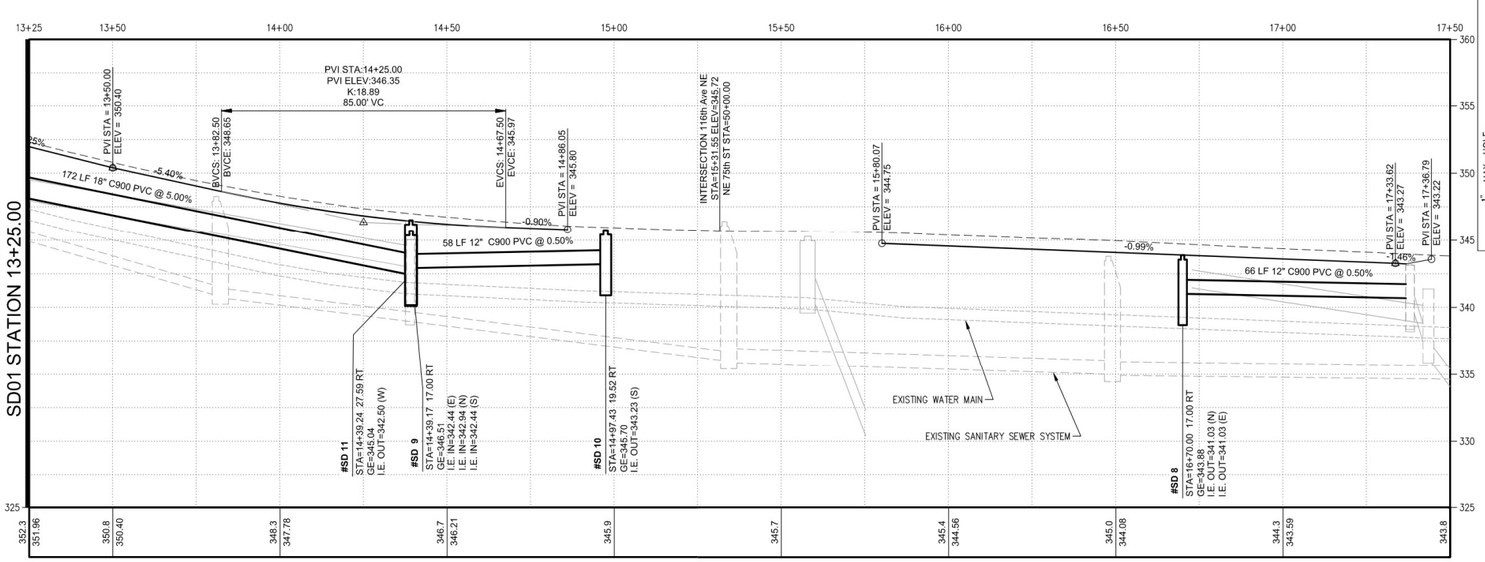


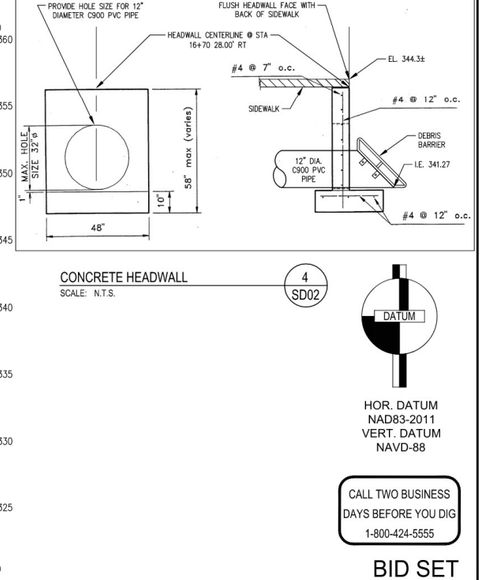


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| APPROVED | KL |
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| SUBMITTAL | |

STORM DRAINAGE PLAN & PROFILE II
31-24-PW
CITY OF KIRKLAND, WA
LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS

SCALE 1"=20'

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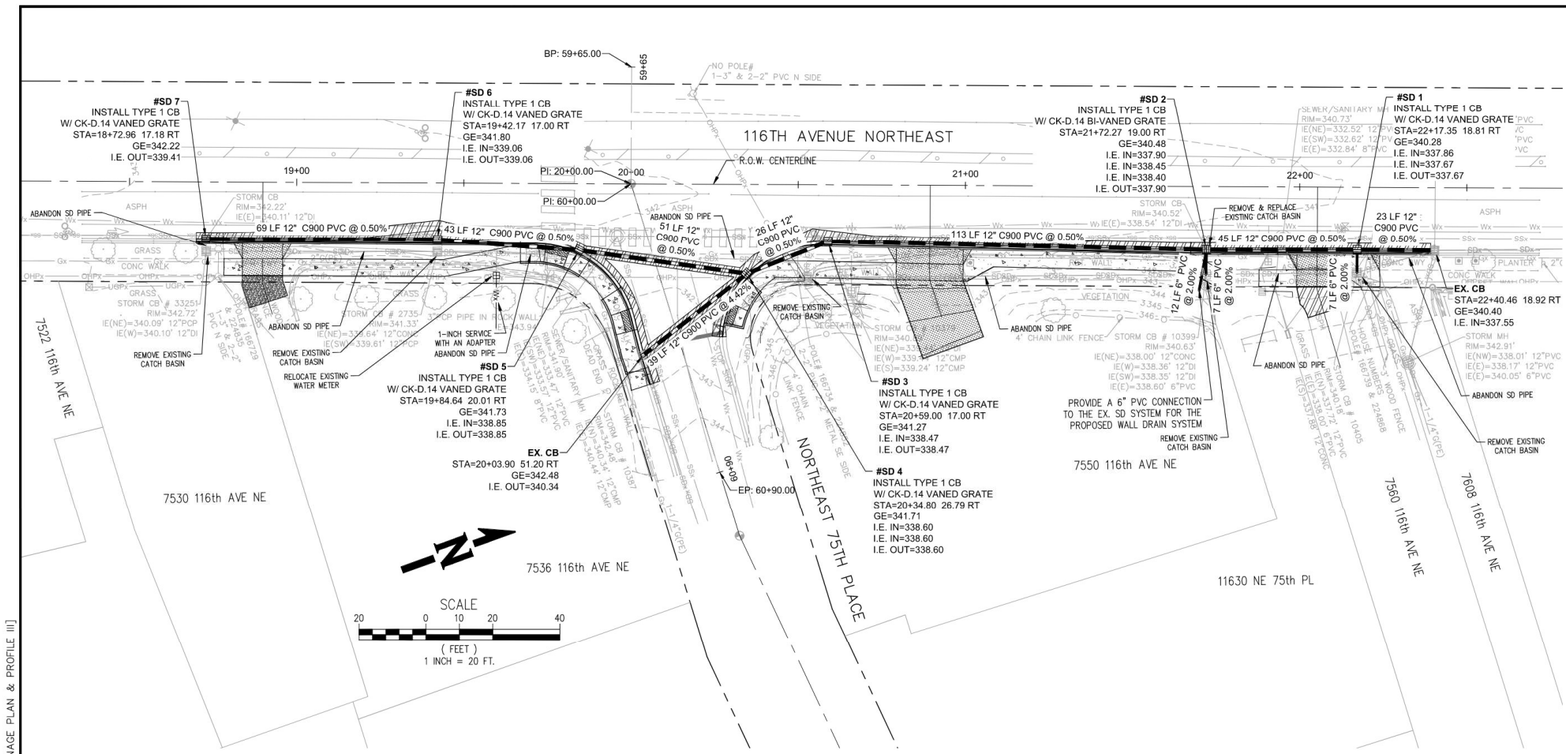


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5. STORM DRAINAGE PIPES NOTED AS ABANDONED ARE TO EITHER BE REMOVED BY THE CONTRACTOR, OR ABANDONED IN PLACE AND FILLED WITH CDF.

## DRAINAGE LEGEND

- CURB INLET, PER COK STD PLAN NO CK-D.06
- CATCH BASIN TYPE 1, PER COK STD PLAN NO CK-D.07
- CATCH BASIN TYPE 2 54" DIAMETER, PER COK STD PLAN NO CK-D.09
- CATCH BASIN TYPE 1L, PER COK STD PLAN NO CK-D.08
- EXISTING CATCH BASIN
- STORM DRAIN PIPE, TYPE AND SIZE AS NOTED

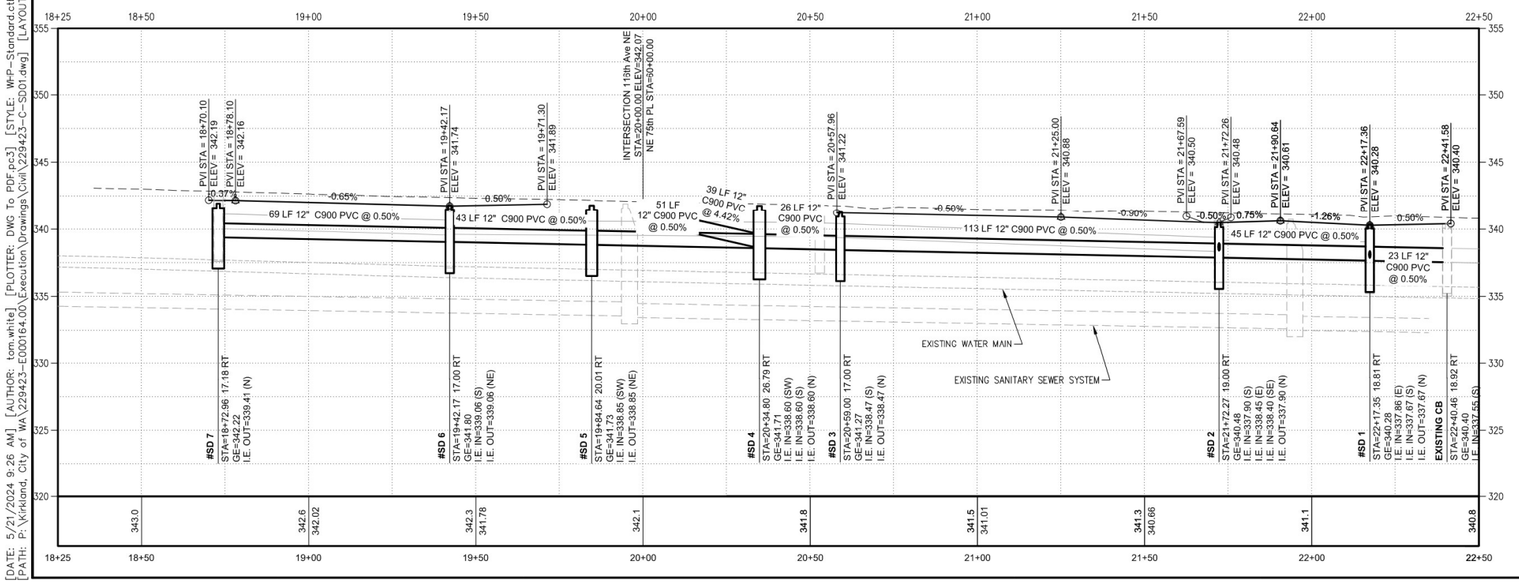
## WATER SERVICE NOTES

1. CONTRACTOR TO RELOCATE AN EXISTING WATER METER SERVICING THE FOLLOWING RESIDENCE 7536 116TH AVENUE NE.
2. THE INSTALL WITH REQUIRE A 1-INCH SERVICE WITH AN ADAPTER.
3. FOR WATER METER PLACEMENT GUIDANCE REFER TO CITY OF KIRKLAND STD. PLAN CK-W.17 (INSTALLATION BEHIND SIDEWALK).
4. REFER TO CITY OF KIRKLAND STD. PLAN CK-W.18 FOR WATER METER SERVICE INSTALLATION FOUND ON SHEET SD05.

## WATER SERVICE LEGEND

- WATER METER, PER COK STD PLAN NO CK-W.18
- —Wx— WATER SERVICE LINE

## 116th AVE NE PROFILE




DATUM

HOR. DATUM
NAD83-2011
VERT. DATUM
NAVD-88

CALL TWO BUSINESS DAYS BEFORE YOU DIG
1-800-424-5555

BID SET

NV5
22122 20TH AVENUE SE, SUITE H-159
BOTHELL, WA 98021
P: 425-951-4800
WWW.NV5.COM

REVISIONS

| NO. | BY | DATE | REMARKS |
|---|---|---|---|
| | | | |

| SHEET INFO | |
|---|---|
| DESIGNED | TTW |
| DRAWN | TTW |
| CHECKED | JTM |
| APPROVED | KL |
| LAST EDIT | 5/21/2024 |
| PLOT DATE | 5/21/2024 |
| SUBMITTAL | |

STORM DRAINAGE PLAN & PROFILE III
31-24-PW
CITY OF KIRKLAND, WA
LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS

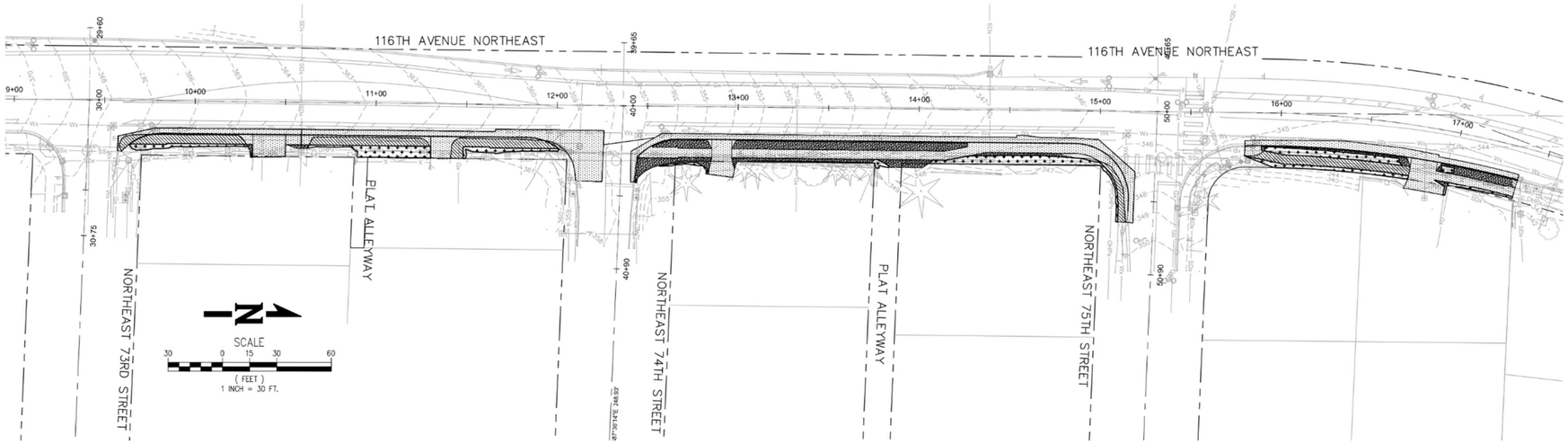
SCALE 1"=20'

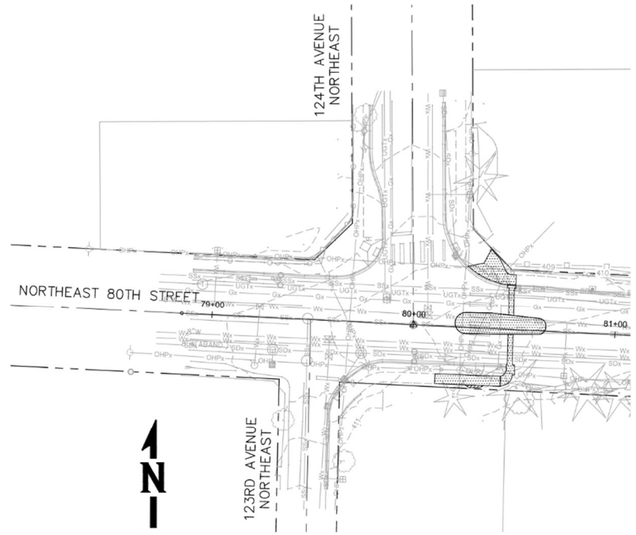
PROJECT NUMBER 229423-E000164
DRAWING FILE NAME 229423-C-SD01

SHEET NUMBER
SD03
26 of 50

[DATE: 5/21/2024 9:26 AM] [AUTHOR: tom.white] [PLOTTER: DWG To PDF.pc3] [STYLE: W+P-Standard.ctb]
[PATH: P:\Kirkland, City of WA\229423-E000164.00\Execution\Drawings\Civil\229423-C-SD01.dwg] [LAYOUT: STORM DRAINAGE PLAN & PROFILE III]

## 10.2 Appendix B: Drainage Exhibit (Pervious/Impervious Areas)




**SUMMARY**

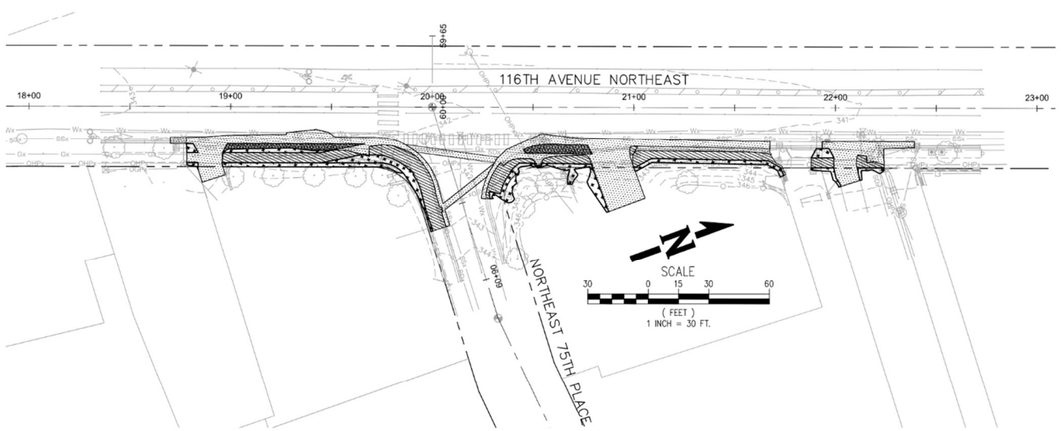
New Pollution Generating Impervious Surface = 83 SF

Replaced Pollution Generating Impervious Surface = 6,295 SF

Total Pervious Surface = 4,357 SF

**LEGEND**

- REPLACED IMPERVIOUS AREA
- NEW IMPERVIOUS AREA
- REPLACED PERVIOUS AREA (2,550 SF)
- NEW PERVIOUS AREA (1807 SF)




IMPERVIOUS / PERVIOUS AREA CALCULATION EXHIBIT

## 10.3 Appendix C: Conveyance System Design

**WHPacific, Inc.**

| | | | |
|---|---|---|---|
| PROJECT : | City Of Kirkland 116th Ave NE/NE 80th Street | | |
| Job No. : | 229423-E000164.00 | | |
| Date: | February 14, 2024 | | |
| Prepared By: | Chris Yamaguchi, PE | Checked by: | Juanito 'Mark' Marquez, PE |

Pipe Sizing Calculations

Calculate Design Flow
Use Rational Method, Q = cIA (Reference: Name of Std Reference), 2021 King county Surface Water Design Manual (KCSWDM), See Below

Rational Method Equation:

$$Q_R = CI_RA \qquad (3\text{-}1)$$

where
$Q_R$ = peak flow (cfs) for a storm of return frequency $R$
$C$ = estimated runoff coefficient (ratio of rainfall that becomes runoff)
$I_R$ = peak rainfall intensity (inches/hour) for a storm of return frequency $R$
$A$ = drainage subbasin area (acres)

Estimated Runoff Coefficient:

$$C_c = (C_1A_1 + C_2A_2 + \ldots + C_nA_n)/A_t \qquad (3\text{-}2)$$

where
$A_t$ = total area (acres)
$A_{1,2,\ldots n}$ = areas of land cover types (acres)
$C_{1,2,\ldots n}$ = runoff coefficients for each area land cover type

Manning's equation:

$$Q = \frac{1.49}{n} A R^{2/3} S^{1/2} \qquad (4\text{-}2)$$

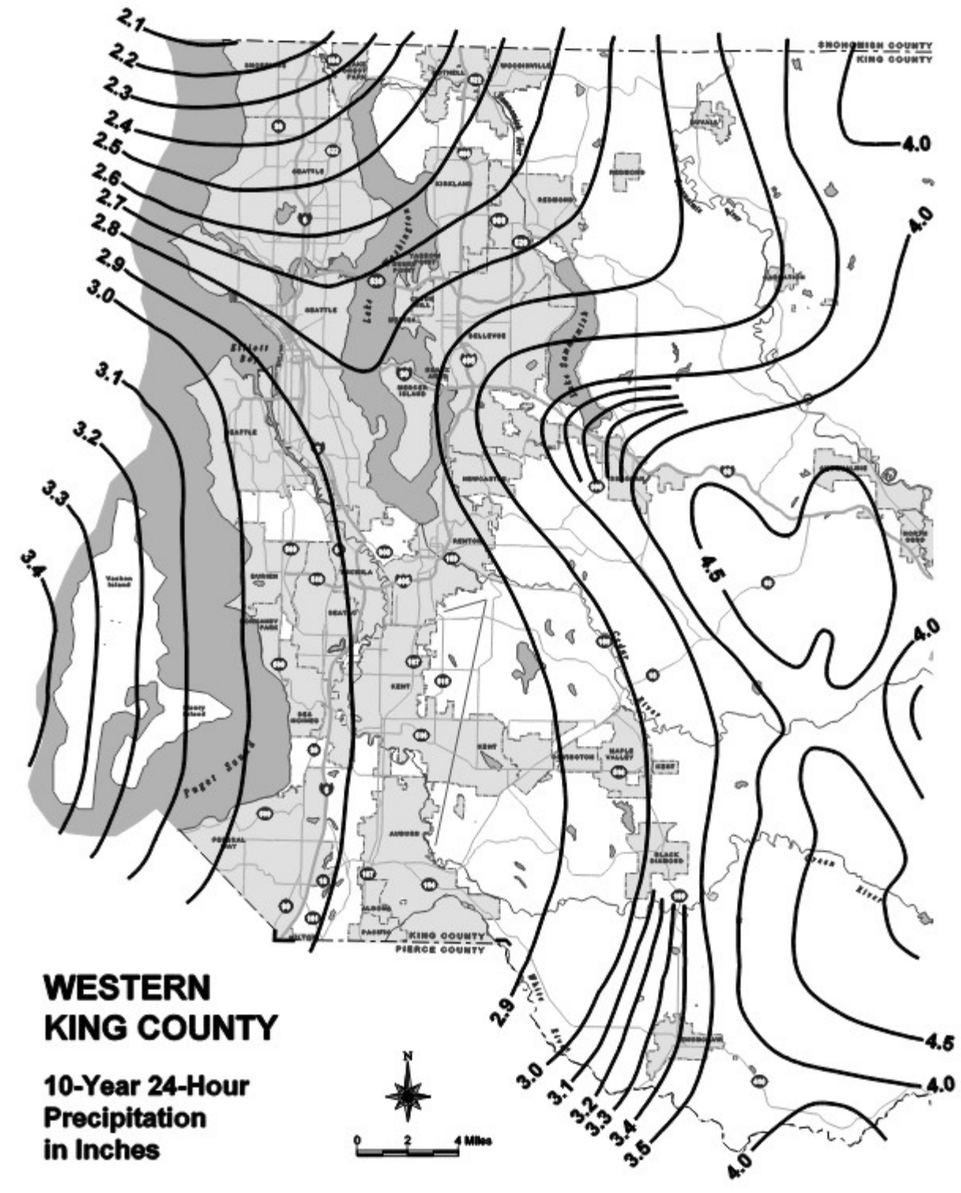
where
$Q$ = discharge (cfs)
$V$ = velocity (fps)
$A$ = area (sf)
$n$ = Manning's roughness coefficient; see Table 4.2.1.D below
$R$ = hydraulic radius = area/wetted perimeter (ft)
$S$ = slope of the energy grade line (ft/ft)

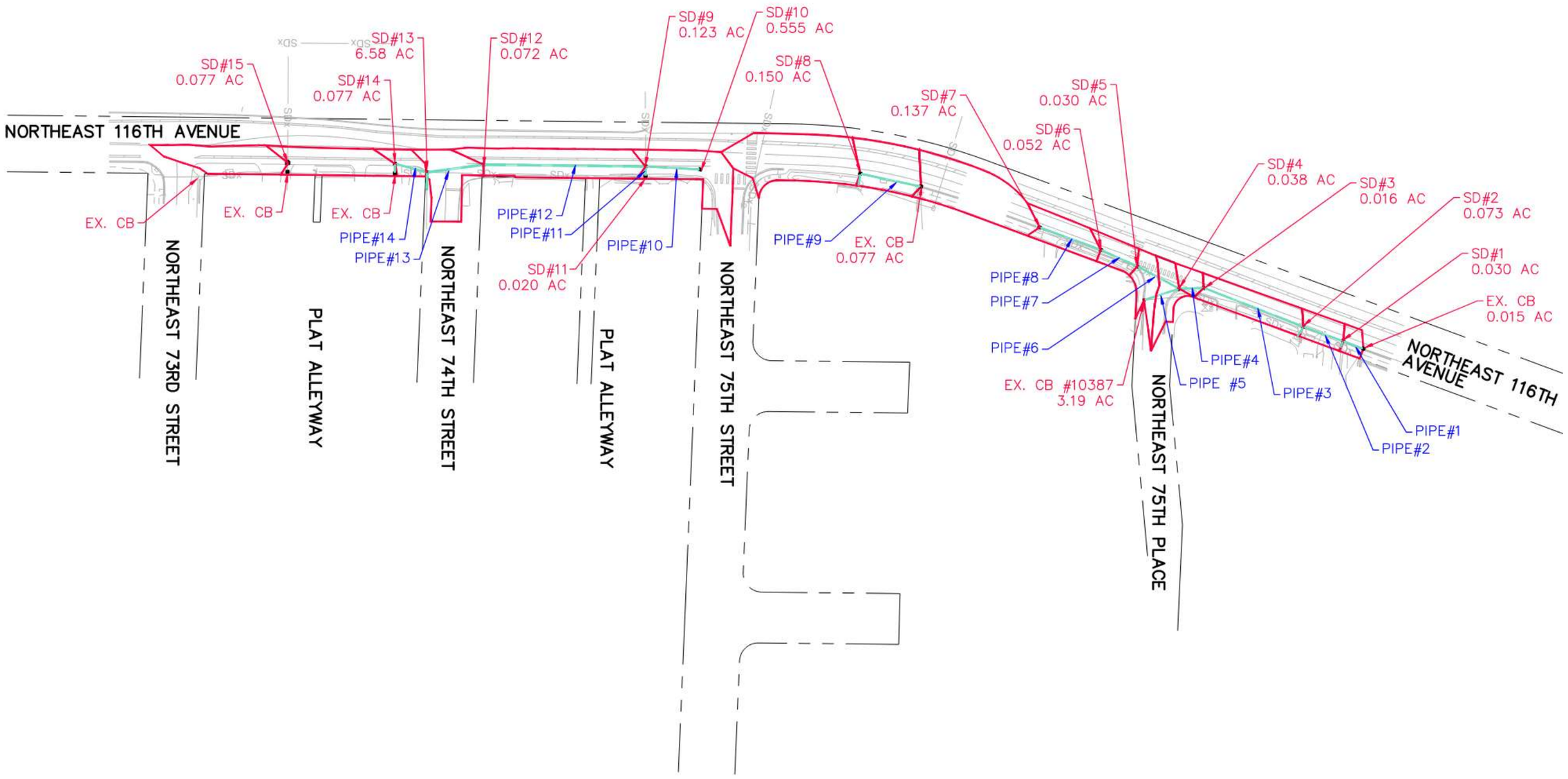
**TABLE 3.2.1.A RUNOFF COEFFICIENTS - "*C*" VALUES FOR THE RATIONAL METHOD**

| General Land Covers | | Single Family Residential Areas* | |
|---|---|---|---|
| Land Cover | *C* | Land Cover Density | *C* |
| Dense forest | 0.10 | 0.20 DU/GA (1 unit per 5 ac.) | 0.17 |
| Light forest | 0.15 | 0.40 DU/GA (1 unit per 2.5 ac.) | 0.20 |
| Pasture | 0.20 | 0.80 DU/GA (1 unit per 1.25 ac.) | 0.27 |
| Lawns | 0.25 | 1.00 DU/GA | 0.30 |
| Playgrounds | 0.30 | 1.50 DU/GA | 0.33 |
| Gravel areas | 0.80 | 2.00 DU/GA | 0.36 |
| Pavement and roofs | 0.90 | 2.50 DU/GA | 0.39 |
| Open water (pond, lakes, wetlands) | 1.00 | 3.00 DU/GA | 0.42 |
| | | 3.50 DU/GA | 0.45 |
| | | 4.00 DU/GA | 0.48 |
| | | 4.50 DU/GA | 0.51 |
| | | 5.00 DU/GA | 0.54 |
| | | 5.50 DU/GA | 0.57 |
| | | 6.00 DU/GA | 0.60 |

* Based on average 2,500 square feet per lot of impervious coverage.
For combinations of land covers listed above, an area-weighted "$C_c \times A_t$" sum should be computed based on the equation $C_c \times A_t = (C_1 \times A_1) + (C_2 \times A_2) + \ldots + (C_n \times A_n)$, where $A_e = (A_1 + A_2 + \ldots + A_n)$, the total drainage basin area.

**FIGURE 3.2.1.B 10-YEAR 24-HOUR ISOPLUVIALS**




NORTHEAST 116TH AVENUE
SD#15
0.077 AC
SD#13
6.58 AC
SD#14
0.077 AC
SD#12
0.072 AC
SD#9
0.123 AC
SD#10
0.555 AC
SD#8
0.150 AC
SD#7
0.137 AC
SD#5
0.030 AC
SD#6
0.052 AC
SD#4
0.038 AC
SD#3
0.016 AC
SD#2
0.073 AC
SD#1
0.030 AC
EX. CB
0.015 AC
EX. CB
EX. CB
EX. CB
EX. CB
EX. CB
0.077 AC
EX. CB #10387
3.19 AC
PIPE#14
PIPE#13
PIPE#12
PIPE#11
PIPE#10
SD#11
0.020 AC
PIPE#9
PIPE#8
PIPE#7
PIPE#6
PIPE#4
PIPE #5
PIPE#3
PIPE#1
PIPE#2
NORTHEAST 73RD STREET
PLAT ALLEYWAY
NORTHEAST 74TH STREET
PLAT ALLEYWAY
NORTHEAST 75TH STREET
NORTHEAST 75TH PLACE
NORTHEAST 116TH AVENUE

INLET TRIBUTARY AREAS

| Inlet ID | Stationing/Location | C (Table 3.2.1.A) | *$I_R$ (25-Year) | A (acres) | $Q_r$ (cfs) |
|---|---|---|---|---|---|
| #SD 15 | STA=10+58.82 17.00 RT | 0.90 | 2.49 | 0.077 | 0.17 |
| | | | | | |
| #SD 14 | STA=11+72.86 17.00 RT | 0.90 | 2.49 | 0.077 | 0.17 |
| #SD 13 | STA=12+07.12 25.79 RT | 0.45 | 2.49 | 6.580 | 7.37 |
| #SD 12 | STA=12+67.09 17.00 RT | 0.90 | 2.49 | 0.072 | 0.16 |
| #SD 9 | STA=14+39.17 17.00 RT | 0.90 | 2.49 | 0.123 | 0.28 |
| #SD 11 | STA=14+39.24 25.79 RT | 0.90 | 2.49 | 0.020 | 0.04 |
| #SD 10 | STA=14+97.43 19.52 RT | 0.45 | 2.49 | 0.555 | 0.62 |
| | | | | | |
| #SD 8 | STA=16+70.00 17.00 RT | 0.90 | 2.49 | 0.150 | 0.34 |
| | | | | | |
| #SD 7 | STA=18+72.96 17.18 RT | 0.90 | 2.49 | 0.137 | 0.31 |
| #SD 6 | STA=19+42.17 17.00 RT | 0.90 | 2.49 | 0.052 | 0.12 |
| #SD 5 | STA=19+84.64 20.01 RT | 0.90 | 2.49 | 0.030 | 0.07 |
| Storm CB # 10387 | STA=20+03.90 51.20 RT | 0.45 | 2.49 | 3.190 | 3.57 |
| #SD 4 | STA=20+34.80 26.79 RT | 0.90 | 2.49 | 0.039 | 0.09 |
| #SD 3 | STA=20+59.00 17.00 RT | 0.90 | 2.49 | 0.016 | 0.04 |
| #SD 2 | STA=21+72.27 19.00 RT | 0.90 | 2.49 | 0.073 | 0.16 |
| #SD 1 | STA=22+17.35 18.81 RT | 0.90 | 2.49 | 0.030 | 0.07 |
| | | | | | |

*Minimum Tc value of 6.5 min used for Ir calculation

PIPE CAPACITY CALCS

| Pipe Number | n, Manning's coefficient | s, slope | Pipe size (in) | Pipe A, (sf) | R, hydraulic radius | Q capacity | Q Tributary |
|---|---|---|---|---|---|---|---|
| Pipe #14 | 0.009 | 0.065 | 12.000 | 0.79 | 0.25 | 13.13 | 0.17 |
| Pipe #13 | 0.009 | 0.038 | 18.000 | 1.77 | 0.38 | 29.61 | 7.55 |
| Pipe #12 | 0.009 | 0.050 | 18.000 | 1.77 | 0.38 | 33.97 | 7.71 |
| | | | | | | | |
| Pipe #11 | 0.009 | 0.006 | 18.000 | 1.77 | 0.38 | 11.77 | 0.04 |
| | | | | | | | |
| Pipe #10 | 0.009 | 0.005 | 12.000 | 0.79 | 0.25 | 3.64 | 0.62 |
| | | | | | | | |
| Pipe #9 | 0.009 | 0.005 | 12.000 | 0.79 | 0.25 | 3.64 | 0.34 |
| | | | | | | | |
| Pipe #8 | 0.009 | 0.005 | 12.000 | 0.79 | 0.25 | 3.64 | 0.31 |
| Pipe #7 | 0.009 | 0.005 | 12.000 | 0.79 | 0.25 | 3.64 | 0.42 |
| Pipe #6 | 0.009 | 0.005 | 12.000 | 0.79 | 0.25 | 3.64 | 0.51 |
| Pipe #5 | 0.009 | 0.042 | 12.000 | 0.79 | 0.25 | 10.55 | 4.09 |
| Pipe #4 | 0.009 | 0.005 | 12.000 | 0.79 | 0.25 | 3.64 | 4.17 |
| Pipe #3 | 0.009 | 0.005 | 12.000 | 0.79 | 0.25 | 3.64 | 4.21 |
| Pipe #2 | 0.009 | 0.005 | 12.000 | 0.79 | 0.25 | 3.64 | 4.37 |
| Pipe #1 | 0.009 | 0.005 | 12.000 | 0.79 | 0.25 | 3.64 | 4.44 |

**Project Location - Backwater Calculations**

| (1) | (3) | (4) | (5) | (6) | (9) | (10) | (11) | (12) | (18) | (19) | (20) | (21) | (23) | **(40)** | (41) | (42) | (45) | (47) | **(49)** | (50) | (51) | (52) | (54) | (55) | (56) | (57) | (58) | (59) | (60) | (61) | (62) | (63) | **(64)** | **(65)** | (66) | (67) | (68) | (69) | (70) | (71) | **(72)** | (72A) | **(73)** | **(74)** | (75) | (76) | (77) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN YEAR STORM | STRUCTURE UP | STRUCTURE DOWN | RIM UP | RIM DOWN | DIAM | PIPE WALL THICKNESS | INVERT UP | INVERT DOWN | ANGL UP | n | L | S | DROP > 1/2 DIAM UP | MAN. INPUT FLOW | FLOW | MANNINGS FULL FLOW CAPACITY | VEL | CRIT DEPTH | MAN. INPUT TAIL WATER DOWN | TAIL WATER DOWN | FRICT LOSS | HGL UP | $K_e$ UP | ENTR LOSS UP | EXIT LOSS DOWN | OUT CTRL | K UP | M UP | c UP | Y UP | Q ($AD^{0.5}$) | SLOPE COEF | FRM 1 UNSUB CTRL DEPTH | FRM 2 UNSUB CTRL DEPTH | USE UNSUB CTRL FRM | UNSUB CTRL DEPTH | SUB CTRL DEPTH | SUB OR UNSUB | IN CTRL | APPR VEL HEAD UP | BEND LOSS COEFF K UP | BEND LOSS UP | KJ | JUNCT LOSS UP | HEAD WATER UP | OVERTOP CHECK UP | Notes |
| (YEAR) | (#) | (#) | (FT) | (FT) | (IN) | (IN) | (FT) | (FT) | (DEG) | | (FT) | % | | (CFS) | (CFS) | (CFS) | (FPS) | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | (FT) | | | | | | | (FT) | (FT) | | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | | (FT) | (FT) | | |
| 25 | SD #14 | SD #13 | 360.19 | 358.59 | 12 | 1.50 | 356.19 | 353.89 | 0.00 | 0.009 | 35 | **6.57%** | **N** | 0.17 | **0.17** | **13.19** | **0.22** | **0.17** | | **355.32** | **0.00** | **357.19** | **0.5** | **0.00** | **0.00** | **357.19** | **0.0098** | **2.00** | **0.0398** | **0.6700** | **0.22** | **-0.50** | **0.19** | | **1** | **0.19** | **0.64** | **UNSUB** | **356.38** | **0.00** | **0.02** | **0.00** | **0.00** | **0.00** | **357.19** | **OK** | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |
| 25 | SD #13 | SD #12 | 358.59 | 355.70 | 18 | 1.50 | 353.39 | 351.04 | 15.00 | 0.009 | 61 | **3.85%** | **N** | 7.55 | **7.55** | **29.78** | **4.27** | **1.06** | | **352.71** | **0.15** | **354.89** | **0.5** | **0.14** | **0.28** | **355.32** | **0.0098** | **2.00** | **0.0398** | **0.6700** | **3.49** | **-0.50** | **1.71** | | **1** | **1.71** | **1.70** | **UNSUB** | **355.10** | **0.00** | **0.08** | **0.00** | **0.00** | **0.00** | **355.32** | **OK** | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |
| 25 | SD #12 | SD #9 | 355.70 | 356.51 | 18 | 1.50 | 351.04 | 342.44 | 7.50 | 0.009 | 172 | **5.00%** | **N** | 7.71 | **7.71** | **33.93** | **4.36** | **1.08** | 343.94 | **343.94** | **0.44** | **352.54** | **0.5** | **0.15** | **0.30** | **352.98** | **0.0098** | **2.00** | **0.0398** | **0.6700** | **3.56** | **-0.50** | **1.73** | | **1** | **1.73** | **1.73** | **TRANS** | **352.77** | **0.28** | **0.04** | **0.01** | **0.00** | **0.00** | **352.71** | **OK** | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |

**Project Location - Backwater Calculations**

| (1) | (3) | (4) | (5) | (6) | (9) | (10) | (11) | (12) | (18) | (19) | (20) | (21) | (23) | **(40)** | (41) | (42) | (45) | (47) | **(49)** | (50) | (51) | (52) | (54) | (55) | (56) | (57) | (58) | (59) | (60) | (61) | (62) | (63) | **(64)** | **(65)** | (66) | (67) | (68) | (69) | (70) | (71) | **(72)** | (72A) | **(73)** | **(74)** | (75) | (76) | (77) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN YEAR STORM | STRUCTURE UP | STRUCTURE DOWN | RIM UP | RIM DOWN | DIAM | PIPE WALL THICKNESS | INVERT UP | INVERT DOWN | ANGL UP | n | L | S | DROP > 1/2 DIAM UP | MAN. INPUT FLOW | FLOW | MANNINGS FULL FLOW CAPACITY | VEL | CRIT DEPTH | MAN. INPUT TAIL WATER DOWN | TAIL WATER DOWN | FRICT LOSS | HGL UP | $K_e$ UP | ENTR LOSS UP | EXIT LOSS DOWN | OUT CTRL | K UP | M UP | c UP | Y UP | Q ($AD^{0.5}$) | SLOPE COEF | FRM 1 UNSUB CTRL DEPTH | FRM 2 UNSUB CTRL DEPTH | USE UNSUB CTRL FRM | UNSUB CTRL DEPTH | SUB CTRL DEPTH | SUB OR UNSUB | IN CTRL | APPR VEL HEAD UP | BEND LOSS COEFF K UP | BEND LOSS UP | KJ | JUNCT LOSS UP | HEAD WATER UP | OVERTOP CHECK UP | Notes |
| (YEAR) | (#) | (#) | (FT) | (FT) | (IN) | (IN) | (FT) | (FT) | (DEG) | | (FT) | % | | (CFS) | (CFS) | (CFS) | (FPS) | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | (FT) | | | | | | | (FT) | (FT) | | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | | (FT) | (FT) | | |
| 25 | SD #11 | SD #9 | 345.05 | 346.51 | 18 | 1.50 | 342.50 | 342.44 | 0.00 | 0.009 | 11 | **0.55%** | **N** | 0.04 | **0.04** | **11.21** | **0.02** | **0.07** | 343.94 | **343.94** | **0.00** | **344.00** | **0.5** | **0.00** | **0.00** | **344.00** | **0.0098** | **2.00** | **0.0398** | **0.6700** | **0.02** | **-0.50** | **0.09** | | **1** | **0.09** | **1.00** | **UNSUB** | **342.59** | **0.00** | **0.02** | **0.00** | **0.00** | **0.00** | **344.00** | **OK** | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |

**Project Location - Backwater Calculations**

| (1) | (3) | (4) | (5) | (6) | (9) | (10) | (11) | (12) | (18) | (20) | (21) | (23) | **(40)** | (41) | (42) | (45) | (47) | **(49)** | (50) | (51) | (52) | (54) | (55) | (56) | (57) | (58) | (59) | (60) | (61) | (62) | (63) | **(64)** | **(65)** | (66) | (67) | (68) | (69) | (70) | (71) | **(72)** | (72A) | **(73)** | **(74)** | (75) | (76) | (77) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN YEAR STORM | STRUCTURE UP | STRUCTURE DOWN | RIM UP | RIM DOWN | DIAM | PIPE WALL THICKNESS | INVERT UP | INVERT DOWN | ANGL UP | L | S | DROP > 1/2 DIAM UP | MAN. INPUT FLOW | FLOW | MANNINGS FULL FLOW CAPACITY | VEL | CRIT DEPTH | MAN. INPUT TAIL WATER DOWN | TAIL WATER DOWN | FRICT LOSS | HGL UP | $K_e$ UP | ENTR LOSS UP | EXIT LOSS DOWN | OUT CTRL | K UP | M UP | c UP | Y UP | Q ($AD^{0.5}$) | SLOPE COEF | FRM 1 UNSUB CTRL DEPTH | FRM 2 UNSUB CTRL DEPTH | USE UNSUB CTRL FRM | UNSUB CTRL DEPTH | SUB CTRL DEPTH | SUB OR UNSUB | IN CTRL | APPR VEL HEAD UP | BEND LOSS COEFF K UP | BEND LOSS UP | KJ | JUNCT LOSS UP | HEAD WATER UP | OVERTOP CHECK UP | Notes |
| (YEAR) | (#) | (#) | (FT) | (FT) | (IN) | (IN) | (FT) | (FT) | (DEG) | (FT) | % | | (CFS) | (CFS) | (CFS) | (FPS) | (FT) | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | (FT) | | | | | | | (FT) | (FT) | | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | | (FT) | (FT) | | |
| 25 | SD #10 | SD #9 | 345.70 | 346.51 | 12 | 1.50 | 343.23 | 342.94 | 0.00 | 58 | **0.50%** | **N** | 0.62 | **0.62** | **3.64** | **0.79** | **0.33** | 343.94 | **343.94** | **0.01** | **344.23** | **0.5** | **0.00** | **0.01** | **344.24** | **0.0098** | **2.00** | **0.0398** | **0.6700** | **0.79** | **-0.50** | **0.45** | | **1** | **0.45** | **0.69** | **UNSUB** | **343.68** | **0.00** | **0.02** | **0.00** | **0.00** | **0.00** | **344.24** | **OK** | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |

**Project Location - Backwater Calculations**

| (1) | (3) | (4) | (5) | (6) | (9) | (10) | (11) | (12) | (18) | (20) | (21) | (23) | **(40)** | (41) | (42) | (45) | (47) | **(49)** | (50) | (51) | (52) | (54) | (55) | (56) | (57) | (58) | (59) | (60) | (61) | (62) | (63) | **(64)** | **(65)** | (66) | (67) | (68) | (69) | (70) | (71) | **(72)** | (72A) | **(73)** | **(74)** | (75) | (76) | (77) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN YEAR STORM | STRUCTURE UP | STRUCTURE DOWN | RIM UP | RIM DOWN | DIAM | PIPE WALL THICKNESS | INVERT UP | INVERT DOWN | ANGL UP | L | S | DROP > 1/2 DIAM UP | MAN. INPUT FLOW | FLOW | MANNINGS FULL FLOW CAPACITY | VEL | CRIT DEPTH | MAN. INPUT TAIL WATER DOWN | TAIL WATER DOWN | FRICT LOSS | HGL UP | $K_e$ UP | ENTR LOSS UP | EXIT LOSS DOWN | OUT CTRL | K UP | M UP | c UP | Y UP | Q ($AD^{0.5}$) | SLOPE COEF | FRM 1 UNSUB CTRL DEPTH | FRM 2 UNSUB CTRL DEPTH | USE UNSUB CTRL FRM | UNSUB CTRL DEPTH | SUB CTRL DEPTH | SUB OR UNSUB | IN CTRL | APPR VEL HEAD UP | BEND LOSS COEFF K UP | BEND LOSS UP | KJ | JUNCT LOSS UP | HEAD WATER UP | OVERTOP CHECK UP | Notes |
| (YEAR) | (#) | (#) | (FT) | (FT) | (IN) | (IN) | (FT) | (FT) | (DEG) | (FT) | % | | (CFS) | (CFS) | (CFS) | (FPS) | (FT) | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | (FT) | | | | | | | (FT) | (FT) | | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | | (FT) | (FT) | | |
| 25 | SD #8 | Ex. CB. | 343.88 | 343.14 | 12 | 1.50 | 341.03 | 340.70 | 0.00 | 66 | **0.50%** | **N** | 0.34 | **0.34** | **3.64** | **0.43** | **0.24** | 341.70 | **341.70** | **0.00** | **342.03** | **0.5** | **0.00** | **0.00** | **342.03** | **0.0098** | **2.00** | **0.0398** | **0.6700** | **0.43** | **-0.50** | **0.32** | | **1** | **0.32** | **0.67** | **UNSUB** | **341.35** | **0.00** | **0.02** | **0.00** | **0.00** | **0.00** | **342.03** | **OK** | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |

**Project Location - Backwater Calculations**

| (1) | (3) | (4) | (5) | (6) | (9) | (10) | (11) | (12) | (18) | (19) | (20) | (21) | (23) | (40) | (41) | (42) | (45) | (47) | (49) | (50) | (51) | (52) | (54) | (55) | (56) | (57) | (58) | (59) | (60) | (61) | (62) | (63) | (64) | (65) | (66) | (67) | (68) | (69) | (70) | (71) | (72) | (72A) | (73) | (74) | (75) | (76) | (77) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN YEAR STORM | STRUCTURE UP | STRUCTURE DOWN | RIM UP | RIM DOWN | DIAM | PIPE WALL THICKNESS | INVERT UP | INVERT DOWN | ANGL UP | n | L | S | DROP > 1/2 DIAM UP | MAN. INPUT FLOW | FLOW | MANNINGS FULL FLOW CAPACITY | VEL | CRIT DEPTH | MAN. INPUT TAIL WATER DOWN | TAIL WATER DOWN | FRICT LOSS | HGL UP | $K_u$ UP | ENTR LOSS UP | EXIT LOSS DOWN | OUT CTRL | K UP | M UP | c UP | Y UP | $Q_{(AD^{0.5})}$ | SLOPE COEF | FRM 1 UNSUB CTRL DEPTH | FRM 2 UNSUB CTRL DEPTH | USE UNSUB CTRL FRM | UNSUB CTRL DEPTH | SUB CTRL DEPTH | SUB OR UNSUB | IN CTRL | APPR VEL HEAD UP | BEND LOSS COEFF K UP | BEND LOSS UP | KJ | JUNCT LOSS UP | HEAD WATER UP | OVERTOP CHECK UP | Notes |
| (YEAR) | (#) | (#) | (FT) | (FT) | (IN) | (IN) | (FT) | (FT) | (DEG) | | (FT) | % | | (CFS) | (CFS) | (CFS) | (FPS) | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | (FT) | | | | | | | (FT) | (FT) | | (FT) | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | | | |
| 25 | SD #7 | SD #6 | 342.22 | 341.80 | 12 | 1.50 | 339.41 | 339.06 | 0.00 | 0.009 | 69 | 0.51% | N | 0.31 | 0.31 | 3.67 | 0.39 | 0.23 | | 341.65 | 0.00 | 341.65 | 0.5 | 0.00 | 0.00 | 341.66 | 0.0098 | 2.00 | 0.0398 | 0.6700 | 0.39 | -0.50 | 0.31 | | 1 | 0.31 | 0.67 | UNSUB | 339.72 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 341.66 | OK | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |
| 25 | SD #6 | SD #5 | 341.80 | 341.73 | 12 | 1.50 | 339.06 | 338.85 | 0.00 | 0.009 | 43 | 0.49% | N | 0.42 | 0.42 | 3.60 | 0.53 | 0.27 | | 341.64 | 0.00 | 341.64 | 0.5 | 0.00 | 0.00 | 341.65 | 0.0098 | 2.00 | 0.0398 | 0.6700 | 0.53 | -0.50 | 0.36 | | 1 | 0.36 | 0.68 | UNSUB | 339.42 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 341.65 | OK | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |
| 25 | SD #5 | SD #4 | 341.73 | 341.71 | 12 | 1.50 | 338.85 | 338.60 | 5.00 | 0.009 | 51 | 0.49% | N | 0.51 | 0.51 | 3.60 | 0.65 | 0.30 | | 341.63 | 0.01 | 341.63 | 0.5 | 0.00 | 0.01 | 341.64 | 0.0098 | 2.00 | 0.0398 | 0.6700 | 0.65 | -0.50 | 0.40 | | 1 | 0.40 | 0.68 | UNSUB | 339.25 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 341.64 | OK | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |
| 25 | SD #4 | SD #3 | 341.71 | 341.27 | 12 | 1.50 | 338.60 | 338.47 | 25.00 | 0.009 | 26 | 0.50% | N | 4.17 | 4.17 | 3.64 | 5.31 | 0.86 | | 340.80 | 0.17 | 340.97 | 0.5 | 0.22 | 0.44 | 341.63 | 0.0098 | 2.00 | 0.0398 | 0.6700 | 5.31 | -0.50 | 1.66 | | 1 | 1.66 | 1.79 | SUB | 340.39 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 341.63 | OK | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |
| 25 | SD #3 | SD #2 | 341.27 | 340.48 | 12 | 1.50 | 338.47 | 337.90 | 25.00 | 0.009 | 113 | 0.50% | N | 4.21 | 4.21 | 3.66 | 5.36 | 0.86 | | 339.74 | 0.76 | 340.50 | 0.5 | 0.22 | 0.45 | 341.17 | 0.0098 | 2.00 | 0.0398 | 0.6700 | 5.36 | -0.50 | 1.67 | | 1 | 1.67 | 1.81 | SUB | 340.28 | 0.44 | 0.16 | 0.07 | 0.00 | 0.00 | 340.80 | OK | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |
| 25 | SD #2 | SD #1 | 340.48 | 340.28 | 12 | 1.50 | 337.90 | 337.67 | 0.00 | 0.009 | 45 | 0.51% | N | 4.37 | 4.37 | 3.68 | 5.56 | 0.88 | | 339.14 | 0.32 | 339.46 | 0.5 | 0.24 | 0.48 | 340.18 | 0.0098 | 2.00 | 0.0398 | 0.6700 | 5.56 | -0.50 | 1.73 | | 1 | 1.73 | 1.90 | SUB | 339.80 | 0.45 | 0.02 | 0.01 | 0.00 | 0.00 | 339.74 | OK | per manufacturers rec. |
| 25 | SD #1 | EX. CB | 340.28 | 340.40 | 12 | 1.50 | 337.67 | 337.55 | 0.00 | 0.009 | 23 | 0.52% | N | 4.44 | 4.44 | 3.72 | 5.65 | 0.88 | 338.55 | 338.55 | 0.17 | 338.72 | 0.5 | 0.25 | 0.50 | 339.47 | 0.0098 | 2.00 | 0.0398 | 0.6700 | 5.65 | -0.50 | 1.76 | | 1 | 1.76 | 1.94 | SUB | 339.61 | 0.48 | 0.02 | 0.01 | 0.00 | 0.00 | 339.14 | OK | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |

**Project Location - Backwater Calculations**

| (1) | (3) | (4) | (5) | (6) | (9) | (10) | (11) | (12) | (18) | (19) | (20) | (21) | (23) | (40) | (41) | (42) | (45) | (47) | (49) | (50) | (51) | (52) | (54) | (55) | (56) | (57) | (58) | (59) | (60) | (61) | (62) | (63) | (64) | (65) | (66) | (67) | (68) | (69) | (70) | (71) | (72) | (72A) | (73) | (74) | (75) | (76) | (77) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESIGN YEAR STORM | STRUCTURE UP | STRUCTURE DOWN | RIM UP | RIM DOWN | DIAM | PIPE WALL THICKNESS | INVERT UP | INVERT DOWN | ANGL UP | n | L | S | DROP > 1/2 DIAM UP | MAN. INPUT FLOW | FLOW | MANNINGS FULL FLOW CAPACITY | VEL | CRIT DEPTH | MAN. INPUT TAIL WATER DOWN | TAIL WATER DOWN | FRICT LOSS | HGL UP | $K_u$ UP | ENTR LOSS UP | EXIT LOSS DOWN | OUT CTRL | K UP | M UP | c UP | Y UP | $Q_{(AD^{0.5})}$ | SLOPE COEF | FRM 1 UNSUB CTRL DEPTH | FRM 2 UNSUB CTRL DEPTH | USE UNSUB CTRL FRM | UNSUB CTRL DEPTH | SUB CTRL DEPTH | SUB OR UNSUB | IN CTRL | APPR VEL HEAD UP | BEND LOSS COEFF K UP | BEND LOSS UP | KJ | JUNCT LOSS UP | HEAD WATER UP | OVERTOP CHECK UP | Notes |
| (YEAR) | (#) | (#) | (FT) | (FT) | (IN) | (IN) | (FT) | (FT) | (DEG) | | (FT) | % | | (CFS) | (CFS) | (CFS) | (FPS) | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | (FT) | | | | | | | (FT) | (FT) | | (FT) | (FT) | (FT) | (FT) | (FT) | (FT) | | (FT) | (FT) | | | |
| 25 | Ex. CB #10387 | SD #4 | 342.48 | 341.71 | 12 | 1.50 | 340.34 | 338.60 | 0.00 | 0.009 | 39 | 4.46% | N | 4.09 | 4.09 | 10.87 | 5.21 | 0.86 | 339.60 | 339.60 | 0.25 | 341.34 | 0.5 | 0.21 | 0.42 | 341.97 | 0.0098 | 2.00 | 0.0398 | 0.6700 | 5.21 | -0.50 | 1.61 | | 1 | 1.61 | 1.73 | SUB | 342.07 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 342.07 | OK | C900 per City of Kirkland rec. n=0.009 per manufacturers rec. |

## Manning's "n" Values:

**TABLE 4.2.1.D MANNING'S "*n*" VALUES FOR PIPES**

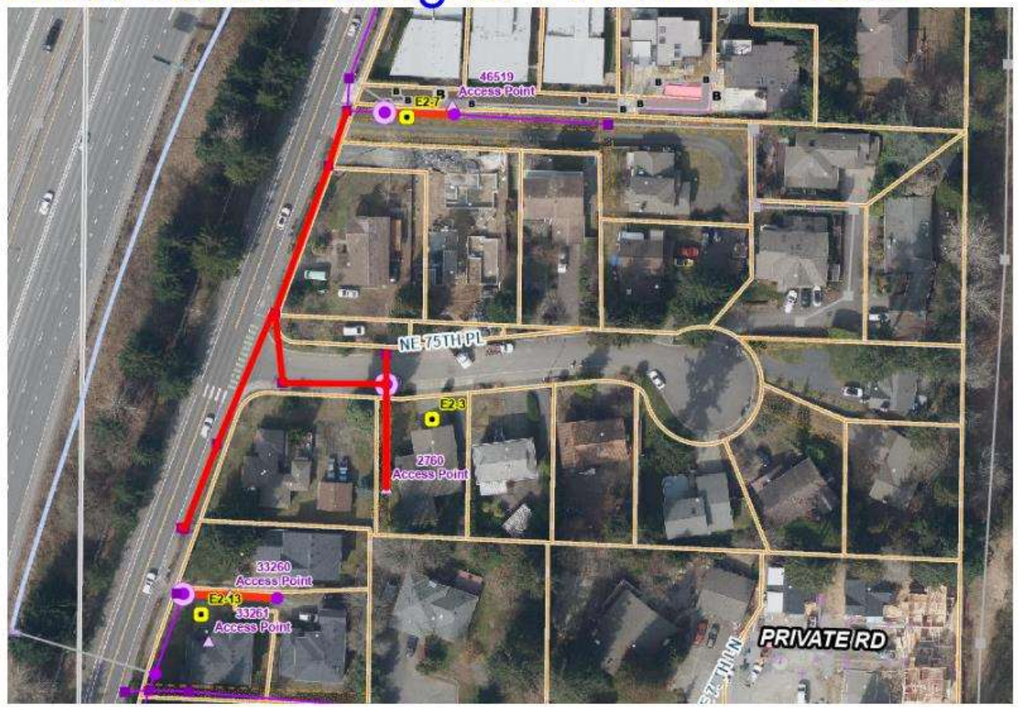
| Type of Pipe Material | Analysis Method | |
|---|---|---|
| | Uniform Flow (Preliminary design) | Backwater Flow (Capacity Verification) |
| A. Concrete pipe, lined CPE pipe and lined PP pipe | 0.014 | 0.012 |
| B. Annular Corrugated Metal Pipe or Pipe Arch: | | |
| 1. 2-2/3" x 1/2" corrugation (riveted): | | |
| a. plain or fully coated | 0.028 | 0.024 |
| b. paved invert (40% of circumference paved): | | |
| 1) flow at full depth | 0.021 | 0.018 |
| 2) flow at 80% full depth | 0.018 | 0.016 |
| 3) flow at 60% full depth | 0.015 | 0.013 |
| c. treatment 5 | 0.015 | 0.013 |
| 2. 3" x 1" corrugation | 0.031 | 0.027 |
| 3. 6" x 2" corrugation (field bolted) | 0.035 | 0.030 |
| C. Helical 2-2/3" x 1/2" corrugation and unlined CPE pipe | 0.028 | 0.024 |
| D. Spiral rib metal pipe and PVC pipe | 0.013 | 0.011 |
| E. Ductile iron pipe cement lined | 0.014 | 0.012 |
| F. Solid wall HDPE pipe (butt fused only) | 0.009 | 0.009 |

C900 PVC has the same 'n' value as HDPE

Each pipe within the system is sized and sloped such that its **barrel capacity at normal full flow** (computed by Manning's equation) is equal to or greater than the design flow. The nomograph in Figure 4.2.1.F (p. 4-22) may be used for an approximate solution of Manning's equation. For more precise results, or for partial pipe full conditions, solve Manning's equation directly:

## 10.4 Appendix D: Downstream Analysis


# Area contributing to EX CB #10387




# Area Contributing to SD #10


5/17/2024

Storm Conduits
2021 Overlay
Storm Filters
Pond
Vaults
Tanks
Other
SW_CB_Others
City of Kirkland
City of Kirkland - Control Structure
<all other values>

1:1,333
0 0.01 0.02 0.04 mi
0 0.0175 0.035 0.07 km

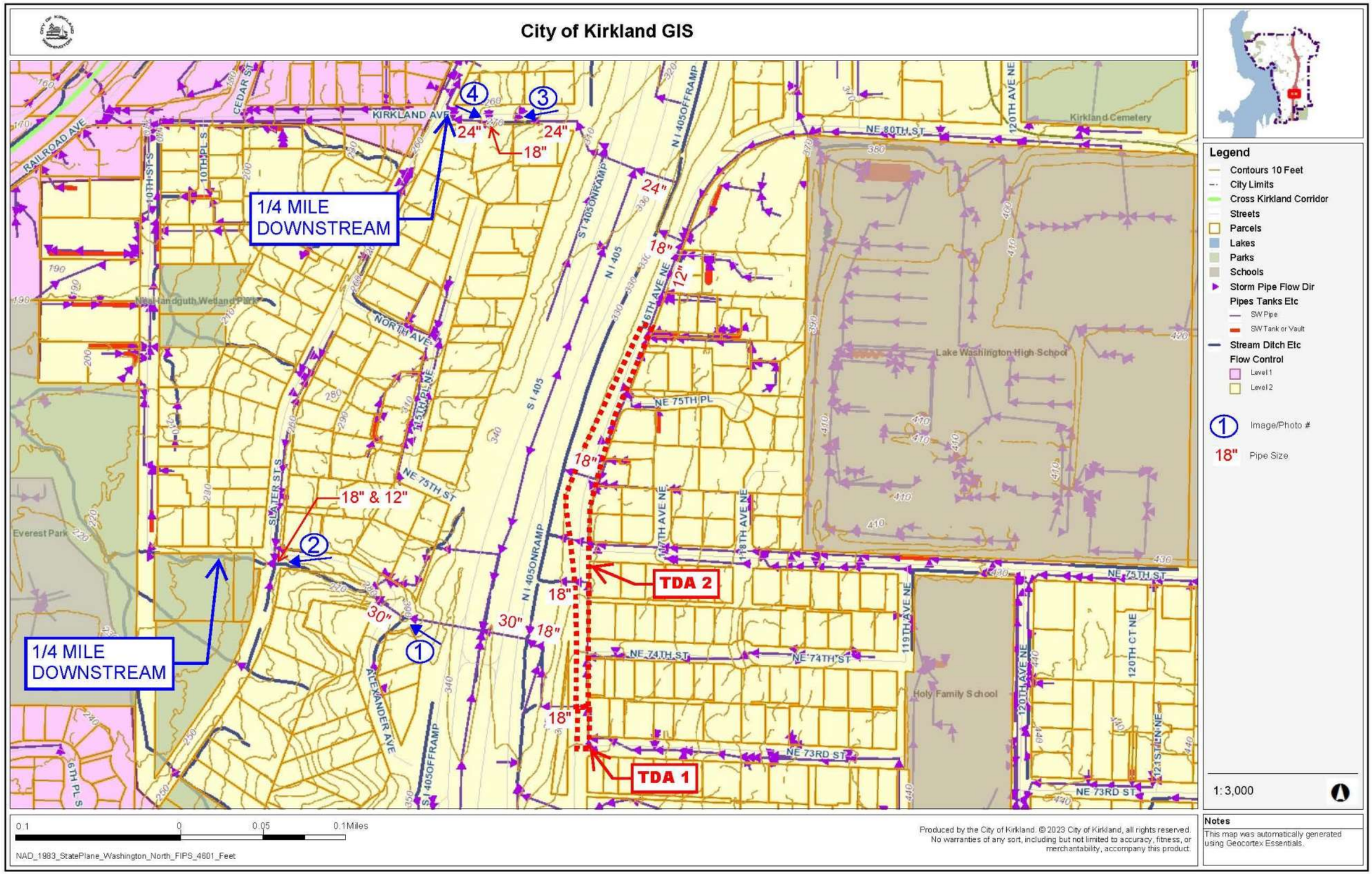

City of Kirkland GIS
KIRKLAND AVE
24"
24"
18"
1/4 MILE DOWNSTREAM
24"
18"
12"
18"
18"
18" & 12"
30"
30"
18"
18"
18"
TDA 2
TDA 1
1/4 MILE DOWNSTREAM
NE 80TH ST
NE 75TH PL
NE 75TH ST
NE 74TH ST
NE 73RD ST
NORTH AVE
RAILROAD AVE
CEDAR ST
10TH ST S
10TH PL S
SLATER ST S
ALEXANDER AVE
6TH PL S
15TH PL NE
6TH AVE NE
117TH AVE NE
118TH AVE NE
119TH AVE NE
120TH AVE NE
120TH CT NE
121ST PL NE
I 405
I 405 ONRAMP
I 405 OFFRAMP
ST 405 ONRAMP
Kirkland Cemetery
Lake Washington High School
Holy Family School
Everest Park
Legend
Contours 10 Feet
City Limits
Cross Kirkland Corridor
Streets
Parcels
Lakes
Parks
Schools
Storm Pipe Flow Dir
Pipes Tanks Etc
SW Pipe
SW Tank or Vault
Stream Ditch Etc
Flow Control
Level 1
Level 2
Image/Photo #
Pipe Size
1:3,000
0.1 0 0.05 0.1 Miles
NAD_1983_StatePlane_Washington_North_FIPS_4601_Feet
Produced by the City of Kirkland. © 2023 City of Kirkland, all rights reserved.
No warranties of any sort, including but not limited to accuracy, fitness, or merchantability, accompany this product.
Notes
This map was automatically generated using Geocortex Essentials.


PHOTO #1, TDA1 - 30 Inch Culvert Inlet at Alexander Ave
Looking Northwest


PHOTO #2, TDA1 - 18" and 12" Culverts at Slater St.
Looking West

PHOTO #3, TDA2 - 18" Culvert Outfall
Looking West

PHOTO #4, TDA2 - 24" Culvert Inlet at Kirkland Ave.
Looking Upstream/Southeast

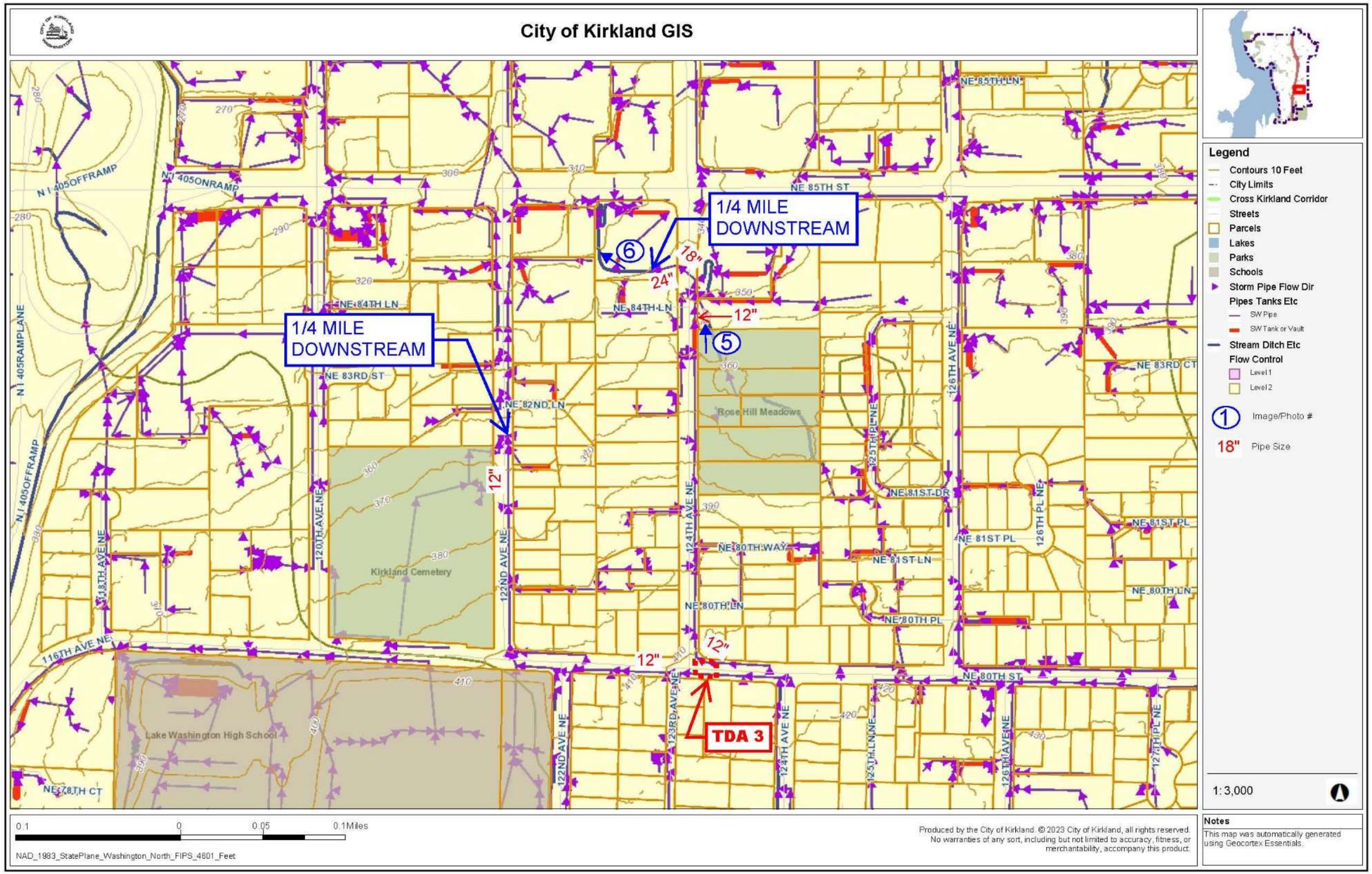
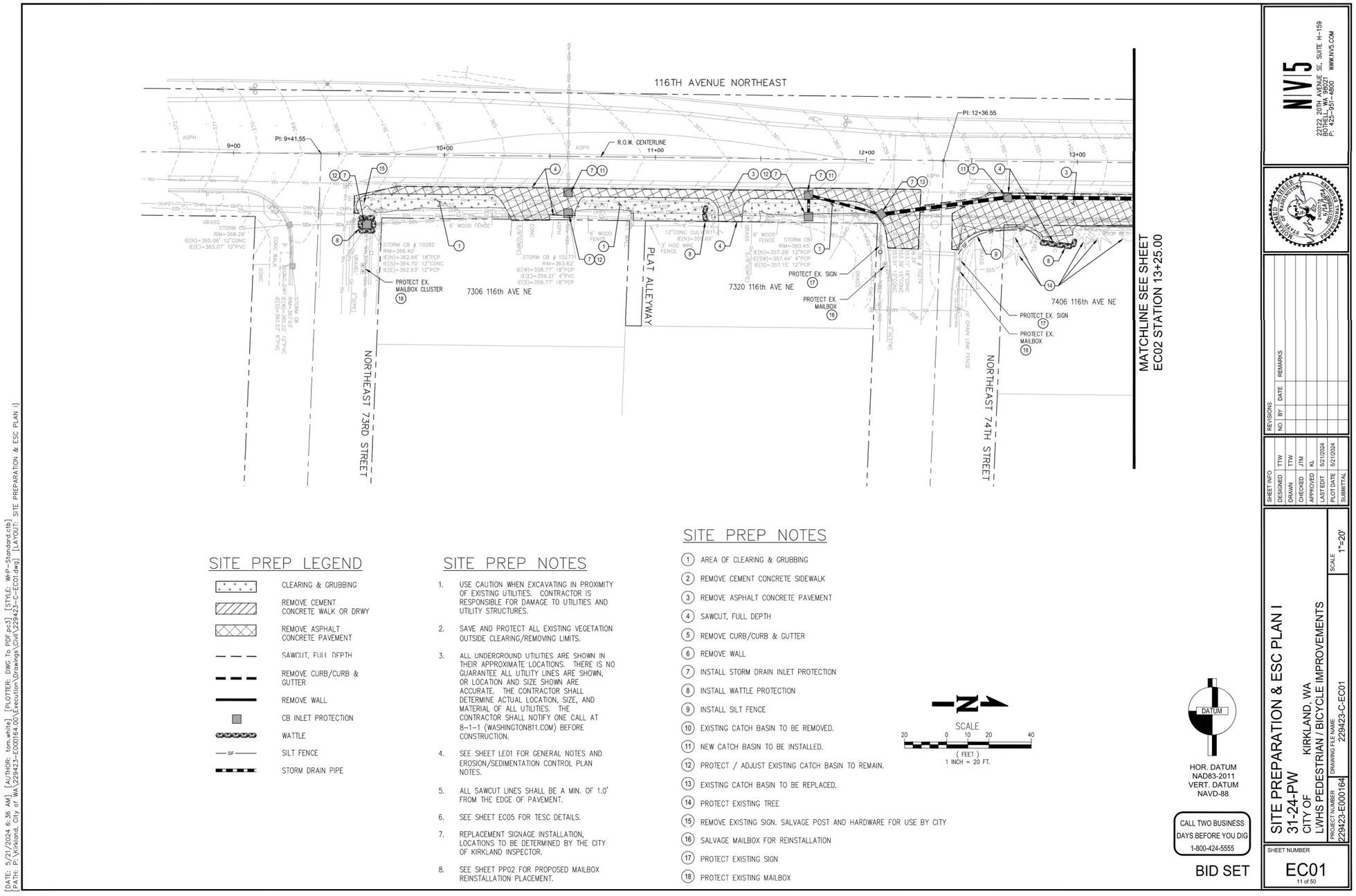

City of Kirkland GIS
1/4 MILE DOWNSTREAM
1/4 MILE DOWNSTREAM
18"
24"
12"
12"
12"
12"
TDA 3
NE 85TH ST
NE 84TH LN
NE 83RD ST
NE 82ND LN
NE 80TH LN
NE 80TH WAY
NE 80TH PL
NE 80TH ST
NE 81ST LN
NE 81ST PL
NE 81ST DR
NE 78TH CT
116TH AVE NE
120TH AVE NE
122ND AVE NE
123RD AVE NE
124TH AVE NE
125TH PL NE
126TH AVE NE
126TH PL NE
127TH PL NE
I 405 OFFRAMP
I 405 ONRAMP
I 405 RAMP LANE
Kirkland Cemetery
Lake Washington High School
Rose Hill Meadows
Legend
Contours 10 Feet
City Limits
Cross Kirkland Corridor
Streets
Parcels
Lakes
Parks
Schools
Storm Pipe Flow Dir
Pipes Tanks Etc
SW Pipe
SW Tank or Vault
Stream Ditch Etc
Flow Control
Level 1
Level 2
Image/Photo #
Pipe Size
1:3,000
0.1 0 0.05 0.1 Miles
NAD_1983_StatePlane_Washington_North_FIPS_4601_Feet
Produced by the City of Kirkland. © 2023 City of Kirkland, all rights reserved.
No warranties of any sort, including but not limited to accuracy, fitness, or merchantability, accompany this product.
Notes
This map was automatically generated using Geocortex Essentials.


PHOTO #5, TDA3 - 12" Storm drain pipe alignment


PHOTO #6, TDA3 - Receiving Ditch, 1/4 mile Downstream
Looking Northwest

## 10.5 Appendix E: Erosion and Sediment Control (ESC) Plan




## SITE PREP LEGEND

- CLEARING & GRUBBING
- REMOVE CEMENT CONCRETE WALK OR DRWY
- REMOVE ASPHALT CONCRETE PAVEMENT
- SAWCUT, FULL DEPTH
- REMOVE CURB/CURB & GUTTER
- REMOVE WALL
- CB INLET PROTECTION
- WATTLE
- SILT FENCE
- STORM DRAIN PIPE

## SITE PREP NOTES

1. USE CAUTION WHEN EXCAVATING IN PROXIMITY OF EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE FOR DAMAGE TO UTILITIES AND UTILITY STRUCTURES.
2. SAVE AND PROTECT ALL EXISTING VEGETATION OUTSIDE CLEARING/REMOVING LIMITS.
3. ALL UNDERGROUND UTILITIES ARE SHOWN IN THEIR APPROXIMATE LOCATIONS. THERE IS NO GUARANTEE ALL UTILITY LINES ARE SHOWN, OR LOCATION AND SIZE SHOWN ARE ACCURATE. THE CONTRACTOR SHALL DETERMINE ACTUAL LOCATION, SIZE, AND MATERIAL OF ALL UTILITIES. THE CONTRACTOR SHALL NOTIFY ONE CALL AT 8-1-1 (WASHINGTON811.COM) BEFORE CONSTRUCTION.
4. SEE SHEET LE01 FOR GENERAL NOTES AND EROSION/SEDIMENTATION CONTROL PLAN NOTES.
5. ALL SAWCUT LINES SHALL BE A MIN. OF 1.0' FROM THE EDGE OF PAVEMENT.
6. SEE SHEET EC05 FOR TESC DETAILS.
7. REPLACEMENT SIGNAGE INSTALLATION, LOCATIONS TO BE DETERMINED BY THE CITY OF KIRKLAND INSPECTOR.
8. SEE SHEET PP02 FOR PROPOSED MAILBOX REINSTALLATION PLACEMENT.

## SITE PREP NOTES

1. AREA OF CLEARING & GRUBBING
2. REMOVE CEMENT CONCRETE SIDEWALK
3. REMOVE ASPHALT CONCRETE PAVEMENT
4. SAWCUT, FULL DEPTH
5. REMOVE CURB/CURB & GUTTER
6. REMOVE WALL
7. INSTALL STORM DRAIN INLET PROTECTION
8. INSTALL WATTLE PROTECTION
9. INSTALL SILT FENCE
10. EXISTING CATCH BASIN TO BE REMOVED.
11. NEW CATCH BASIN TO BE INSTALLED.
12. PROTECT / ADJUST EXISTING CATCH BASIN TO REMAIN.
13. EXISTING CATCH BASIN TO BE REPLACED.
14. PROTECT EXISTING TREE
15. REMOVE EXISTING SIGN. SALVAGE POST AND HARDWARE FOR USE BY CITY
16. SALVAGE MAILBOX FOR REINSTALLATION
17. PROTECT EXISTING SIGN
18. PROTECT EXISTING MAILBOX

DATUM
HOR. DATUM NAD83-2011
VERT. DATUM NAVD-88

CALL TWO BUSINESS DAYS BEFORE YOU DIG 1-800-424-5555

BID SET

NV5
22122 20TH AVENUE SE, SUITE H-159
BOTHELL, WASHINGTON 98021
P: 425-951-4800 WWW.NV5.COM

REVISIONS: NO. | BY | DATE | REMARKS

SHEET INFO: DESIGNED TTW | DRAWN TTW | CHECKED JTM | APPROVED KL | LAST EDIT 5/21/2024 | PLOT DATE 5/21/2024 | SUBMITTAL

SITE PREPARATION & ESC PLAN I
31-24-PW
CITY OF KIRKLAND, WA
LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS

PROJECT NUMBER 229423-E000164 | DRAWING FILE NAME 229423-C-EC01 | SCALE 1"=20'

SHEET NUMBER EC01
11 of 50

[DATE: 5/21/2024 6:36 AM] [AUTHOR: tom.white] [PLOTTER: DWG To PDF.pc3] [STYLE: WFP-Standard.ctb]
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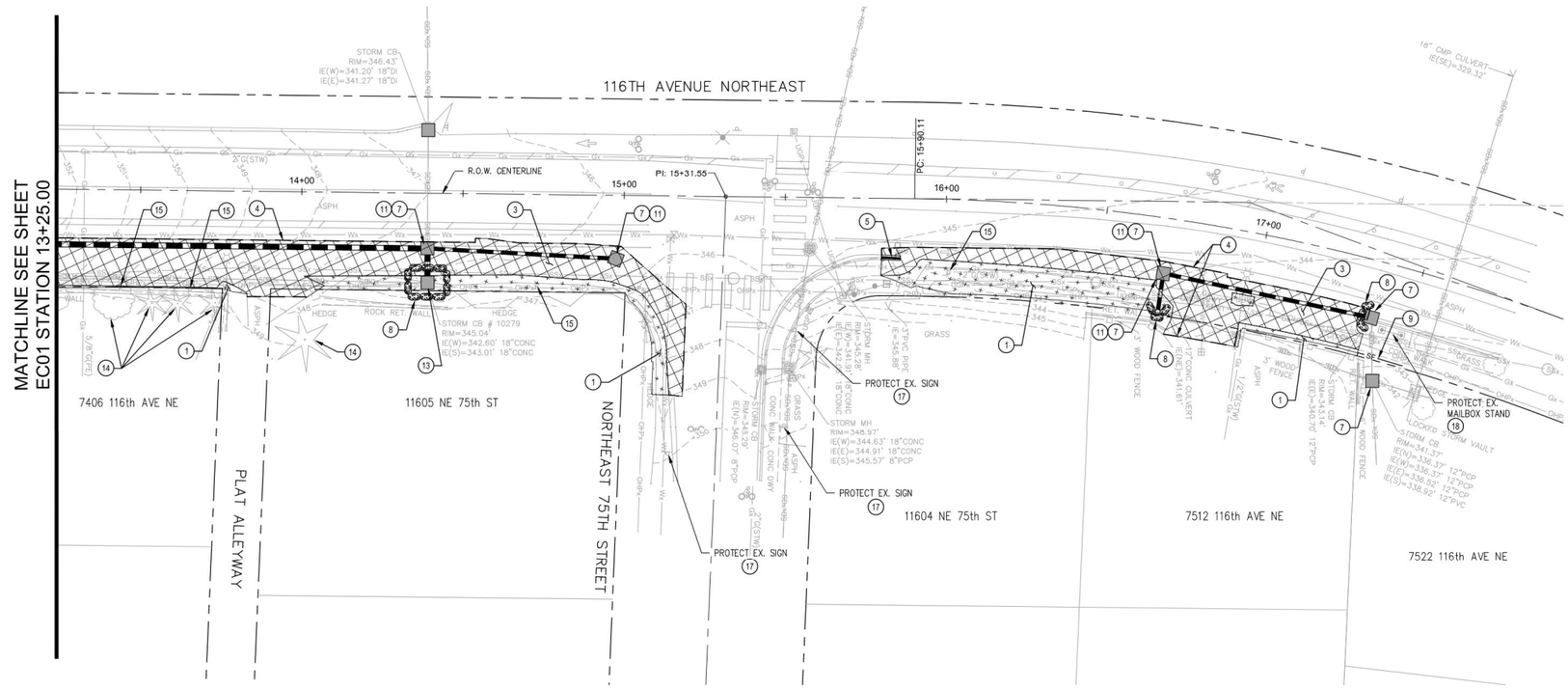


## SITE PREP LEGEND

- CLEARING & GRUBBING
- REMOVE CEMENT CONCRETE WALK OR DRWY
- REMOVE ASPHALT CONCRETE PAVEMENT
- SAWCUT, FULL DEPTH
- REMOVE CURB/CURB & GUTTER
- REMOVE WALL
- CB INLET PROTECTION
- WATTLE
- SILT FENCE (SF)
- STORM DRAIN PIPE

## SITE PREP NOTES

1. USE CAUTION WHEN EXCAVATING IN PROXIMITY OF EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE FOR DAMAGE TO UTILITIES AND UTILITY STRUCTURES.
2. SAVE AND PROTECT ALL EXISTING VEGETATION OUTSIDE CLEARING/REMOVING LIMITS.
3. ALL UNDERGROUND UTILITIES ARE SHOWN IN THEIR APPROXIMATE LOCATIONS. THERE IS NO GUARANTEE ALL UTILITY LINES ARE SHOWN, OR LOCATION AND SIZE SHOWN ARE ACCURATE. THE CONTRACTOR SHALL DETERMINE ACTUAL LOCATION, SIZE, AND MATERIAL OF ALL UTILITIES. THE CONTRACTOR SHALL NOTIFY ONE CALL AT 8-1-1 (WASHINGTON811.COM) BEFORE CONSTRUCTION.
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5. ALL SAWCUT LINES SHALL BE A MIN. OF 1.0' FROM THE EDGE OF PAVEMENT.
6. SEE SHEET EC05 FOR TESC DETAILS.
7. REPLACEMENT SIGNAGE INSTALLATION, LOCATIONS TO BE DETERMINED BY THE CITY OF KIRKLAND INSPECTOR.
8. SEE SHEET PP02 FOR PROPOSED MAILBOX REINSTALLATION PLACEMENT.

## SITE PREP NOTES

1. AREA OF CLEARING & GRUBBING
2. REMOVE CEMENT CONCRETE SIDEWALK
3. REMOVE ASPHALT CONCRETE PAVEMENT
4. SAWCUT, FULL DEPTH
5. REMOVE CURB/CURB & GUTTER
6. REMOVE WALL
7. INSTALL STORM DRAIN INLET PROTECTION
8. INSTALL WATTLE PROTECTION
9. INSTALL SILT FENCE
10. EXISTING CATCH BASIN TO BE REMOVED.
11. NEW CATCH BASIN TO BE INSTALLED.
12. PROTECT / ADJUST EXISTING CATCH BASIN TO REMAIN.
13. EXISTING CATCH BASIN TO BE REPLACED.
14. PROTECT EXISTING TREE
15. REMOVE EXISTING SIGN. SALVAGE POST AND HARDWARE FOR USE BY CITY
16. SALVAGE MAILBOX FOR REINSTALLATION
17. PROTECT EXISTING SIGN
18. PROTECT EXISTING MAILBOX

N

SCALE
20 0 10 20 40
( FEET )
1 INCH = 20 FT.

DATUM

HOR. DATUM
NAD83-2011
VERT. DATUM
NAVD-88

CALL TWO BUSINESS DAYS BEFORE YOU DIG
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BOTHELL, WA 98021
P: 425-951-4800
WWW.NV5.COM

REGISTERED PROFESSIONAL ENGINEER
STATE OF WASHINGTON
JAMES T. MCMILLAN
34021
REGISTERED PROFESSIONAL ENGINEER

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | REMARKS |
| | | | |

| SHEET INFO | | |
|---|---|---|
| DESIGNED | TTW | |
| DRAWN | TTW | |
| CHECKED | JTM | |
| APPROVED | KL | |
| LAST EDIT | 5/21/2024 | |
| PLOT DATE | 5/21/2024 | |
| SUBMITTAL | | |

SITE PREPARATION & ESC PLAN II
31-24-PW
CITY OF KIRKLAND, WA
LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS

PROJECT NUMBER 229423-E000164
DRAWING FILE NAME: 229423-C-EC01
SCALE 1"=20'

SHEET NUMBER
EC02
12 of 50

[DATE: 5/21/2024 6:37 AM] [AUTHOR: tom.white] [PLOTTER: DWG To PDF.pc3] [STYLE: WeP-Standard.ctb]
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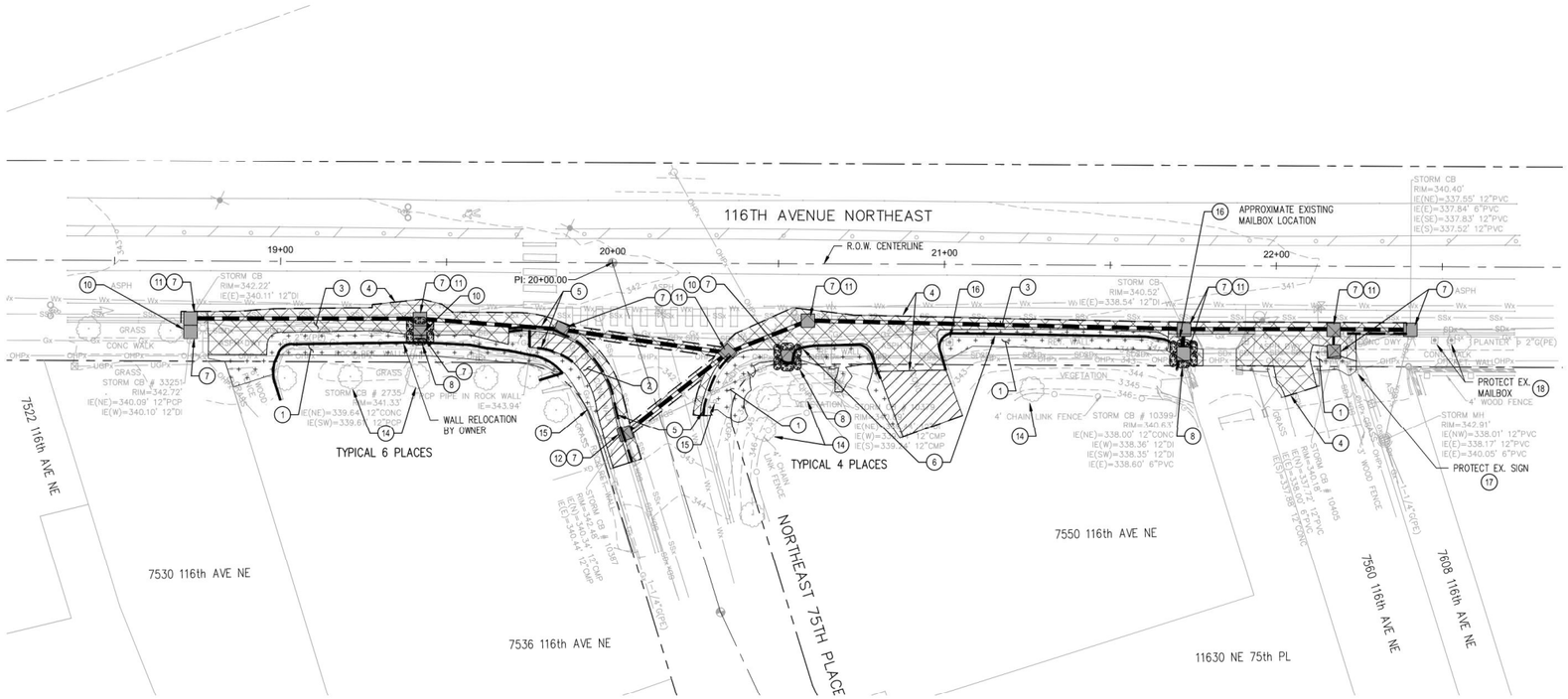


## SITE PREP LEGEND

- CLEARING & GRUBBING
- REMOVE CEMENT CONCRETE WALK OR DRWY
- REMOVE ASPHALT CONCRETE PAVEMENT
- SAWCUT, FULL DEPTH
- REMOVE CURB/CURB & GUTTER
- REMOVE WALL
- CB INLET PROTECTION
- WATTLE
- SILT FENCE (—SF—)
- STORM DRAIN PIPE

## SITE PREP NOTES

1. USE CAUTION WHEN EXCAVATING IN PROXIMITY OF EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE FOR DAMAGE TO UTILITIES AND UTILITY STRUCTURES.
2. SAVE AND PROTECT ALL EXISTING VEGETATION OUTSIDE CLEARING/REMOVING LIMITS.
3. ALL UNDERGROUND UTILITIES ARE SHOWN IN THEIR APPROXIMATE LOCATIONS. THERE IS NO GUARANTEE ALL UTILITY LINES ARE SHOWN, OR LOCATION AND SIZE SHOWN ARE ACCURATE. THE CONTRACTOR SHALL DETERMINE ACTUAL LOCATION, SIZE, AND MATERIAL OF ALL UTILITIES. THE CONTRACTOR SHALL NOTIFY ONE CALL AT 8-1-1 (WASHINGTON811.COM) BEFORE CONSTRUCTION.
4. SEE SHEET LE01 FOR GENERAL NOTES AND EROSION/SEDIMENTATION CONTROL PLAN NOTES.
5. ALL SAWCUT LINES SHALL BE A MIN. OF 1.0' FROM THE EDGE OF PAVEMENT.
6. SEE SHEET EC05 FOR TESC DETAILS.
7. REPLACEMENT SIGNAGE INSTALLATION, LOCATIONS TO BE DETERMINED BY THE CITY OF KIRKLAND INSPECTOR.
8. SEE SHEET PP02 FOR PROPOSED MAILBOX REINSTALLATION PLACEMENT.

## SITE PREP NOTES

1. AREA OF CLEARING & GRUBBING
2. REMOVE CEMENT CONCRETE SIDEWALK
3. REMOVE ASPHALT CONCRETE PAVEMENT
4. SAWCUT, FULL DEPTH
5. REMOVE CURB/CURB & GUTTER
6. REMOVE WALL
7. INSTALL STORM DRAIN INLET PROTECTION
8. INSTALL WATTLE PROTECTION
9. INSTALL SILT FENCE
10. EXISTING CATCH BASIN TO BE REMOVED.
11. NEW CATCH BASIN TO BE INSTALLED.
12. PROTECT / ADJUST EXISTING CATCH BASIN TO REMAIN.
13. EXISTING CATCH BASIN TO BE REPLACED.
14. PROTECT EXISTING TREE
15. REMOVE EXISTING SIGN. SALVAGE POST AND HARDWARE FOR USE BY CITY
16. SALVAGE MAILBOX FOR REINSTALLATION
17. PROTECT EXISTING SIGN
18. PROTECT EXISTING MAILBOX

SCALE
20 0 10 20 40
( FEET )
1 INCH = 20 FT.

DATUM
HOR. DATUM NAD83-2011
VERT. DATUM NAVD-88

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[PATH: P:\Kirkland, City of WA\229423-E000164.00\Execution\Drawings\Civil\229423-C-EC01.dwg] [LAYOUT: SITE PREPARATION & ESC PLAN III]

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WWW.NV5.COM

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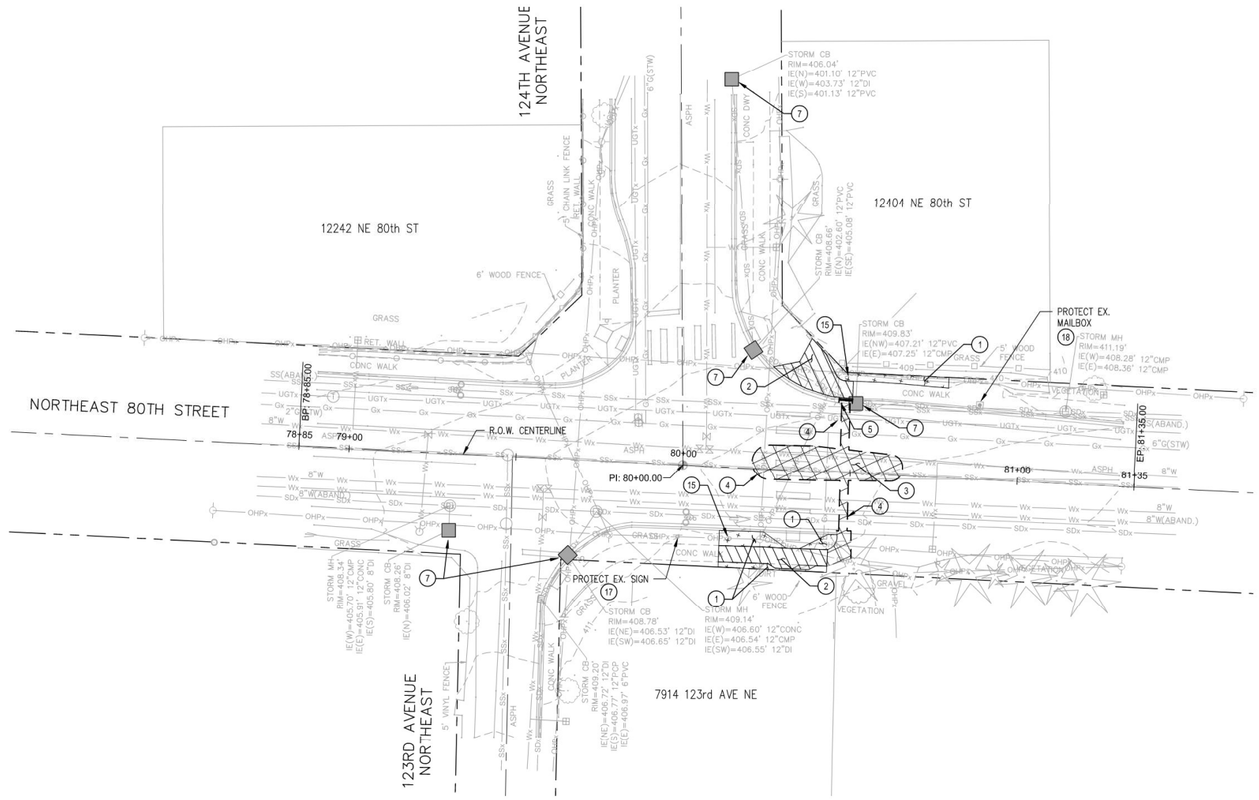
| DESIGNED | TTW |
| DRAWN | TTW |
| CHECKED | JTM |
| APPROVED | KL |
| LAST EDIT | 5/21/2024 |
| PLOT DATE | 5/21/2024 |
| SUBMITTAL | |

SITE PREPARATION & ESC PLAN III
31-24-PW
CITY OF KIRKLAND, WA
LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS

SCALE 1"=20'

PROJECT NUMBER 229423-E000164
DRAWING FILE NAME: 229423-C-EC01

SHEET NUMBER
EC03
13 of 50




## SITE PREP LEGEND

- CLEARING & GRUBBING
- REMOVE CEMENT CONCRETE WALK OR DRWY
- REMOVE ASPHALT CONCRETE PAVEMENT
- SAWCUT, FULL DEPTH
- REMOVE CURB/CURB & GUTTER
- REMOVE WALL
- CB INLET PROTECTION
- WATTLE
- SILT FENCE — SF —
- STORM DRAIN PIPE

## SITE PREP NOTES

1. USE CAUTION WHEN EXCAVATING IN PROXIMITY OF EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE FOR DAMAGE TO UTILITIES AND UTILITY STRUCTURES.
2. SAVE AND PROTECT ALL EXISTING VEGETATION OUTSIDE CLEARING/REMOVING LIMITS.
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5. ALL SAWCUT LINES SHALL BE A MIN. OF 1.0' FROM THE EDGE OF PAVEMENT.
6. SEE SHEET EC05 FOR TESC DETAILS.
7. REPLACEMENT SIGNAGE INSTALLATION, LOCATIONS TO BE DETERMINED BY THE CITY OF KIRKLAND INSPECTOR.
8. SEE SHEET PP02 FOR PROPOSED MAILBOX REINSTALLATION PLACEMENT.

## SITE PREP NOTES

1. AREA OF CLEARING & GRUBBING
2. REMOVE CEMENT CONCRETE SIDEWALK
3. REMOVE ASPHALT CONCRETE PAVEMENT
4. SAWCUT, FULL DEPTH
5. REMOVE CURB/CURB & GUTTER
6. REMOVE WALL
7. INSTALL STORM DRAIN INLET PROTECTION
8. INSTALL WATTLE PROTECTION
9. INSTALL SILT FENCE
10. EXISTING CATCH BASIN TO BE REMOVED.
11. NEW CATCH BASIN TO BE INSTALLED.
12. PROTECT / ADJUST EXISTING CATCH BASIN TO REMAIN.
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15. REMOVE EXISTING SIGN. SALVAGE POST AND HARDWARE FOR USE BY CITY
16. SALVAGE MAILBOX FOR REINSTALLATION
17. PROTECT EXISTING SIGN
18. PROTECT EXISTING MAILBOX

N

SCALE
20 0 10 20 40
( FEET )
1 INCH = 20 FT.

DATUM

HOR. DATUM
NAD83-2011
VERT. DATUM
NAVD-88

CALL TWO BUSINESS DAYS BEFORE YOU DIG
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P: 425-951-4800 WWW.NV5.COM

REGISTERED PROFESSIONAL ENGINEER
STATE OF WASHINGTON
34021
TIMOTHY T. WILLIAMS
05/21/2024
PROFESSIONAL SERVICES

| REVISIONS | | | |
|---|---|---|---|
| NO. | BY | DATE | REMARKS |
| | | | |

| SHEET INFO | | |
|---|---|---|
| DESIGNED | TTW | |
| DRAWN | TTW | |
| CHECKED | JTM | |
| APPROVED | KL | |
| LAST EDIT | 5/21/2024 | |
| PLOT DATE | 5/21/2024 | |
| SUBMITTAL | | |

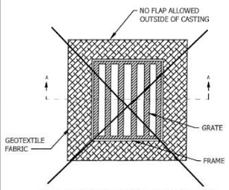
SITE PREPARATION & ESC PLAN IV
31-24-PW
CITY OF KIRKLAND, WA
LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS

SCALE 1"=20'
PROJECT NUMBER 229423-E000164
DRAWING FILE NAME: 229423-C-EC01

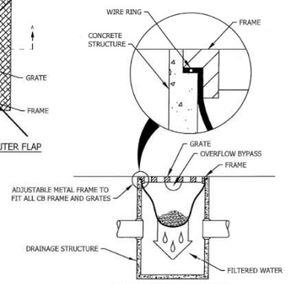
SHEET NUMBER
EC04
14 of 50

[DATE: 5/21/2024 6:38 AM] [AUTHOR: tom.white] [PLOTTER: DWG To PDF.pc3] [STYLE: WeP-Standard.ctb]
[PATH: P:\Kirkland, City of WA\229423-E000164.00\Execution\Drawings\Civil\229423-C-EC01.dwg] [LAYOUT: SITE PREPARATION & ESC PLAN IV]

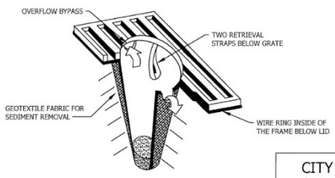
LAST REVISED: 01/2020




PROTECTION INSERSET WITH OUTER FLAP (NOT ALLOWED)



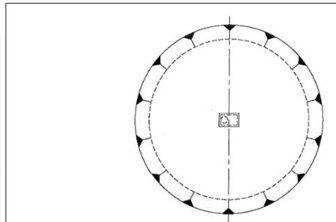

STORM DRAIN PROTECTION INSERT SECTION A-A

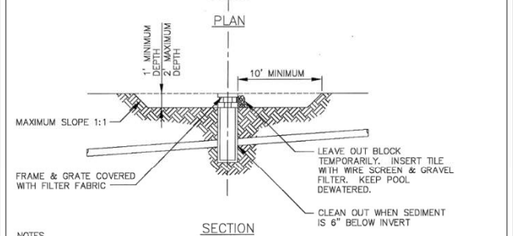



STORM DRAIN PROTECTION INSERT ISOMETRIC VIEW (TYP.)

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK- E.11 | |
| CITY OF KIRKLAND WASHINGTON | STORM DRAIN PROTECTION INSERT |

LAST REVISED:04/15/12



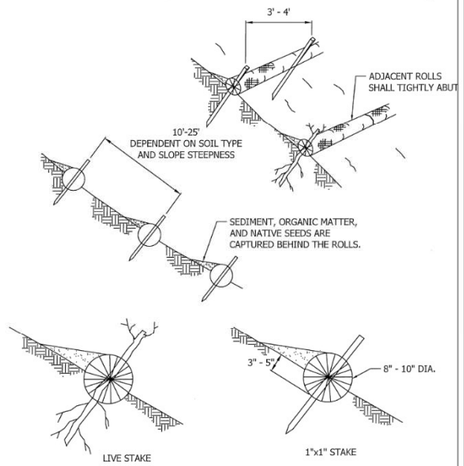

SECTION

NOTES

1. PROTECT INLETS DURING CONSTRUCTION. KEEP SEDIMENT OUT OF THE STORM DRAINAGE SYSTEM. USE HALF-CIRCLE BEHIND CURB INLETS DURING STREET CONSTRUCTION. MODIFY PROTECTION AS CONSTRUCTION PROGRESSES.
2. CIRCULAR SHAPE IS NOT ESSENTIAL; VARY SHAPE TO FIT DRAINAGE AREA AND TERRAIN. OBSERVE TO CHECK TRAP EFFICENCY AND MODIFY AS NECESSARY TO INSURE SATISFACTORY TRAPPING OF SEDIMENT. CAN BE ADAPTED TO THRU-CURB INLET.
3. ALLOW 2' MINIMUM OVERHANG OR FILTER FABRIC. FILTER FABRIC OVERHANG MUST BE COVERED WITH 1-1/4" CRUSHED ROCK.
4. FILTER FENCE MAY BE REQUIRED AROUND PERIMETER OF BASIN.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK-E.08 | |
| CITY OF KIRKLAND WASHINGTON | CATCH BASIN/INLET SEDIMENTATION TRAP |

LAST REVISED: 01/2022



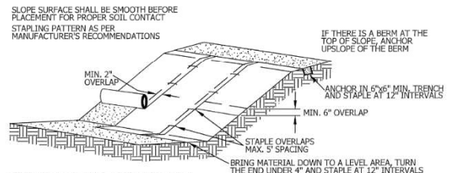

NOT TO SCALE

NOTES

1. STRAW ROLLS SHALL BE PLACED ALONG SLOPE CONTOURS.
2. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
3. DRIVE STAKE THROUGH MIDDLE OF WATTLE, LEAVING 2"-3" OF STAKE PROTRUDING ABOVE WATTLE.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK - E.10 | |
| CITY OF KIRKLAND WASHINGTON | STRAW WATTLES |

LAST REVISED: 07/2022




NET & BLANKET INSTALLATION

NOT TO SCALE

NOTES:

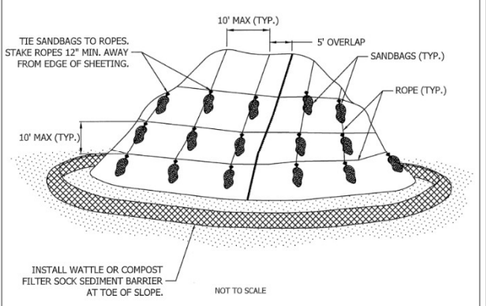
1. IF BLANKET IS NOT LONG ENOUGH TO COVER THE ENTIRE SLOPE LENGTH, THE TRAILING EDGE OF THE UPPER BLANKET SHOULD OVERLAP THE LEADING EDGE OF THE LOWER BLANKET AND BE STAPLED.
2. MULCH IS REQUIRED FOR NETS, AND NOT REQUIRED FOR BLANKETS.
3. USE 100% BIODEGRADABLE BLANKETS IN SENSITIVE AREAS.
4. MAINTAIN GOOD CONTACT WITH THE GROUND. EROSION MUST NOT OCCUR BENEATH THE BLANKET.
5. INSPECT NETS AND BLANKETS AFTER EACH SIGNIFICANT STORM; MAINTAIN AND REPAIR PROMPTLY.

TEMPORARY STABILIZATION NOTES:

1. STRAW, WOOD FIBER CELLULOSE, COMPOST, AND CHIPPED SITE VEGETATION USED FOR TEMPORARY STABILIZATION SHALL BE PLACED AT A MINIMUM 2" THICK ACROSS THE AREA TO BE STABILIZED.
2. HYDRAULIC MATRICES SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATION.
3. SEE TABLE D.2.1.2.A IN THE 2021 KING COUNTY SURFACE WATER DESIGN MANUAL FOR MORE DETAIL.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK- E.06 | |
| CITY OF KIRKLAND WASHINGTON | NETS, BLANKETS, TEMP. STABILIZATION |

LAST REVISED: 01/2022



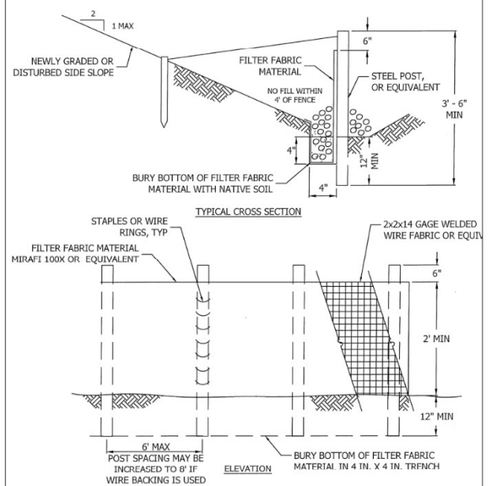

NOT TO SCALE

NOTES

1. INSTALL PLASTIC SHEETING VERTICALLY DOWN SLOPE.
2. INSTALL PLASTIC SHEETING SO EDGES OVERLAP AND ARE SHINGLED AWAY FROM PREVAILING WINDS.
3. PLASTIC SHEETING SHALL BE BLACK MIN 6 MIL.
4. COVER MEASURES SHALL BE INSTALLED IF AN AREA IS TO REMAIN UNWORKED FOR MORE THAN SEVEN DAYS DURING THE DRY SEASON (MAY 1 TO SEPTEMBER 30) OR FOR MORE THAN TWO CONSECUTIVE WORKING DAYS DURING THE WET SEASON (OCTOBER 1 TO APRIL 30).
5. DURING THE WET SEASON, EXPOSED STOCKPILE SLOPES WITH AN INCLINE OF 3 HORIZONTAL TO 1 VERTICAL (3H:1V) OR STEEPER AND WITH MORE THAN TEN FEET OF VERTICAL RELIEF SHALL BE COVERED IF THEY ARE TO REMAIN UNWORKED FOR MORE THAN 12 HOURS.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK - E.05 | |
| CITY OF KIRKLAND WASHINGTON | TEMPORARY STOCKPILE |

LAST REVISED: 01/2022




NOTES

1. PREFAB FENCE ALLOWED IF REINFORCED AND APPROVED BY CITY INSPECTOR.
2. FENCE SHALL NOT BE INSTALLED ON SLOPES STEEPER THAN 2:1.
3. JOINTS IN FILTER FABRIC SHALL BE SPLICED AT POSTS. USE STAPLES, WIRE RINGS, OR EQUIVALENT TO ATTACH FABRIC TO POSTS AND FENCE.
4. REMOVE SEDIMENT WHEN IT REACHES 1/3 FENCE HEIGHT.
5. LOCATION OF FENCING SHALL BE AS SHOWN ON APPROVED PLANS OR AS DIRECTED BY THE CITY.
6. MAXIMUM 100' SHEET OR OVERLAND FLOW PATH LENGTH TO SILT FENCE.
7. DO NOT DIRECT FLOWS GREATER THAN 0.5 CFS TO FENCE.
8. SILT FENCE SHOULD NOT BE INSTALLED IN STREAMS OR V-SHAPED DITCHES.
9. FILTER FABRIC SHOULD BE INSTALLED ALONG CONTOURS WHENEVER POSSIBLE.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK - E.03 | |
| CITY OF KIRKLAND WASHINGTON | SILT FENCE |

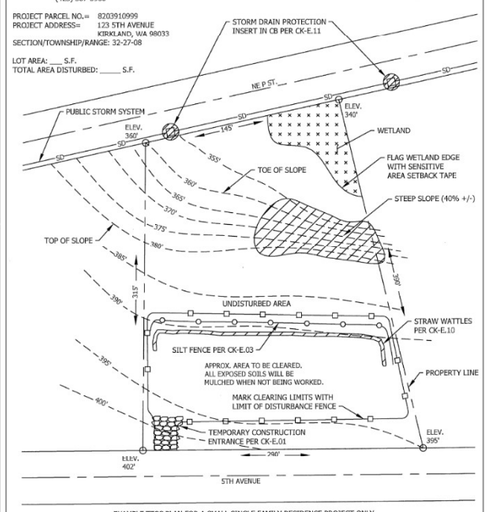
APPLICANT: MALENE MCRESIDENT
123 5TH AVENUE
KIRKLAND, WA 98033
(425) 587-3900

LAST REVISED: 01/2020

PROJECT PARCEL NO.= 8203910999
PROJECT ADDRESS= 123 5TH AVENUE KIRKLAND, WA 98033

SECTION/TOWNSHIP/RANGE: 32-27-08

LOT AREA: ___ S.F.
TOTAL AREA DISTURBED: _____ S.F.




EXAMPLE TESC PLAN FOR A SMALL SINGLE FAMILY RESIDENCE PROJECT ONLY

NOTES

1. IDENTIFY ALL SENSITIVE AREAS (EROSION AREAS, STEEP SLOPES, LANDSLIDE HAZARD AREAS, LAKES, STREAMS, WETLANDS).
2. REFER TO THE CURRENT VERSION OF KING COUNTY SURFACE WATER DESIGN MANUAL, CORE REQUIREMENT #5 FOR ESC STANDARDS ADOPTED BY THE CITY OF KIRKLAND. REFER TO CITY OF KIRKLAND POLICIES FOUND WITHIN THE EROSION AND SEDIMENT CONTROL PRE-APPROVED PLANS.

| CITY OF KIRKLAND | |
|---|---|
| PLAN NO. CK-E.04 | |
| CITY OF KIRKLAND WASHINGTON | EXAMPLE TEMP. EROSION & SEDIMENT CONTROL PLAN |

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BOTHELL, WA 98021
P: 425-951-4800 WWW.NV5.COM


REGISTERED PROFESSIONAL ENGINEER — JAMES T. MCMINN — STATE OF WASHINGTON — 24073 — 5/21/2024

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| DRAWN | TTW |
| CHECKED | JTM |
| APPROVED | KL |
| LAST EDIT | 5/21/2024 |
| PLOT DATE | 5/21/2024 |
| SUBMITTAL | |

EROSION CONTROL DETAILS
31-24-PW
CITY OF KIRKLAND, WA
LWHS PEDESTRIAN / BICYCLE IMPROVEMENTS

SCALE: 1"=20'

PROJECT NUMBER: 229423-E000164
DRAWING FILE NAME: 229423-C-EC01

SHEET NUMBER
EC05
15 of 50

[DATE: 5/21/2024 6:38 AM] [AUTHOR: tom.white] [PLOTTER: DWG To PDF.pc3] [STYLE: WHP-Standard.ctb]
[PATH: P:\Kirkland, City of WA\229423-E000164.00\Execution\Drawings\Civil\229423-C-EC01.dwg] [LAYOUT: SITE PREPARATION & EROSION CONTROL PLAN V]

## 10.6 Appendix F: WWHM Model

# WWHM2012

# PROJECT REPORT

# General Model Information

| | |
|---|---|
| Project Name: | LWHS Improvements |
| Site Name: | KWHS Route Enhancement |
| Site Address: | |
| City: | |
| Report Date: | 5/17/2024 |
| Gage: | Seatac |
| Data Start: | 1948/10/01 |
| Data End: | 2009/09/30 |
| Timestep: | 15 Minute |
| Precip Scale: | 1.000 |
| Version Date: | 2021/08/18 |
| Version: | 4.2.18 |

## POC Thresholds

| | |
|---|---|
| Low Flow Threshold for POC1: | 50 Percent of the 2 Year |
| High Flow Threshold for POC1: | 50 Year |
| Low Flow Threshold for POC2: | 50 Percent of the 2 Year |
| High Flow Threshold for POC2: | 50 Year |

# *Landuse Basin Data*

## *Predeveloped Land Use*

### TDA 1

| | |
|---|---|
| Bypass: | No |
| GroundWater: | No |
| Pervious Land Use | acre |
| C, Forest, Flat | 0.008 |
| Pervious Total | 0.008 |
| Impervious Land Use | acre |
| Impervious Total | 0 |
| Basin Total | 0.008 |

Element Flows To:

| Surface | Interflow | Groundwater |
|---|---|---|

## TDA 2

| | |
|---|---|
| Bypass: | No |
| GroundWater: | No |

| Pervious Land Use | acre |
|---|---|
| C, Forest, Flat | 0.058 |
| Pervious Total | 0.058 |

| Impervious Land Use | acre |
|---|---|
| Impervious Total | 0 |
| Basin Total | 0.058 |

Element Flows To:

| Surface | Interflow | Groundwater |
|---|---|---|

## *Mitigated Land Use*

### Basin 1

| | |
|---|---|
| Bypass: | No |
| GroundWater: | No |
| Pervious Land Use | acre |
| Pervious Total | 0 |
| Impervious Land Use | acre |
| SIDEWALKS FLAT | 0.008 |
| Impervious Total | 0.008 |
| Basin Total | 0.008 |

Element Flows To:

| Surface | Interflow | Groundwater |
|---|---|---|

## Basin 2

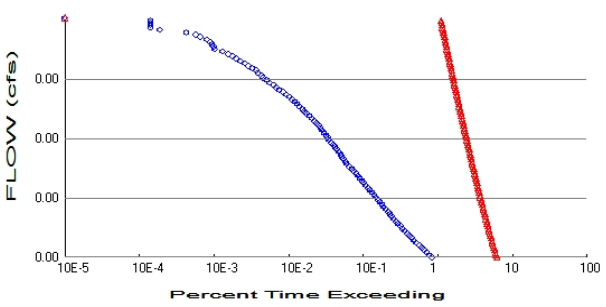
| | |
|---|---|
| Bypass: | No |
| GroundWater: | No |
| Pervious Land Use | acre |
| Pervious Total | 0 |
| Impervious Land Use | acre |
| SIDEWALKS FLAT | 0.058 |
| Impervious Total | 0.058 |
| Basin Total | 0.058 |

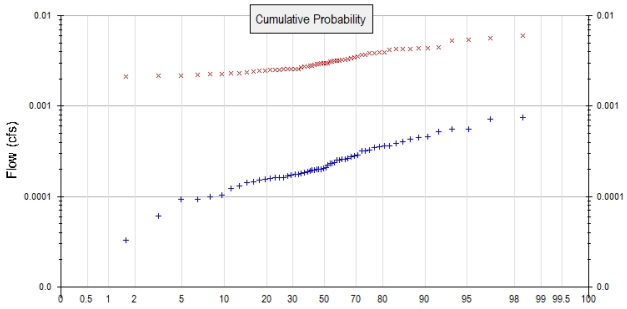
Element Flows To:

| Surface | Interflow | Groundwater |
|---|---|---|

# Analysis Results

## POC 1




\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.008
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0
Total Impervious Area: 0.008

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

| **Return Period** | **Flow(cfs)** |
|---|---|
| 2 year | 0.000235 |
| 5 year | 0.000369 |
| 10 year | 0.000445 |
| 25 year | 0.000526 |
| 50 year | 0.000576 |
| 100 year | 0.000618 |

Flow Frequency Return Periods for Mitigated. POC #1

| **Return Period** | **Flow(cfs)** |
|---|---|
| 2 year | 0.00305 |
| 5 year | 0.003853 |
| 10 year | 0.004398 |
| 25 year | 0.005105 |
| 50 year | 0.005647 |
| 100 year | 0.006201 |

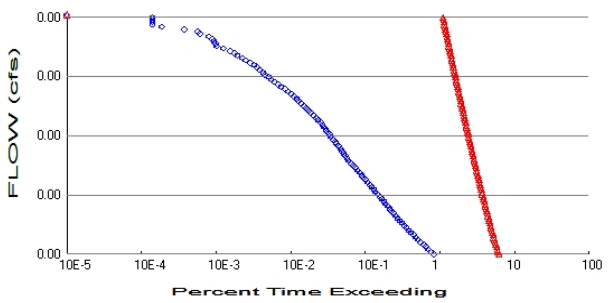
Q100 increase by 0.005 cfs, which is less than 0.15 cfs therefore exception #2 applies

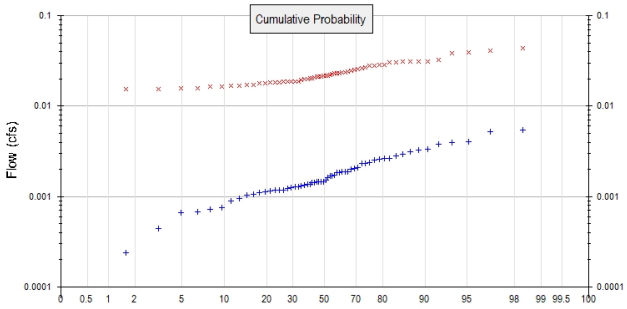
## Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

| **Year** | **Predeveloped** | **Mitigated** |
|---|---|---|
| 1949 | 0.000 | 0.004 |
| 1950 | 0.000 | 0.004 |
| 1951 | 0.001 | 0.002 |
| 1952 | 0.000 | 0.002 |
| 1953 | 0.000 | 0.002 |
| 1954 | 0.000 | 0.002 |
| 1955 | 0.000 | 0.003 |
| 1956 | 0.000 | 0.003 |
| 1957 | 0.000 | 0.003 |
| 1958 | 0.000 | 0.003 |

## *POC 2*




\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 0.058
Total Impervious Area: 0

Mitigated Landuse Totals for POC #2
Total Pervious Area: 0
Total Impervious Area: 0.058

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #2

| **Return Period** | **Flow(cfs)** |
|---|---|
| 2 year | 0.001705 |
| 5 year | 0.002678 |
| 10 year | 0.00323 |
| 25 year | 0.003814 |
| 50 year | 0.004175 |
| 100 year | 0.004483 |

Flow Frequency Return Periods for Mitigated. POC #2

| **Return Period** | **Flow(cfs)** |
|---|---|
| 2 year | 0.022113 |
| 5 year | 0.027932 |
| 10 year | 0.031885 |
| 25 year | 0.037013 |
| 50 year | 0.040938 |
| 100 year | 0.044958 |

Q100 increase by 0.041 cfs, which is less than 0.15 cfs therefore exception #2 applies

## Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #2

| **Year** | **Predeveloped** | **Mitigated** |
|---|---|---|
| 1949 | 0.002 | 0.029 |
| 1950 | 0.002 | 0.031 |
| 1951 | 0.004 | 0.018 |
| 1952 | 0.001 | 0.016 |
| 1953 | 0.001 | 0.017 |
| 1954 | 0.001 | 0.018 |
| 1955 | 0.002 | 0.020 |
| 1956 | 0.002 | 0.020 |
| 1957 | 0.002 | 0.023 |
| 1958 | 0.002 | 0.018 |
| 1959 | 0.001 | 0.019 |

# Model Default Modifications

Total of 0 changes have been made.

## PERLND Changes

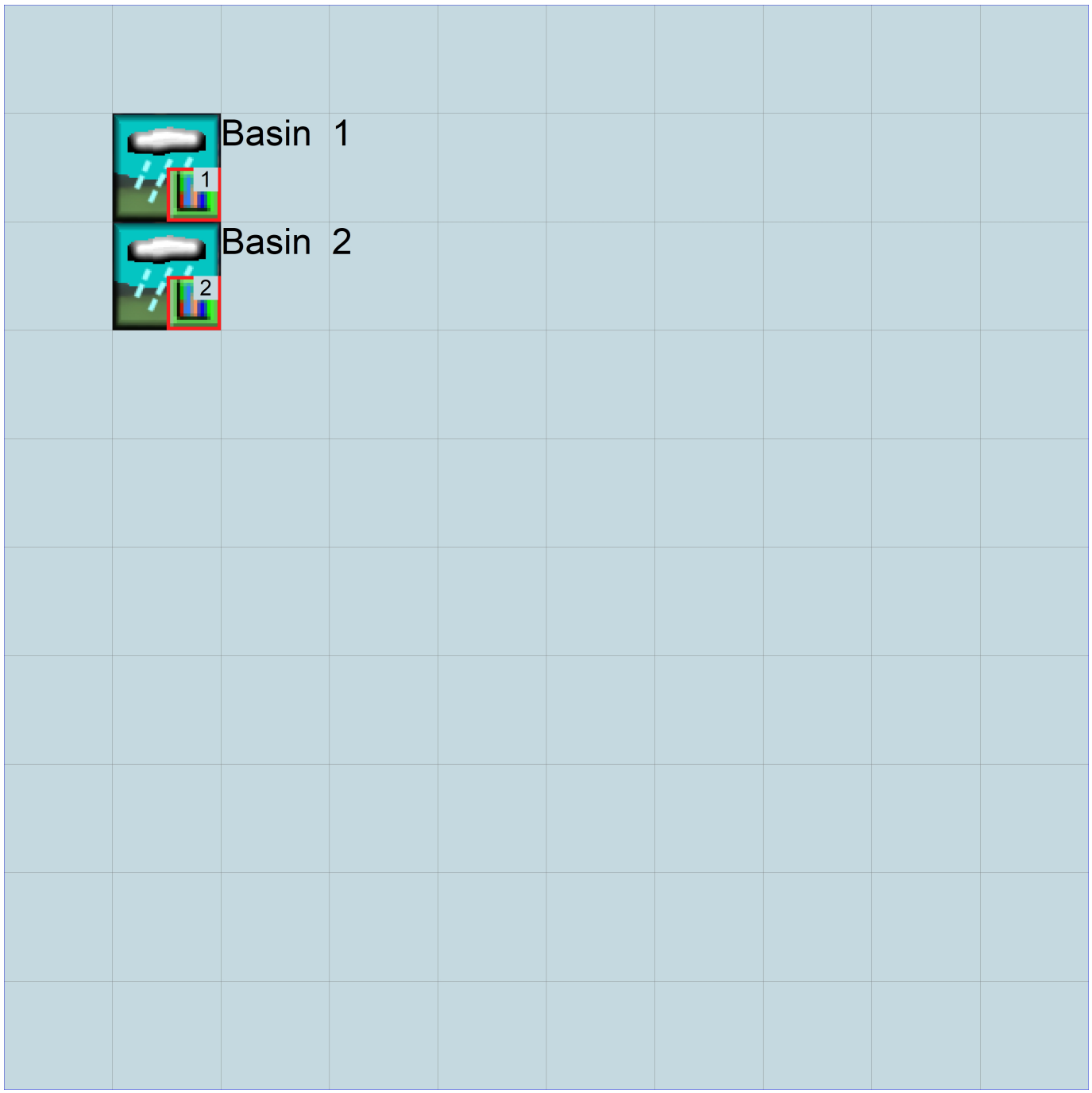
No PERLND changes have been made.

## IMPLND Changes

No IMPLND changes have been made.

# *Appendix*
## *Predeveloped Schematic*

## *Mitigated Schematic*



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**City of Kirkland**