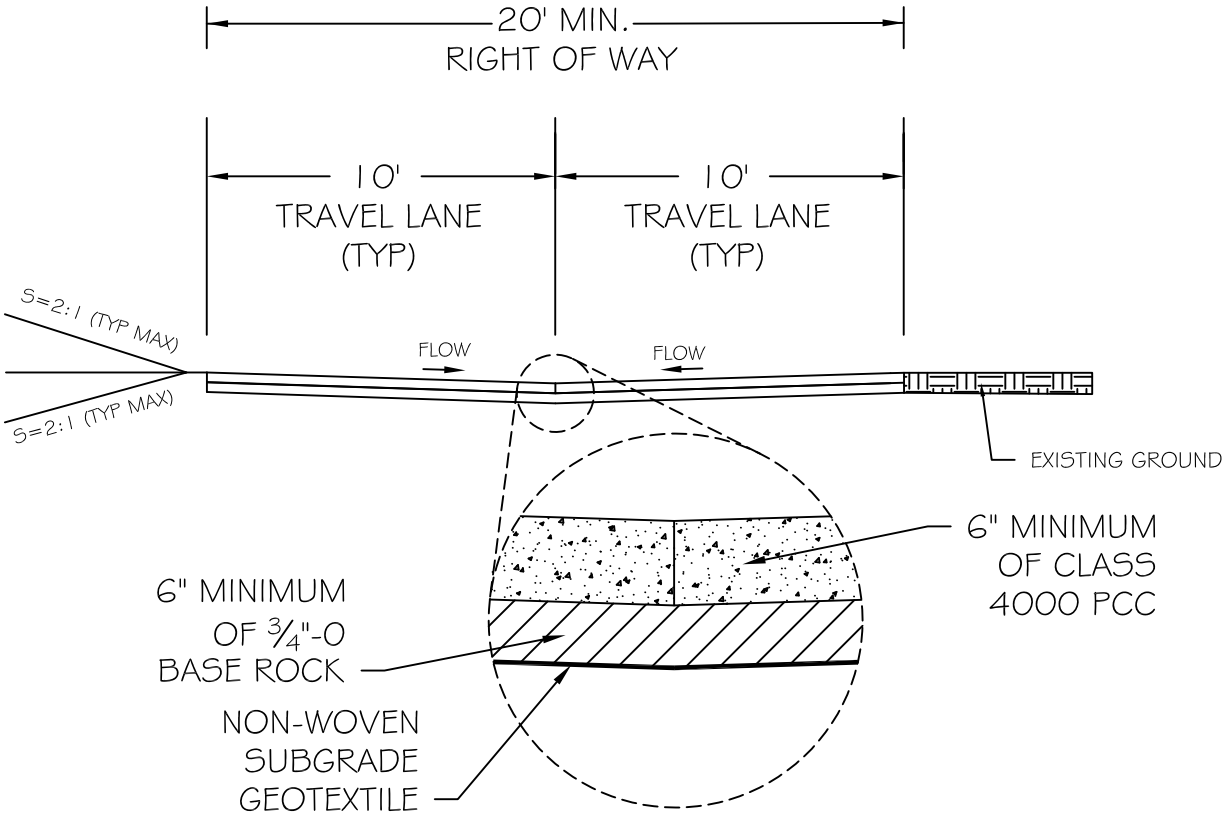
Appendix A

NOTE:

The standard details are intended to assist but not to substitute for competent work by design professionals. As noted in the PWDS, standard details illustrate the minimum requirements and materials required by the Public Works Department for the construction of certain public systems and are note considered to be the final documents until incorporated into a design approved by the city. Project specific details are required when these details are less than the requirements of the project design.

PUBLIC ALLEY
VIEW LOOKING NORTH OR EAST



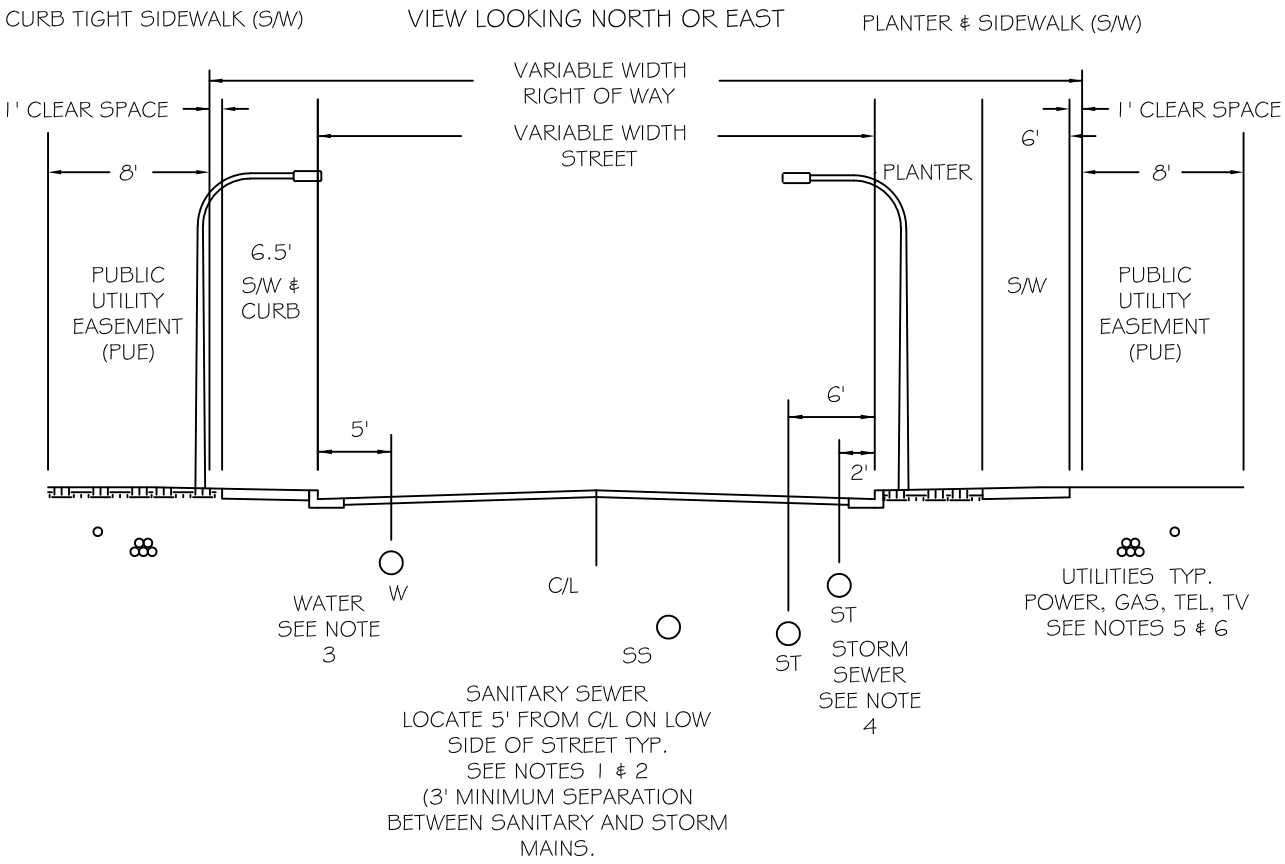
NOTES:

1. WIDTH OF ALLEY DEPENDENT UPON EXISTING RIGHT OF WAY WIDTH. NEW ALLEYS SHALL HAVE A RIGHT OF WAY WIDTH OF 20 FEET MINIMUM.
2. ALLEY DRAINAGE SHALL FLOW TO CENTER OF RIGHT OF WAY TO INTERMEDIATE AREA DRAINS AND STORM SYSTEM.
3. "NO PARKING FIRE LANE" SIGNAGE AS REQUIRED.
4. ALLEYS ARE FOR VEHICLE ACCESS TO PROPERTIES ONLY.
5. ALLEY CROSS SLOPE SHALL NOT EXCEED 2%.
6. ALLEYS SHALL BE CONSTRUCTED OF 6-INCH THICK CLASS 4000 PCC MEETING THE REQUIREMENTS OF ODOT SSC SECTION 00756 PLAIN CONCRETE PAVEMENT.
7. BASE ROCK SHALL BE 6-INCH THICK COMPACTED $\frac{3}{4}$"-0 CRUSHED AGGREGATE WITH A NON-WOVEN SUBGRADE GEOTEXTILE.
8. SAW CUT JOINTS SHALL BE 2-INCH DEEP MINIMUM AND PLACED AT 10' INTERVALS.
9. POUR ONE SIDE OF ALLEY TO CONTROL CENTERLINE GRADE FOLLOWED BY POURING OF SECOND SIDE. SIDES SHALL NOT BE POURED MONOLITHICALLY.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

PUBLIC ALLEY

DRAWN BY	PW	2/2025	R-1000
CHECKED BY	MWH	2/2025	



NOTES:

1. MINIMUM COVER OF 6' FOR SANITARY SEWER MAINS & MINIMUM 4' COVER FOR SANITARY SEWER LATERALS.
2. LATERALS AND P/L CLEANOUTS TO BE INSTALLED DURING CONSTRUCTION OF SANITARY SEWER & STORM SEWER MAINS, UNLESS OTHERWISE APPROVED BY CITY ENGINEER.
3. WATER LOCATED IN STREET 5' FROM FACE OF CURB. 36" MINIMUM COVER ON ALL WATERLINES & 30" MINIMUM COVER ON SERVICES.
4. STORM DRAIN INSTALLED ON LOW SIDE OF STREET: 2' FROM FACE OF CURB FOR <4' RIM TO INVERT. 6' FROM FACE OF CURB FOR >4' RIM TO INVERT.
5. MAINTAIN MINIMUM 5' HORIZONTAL SEPARATION BETWEEN PUBLIC UTILITIES AND PARALLEL FRANCHISE UTILITIES. FRANCHISE UTILITY STREET CROSSINGS SHALL BE PERPENDICULAR TO STREET CENTERLINE. OTHER VERTICAL & HORIZONTAL SEPARATION SHALL BE AS SPECIFIED BY DEQ, OHA, AND OTHER PUBLIC/PRIVATE UTILITY COMPANIES.
6. STREET LIGHTS SHALL BE LOCATED BEHIND BACK OF WALK IN PUE ON CURB TIGHT SIDEWALK STREETS. STREET LIGHTS SHALL BE LOCATED IN PLANTER STRIP ON PLANTER & SIDEWALK STREETS.
7. COMBINED/UNITY TRENCH PER FRANCHISE UTILITY COMPANY REQUIREMENTS.

CITY OF INDEPENDENCE
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TYPICAL UTILITY LOCATIONS (CURBED STREETS)

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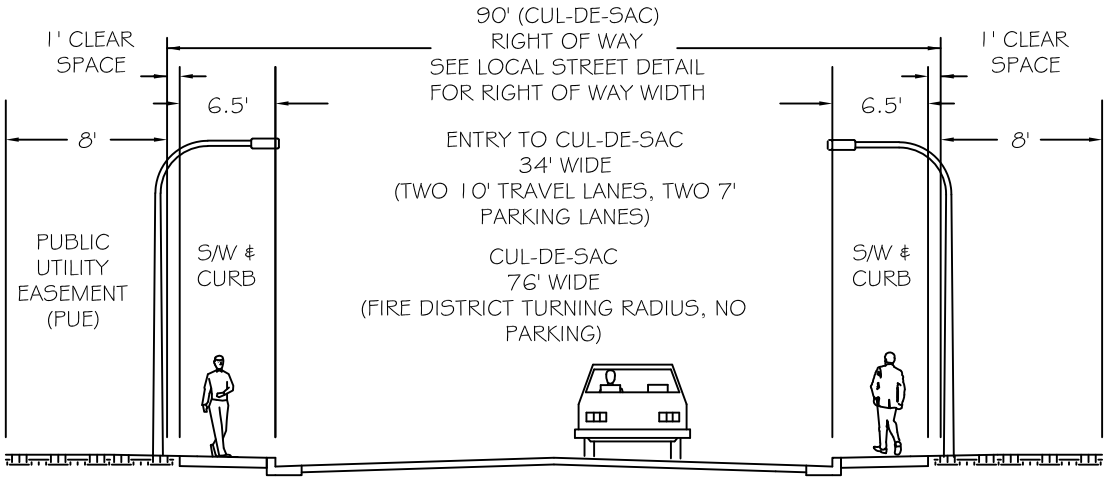
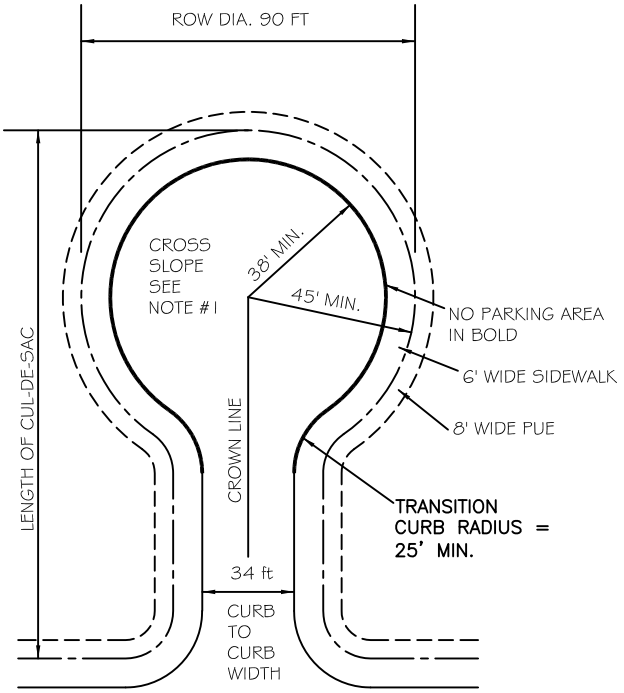
R-1005

LOCAL STREET CUL-DE-SAC
VIEW ALL DIRECTIONS



NOTES:

1. 2.5% MINIMUM, 5% MAXIMUM CROSS SLOPE FROM CENTER OF CUL-DE-SAC TO GUTTER.
2. A 6' WIDE SIDEWALK IS REQUIRED ON ALL CUL-DE-SACS.
3. 6" CURB WIDTH IS NOT INCLUDED IN SIDEWALK WIDTH.
4. STREET LIGHTS SHALL BE LOCATED BEHIND BACK OF WALK IN PUE.
5. NO STRIPING ON STREET. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
6. ON-STREET PARKING IS NOT ALLOWED IN THE CUL-DE-SAC.
7. CUL-DE-SAC LENGTH SHALL NOT EXCEED 200' AND SERVE NO MORE THAN 20 DWELLING UNITS (IDC 90.90.010.M)
8. THE DISTANCE SHALL BE MEASURED FROM THE OUTSIDE RIGHT-OF WAY OF BULB TO NEAR SIDE RIGHT-OF-WAY OF INTERSECTING STREET.
9. MINIMUM 38' OUTER TURNING RADII REQUIRED. CONSULT WITH FIRE DISTRICT.
10. USE OF OFFSET CUL-DE-SAC SHALL BE APPROVED BY CITY ENGINEER. OFFSET SHALL NOT EXCEED ONE HALF WIDTH OF ENTRY STREET TO CUL-DE-SAC.



Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

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LOCAL STREET CUL-DE-SAC

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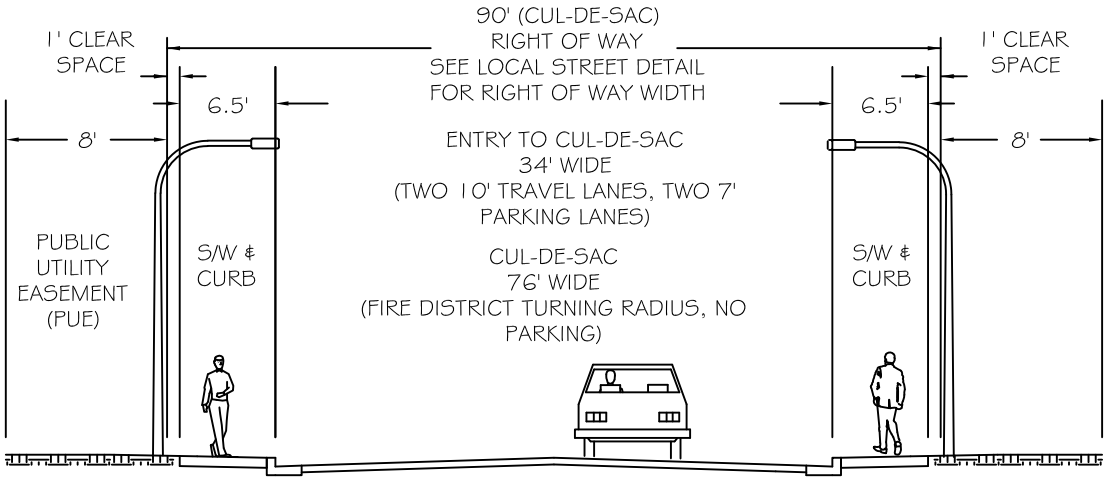
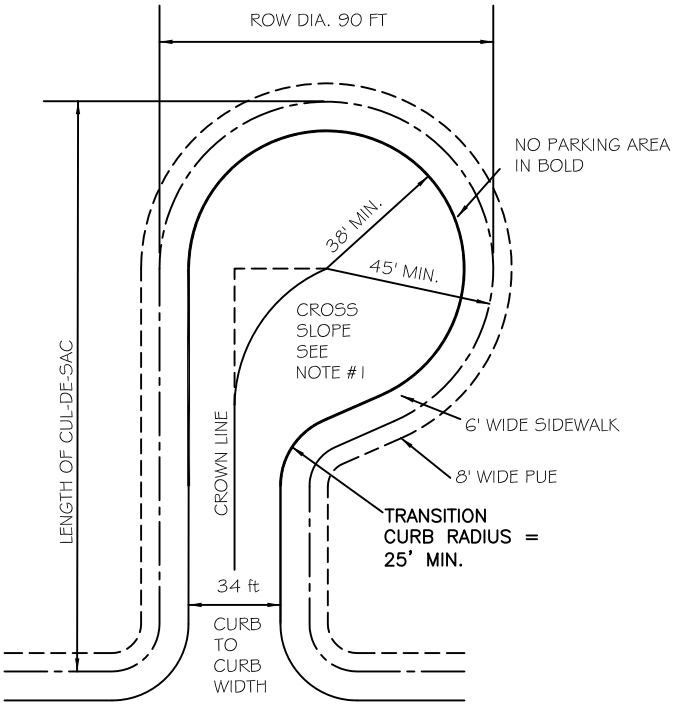
CHECKED BY	MWH	2/2025	

LOCAL STREET OFFSET CUL-DE-SAC
VIEW ALL DIRECTIONS



NOTES:

1. 2.5% MINIMUM, 5% MAXIMUM CROSS SLOPE FROM CENTER OF CUL-DE-SAC TO GUTTER. MAINTAIN CROWN LINE TO CENTER OF CUL-DE-SAC.
2. A 6' WIDE SIDEWALK IS REQUIRED ON ALL CUL-DE-SACS.
3. 6" CURB WIDTH IS NOT INCLUDED IN SIDEWALK WIDTH.
4. STREET LIGHTS SHALL BE LOCATED BEHIND BACK OF WALK IN PUE.
5. NO STRIPING ON STREET. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
6. ON-STREET PARKING IS NOT ALLOWED IN THE CUL-DE-SAC.
7. CUL-DE-SAC LENGTH SHALL NOT EXCEED 200' AND SERVE NO MORE THAN 20 DWELLING UNITS (IDC 90.90.010.M)
8. THE DISTANCE SHALL BE MEASURED FROM THE OUTSIDE RIGHT-OF WAY OF BULB TO NEAR SIDE RIGHT-OF-WAY OF INTERSECTING STREET.
9. MINIMUM 38' OUTER TURNING RADII REQUIRED. CONSULT WITH FIRE DISTRICT.
10. USE OF OFFSET CUL-DE-SAC SHALL BE APPROVED BY CITY ENGINEER. OFFSET SHALL NOT EXCEED ONE HALF WIDTH OF ENTRY STREET TO CUL-DE-SAC.



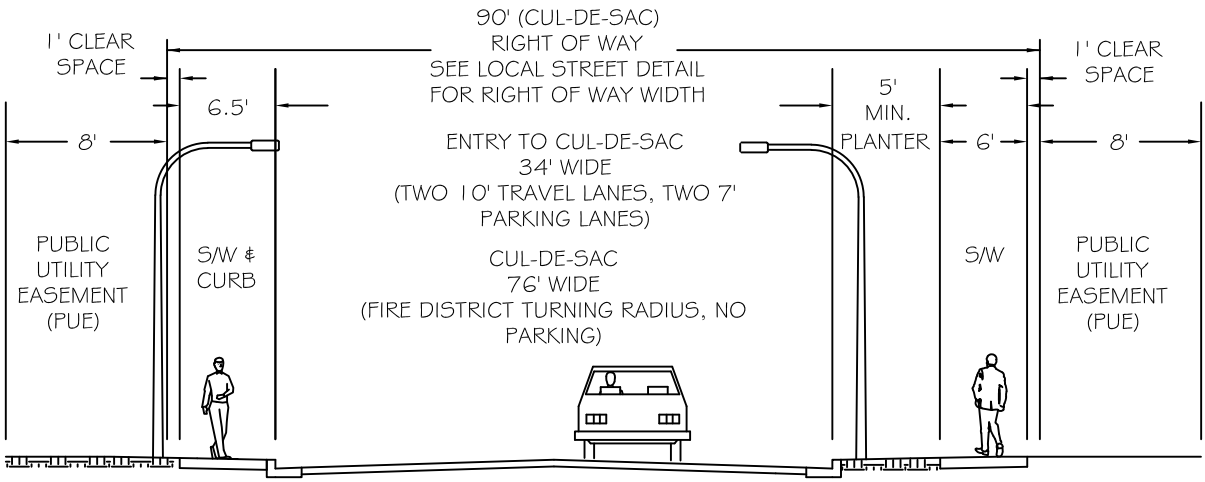
Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

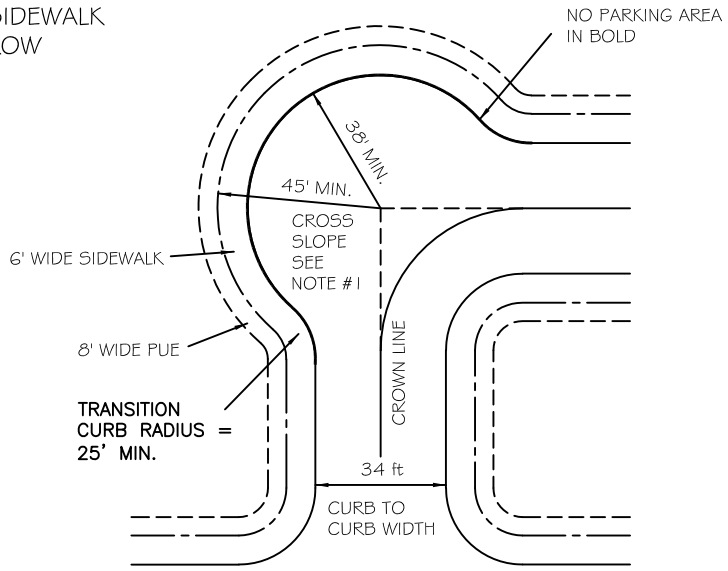
LOCAL STREET OFFSET CUL-DE-SAC

DRAWN BY	PW	2/2025	R-1015
CHECKED BY	MWH	2/2025	

LOCAL STREET EYEBROW CUL-DE-SAC
VIEW ALL DIRECTIONS



CURB TIGHT SIDEWALK IN EYEBROW



NOTES:

1. 2.5% MINIMUM, 5% MAXIMUM CROSS SLOPE FROM CENTER OF CUL-DE-SAC TO GUTTER. MAINTAIN CROWN LINE TO CENTER OF CUL-DE-SAC.
2. A 6' WIDE SIDEWALK IS REQUIRED ON ALL CUL-DE-SACS.
3. 6" CURB WIDTH IS NOT INCLUDED IN SIDEWALK WIDTH.
4. STREET LIGHTS SHALL BE LOCATED BEHIND BACK OF WALK IN PUE.
5. NO STRIPING ON STREET. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
6. ON-STREET PARKING IS NOT ALLOWED IN THE CUL-DE-SAC.
7. MINIMUM 38' OUTER TURNING RADII REQUIRED. CONSULT WITH FIRE DISTRICT.
8. USE OF EYEBROW CUL-DE-SAC SHALL BE APPROVED BY CITY ENGINEER.

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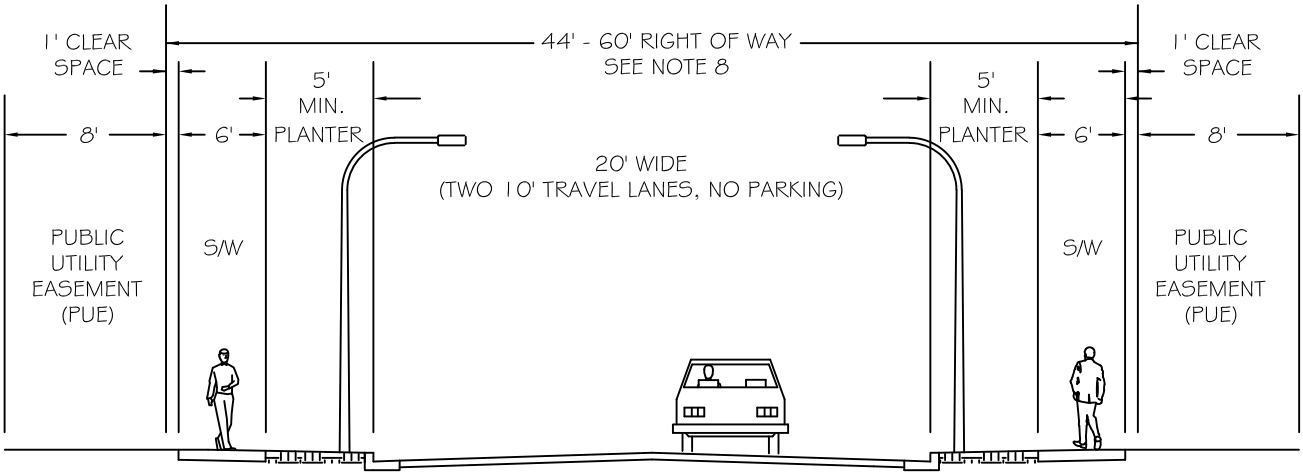
LOCAL STREET EYEBORW CUL-DE-SAC

DRAWN BY	PW	2/2025	R-1020
CHECKED BY	MWH	2/2025	

LOCAL STREET NO PARKING
VIEW ALL DIRECTIONS



NOTES:

1. CROSS SECTION BASED ON CURRENT VERSION OF THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ALL LOCAL STREETS.
6. NO STRIPING ON STREET EXCEPT AS REQUIRED FOR SHARED ROADWAYS, BIKE LANES, CROSSWALKS, SIGHT DISTANCE, AND FIRE HYDRANTS. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
7. ON-STREET PARKING IS NOT ALLOWED.
8. LOCAL STREET WITH NO ON-STREET PARKING REQUIRES 44' RIGHT OF WAY FOR <400 ADT. THE CITY MAY REQUIRE 60' RIGHT OF WAY FOR >400 ADT.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.

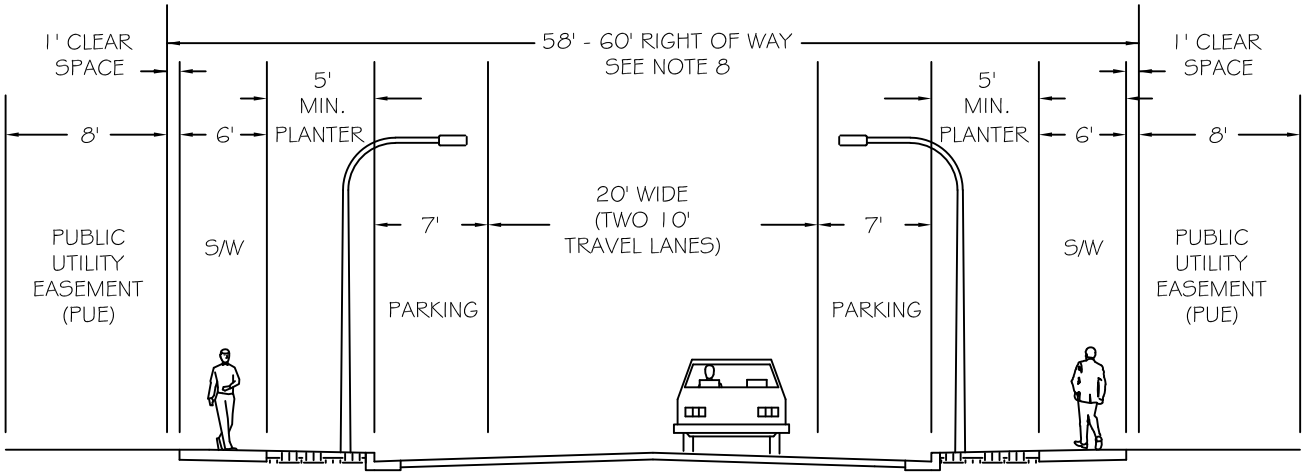
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

LOCAL STREET
NO ON-STREET PARKING

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1025

LOCAL STREET WITH PARKING
VIEW ALL DIRECTIONS



NOTES:

1. CROSS SECTION BASED ON CURRENT VERSION OF THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ALL LOCAL STREETS.
6. NO STRIPING ON STREET EXCEPT AS REQUIRED FOR SHARED ROADWAYS, BIKE LANES, CROSSWALKS, SIGHT DISTANCE, AND FIRE HYDRANTS. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
7. ON-STREET PARKING IS ALLOWED.
8. LOCAL STREET WITH ON-STREET PARKING REQUIRES 58' RIGHT OF WAY FOR <400 ADT. THE CITY MAY REQUIRE 60' RIGHT OF WAY FOR >400 ADT. THE CITY MAY REQUIRE UP TO 36' WIDE WIDTH (CURB TO CURB) AND NO PARKING AND/OR PLANTER STRIP NEAR INTERSECTIONS WITH HIGH CLASSIFICATION ROADWAYS.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.

CITY OF INDEPENDENCE
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LOCAL STREET WITH ON-STREET PARKING

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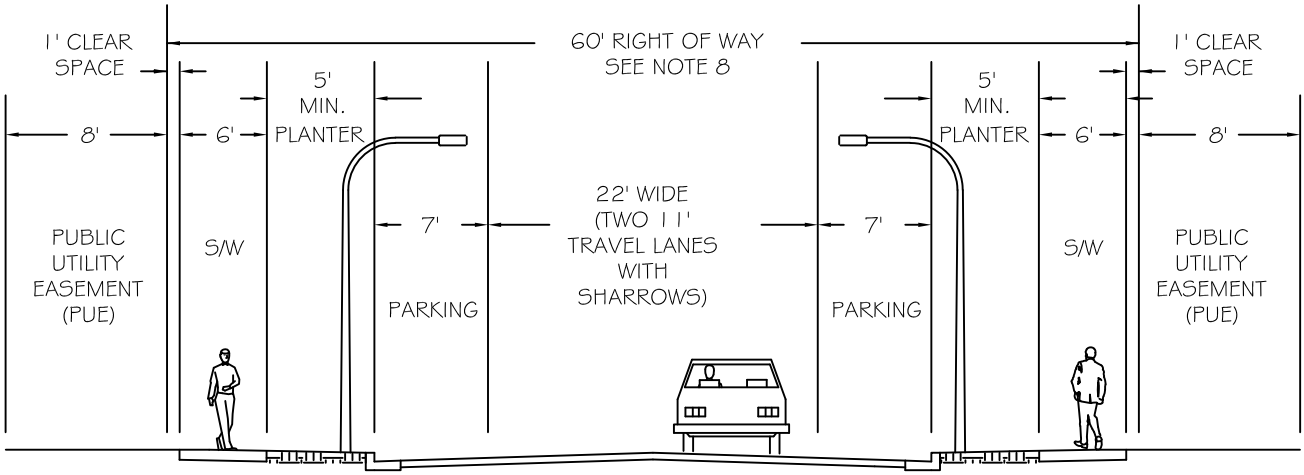
R-1030

COLLECTOR STREET WITH PARKING
VIEW ALL DIRECTIONS



NOTES:

1. CROSS SECTION BASED ON CURRENT VERSION OF THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ALL COLLECTOR STREETS.
6. NO STRIPING ON STREET EXCEPT AS REQUIRED FOR SHARED ROADWAYS, BIKE LANES, CROSSWALKS, SIGHT DISTANCE, AND FIRE HYDRANTS. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
7. ON-STREET PARKING IS ALLOWED.
8. COLLECTOR STREET WITH ON-STREET PARKING REQUIRES 60' RIGHT OF WAY. THE CITY MAY REQUIRE ADDITIONAL RIGHT OF WAY FOR >2000 ADT. THE CITY MAY REQUIRE UP TO 36' WIDE WIDTH (CURB TO CURB) WITH TURN LANES AND NO PARKING AND/OR PLANTER STRIP NEAR INTERSECTIONS.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.

CITY OF INDEPENDENCE
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COLLECTOR STREET
ON-STREET PARKING (<2000 ADT)

DRAWN BY	PW	2/2025
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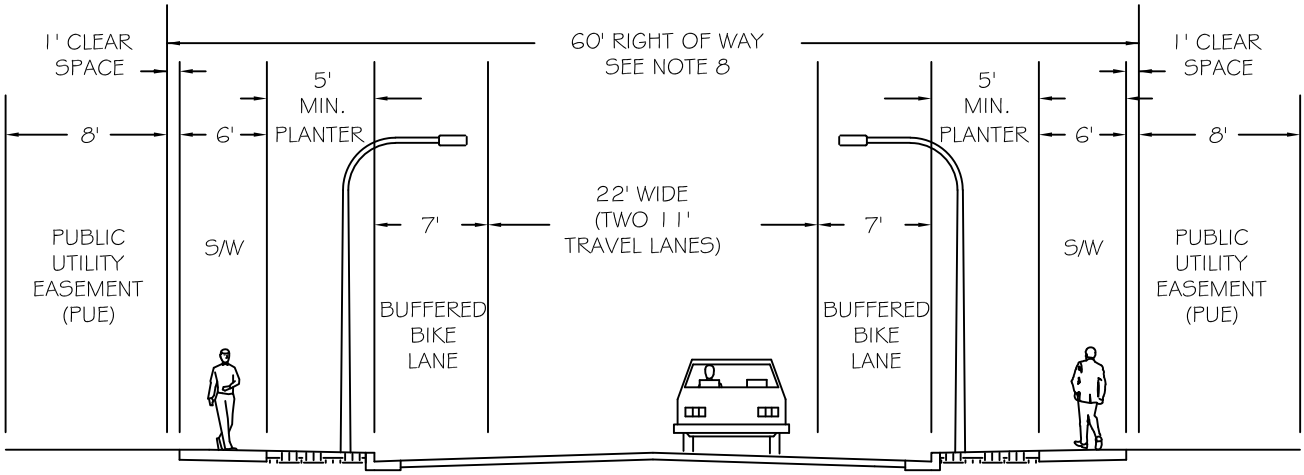
R-1035

COLLECTOR STREET WITH BIKE LANES
VIEW ALL DIRECTIONS



NOTES:

1. CROSS SECTION BASED ON CURRENT VERSION OF THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ALL COLLECTOR STREETS.
6. NO STRIPING ON STREET EXCEPT AS REQUIRED FOR SHARED ROADWAYS, BIKE LANES, CROSSWALKS, SIGHT DISTANCE, AND FIRE HYDRANTS. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
7. ON-STREET PARKING IS NOT ALLOWED.
8. COLLECTOR STREET WITH BUFFERED BIKE LANES REQUIRES 60' RIGHT OF WAY. THE CITY MAY REQUIRE ADDITIONAL RIGHT OF WAY. THE CITY MAY REQUIRE UP TO 36' WIDE WIDTH (CURB TO CURB) WITH TURN LANES AND NO BIKE LANES AND/OR PLANTER STRIP NEAR INTERSECTIONS.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.

CITY OF INDEPENDENCE
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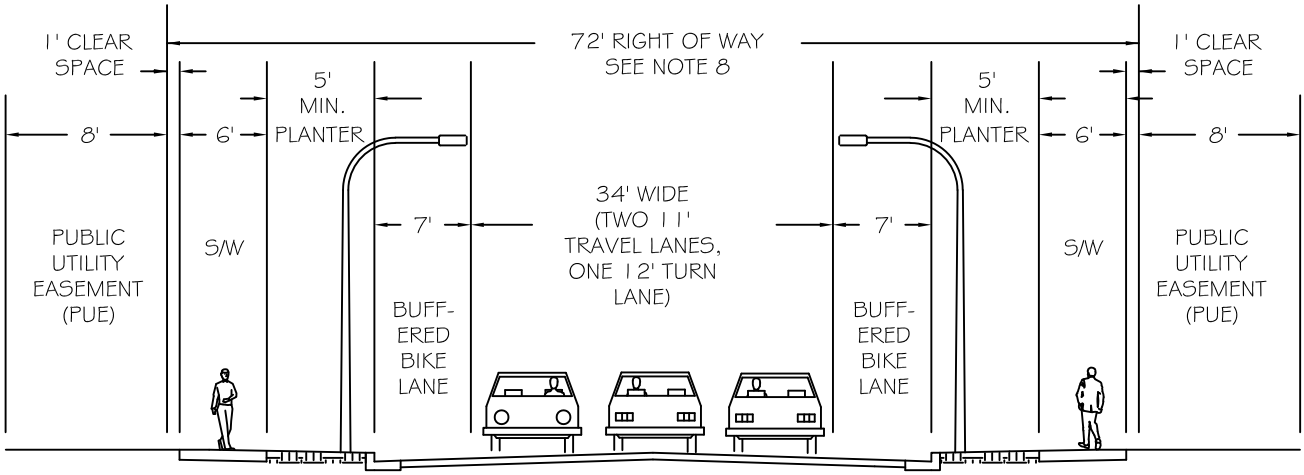
COLLECTOR STREET WITH BIKE LANE (>2000 ADT)

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1040

COLLECTOR STREET WITH TURN LANE
VIEW ALL DIRECTIONS



NOTES:

1. CROSS SECTION BASED ON CURRENT VERSION OF THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ALL COLLECTOR STREETS.
6. PROVIDE TURN LANE AND OTHER STRIPING AS REQUIRED BY THE PUBLIC WORKS DIRECTOR.
7. ON-STREET PARKING IS NOT ALLOWED.
8. COLLECTOR STREET WITH BUFFERED BIKE LANES AND TURN LANE REQUIRES 72' RIGHT OF WAY. THE CITY MAY REQUIRE ADDITIONAL RIGHT OF WAY. THE CITY MAY REQUIRE NO BIKE LANES AND/OR PLANTER STRIP NEAR INTERSECTIONS.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

COLLECTOR STREET WITH TURN LANE

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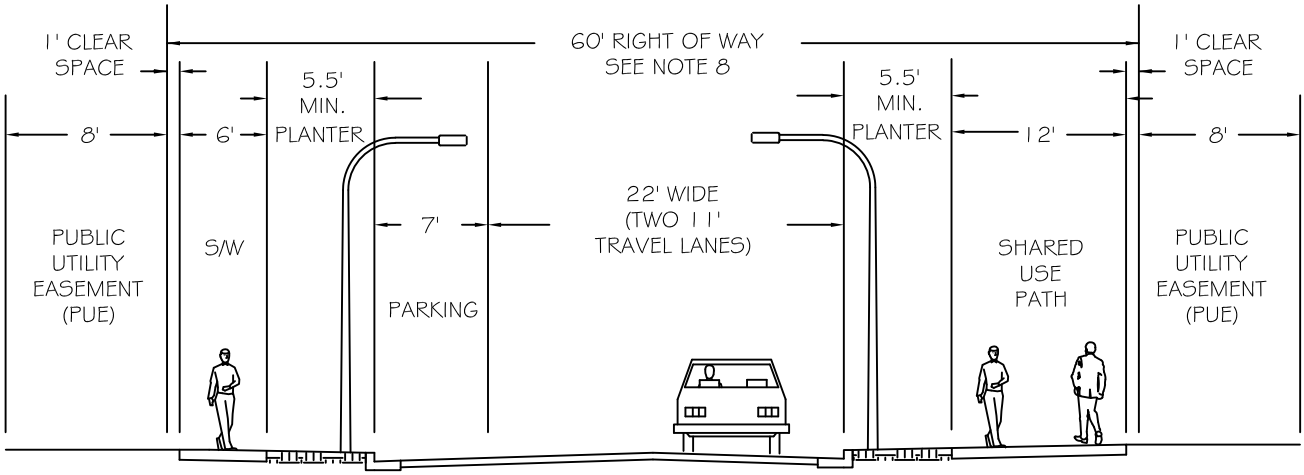
CHECKED BY	MWH	2/2025	

COLLECTOR STREET WITH PARKING
VIEW ALL DIRECTIONS



NOTES:

1. CROSS SECTION BASED ON CURRENT VERSION OF THE SOUTHWEST CONCEPT PLAN (SWCP) AS AN AMENDMENT TO THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ONE SIDE OF THE STREET AND 12' WIDE SHARED USE PATH ON THE OTHER SIDE OF THE STREET. SHARED USE PATH LOCATION SHALL BE APPROVED BY THE PLANNING DEPARTMENT AND PUBLIC WORKS DEPARTMENT.
6. NO STRIPING ON STREET EXCEPT AS REQUIRED FOR SHARED ROADWAYS, BIKE LANES, CROSSWALKS, SIGHT DISTANCE, AND FIRE HYDRANTS. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
7. ON-STREET PARKING IS ALLOWED ONLY ON SIDE OPPOSITE OF SHARED USE PATH.
8. SW CONCEPT PLAN COLLECTOR STREET REQUIRES 60' RIGHT OF WAY. THE CITY MAY REQUIRE ADDITIONAL RIGHT OF WAY AND UP TO 36' WIDE WIDTH (CURB TO CURB) WITH TURN LANES AND NO PARKING AND/OR PLANTER STRIP NEAR INTERSECTIONS.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.

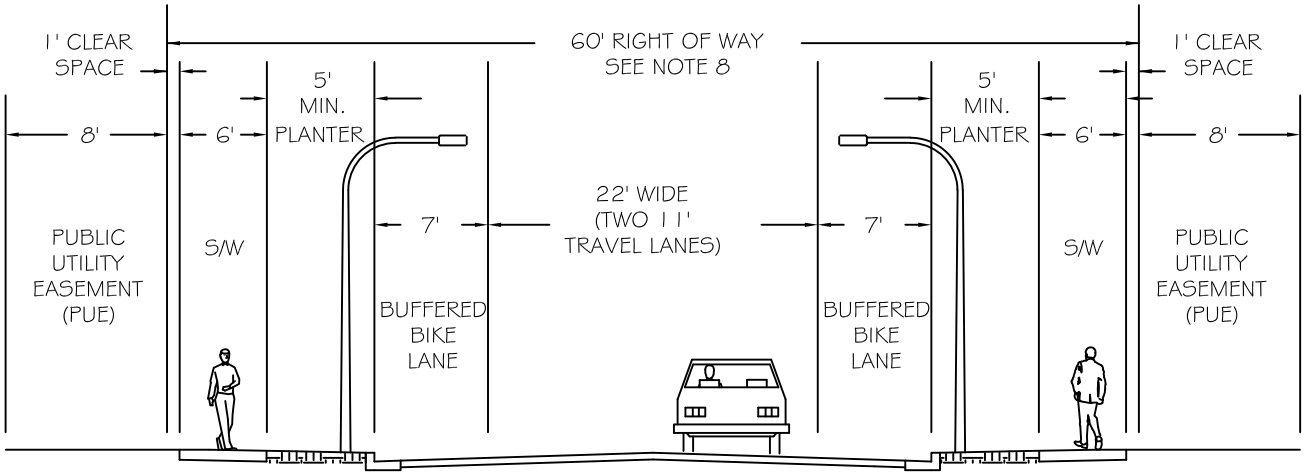
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

COLLECTOR STREET SW CONCEPT PLAN

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1050

MINOR ARTERIAL STREET WITH BIKE LANE
VIEW ALL DIRECTIONS



NOTES:

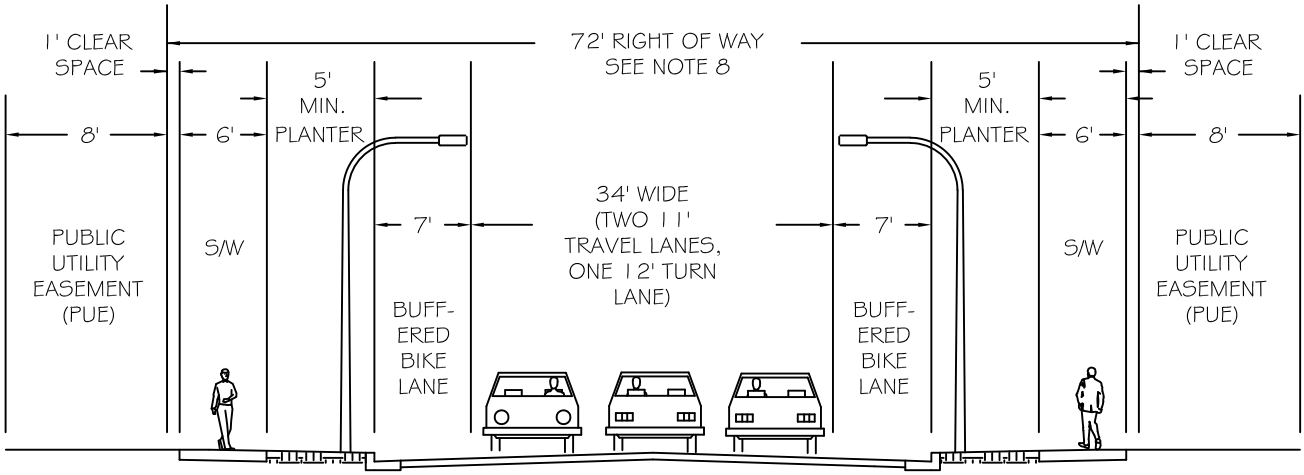
1. CROSS SECTION BASED ON CURRENT VERSION OF THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ALL MINOR ARTERIAL STREETS.
6. NO STRIPING ON STREET EXCEPT AS REQUIRED FOR SHARED ROADWAYS, BIKE LANES, CROSSWALKS, SIGHT DISTANCE, AND FIRE HYDRANTS. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
7. ON-STREET PARKING IS NOT ALLOWED.
8. MINOR ARTERIAL STREET WITH BUFFERED BIKE LANES REQUIRES 60' RIGHT OF WAY. THE CITY MAY REQUIRE ADDITIONAL RIGHT OF WAY. THE CITY MAY REQUIRE UP TO 36' WIDE WIDTH (CURB TO CURB) WITH TURN LANES AND NO BIKE LANES AND/OR PLANTER STRIP NEAR INTERSECTIONS.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

MINOR ARTERIAL STREET WITH BIKE LANE

DRAWN BY	PW	2/2025	R-1055
CHECKED BY	MWH	2/2025	

MINOR ARTERIAL STREET WITH TURN LANE
VIEW ALL DIRECTIONS



NOTES:

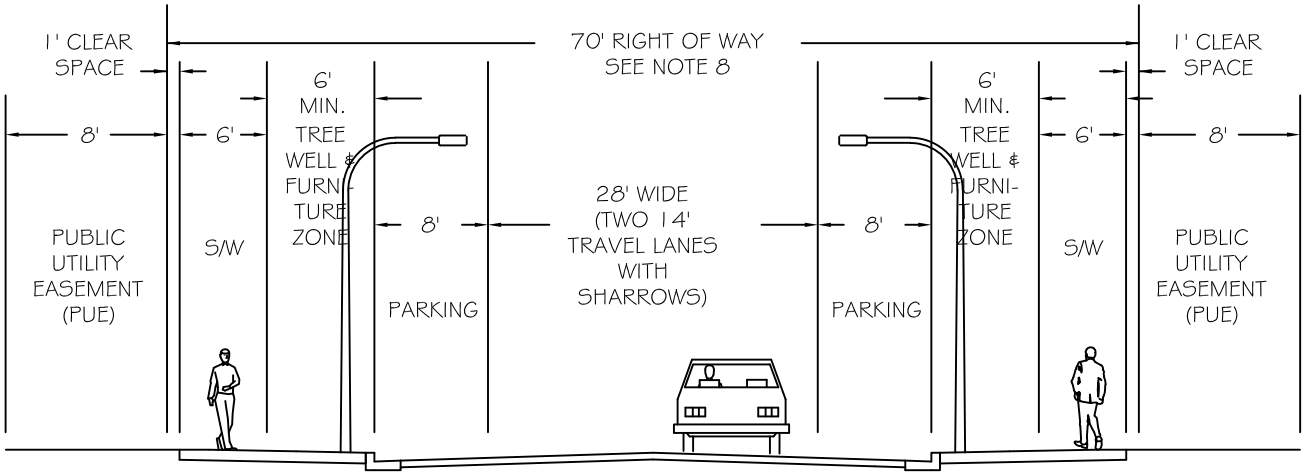
1. CROSS SECTION BASED ON CURRENT VERSION OF THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ALL COLLECTOR STREETS.
6. NO STRIPING ON STREET EXCEPT AS REQUIRED FOR SHARED ROADWAYS, BIKE LANES, CROSSWALKS, SIGHT DISTANCE, AND FIRE HYDRANTS. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
7. ON-STREET PARKING IS NOT ALLOWED.
8. MINOR ARTERAIL STREET WITH BUFFERED BIKE LANES AND TURN LANE REQUIRES 72' RIGHT OF WAY. THE CITY MAY REQUIRE ADDITIONAL RIGHT OF WAY. THE CITY MAY REQUIRE NO BIKE LANES AND/OR PLANTER STRIP NEAR INTERSECTIONS.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

MINOR ARTERIAL STREET WITH TURN LANE

DRAWN BY	PW	2/2025	R-1060
CHECKED BY	MWH	2/2025	

MAJOR ARTERIAL STREET WITH PARKING (DOWNTOWN)
VIEW ALL DIRECTIONS



NOTES:

1. CROSS SECTION BASED ON CURRENT VERSION OF THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ALL MAJOR ARTERIAL STREETS.
6. NO STRIPING ON STREET EXCEPT AS REQUIRED FOR SHARED ROADWAYS, BIKE LANES, CROSSWALKS, SIGHT DISTANCE, AND FIRE HYDRANTS. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
7. ON-STREET PARKING IS ALLOWED.
8. MAJOR ARTERIAL STREET WITH ON-STREET PARKING REQUIRES 70' RIGHT OF WAY. STREET TREES ARE REQUIRED IN TREE WELLS. ALL AREAS BETWEEN THE CURB AND RIGHT OF WAY SHALL BE SIDEWALKS.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.
10. CROSS SECTION FOR OR 51 (MAIN STREET) FROM MONMOUTH TO B STREET AND OR 51 (MONMOUTH STREET) FROM MAIN STREET TO 3RD STREET.

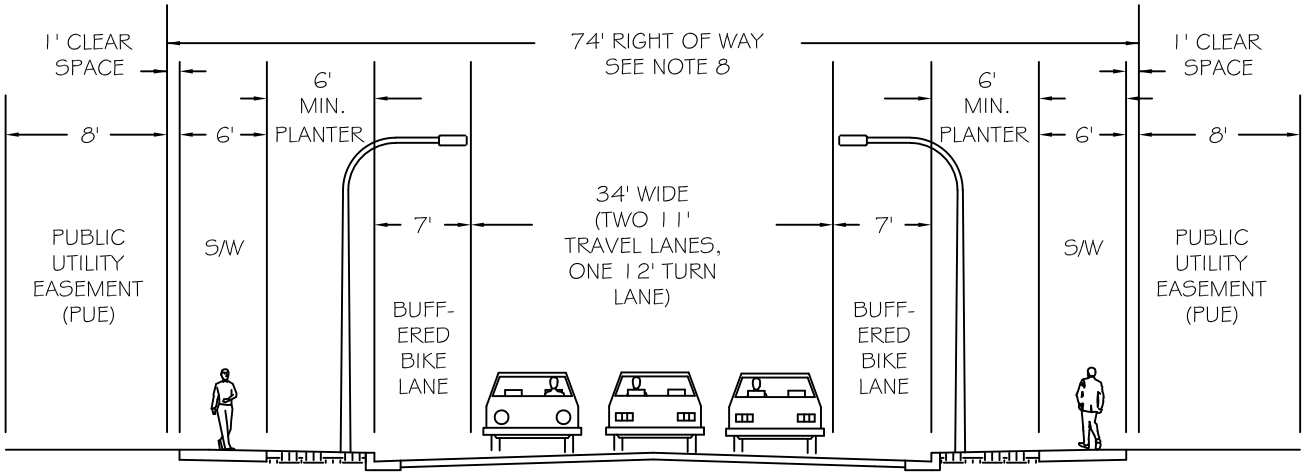
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

MAJOR ARTERIAL STREET W/PARKING (OR-51-MAIN ST)

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1065

MAJOR ARTERIAL STREET WITH TURN LANE
VIEW ALL DIRECTIONS



NOTES:

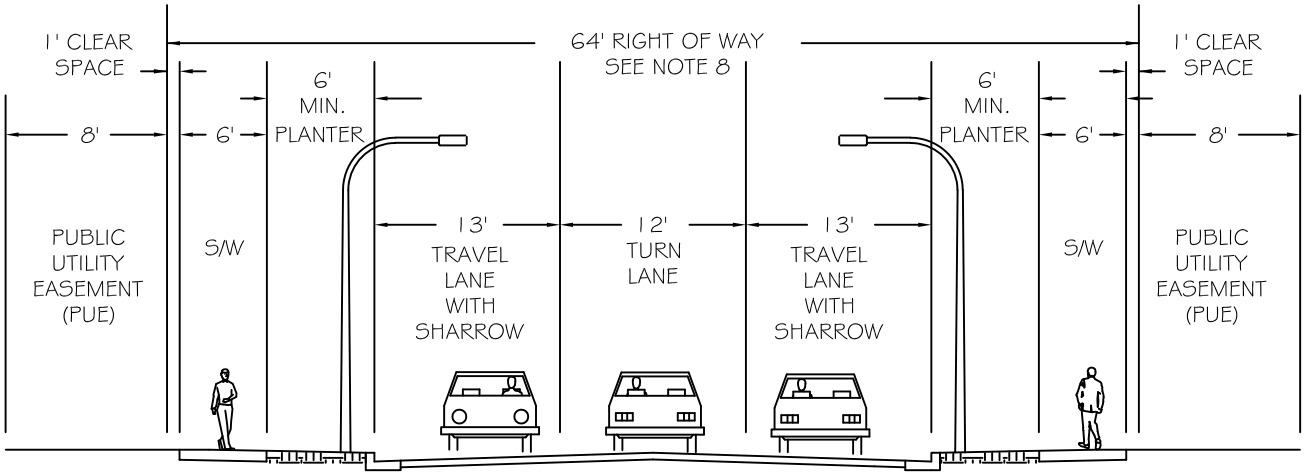
1. CROSS SECTION BASED ON CURRENT VERSION OF THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ALL MAJOR ARTERIAL STREETS.
6. NO STRIPING ON STREET EXCEPT AS REQUIRED FOR SHARED ROADWAYS, BIKE LANES, CROSSWALKS, SIGHT DISTANCE, AND FIRE HYDRANTS. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
7. ON-STREET PARKING IS NOT ALLOWED.
8. MAJOR ARTERIAL STREET WITH BUFFERED BIKE LANES AND TURN LANE REQUIRES 74' RIGHT OF WAY. THE CITY MAY REQUIRE ADDITIONAL RIGHT OF WAY. THE CITY MAY REQUIRE NO BIKE LANES AND/OR PLANTER STRIP NEAR INTERSECTIONS.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.
10. CROSS SECTION FOR OR 51 (MAIN STREET) NORTH OF DOWNTOWN, OR 51 (MONMOUTH STREET) WEST OF ASH CREEK, AND OTHER MAJOR ARTERIALS WITH TURN LANE AND BIKE LANES.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

MAJOR ARTERIAL STREET WITH TURN LANE

DRAWN BY	PW	6/2025	R-1070
CHECKED BY	MWH	6/2025	

MAJOR ARTERIAL STREET WITH TURN LANE
BETWEEN ASH CREEK AND DOWNTOWN
VIEW ALL DIRECTIONS



NOTES:

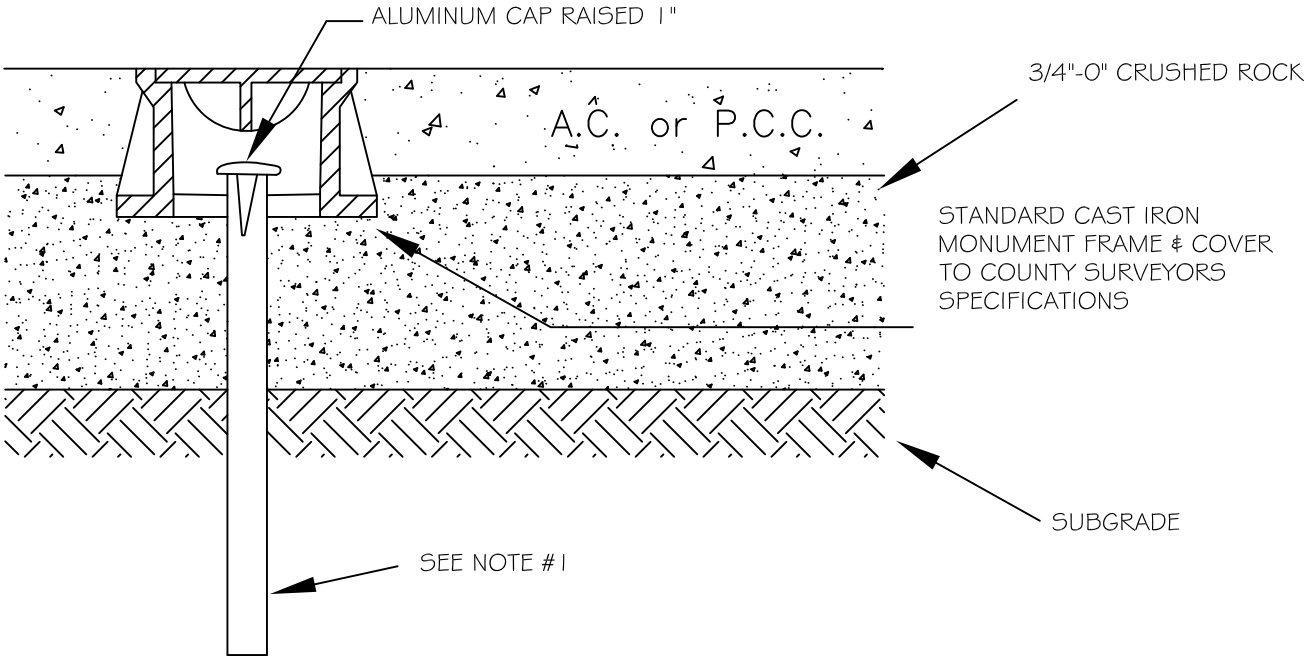
1. CROSS SECTION BASED ON CURRENT VERSION OF THE TRANSPORTATION SYSTEM MASTER PLAN (TSP OR TSMP).
2. PLANTER STRIPS SHALL BE USED FOR PLACEMENT OF STREET TREES, STREET LIGHTING, FIRE HYDRANTS, AND STREET SIGNAGE. ALL FRANCHISE UTILITIES SHALL BE PLACED IN THE PUE AND NOT LOCATED IN THE PUBLIC RIGHT OF WAY.
3. CROSS SLOPE FROM CENTERLINE TO GUTTER SHALL NOT EXCEED 2% MAXIMUM AT PEDESTRIAN CROSSING LOCATIONS AND 5% AT ALL OTHER LOCATIONS.
4. TYPE "A" CURB AND GUTTER REQUIRED ON ALL NEW AND RECONSTRUCTED STREETS.
5. A 6' WIDE SIDEWALK IS REQUIRED ON ALL MAJOR ARTERIAL STREETS.
6. NO STRIPING ON STREET EXCEPT AS REQUIRED FOR SHARED ROADWAYS, BIKE LANES, CROSSWALKS, SIGHT DISTANCE, AND FIRE HYDRANTS. NO PARKING FIRE LANE SIGNAGE AS REQUIRED.
7. ON-STREET PARKING IS NOT ALLOWED.
8. MAJOR ARTERIAL STREET WITH SHARED BIKE LANES AND TURN LANE REQUIRES 64' RIGHT OF WAY. THE CITY MAY REQUIRE ADDITIONAL RIGHT OF WAY. THE CITY MAY REQUIRE NO BIKE LANES AND/OR PLANTER STRIP NEAR INTERSECTIONS.
9. ALL RIGHT OF WAYS SHALL HAVE AN 8' WIDE PUBLIC UTILITY EASEMENT ON BOTH SIDES OF THE STREET. NO BUILDINGS, OVERHANGS, STAIRS OR PORCHES SHALL BE LOCATED IN THE PUBLIC UTILITY EASEMENT. WHERE BUILDINGS ARE REQUIRED TO BUILD TO THE RIGHT OF WAY, ALL PUBLIC UTILITY EASEMENTS SHALL BE LOCATED ON REAR LOTS OR PRIVATE ALLEYS.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

MAJOR ARTERIAL STREET W/TL (ASH CR TO DOWNTOWN)

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1075



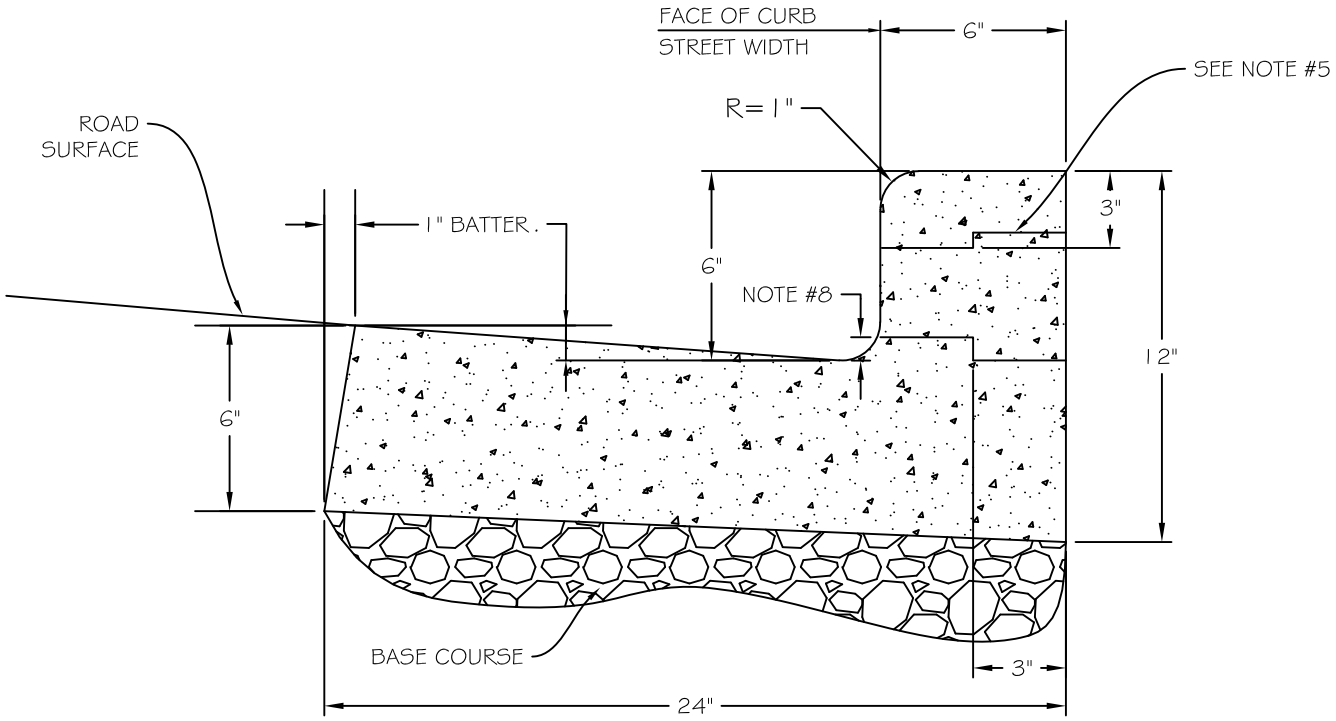
NOTE:

1. ALL MONUMENTS SHALL USE 5/8" DIA. X 30" LONG IRON ROD WITH ALUMINUM CAP OR AS APPROVED BY POLK COUNTY SURVEYORS OFFICE.
2. ALL MONUMENT BOXES SHALL CONFORM TO REQUIREMENTS SET BY POLK COUNTY SURVEYOR'S OFFICE.
3. 12" BOXES SHALL BE USED FOR DESIGN SPEEDS OF 35 MPH OR GREATER (EJ 3673Z BOX WITH 3673A LID).
4. 8" BOXES SHALL BE USED FOR DESIGN SPEEDS LESS THAN 35 MPH (EJ3614Z BOX WITH 3614A LID).
5. PER ORS 92.044(7), UTILITY INFRASTRUCTURE MAY NOT BE PLACED WITHIN ONE FOOT OF A SURVEY MONUMENT LOCATED OR NOTED ON A SUBDIVISION OR PARTITION PLAT.
6. SLOPE PAVEMENT AWAY FROM MONUMENT BOX TO AVOID LOW POINT AND WATER COLLECTION.
7. USE RISER RINGS FOR ADJUSTMENT OF PAVEMENT HEIGHT.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

CENTERLINE SURVEY MONUMENT

DRAWN BY	PW	2/2025	R-1080
CHECKED BY	MWH	2/2025	



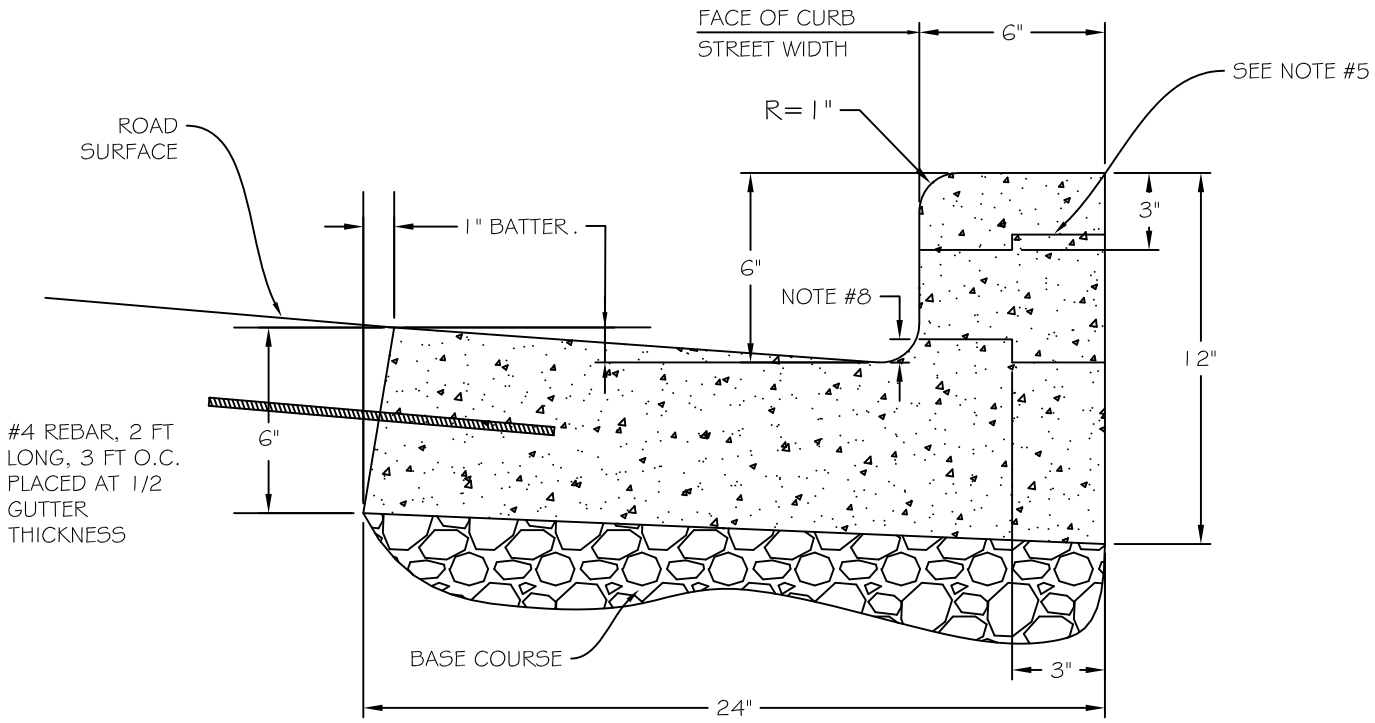
1. FOR USE ALONG MEDIANS, GUTTERS MAY BE REDUCED WITH PRIOR APPROVAL FROM THE CITY ENGINEER.
2. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
3. CONSTRUCTION JOINTS.
   - 3.1. SPACING TO BE NOT MORE THAN 12 FEET.
   - 3.2. THE DEPTH OF THE JOINT SHALL BE AT LEAST 2 INCHES.
4. BASE ROCK TO BE 3/4"-0 COMPACTED TO 95% OF AASHTO T-180 AND SHALL BE TO SUB GRADE, STREET STRUCTURE, OR 4" IN DEPTH, WHICHEVER IS GREATER.
5. DRAINAGE BLOCK OUT
   - 5.1. 3" I.D. PLASTIC PIPE WITH COUPLING.
   - 5.2. DRAINAGE ACCESS THRU EXISTING CURB SHALL BE CORE DRILLED.
6. FOR RECONSTRUCTED CURB, DRILL CONCRETE STREET AND SET DOWELS WITH EPOXY PRIOR TO CURB INSTALLATION.
7. BASE COURSE SHALL BE THOROUGHLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 50 DEGREES OR GREATER
8. CURB REVEAL
   - 8.1. DRIVEWAYS ½" AND PEDESTRIAN RAMP 0" REVEAL.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

TYPE "A" CURB AND GUTTER

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1085

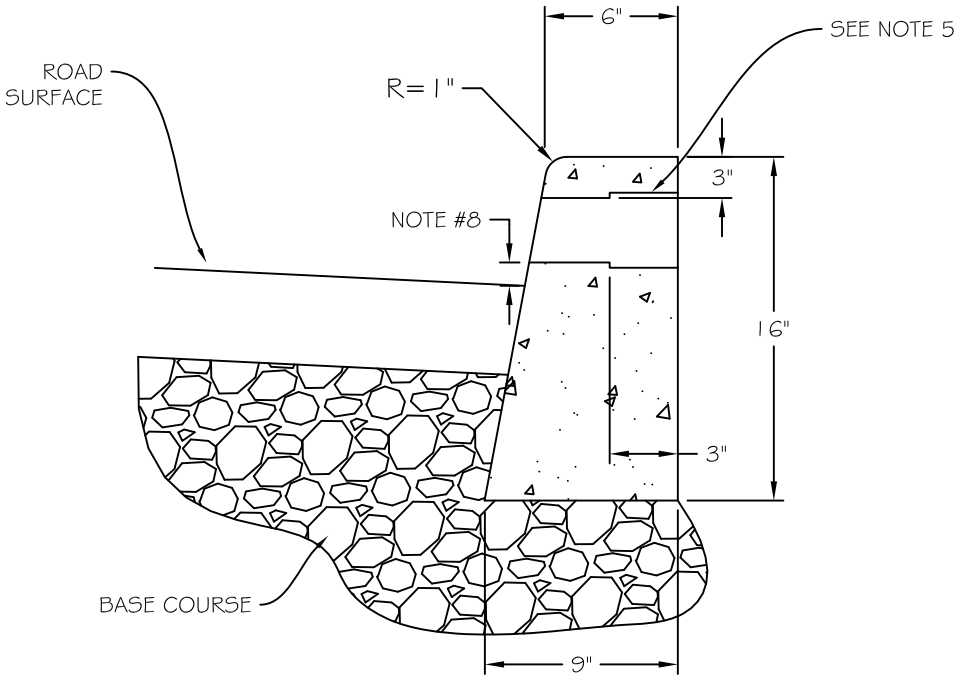


1. NOT FOR USE ALONG MEDIANS.
2. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS AND INCORPORATE MICRO-REINFORCEMENT "FIBERMESH 300" OR APPROVED EQUAL.
3. CONSTRUCTION JOINTS.
   - 3.1. SPACING TO BE NOT MORE THAN 12 FEET AND SHALL MATCH WITH STREET JOINT.
   - 3.2. JOINTS SHALL BE HAND SAWCUT, WHEN WET, THROUGH ENTIRE WIDTH AND FULL DEPTH OF CURB AND GUTTER.
4. BASE ROCK TO BE 3/4"-0 COMPACTED TO 95% OF AASHTO T-180 AND SHALL BE TO SUB GRADE, STREET STRUCTURE, OR 4" IN DEPTH, WHICHEVER IS GREATER.
5. DRAINAGE BLOCK OUT
   - 5.1. 3" I.D. PLASTIC PIPE WITH COUPLING.
   - 5.2. DRAINAGE ACCESS THRU EXISTING CURB SHALL BE CORE DRILLED.
6. FOR RECONSTRUCTED CURB, DRILL CONCRETE STREET AND SET DOWELS WITH EPOXY PRIOR TO CURB INSTALLATION.
7. BASE COURSE SHALL BE THOROUGHLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 50 DEGREES OR GREATER.
8. CURB REVEAL
   - 8.1. DRIVEWAYS ½" AND PEDESTRIAN RAMP 0" REVEAL.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

CONCRETE STREET CURB AND GUTTER

DRAWN BY	PW	2/2025	R-1090
CHECKED BY	MWH	2/2025	



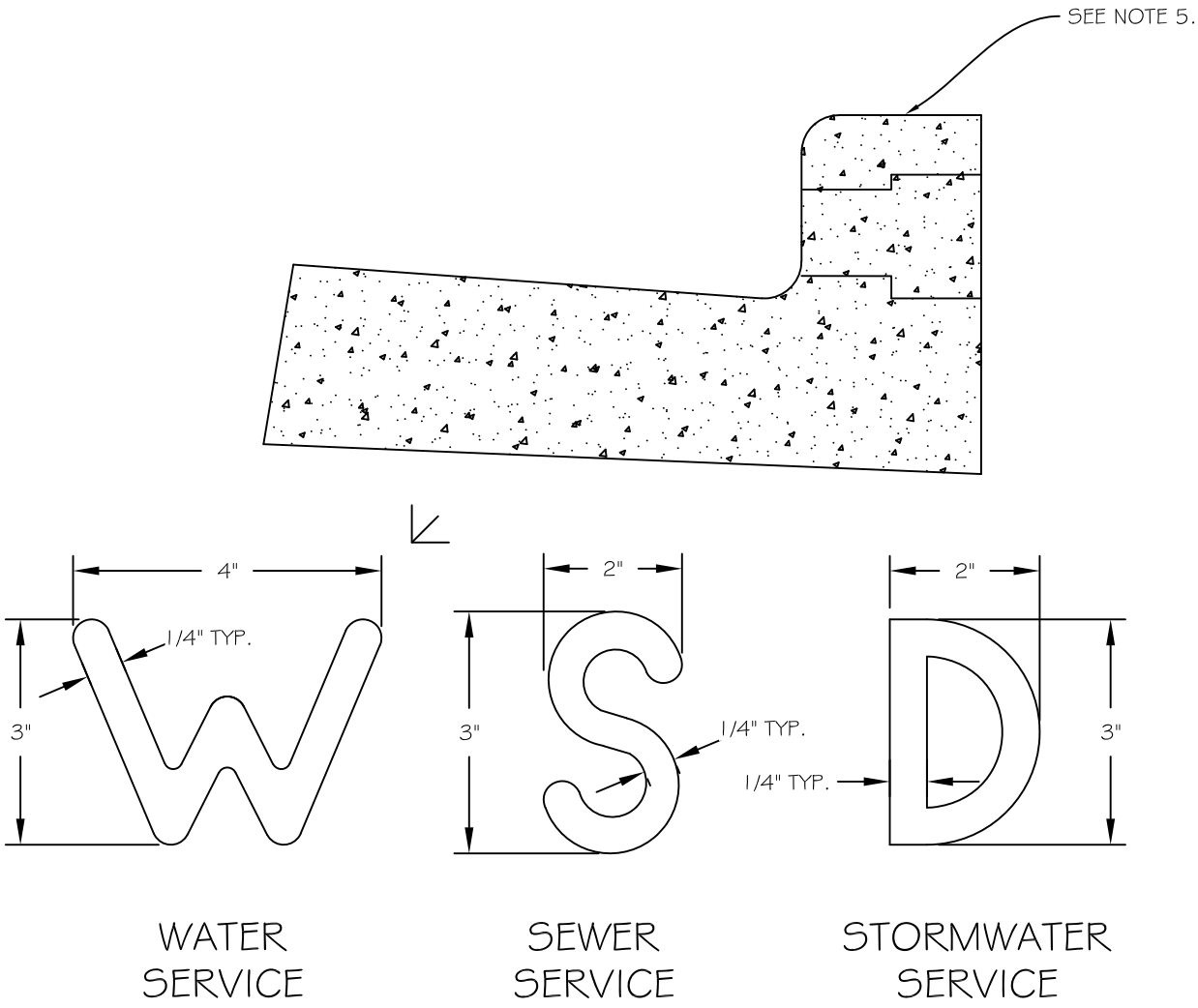
1. NOT FOR USE ALONG MEDIANS.
2. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS AND INCORPORATE MICRO-REINFORCEMENT "FIBERMESH 300" OR APPROVED EQUAL.
3. CONSTRUCTION JOINTS.
   - 3.1. SPACING TO BE NOT MORE THAN 12 FEET AND SHALL MATCH WITH STREET JOINT.
   - 3.2. JOINTS SHALL BE HAND SAWCUT, WHEN WET, THROUGH ENTIRE WIDTH AND FULL DEPTH OF CURB AND GUTTER.
4. BASE ROCK TO BE 3/4"-0 COMPACTED TO 95% OF AASHTO T-180 AND SHALL BE TO SUB GRADE, STREET STRUCTURE, OR 4" IN DEPTH, WHICHEVER IS GREATER.
5. DRAINAGE BLOCK OUT
   - 5.1. 3" I.D. PLASTIC PIPE WITH COUPLING.
   - 5.2. DRAINAGE ACCESS THRU EXISTING CURB SHALL BE CORE DRILLED.
6. FOR RECONSTRUCTED CURB, DRILL CONCRETE STREET AND SET DOWELS WITH EPOXY PRIOR TO CURB INSTALLATION.
7. BASE COURSE SHALL BE THOROUGHLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 50 DEGREES OR GREATER.
8. CURB REVEAL
   - 8.1. DRIVEWAYS ½" AND PEDESTRIAN RAMP 0" REVEAL.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

TYPE "C" CURB

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1095



WATER SERVICE

SEWER SERVICE

STORMWATER SERVICE

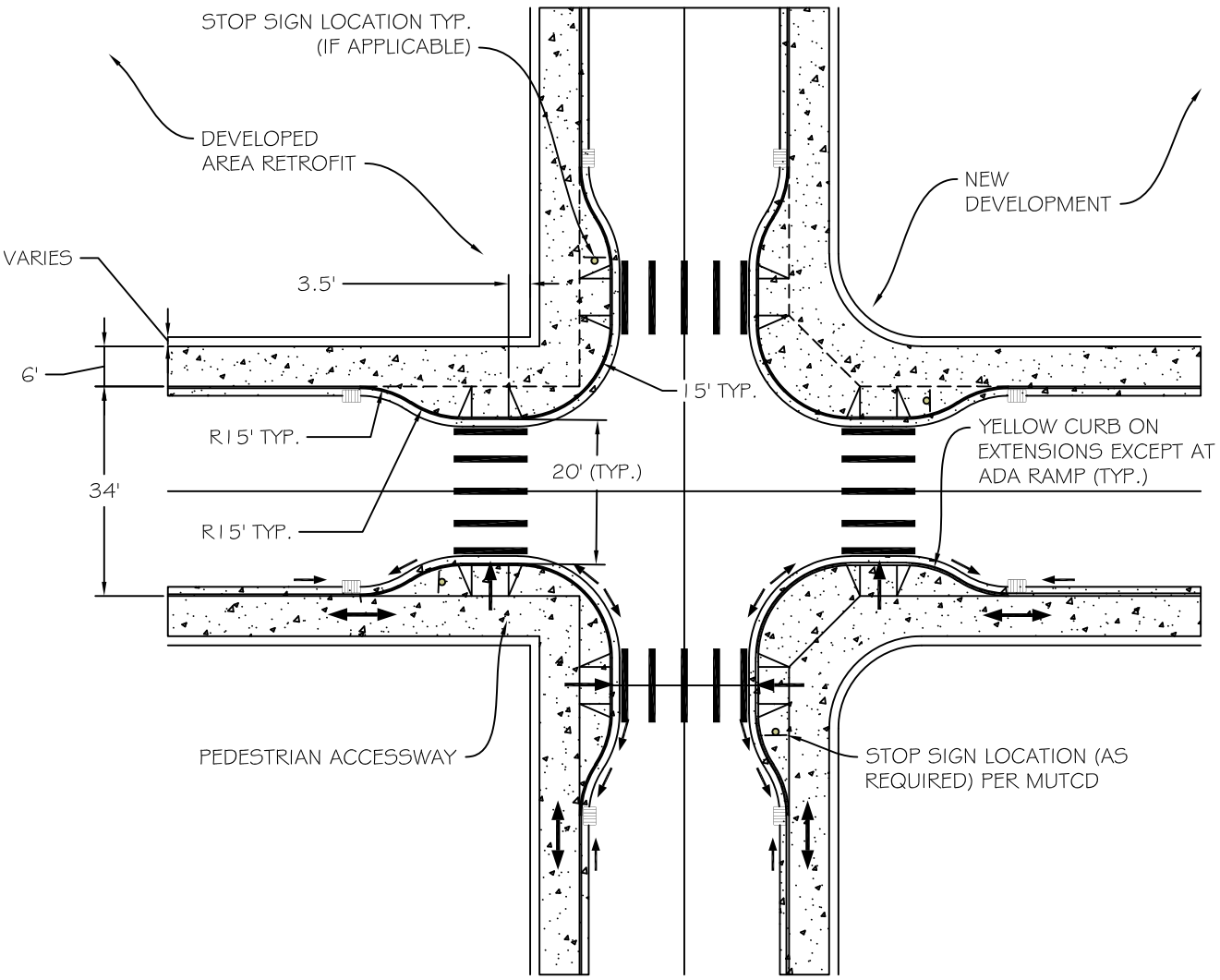
1. STAMPS SHALL BE OBTAINED AND PREPARED BY THE CONTRACTOR OR SUBCONTRACTOR INSTALLING THE CURBS.
2. CONTRACTOR SHALL OBTAIN PUBLIC WORKS APPROVAL OF STAMPS A MINIMUM OF TWO BUSINESS DAYS PRIOR TO PLACING CONCRETE.
3. STAMPS IN TOP OF CURB SHALL BE SET IN GREEN CONCRETE AFTER INITIAL FINISHING TO A MINIMUM DEPTH OF 3/8".
4. FAILURE TO INSTALL STAMPS AT TIME OF CURB INSTALLATION WILL REQUIRE INSTALLATION OF BERNTSEN BP2-U UTILITY MARKERS WITH ANCHOR PLUG OR APPROVED EQUAL. PLASTIC MARKERS ARE NOT AN APPROVED SUBSTITUTE.
5. CENTER STAMP ON TOP OF CURB FACING CENTERLINE OF ROADWAY.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

CURB AND GUTTER STAMP

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1100



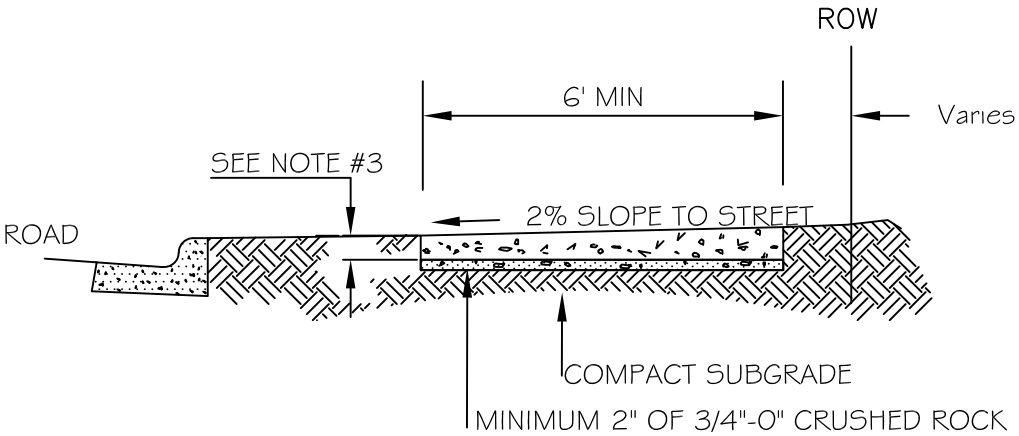
1. EXTENSIONS ARE INTENDED TO SIMULATE A PARKED VEHICLE, THEREFORE SHALL ONLY BE ALLOWED WITH ON-STREET PARKING.
2. EXTENSION SHALL BE CONCRETE SO AS NOT TO RESTRICT SIGHT DISTANCE. PCC SHALL BE 6" THICK WITH 4" OF COMPACTED BASE ROCK.
3. INTERSECTION RADII SHALL BE CHECKED TO ASSURE SAFE PASSAGE OF THE DESIGN VEHICLE. IN ALL CASES, EMERGENCY VEHICLES SHALL BE ACCOMMODATED. USE OF THE OPPOSING LANE MAY BE ALLOWED BY THE PUBLIC WORKS DIRECTOR.
4. DRAINAGE SHALL NOT TRAP WATER WITHIN THE ADA RAMP AND GRADING SHALL CONVEY RUNOFF AWAY FROM INTERSECTION TO STORM CATCH BASINS.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

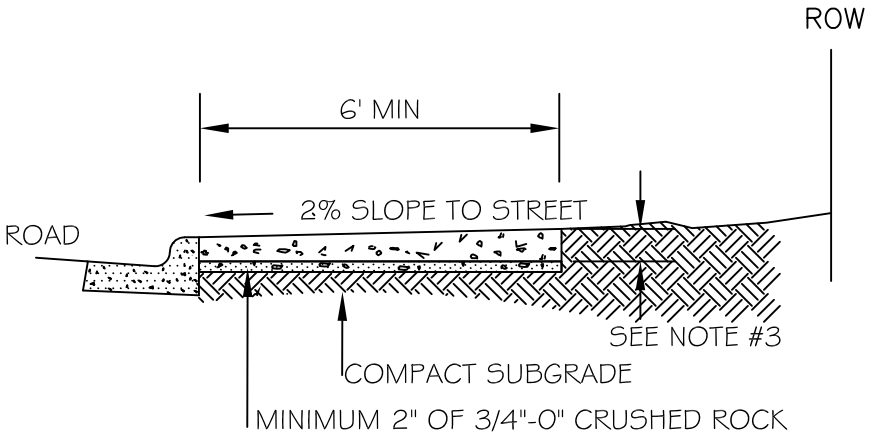
CURB EXTENSION - LOCAL STREET

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1105



OFFSET SIDEWALK



CURB TIGHT SIDEWALK

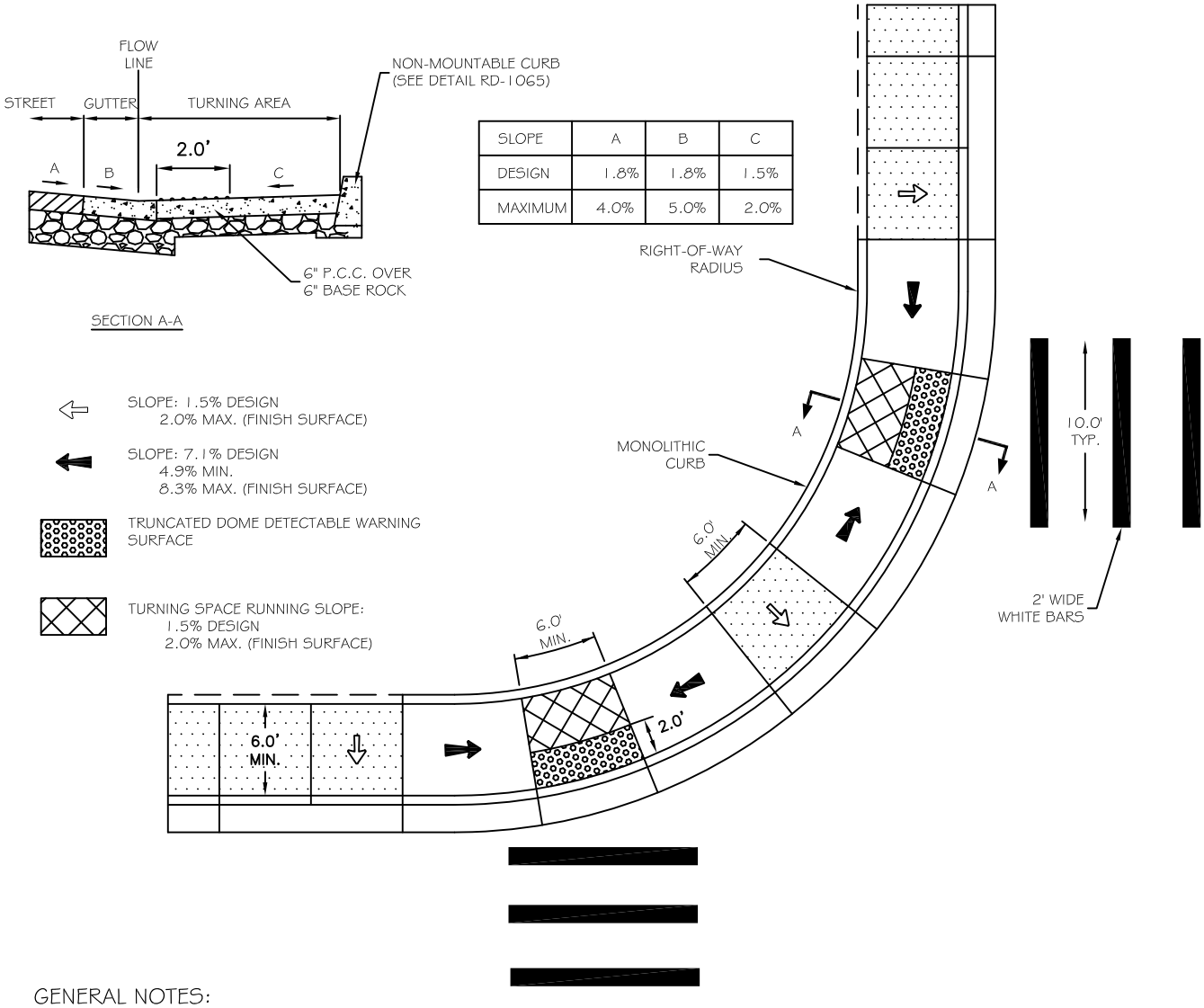
1. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI. AT 28 DAYS.
2. PANELS TO BE 6 FEET LONG.
3. SIDEWALK SHALL HAVE A MINIMUM THICKNESS OF 4". SIDEWALK THICKNESS SHALL BE INCREASED TO 6" AT:
   - 3.1. CURB TIGHT SIDEWALK AT INTERSECTION RADIUS.
   - 3.2. A MINIMUM OF ONE PANEL BEYOND EDGES OF ALL DRIVEWAYS.
4. DRAIN BLOCKOUTS IN CURBS SHALL BE EXTENDED TO BACK OF SIDEWALK WITH 3" DIA. PLASTIC PIPE AT MINIMUM 1% SLOPE. CONSTRUCTION JOINT TO BE PLACED OVER PIPE.
5. BASE ROCK SHALL BE COMPACTED TO PROVIDE A FIRM BASE FOR CONCRETE.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

CONCRETE SIDEWALK

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1110



SLOPE	A	B	C
DESIGN	1.8%	1.8%	1.5%
MAXIMUM	4.0%	5.0%	2.0%

GENERAL NOTES:

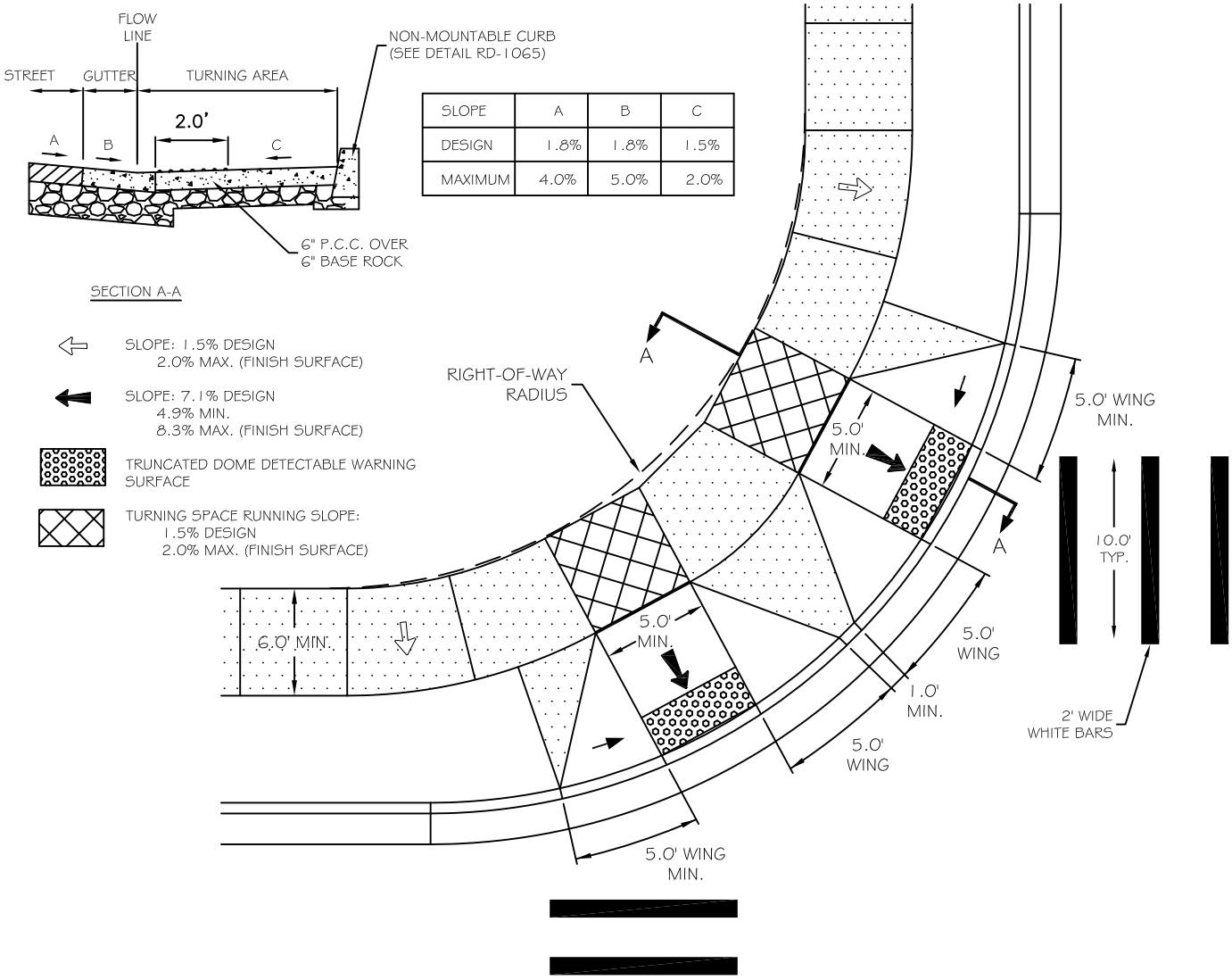
1. PARALLEL RAMPS ARE A SPECIAL APPLICATION AND MAY ONLY BE USED WITH PRIOR APPROVAL FROM THE CITY ENGINEER.
2. SIDEWALK RAMPS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH "PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY" (PROWAG), JULY 2011 EDITION.
3. SIDEWALK RAMPS SHALL BE LOCATED TO MINIMIZE OUT-OF-DIRECTION TRAVEL WHILE MAINTAINING PEDESTRIAN VISIBILITY AND MINIMIZING STREET CROSSING DISTANCES.
4. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
5. BASE ROCK SHALL CONSIST OF COMPACTED 3/4"-0 CRUSHED ROCK.
6. BASE ROCK SHALL BE THOROUGHLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 80 DEGREES OR GREATER.
7. TRUNCATED DOME DETECTABLE WARNING SURFACE SHALL BE INSTALLED THE FULL WIDTH OF THE TURNING AREA AND CONSIST OF (SALEM RED) MASCO CAST-IN-TACT OR APPROVED EQUAL.
8. TURNING SPACES SHALL HAVE A MINIMUM WIDTH OF 6 FEET AND MINIMUM DEPTH OF 6 FEET. WHERE SIDEWALK RAMPS ARE USED TO PROVIDE BICYCLE ACCESS, THE MINIMUM TURNING SPACE WIDTH SHALL BE 8 FEET.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

CURB TIGHT SIDEWALK RAMP INTERSECTION

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1115



SLOPE	A	B	C
DESIGN	1.8%	1.8%	1.5%
MAXIMUM	4.0%	5.0%	2.0%

GENERAL NOTES:

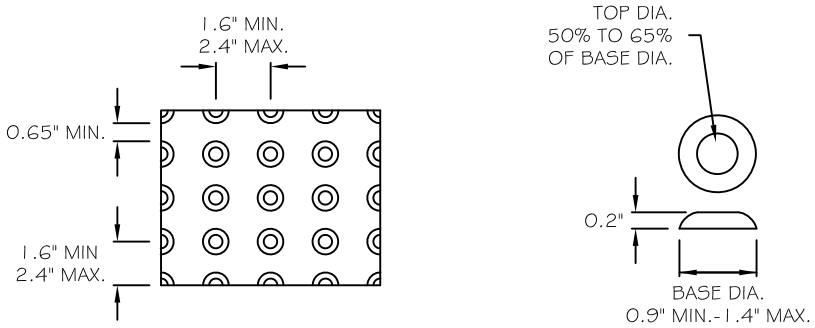
1. PARALLEL RAMPS ARE A SPECIAL APPLICATION AND MAY ONLY BE USED WITH PRIOR APPROVAL FROM THE CITY ENGINEER.
2. SIDEWALK RAMPS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH "PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY" (PROWAG), JULY 2011 EDITION.
3. SIDEWALK RAMPS SHALL BE LOCATED TO MINIMIZE OUT-OF-DIRECTION TRAVEL WHILE MAINTAINING PEDESTRIAN VISIBILITY AND MINIMIZING STREET CROSSING DISTANCES.
4. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
5. BASE ROCK SHALL CONSIST OF COMPACTED 3/4"-0 CRUSHED ROCK.
6. BASE ROCK SHALL BE THOROUGHLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 80 DEGREES OR GREATER.
7. TRUNCATED DOME DETECTABLE WARNING SURFACE SHALL BE INSTALLED THE FULL WIDTH OF THE TURNING AREA AND CONSIST OF (SALEM RED) MASCO CAST-IN-TACT OR APPROVED EQUAL.
8. TURNING SPACES SHALL HAVE A MINIMUM WIDTH OF 6 FEET AND MINIMUM DEPTH OF 6 FEET. WHERE SIDEWALK RAMPS ARE USED TO PROVIDE BICYCLE ACCESS, THE MINIMUM TURNING SPACE WIDTH SHALL BE 8 FEET.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

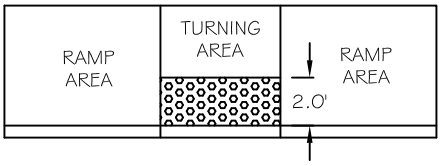
PROPERTY LINE SIDEWALK RAMP INTERSECTION

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

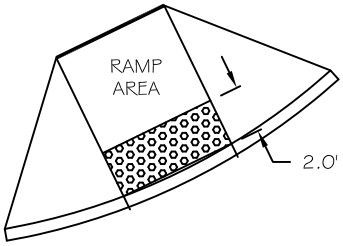
R-1120



TRUNCATED DOME DETECTABLE
WARNING SURFACE DETAIL



PARALLEL RAMP



STANDARD
PERPENDICULAR RAMP

GENERAL NOTES:

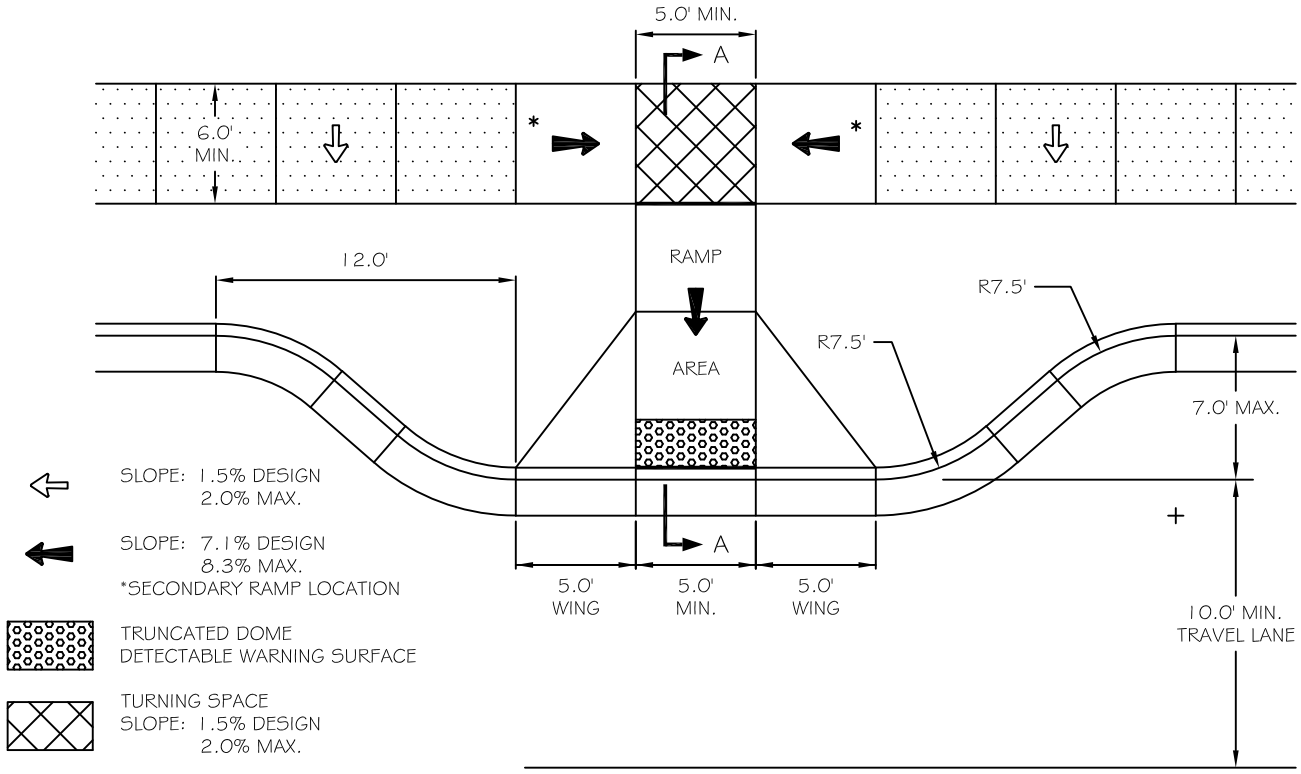
1. DETECTABLE WARNING SURFACE SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH "PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY" (PROWAG), CURRENT EDITION.
2. THE DETECTABLE WARNING SURFACE SHALL EXTEND 2.0 FEET MINIMUM IN THE DIRECTION OF PEDESTRIAN TRAVEL.
3. TRUNCATED DOME DETECTABLE WARNING SURFACE SHALL BE INSTALLED THE FULL WIDTH OF THE TURNING AREA ON PARALLEL RAMPS.
4. TRUNCATED DOME DETECTABLE WARNING SURFACE SHALL BE INSTALLED THE FULL WIDTH OF THE RAMP AREA ON PERPENDICULAR RAMPS.
5. TRUNCATED DOM DETECTABLE WARNING SURFACES SHALL CONSIST OF (BLACK) MASCO CAST-IN-TACT ¢ CAST-IN-TACT III OR APPROVED EQUAL.
6. ARRANGE TRUNCATED DOMES USING SQUARE IN-LINE PATTERN ONLY.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

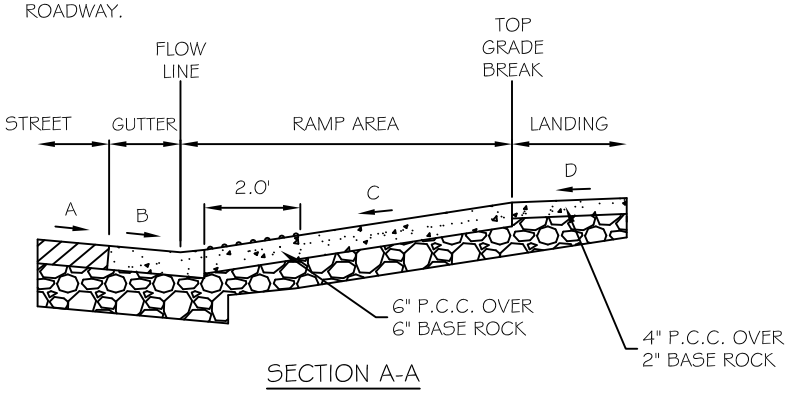
DETECTABLE WARNING SURFACE

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1130



CROSS SLOPE OF TURNING AREA, RAMP AREA, AND PEDESTRIAN STREET CROSSING SHALL NOT BE GREATER THAN THE SLOPE OF THE ADJACENT ROADWAY.



SECTION A-A

SLOPE	A	B*	C*,°	D
DESIGN	1.8%	1.8%	7.1%	1.5%
MAXIMUM	4.0%	5.0%	8.3%	2.0%

*THE ALGEBRAIC DIFFERENCE BETWEEN B & C SHALL NOT EXCEED 11.0%.
°THE MINIMUM SLOPE FOR THE PRIMARY RAMP AREA IS 4.9%

GENERAL NOTES:

1. SIDEWALK RAMPS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH "PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY" (PROWAG), CURRENT EDITION.
2. SIDEWALK RAMPS SHALL BE LOCATED PERPENDICULAR TO THE CURBLINE.
3. PROVIDE CURB EXTENSION AT MID-BLOCK PEDESTRIAN STREET CROSSINGS WITH ON-STREET PARKING.
4. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3300 PSI AT 28 DAYS.
5. BASE ROCK SHALL CONSIST OF 3/4"-0 CRUSHED ROCK COMPACTED TO 95% OF AASHTO T-180.
6. BASE ROCK SHALL BE THOROUGHLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 80 DEGREES OR GREATER.
7. TRUNCATED DOME DETECTABLE WARNING SURFACE SHALL BE INSTALLED THE FULL WIDTH OF THE RAMP AND CONSIST OF (BLACK) MASCO CAST-IN-TACT & CAST-IN-TACT III OR APPROVED EQUAL.
8. ON STEEP SLOPES, SIDEWALK RAMPS SHALL HAVE A MAXIMUM SLOPE OF 8.3% OR MAXIMUM LENGTH OF 15 FEET CONSTRUCTED AT CONSTANT SLOPE.
9. SIDEWALK RAMPS SHALL HAVE A MINIMUM WIDTH OF 5 FEET. WHERE SIDEWALK RAMPS ARE USED TO PROVIDE BICYCLE ACCESS, THE MINIMUM RAMP WIDTH SHALL BE 8 FEET.

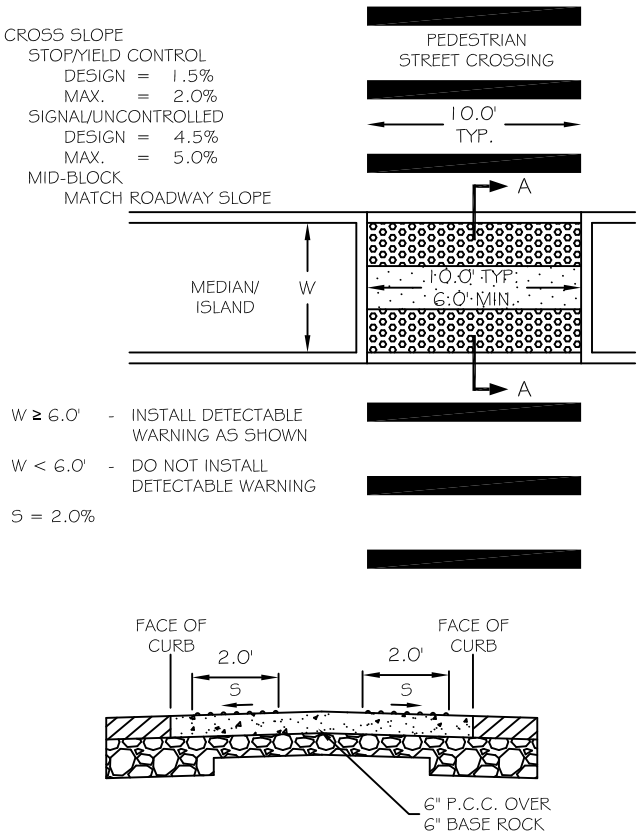
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

MID-BLOCK PERPENDICULAR RAMP

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

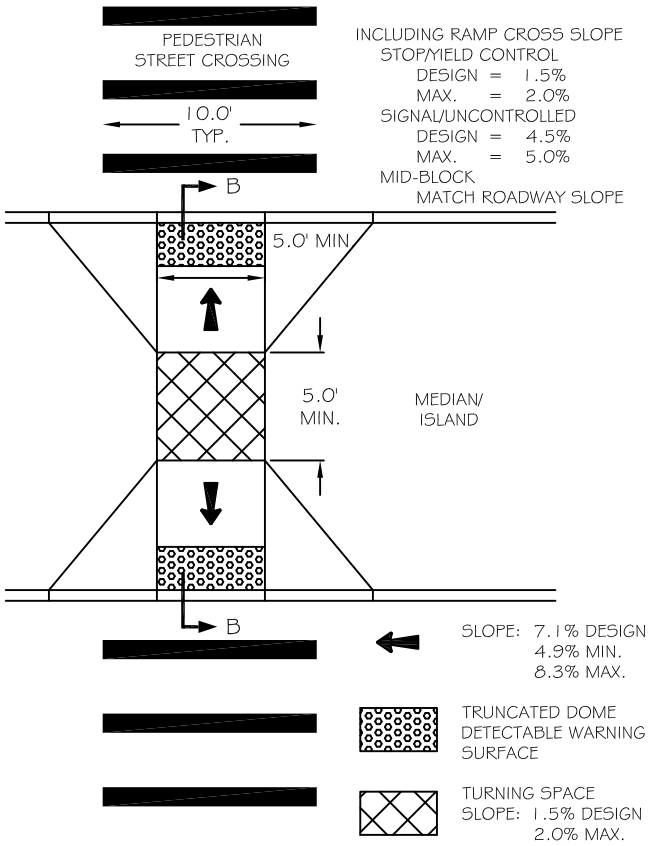
R-1135

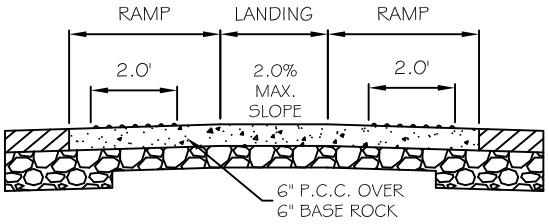
CUT THROUGH PEDESTRIAN REFUGE



SECTION A-A

RAMPED PEDESTRIAN REFUGE





SECTION B-B

GENERAL NOTES:

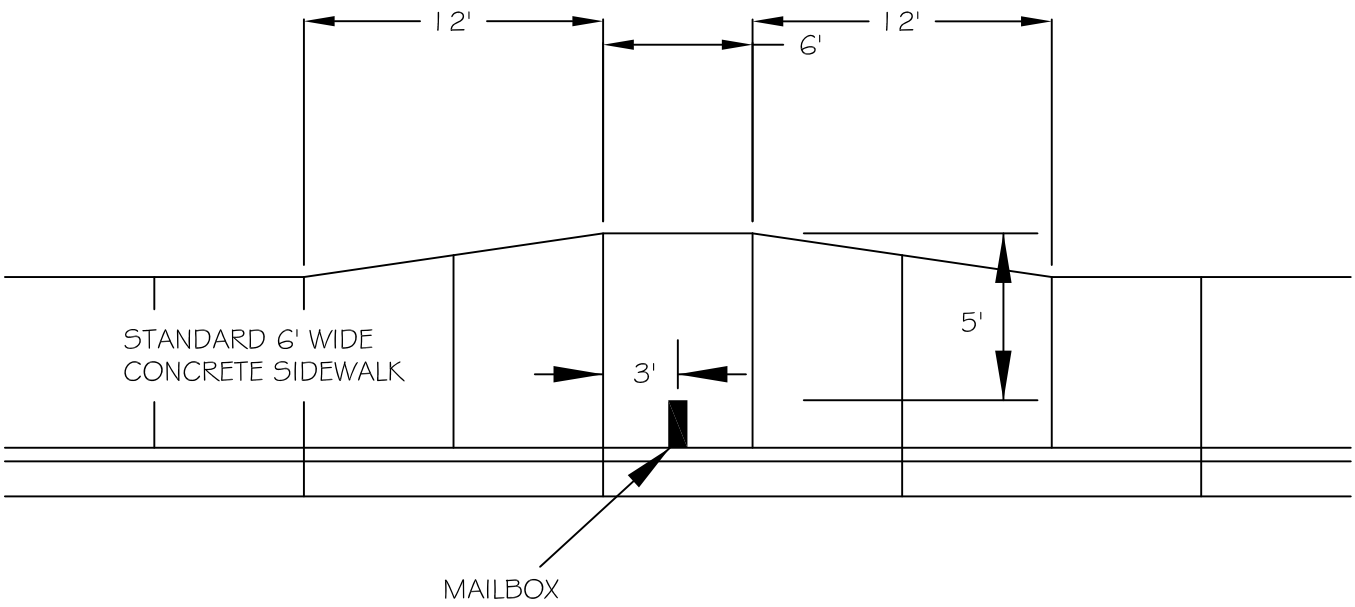
1. SIDEWALK RAMPS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH "PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY" (PROWAG), CURRENT EDITION.
2. SIDEWALK RAMPS SHALL BE LOCATED PERPENDICULAR TO THE CURBLINE AND TO MINIMIZE OUT-OF-DIRECTION TRAVEL WHILE MAINTAINING PEDESTRIAN VISIBILITY AND MINIMIZING STREET CROSSING DISTANCES.
3. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
4. BASE ROCK SHALL CONSIST OF 3/4"-0 CRUSHED ROCK COMPACTED TO 95% OF AASHTO T-180.
5. BASE ROCK SHALL BE THOROUGHLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 80 DEGREES OR GREATER.
6. TRUNCATED DOME DETECTABLE WARNING SURFACE SHALL BE INSTALLED THE FULL WIDTH OF THE RAMP AND CONSIST OF (BLACK) MASCO CAST-IN-TACT ⅈ CAST-IN-TACT III OR APPROVED EQUAL.
7. ON STEEP SLOPES, SIDEWALK RAMPS SHALL HAVE A MAXIMUM SLOPE OF 8.3% OR MAXIMUM LENGTH OF 15 FEET CONSTRUCTED AT CONSTANT SLOPE.
8. SIDEWALK RAMPS SHALL HAVE A MINIMUM WIDTH OF 5 FEET. WHERE SIDEWALK RAMPS ARE USED TO PROVIDE BICYCLE ACCESS, THE MINIMUM RAMP WIDTH SHALL BE 8 FEET.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

PEDESTRIAN ISLAND REFUGE

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1140



STREET

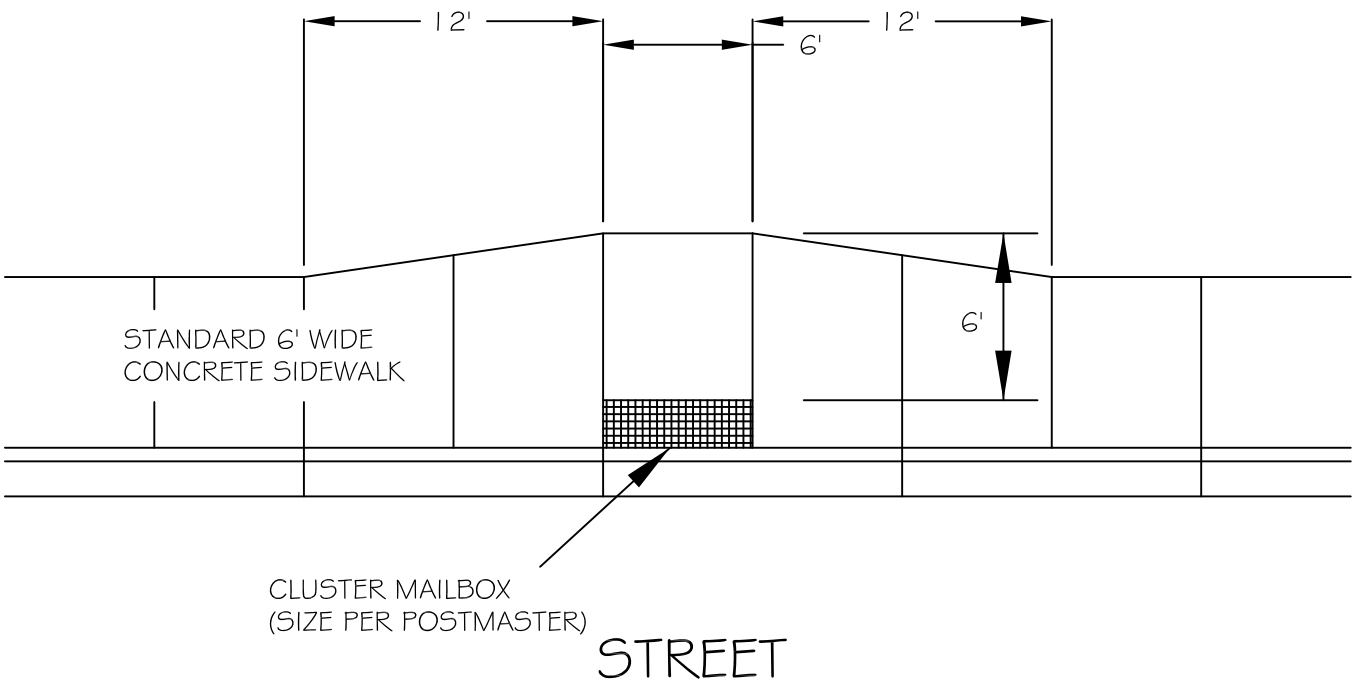
Notes:

1. CONSTRUCT WIDENED SIDEWALK AT ALL MAILBOX LOCATIONS.
2. MAILBOX PLACEMENT SPECIFICATIONS:
   - -FRONT FACE OF MAILBOX TO BE SET BACK 6" FROM FACE OF CURB.
   - -BASE OF MAILBOX TO BE 40" ABOVE PAVEMENT GRADE AT GUTTER.
   - -MAINTAIN 5' CLEARANCE BETWEEN BACK OF MAILBOX AND BACK OF WALK.
3. WIDENED SIDEWALK OUTSIDE OF PUBLIC RIGHT OF WAY SHALL HAVE A SIDEWALK EASEMENT DEDICATED TO THE CITY.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

SIDEWALK AT SINGLE MAILBOX

DRAWN BY	PW	2/2025	R-1145
CHECKED BY	MWH	2/2025	



Notes:

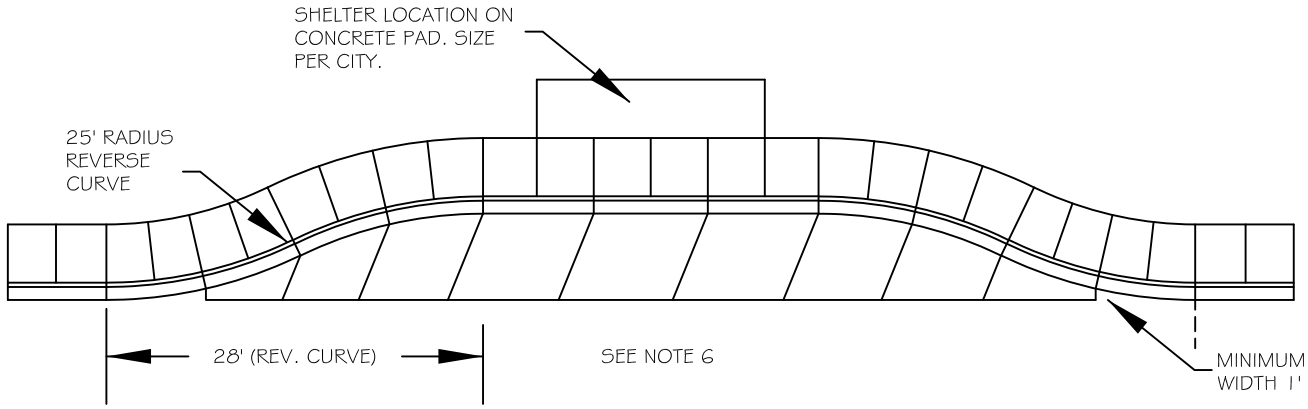
1. CLUSTERED MAILBOX/CENTRALIZED BOX UNITS ARE FREE STANDING MAILBOX UNITS WITH MULTIPLE LOCKED MAILBOXES.
2. CONSTRUCT WIDENED SIDEWALK WITH A MINIMUM OF 6 FEET OF CLEAR SPACE PROVIDED AT FRONT OF EACH MAILBOX UNIT.
3. AT LEAST ONE CLEAR PEDESTRIAN ACCESS ROUTE WITH CURB RAMP SHALL BE PROVIDED WITHIN 50 FEET OF CLUSTERED MAILBOX UNIT FROM THE VEHICULAR WAY
4. BACK OF CLUSTERED MAILBOX TO BE SET BACK 6" FROM FACE OF CURB.
5. WIDENED SIDEWALK OUTSIDE OF PUBLIC RIGHT OF WAY SHALL HAVE A SIDEWALK EASEMENT DEDICATED TO THE CITY.
6. LOCATION OF CLUSTERED MAILBOX SHALL BE COORDINATED WITH THE LOCAL POSTMASTER.

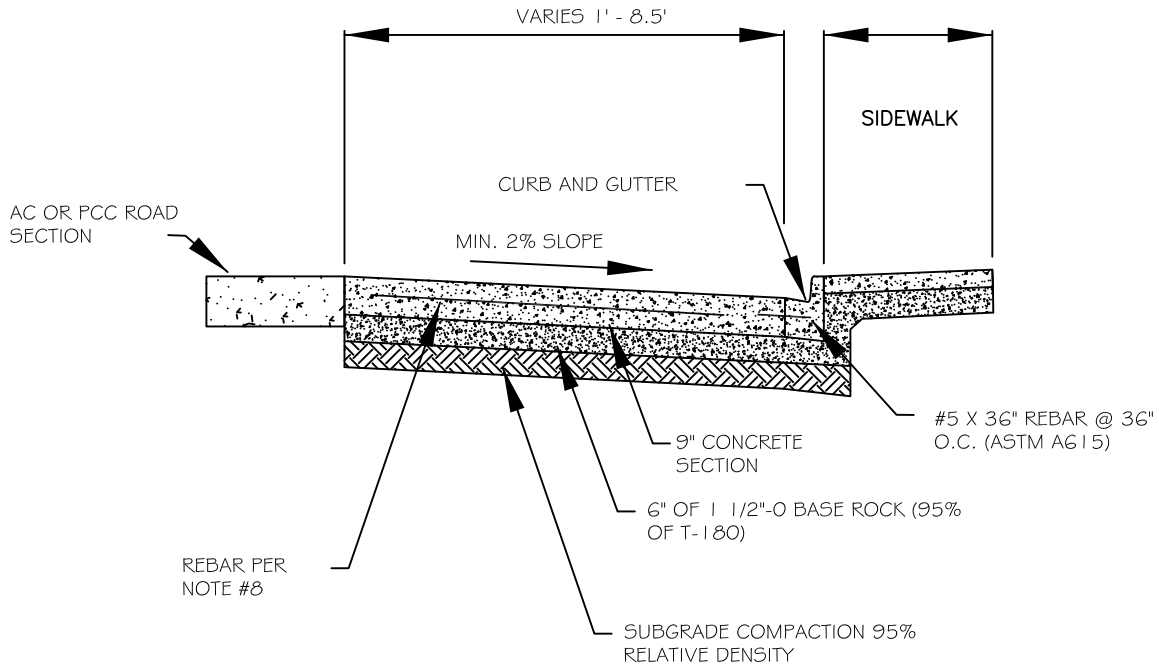
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

SIDEWALK AT CLUSTERED MAILBOX

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1150





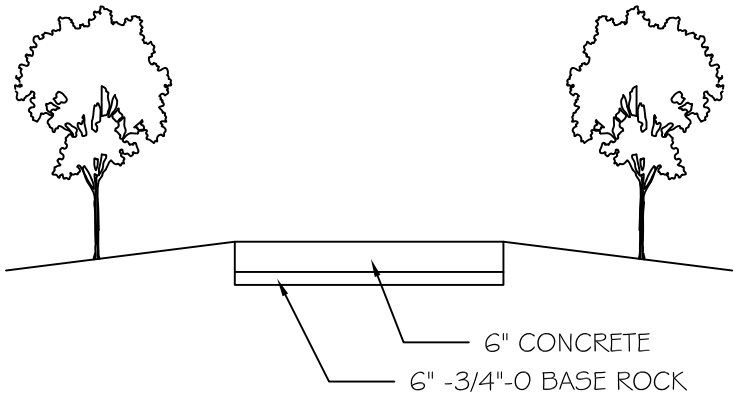
NOTES:

1. CONCRETE SHALL BE 4,000 PSI IN 28 DAYS.
2. TRANSVERSE CONTRACTION JOINTS SHALL BE SAWCUT AND FILLED WITH APPROVED JOINT SEALANT.
3. JOINT SPACING SHALL MATCH CURB JOINT SPACING BUT BE NO MORE THAN 12' O.C.
4. JOINT SKEW SHALL BE 6:1 AND MATCH SKEW IN CONCRETE STREETS.
5. CONSTRUCTION JOINTS WITH PCC STREET AND CURB SHALL BE DOWELED WITH #5 REBAR, 3' O.C..
6. MINIMUM LENGTH TO BE APPROVED BY THE TRANSIT DIRECTOR AND CITY ENGINEER.
7. BASE COURSE SHALL BE THOROUGHLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 80 DEGREES OR GREATER.
8. TRANSIT PAD SHALL BE REINFORCED WITH #4 REBAR, 1' O.C. EACH WAY, 2" ABOVE BASE ROCK.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

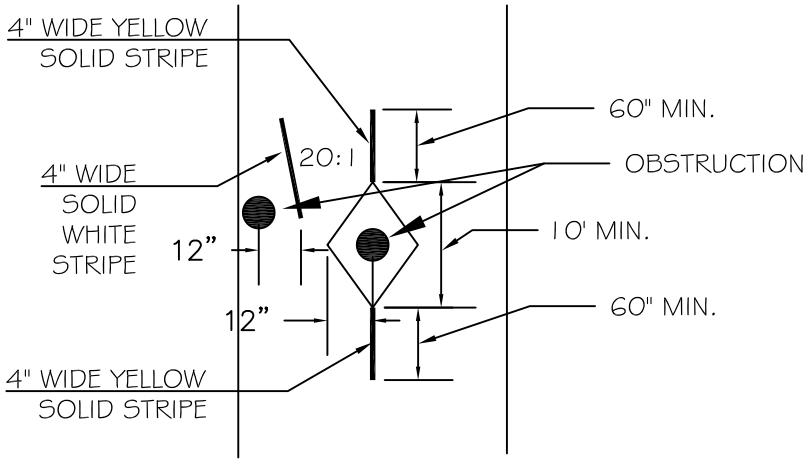
TRANSIT BUS TURNOUT

DRAWN BY	PW	2/2025	R-1155
CHECKED BY	MWH	2/2025	



NOTES:

1. SHARED USE PATHS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH "PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY" (PROWAG) CURRENT EDITION.
2. SHARED USE PATHS SHALL HAVE A LIGHT BROOM FINISH TRANSVERSE TO THE LINE OF TRAVEL.
3. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
4. BASE ROCK SHALL BE COMPACTED TO 95% OF AASHTO T-180.
5. CONCRETE SHARED USE PATHS SHALL BE CONSTRUCTED OF PANELS THAT ARE OF EQUAL SIZE, SQUARE AND OF CONSISTANT DIMENSION ALONG THE FULL LENGTH OF THE PATH. PANELS SHALL HAVE NO DIMENSION GREATER THAN 6 FEET.
6. PATHS CONSTRUCTED ADJACENT TO SLOPES GREATER THAN 3H:1V OR A CHANGE OF ELEVATION GREATER THAN 18" SHALL BE PROTECTED WITH AN APPROVED HANDRAIL SYSTEM.
7. CITY APPROVED ROOT BARRIER METHOD TO BE USED FOR ALL STREET TREES LOCATED WITHIN 8 FEET OF SHARED USE PATHS. ROOT BARRIER SHALL EXTEND TO A DISTANCE OF 20' CENTERED WITH THE TREE BASE. BARRIER SHALL BE 2" - 4" FROM THE PATH FACE AND EXTEND A MINIMUM OF 24" IN DEPTH.



OBSTRUCTION NOTES:

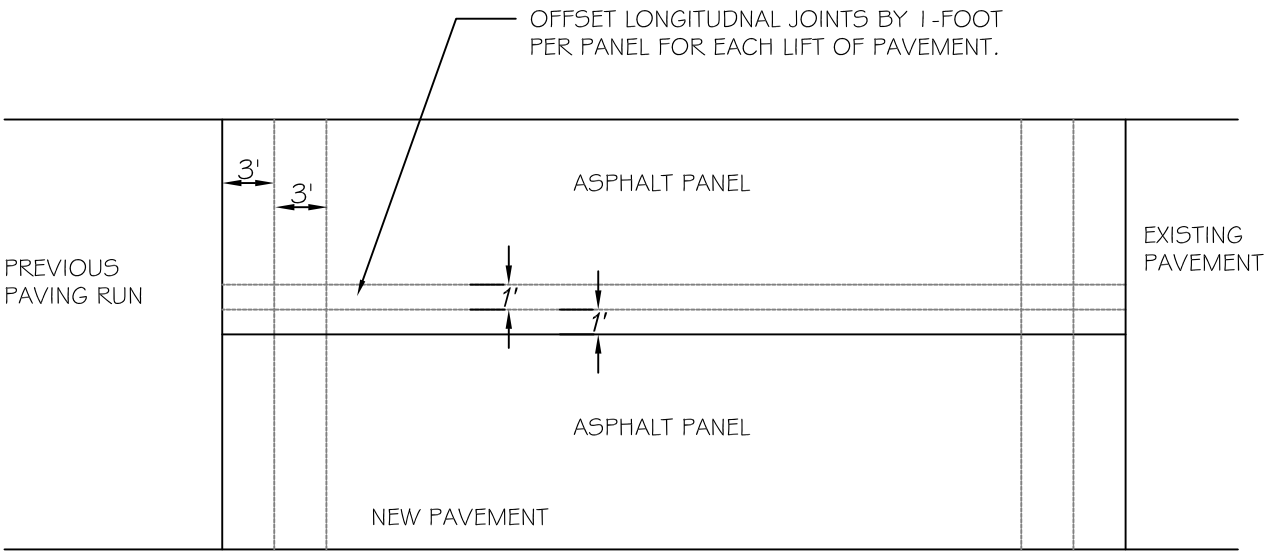
1. SIGNAGE AND PAVEMENT MARKINGS FOR SHARED USE PATHS SHALL BE PROVIDED IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE MUTCD, PART 9.
2. ON PATHS WITH HEAVY VOLUMES OF TRAFFIC, PROVIDE A 4" WIDE YELLOW CENTERLINE SKIP STRIPE (3' STRIPE / 9' GAP.
3. ON PATHS WITH LIMITED SITE VISION OR CURVES, PROVIDE A 4" YELLOW CENTERLINE SOLID STRIPE.

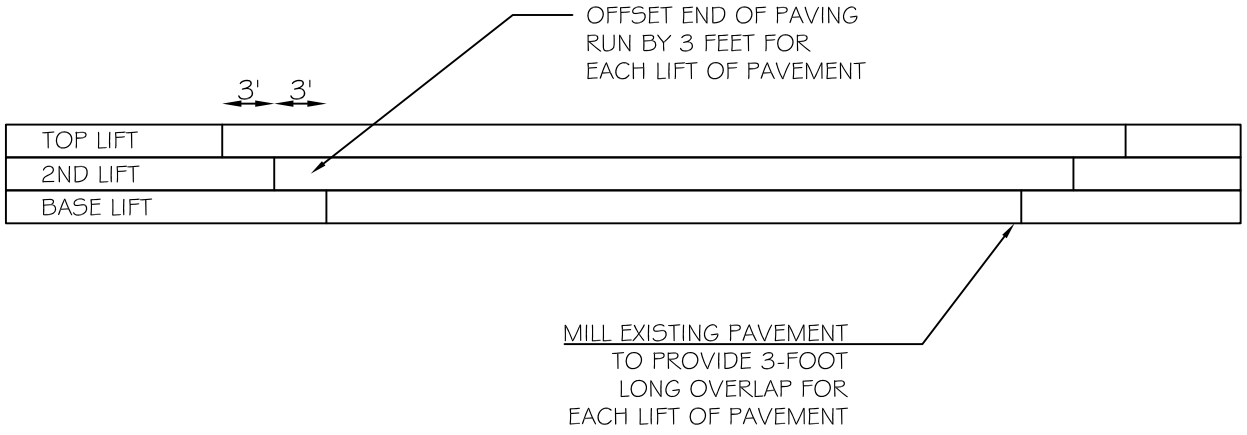
Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

SHARED USE PATH

DRAWN BY	PW	2/2025	R-1160
CHECKED BY	MWH	2/2025	





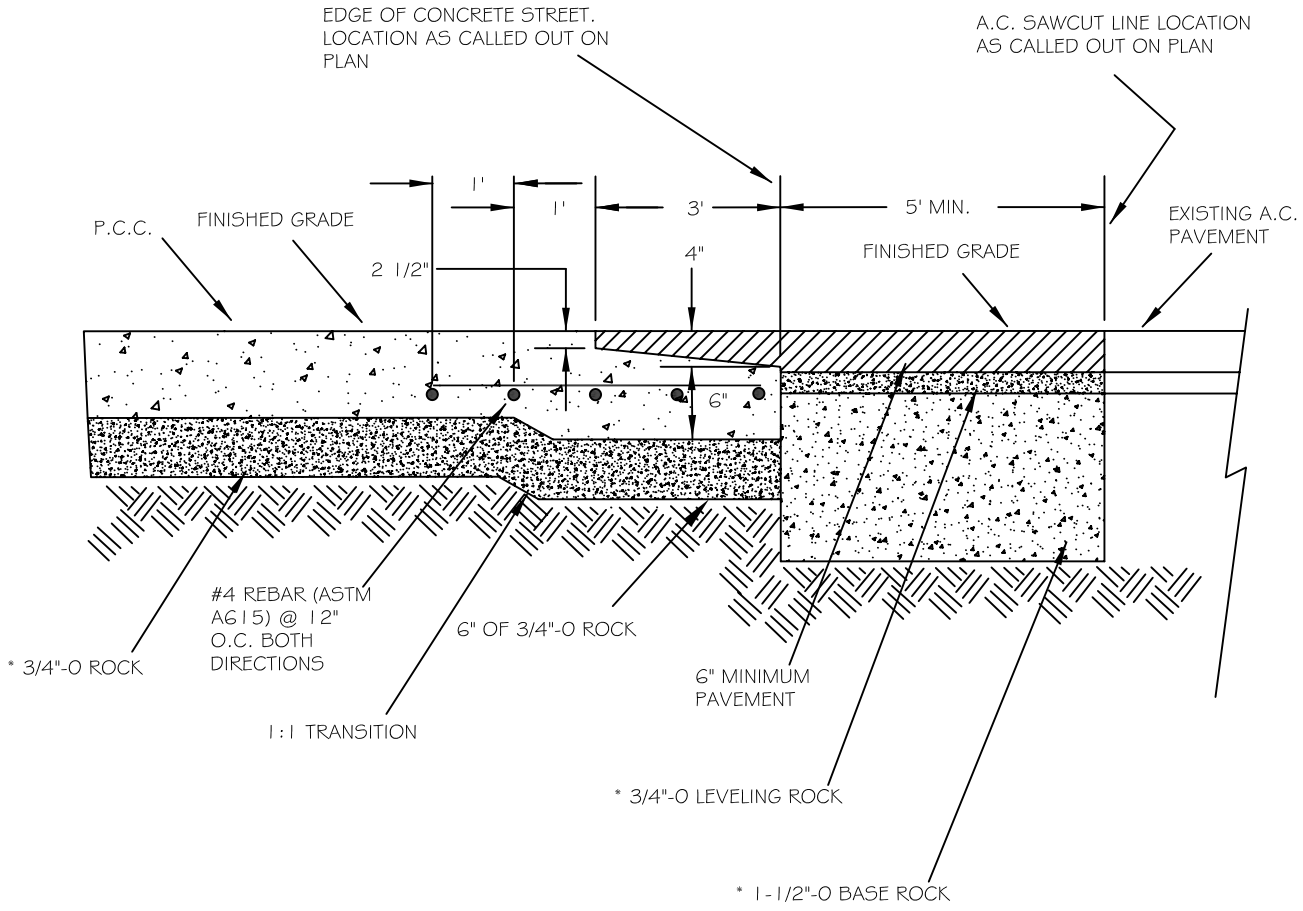
NOTES:
PRIOR TO PLACING NEW PAVEMENT, ASPHALT COLD JOINTS SHALL BE SAWCUT TO A STRAIGHT LINE, CREATING A SMOOTH, SOUND EDGE FOR JOINING NEW PAVEMENT.

Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

ASPHALT PAVEMENT PLACEMENT

DRAWN BY	PW	2/2025	R-1165
CHECKED BY	MWH	2/2025	



NOTES:

1. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.
2. BASE ROCK SHALL BE COMPACTED TO 95% OF AASHTO T-180.
3. BASE COURSE SHALL BE THOROUGHLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 80 DEGREES OR GREATER

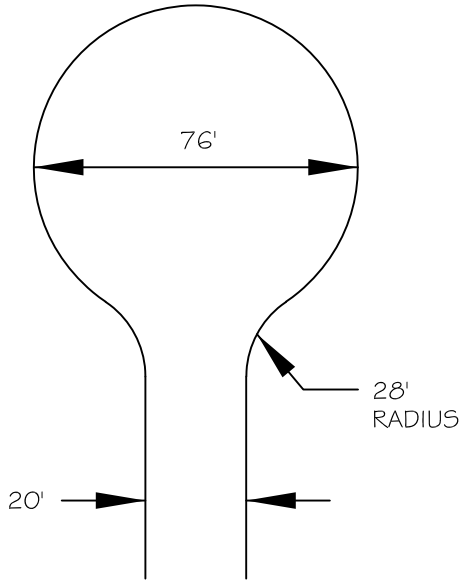
* ROCK SECTIONS VARY DEPENDING ON STRUCTURAL DESIGN OR STREET SECTIONS.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

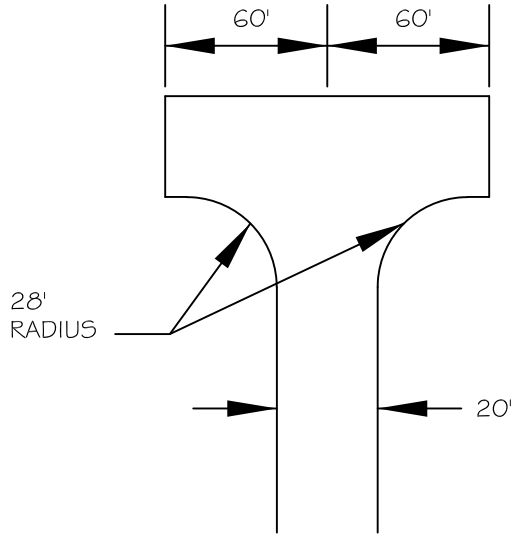
AC TO PCC PAVING CONNECTION

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

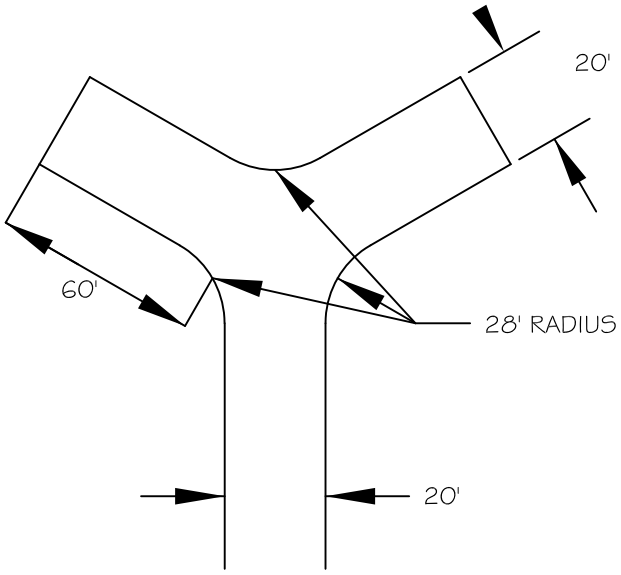
R-1170



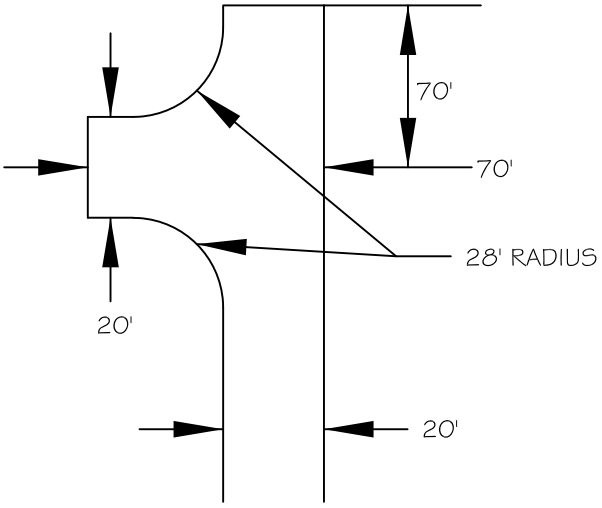
CUL-DE-SAC



HAMMERHEAD



HAMMERHEAD
ALTERNATIVE 1



HAMMERHEAD
ALTERNATIVE 2

NOTE:

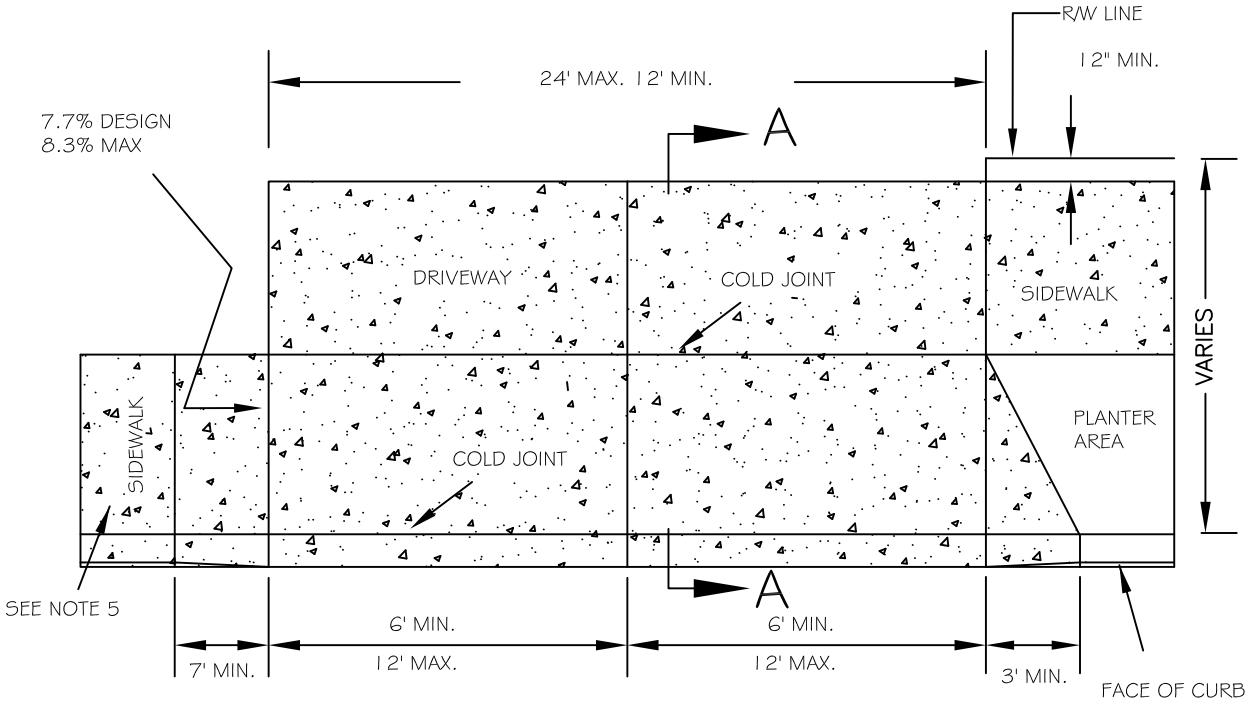
1. APPROVAL FOR ALTERNATIVE TO CUL-DE-SAC SHALL BE APPROVED BY THE CITY ENGINEER AND THE FIRE MARSHALL.
2. ALL DISTANCES ARE MEASURED TO THE FACE OF CURB.
3. ALL DIMENSIONS SHOWN ARE MINIMUM TURNING MOVEMENT CLEAR ZONES. STREET WIDTHS SHALL MEET THE CURRENT VERSION OF THE PUBLIC WORKS STANDARDS AND TRANSPORTATION MASTER PLAN.

Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

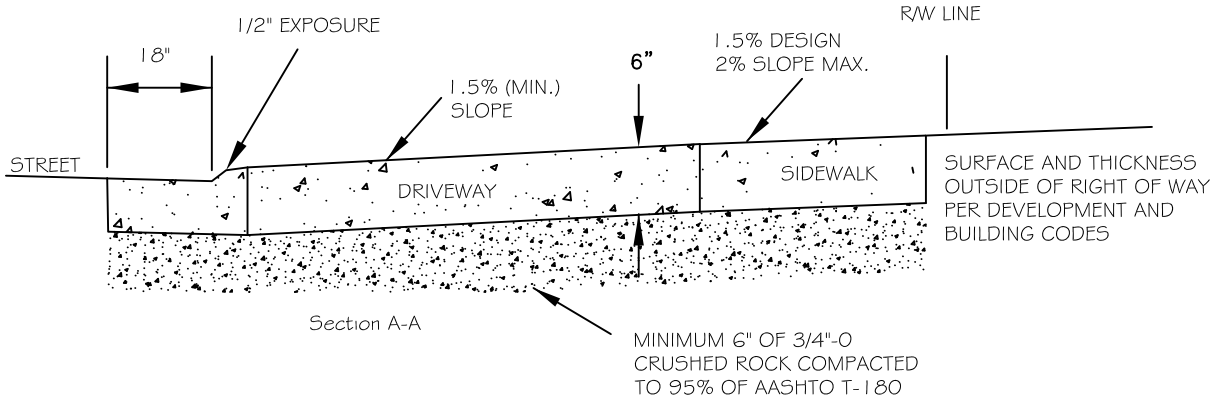
FIRE DISTRICT TURN AROUND

DRAWN BY	PW	2/2025	R-1175
CHECKED BY	MWH	2/2025	



CURB TIGHT SIDEWALK

SIDEWALK BEHIND PLANTER STRIP



NOTES

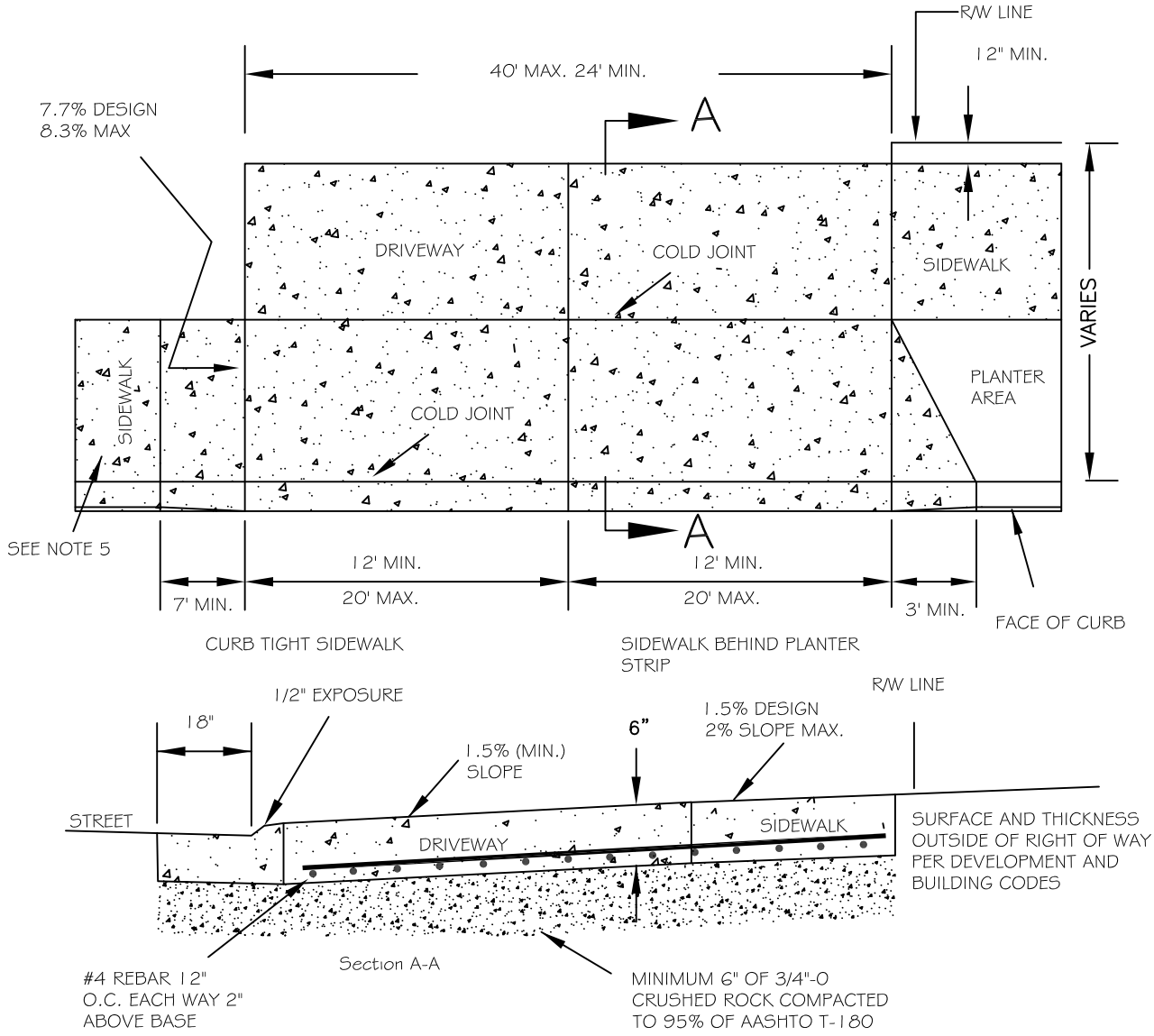
1. DRIVEWAYS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH "PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY" (PROWAG) CURRENT EDITION.
2. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
3. BASE COURSE SHALL BE THOROUGHTLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 80 DEGREES OR GREATER.
4. CURB JOINT SHALL BE A TROWELED JOINT WITH A MIN. 1/2" RADIUS ALONG THE BACK OF CURB.
5. SIDEWALK THICKNESS SHALL BE 6 INCHES MINIMUM AND EXTEND TO AT LEAST ONE PANEL BEYOND DRIVEWAY APRON. DRIVEWAY FINISH SHALL MATCH FINISH OF THE CONCRETE SIDEWALK.
6. THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL BE DESIGNED AT 1.5% AND NOT EXCEED 2%.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

RESIDENTIAL DRIVEWAY

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1180



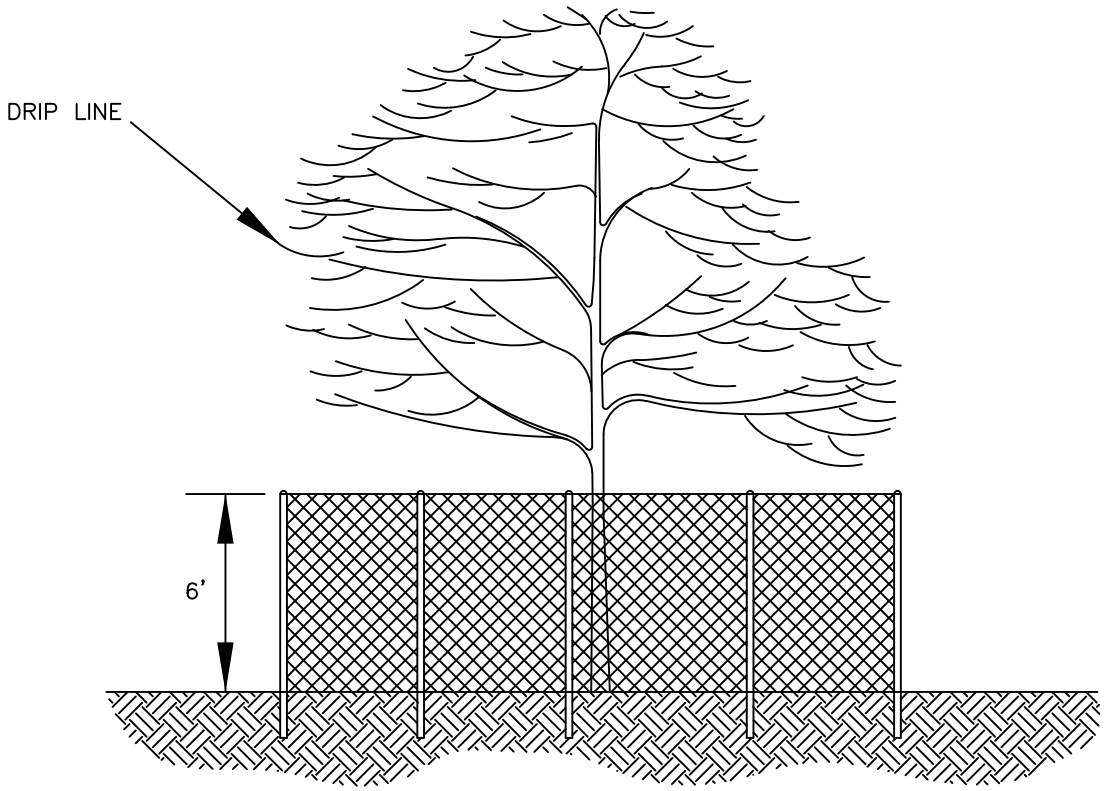
NOTES

1. DRIVEWAYS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH "PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY" (PROWAG) CURRENT EDITION.
2. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
3. BASE COURSE SHALL BE THOROUGHTLY WATERED IMMEDIATELY PRIOR TO PLACEMENT OF CONCRETE WHEN THE MEASURED OR FORECASTED ASCENDING AIR TEMPERATURE IS 80 DEGREES OR GREATER.
4. CURB JOINT SHALL BE A TROWELED JOINT WITH A MIN. 1/2" RADIUS ALONG THE BACK OF CURB.
5. SIDEWALK THICKNESS SHALL BE 6 INCHES MINIMUM AND EXTEND TO AT LEAST ONE PANEL BEYOND DRIVEWAY APRON. DRIVEWAY FINISH SHALL MATCH FINISH OF THE CONCRETE SIDEWALK.
6. THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL BE DESIGNED AT 1.5% AND NOT EXCEED 2%.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

COMMERCIAL-INDUSTRIAL DRIVEWAY

DRAWN BY	PW	2/2025	R-1185
CHECKED BY	MWH	2/2025	



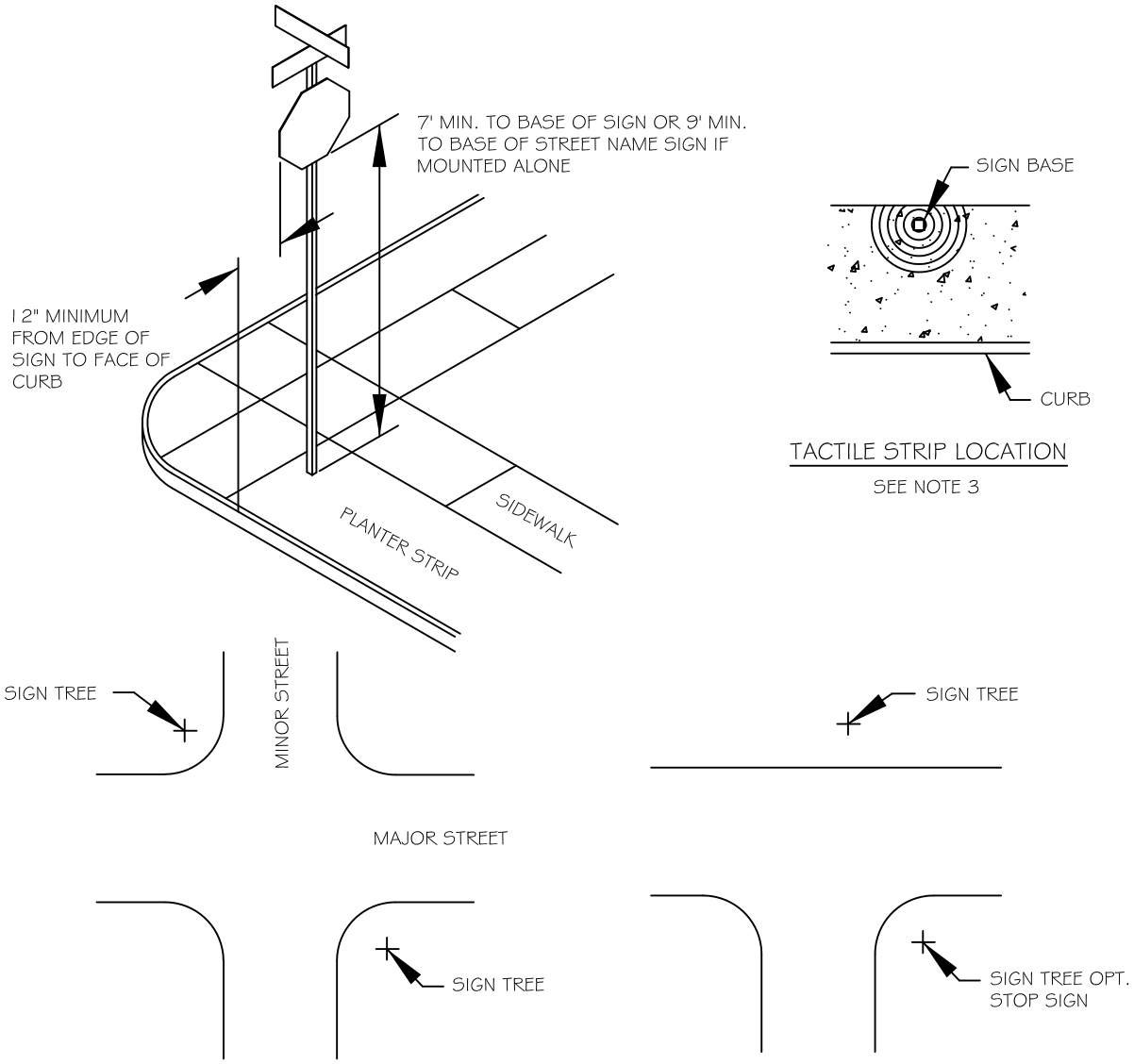
NOTES:

1. FENCE SHALL BE 6' IN HEIGHT AND SET AT TREE DRIP LINE.
2. FENCE MATERIALS SHALL CONSIST OF 2" MESH CHAIN LINKS SECURED TO A MINIMUM 1 1/2" DIA. STEEL OR ALUMINUM LINE POSTS.
3. POSTS SHALL BE SET TO A DEPTH OF NO LESS THAN 2 FEET IN NATIVE SOIL.
4. FENCE SHALL REMAIN IN PLACE UNTIL THE COMPLETION OF CONSTRUCTION ACTIVITIES.
5. MOVEMENT OR REMOVAL OF FENCE REQUIRES APPROVAL BY CITY'S AUTHORIZED REPRESENTATIVE.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

TREE PROTECTION FENCING

DRAWN BY	PW	2/2025	R-1190
CHECKED BY	MWH	2/2025	



TACTILE STRIP LOCATION

SEE NOTE 3

CROSS INTERSECTION

TEE INTERSECTION

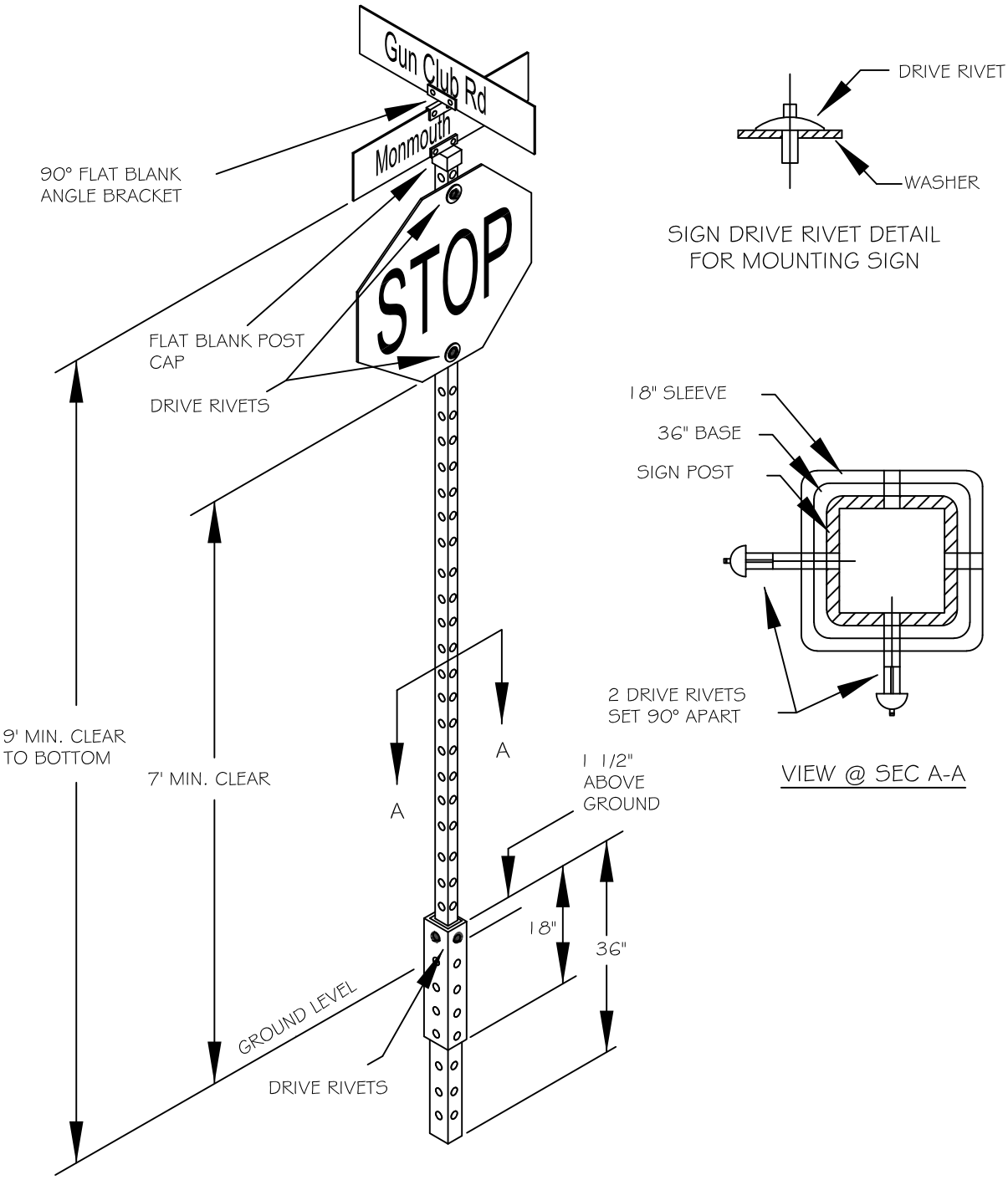
NOTE:

1. SIGN LOCATIONS SHALL BE ACCORDING TO MUTCD AND AS MODIFIED HEREIN.
2. SIGNS WHERE THE SIDEWALK IS CURB TIGHT SHALL BE LOCATED 6" OUTSIDE THE SIDEWALK TO MAXIMUM DISTANCE OF 7' FROM THE FACE OF CURB.
3. IF THE SIDEWALK IS LARGER THAN 6', A TACTILE STRIP 2' WIDE FROM A RADIUS POINT FROM THE BASE OF THE SIGN SHALL BE PLACED IN THE WET CONCRETE.
4. THE TACTILE STRIP SHALL BE MADE BY USING A 1/4" TINE METAL BROOM TO A DEPTH OF 1/4".

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

STREET SIGN LOCATIONS

DRAWN BY	PW	2/2025	R-1195
CHECKED BY	MWH	2/2025	



SIGN DRIVE RIVET DETAIL
FOR MOUNTING SIGN

VIEW @ SEC A-A

NOTES:

1. SIGN POST SHALL BE EMBEDDED 12" INTO BASE.

Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

STREET SIGN ASSEMBLY

DRAWN BY	PW	2/2025	R-1200
CHECKED BY	MWH	2/2025	

S. Main St.

MATERIALS:
STREET NAME SIGN SHALL BE MINIMUM 6" HEIGHT, 0.100" GAUGE FLAT ALODINE FINISH ALUMINUM. THE MINIMUM LENGTH SHALL BE 24" AND MAXIMUM LENGTH SHALL BE 36". BOTH SIDES OF STREET NAME SIGNS SHALL BE GREEN 3M SCOTCHLITE BRAND HIGH INTENSITY REFLECTIVE SHEETING.

LETTERING:
ALL LETTERS AND NUMBERS USED TO FABRICATE A STREET NAME SIGN SHALL BE HIGH INTENSITY SILVER USING 3M SCOTCHLITE BRAND. THE ACTUAL NAME OF THE STREET IS A 4" SERIES 'B'.

INSTALLATION:
MOUNTING HARDWARE SHALL BE STYLE #850F LONG (5") ALUMINUM CAPS/TEES.

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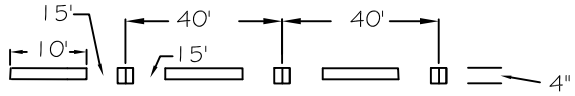
DEPARTMENT OF PUBLIC WORKS

STREET NAME SIGN

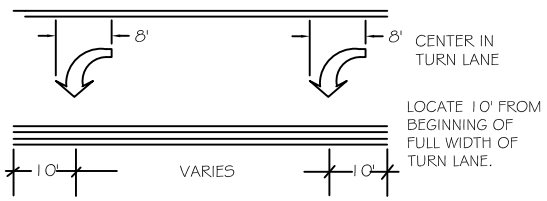
DRAWN BY	PW	2/2025	R-1205
CHECKED BY	MWH	2/2025	

A



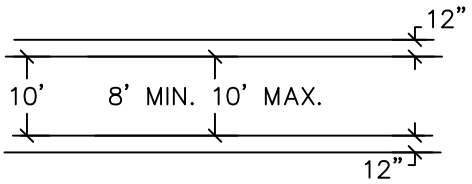
SKIP CENTERLINE:
4" YELLOW LINE WITH TYPE I BI- DIRECTIONAL YELLOW RAISED PAVEMENT MARKERS AT 40' O.C.

B



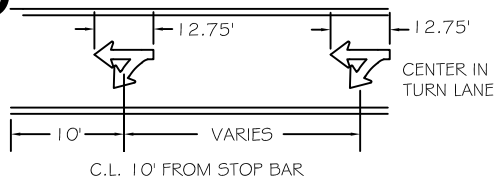
TURN LANE MARKINGS:
SEE MUTCD AND ODOT STANDARD DRAWING FOR DETAILS. ARROWS SHALL BE PREFORMED THERMOPLASTIC PAVEMENT MARKING MATERIAL.

C



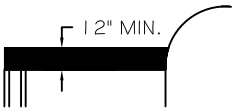
CROSSWALK:
SPACE TWO 12" WHITE LINES AS SHOWN ON PLANS. CROSSWALK SHALL BE THERMOPLASTIC PAVEMENT MARKING MATERIAL

D



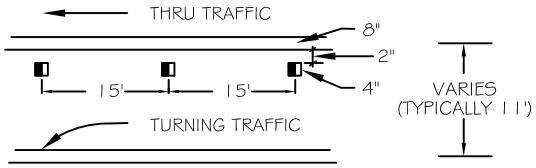
THRU AND TURN LANE MARKINGS
SEE MUTCD FOR DETAILS. TURN AND THRU ARROWS SHALL BE PREFORMED THERMOPLASTIC PAVEMENT MARKING MATERIAL

E



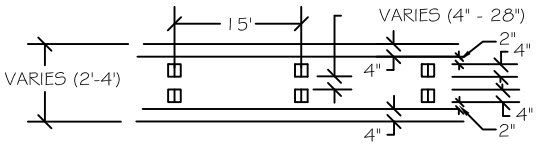
STOP BAR:
SHALL BE THERMOPLASTIC PAVEMENT MARKING MATERIAL. PER CITY AT INTERSECTIONS IF MARKED CROSSWALKS ARE INSTALLED.

F



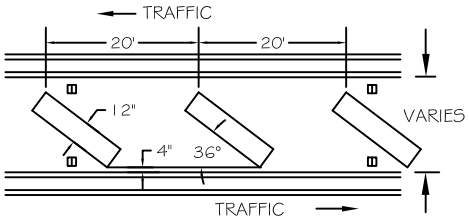
TURN LANE:
8" WHITE LINE WITH MONO-DIRECTIONAL CRYSTAL TYPE I MARKERS (WHITE) AT 15' O.C.

G



MEDIAN NOSE:
TWO 4" YELLOW LINES WITH BI- DIRECTIONAL YELLOW TYPE I MARKERS AT 15' O.C. FOR USE AT INTERSECTIONS WHERE MEDIAN NOSE IS LESS THAN 4' WIDE.

H



DIAGONAL LINES:
12" YELLOW OR WHITE LINES INSTALLED AS SHOWN.

Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

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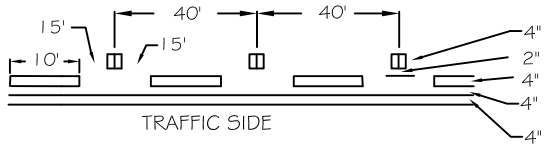
DEPARTMENT OF PUBLIC WORKS

PAVEMENT MARKINGS PAGE 1

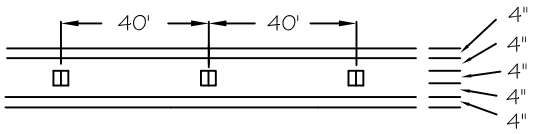
DRAWN BY	PW	2/2025	R-1210
CHECKED BY	MWH	2/2025	

I



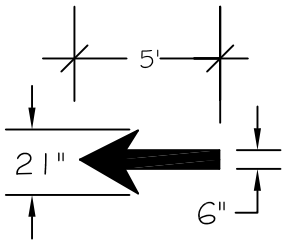
TWO WAY LEFT TURN STRIPE:
4" YELLOW LINES WITH TYPE I BI-DIRECTIONAL YELLOW RAISED PAVEMENT MARKERS AT 40' O.C.
OUTSIDE LINE IS SOLID INSIDE AT 10'/30' PATTERN.

J



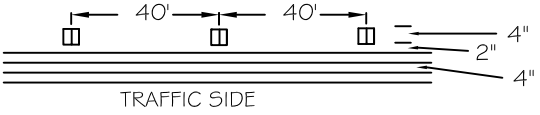
CENTERLINES:
TWO 4" YELLOW LINES WITH BI-DIRECTIONAL YELLOW TYPE I MARKERS AT 40' O.C.

K



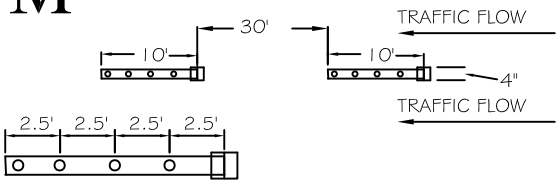
BICYCLE LANE ARROW:
SEE ODOT BIKE LANE STANDARDS. USE PREFORMED THERMOPLASTIC PAVEMENT MARKING MATERIAL.

L



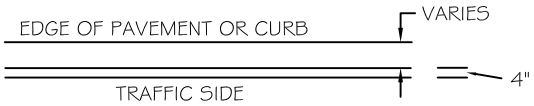
MEDIAN STRIPE:
TWO 4" YELLOW LINES WITH TYPE I BI-DIRECTIONAL YELLOW RAISED PAVEMENT MARKERS AT 40' O.C.

M



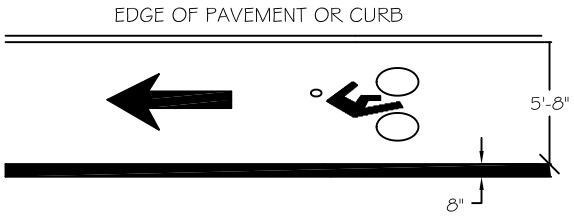
LANE LINE:
4" WHITE WITH CRYSTAL. TYPE I WHITE MONO-DIRECTIONAL MARKERS AT 40' O.C.

N



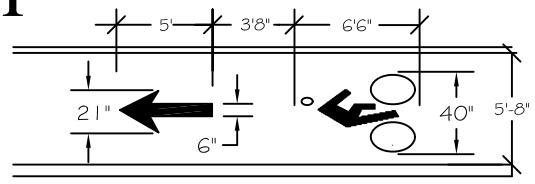
FOG LINE:
4" WHITE LINE AS SHOWN ON PLANS

O



BIKE LANE LINE - 8" WIDE WHITE LINE

P



BICYCLE LANE MARKING:
SEE ODOT BIKE LANE STANDARDS. USE PREFORMED THERMOPLASTIC PAVEMENT MARKING MATERIAL.

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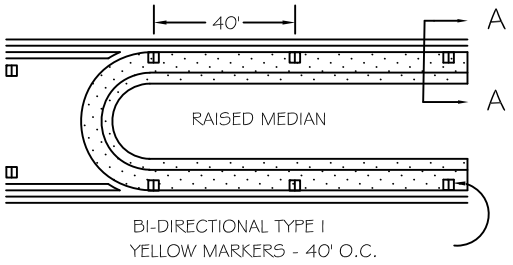
DEPARTMENT OF PUBLIC WORKS

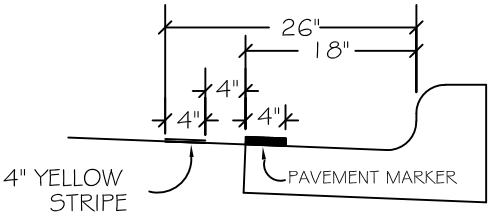
PAVEMENT MARKINGS PAGE 2

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1215

Q

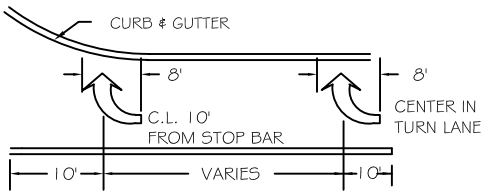




SECTION A - A

RAISED MEDIAN STRIPE:
4" YELLOW LINE WITH TYPE I BI-DIRECTIONAL YELLOW RAISED PAVEMENT MARKERS AT 40' O.C.

R



RIGHT TURN LANE MARKINGS:
SEE MUTCD FOR DETAILS. ARROWS SHALL BE THERMOPLASTIC PAVEMENT MARKING MATERIAL.

NOTES

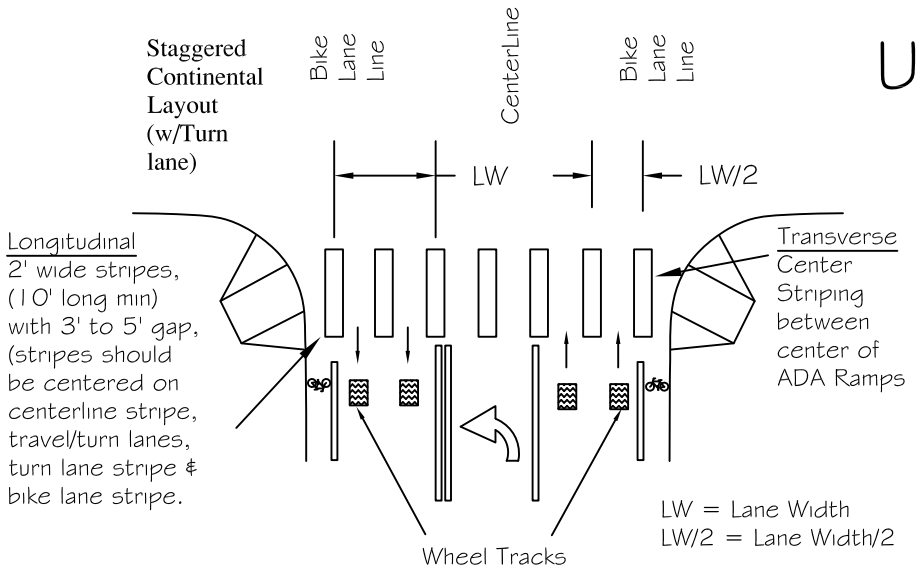
1. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
2. ALL STRIPING AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CITY OF INDEPENDENCE, AND ODOT TRAFFIC ENGINEERING DESIGN SPECIFICATIONS.
3. LOCATE STOP BARS 10' BACK OF THE EXTENDED FOG LINE, EDGE OF PAVEMENT, OR CURB FACE. VERIFY SIGHT DISTANCE.
4. LOCATE CROSSWALKS AS PER WHEELCHAIR RAMP LOCATIONS OR 5' BACK OF EXTENDED FOG LINE, EDGE OF PAVEMENT OR CURB FACE.
5. ANY REMOVAL OF EXISTING STRIPING TO BE DETERMINED IN THE FIELD AND IS CONSIDERED INCIDENTAL WORK. STRIPING SHALL BE BEAD BLASTED FOR PAINT AND GROUND FOR THERMOPLASTIC OR AS DIRECTED BY THE CITY'S AUTHORIZED REPRESENTATIVE.
6. ALL THERMOPLASTIC PAVEMENT MARKING MATERIALS SHALL BE INSTALLED AS PER SECTION 00850 OF THE ODOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
7. ALL PAVEMENT MARKING SHALL CONFORM TO THE MOST CURRENT ODOT SPECIFICATIONS FOR THERMOPLASTIC.
8. LANE WIDTHS SHALL BE MEASURED FROM CENTERLINE OF STRIPES.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

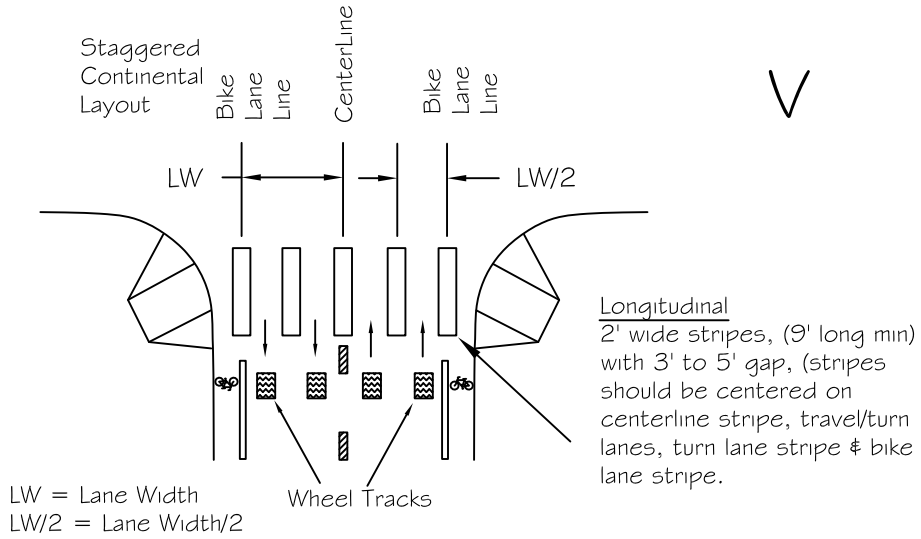
PAVEMENT MARKINGS PAGE 3

DRAWN BY	PW	2/2025	R-1220
CHECKED BY	MWH	2/2025	

U



V



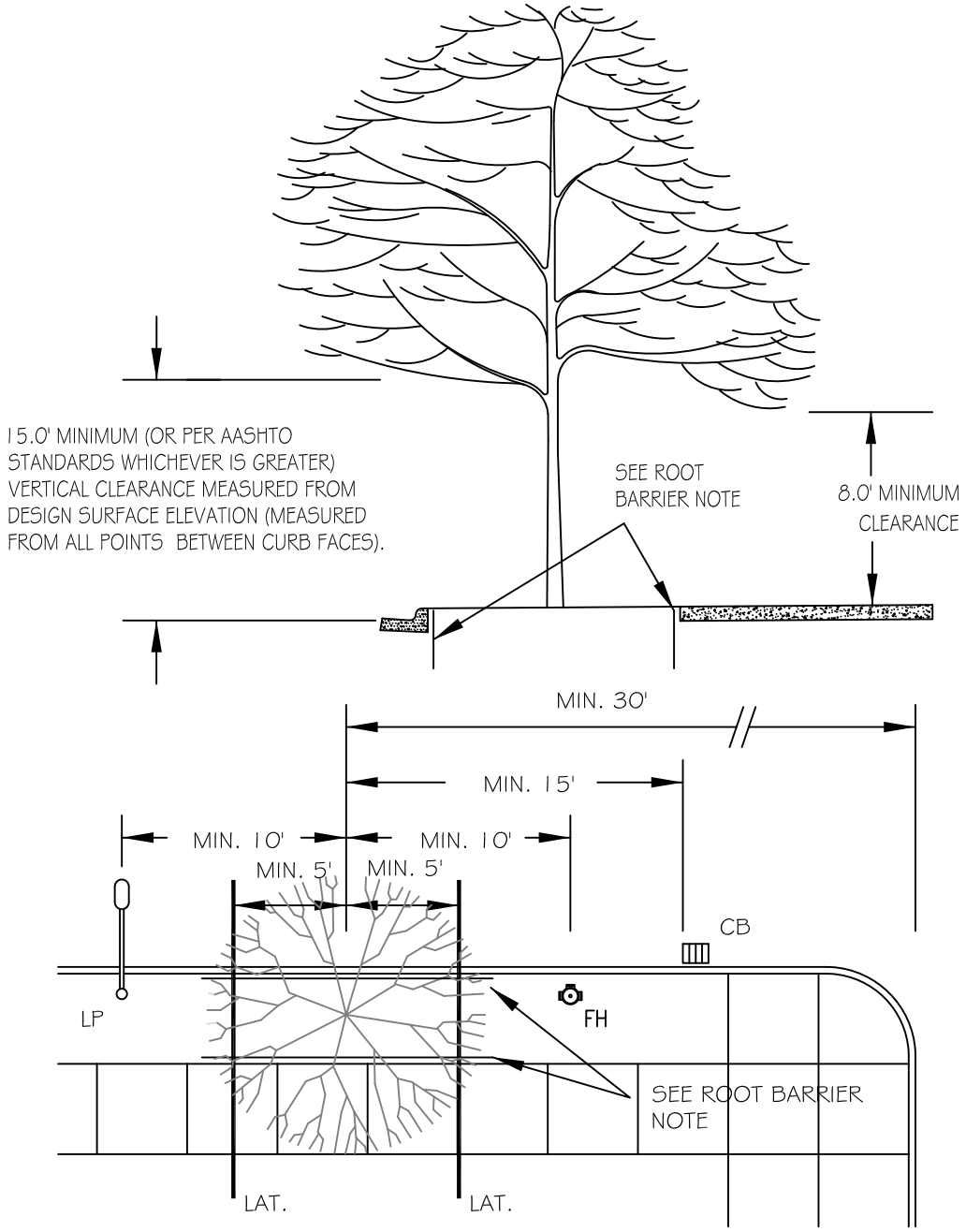
GENERAL NOTES FOR ALL PAVEMENT MARKINGS:

1. ALL STRIPING AND PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
2. ALL STRIPING AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND THE CITY OF INDEPENDENCE AND ODOT TRAFFIC ENGINEERING DESIGN SPECIFICATIONS.
3. LOCATE STOP BARS PER MUTCD REQUIREMENTS IF REQUIRED.
4. LOCATE CROSSWALKS AS PER SIDEWALK RAMP LOCATIONS OR 5' BACK OF EXTENDED FOG LINE, EDGE OF PAVEMENT OR CURB FACE.
5. ANY REMOVAL OF EXISTING STRIPING TO BE DETERMINED IN THE FIELD AND IS CONSIDERED INCIDENTAL WORK. STRIPING SHALL BE BEAD BLASTED FOR PAINT AND GROUND FOR THERMOPLASTIC OR AS DIRECTED BY THE CITY'S AUTHORIZED REPRESENTATIVE.
6. ALL THERMOPLASTIC PAVEMENT MARKING MATERIALS SHALL BE INSTALLED AS PER SECTION 00850 OF THE CURRENT VERSION OF THE ODOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
7. ALL PAVEMENT MARKING SHALL CONFORM TO THE MOST CURRENT ODOT SPECIFICATIONS THERMOPLASTIC.
8. LANE WIDTHS SHALL BE MEASURED FROM CENTERLINE OF STRIPE TO CENTERLINE OF STRIPE OR CURB FACE.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

PAVEMENT MARKINGS PAGE 4

DRAWN BY	PW	2/2025	R-1225
CHECKED BY	MWH	2/2025	



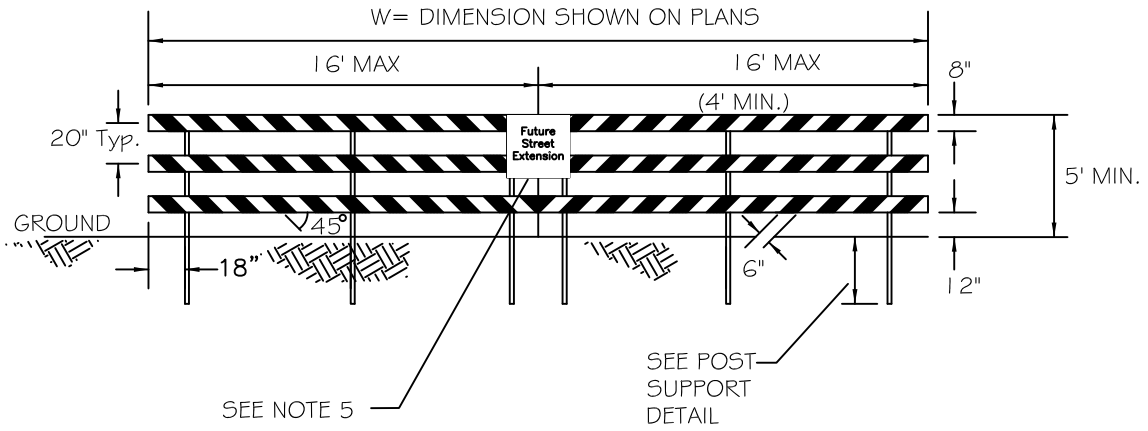
NOTES:

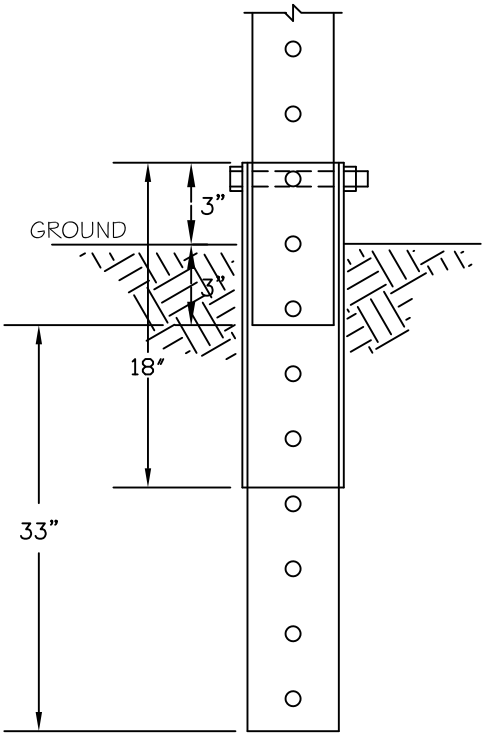
1. 5' MINIMUM CLEARANCE FROM UNDERGROUND UTILITIES AND LATERALS. LANDSCAPE DESIGN OF TREES AND ENGINEERING DESIGN OF UNDERGROUND SERVICES SHALL BE COORDINATED.
2. TREES SHALL BE CENTERED BETWEEN CURB AND SIDEWALK.
3. CITY APPROVED ROOT BARRIER METHOD TO BE USED FOR ALL STREET TREES AT CURBS AND SIDEWALKS. ROOT BARRIER SHALL EXTEND TO A DISTANCE OF 20' CENTERED WITH THE TREE BASE. BARRIER SHALL BE 2"-4" FROM CURB OR SIDEWALK AND EXTEND A MINIMUM OF 24" IN DEPTH.
4. 4. WHEN TREES ARE WITHIN TREE WELLS, ROOT BARRIER SHALL BE PLACED ON ALL SIDES.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

STREET TREE LOCATIONS

DRAWN BY	PW	2/2025	R-1230
CHECKED BY	MWH	2/2025	





POST SUPPORT DETAIL

NOTES:

1. MATERIALS:
- 2" X 2" X 63", GA. GALV. PERFORATED STEEL POST.
- 2 1/2" X 2 1/2" X 18", 12 GA. GALV. PERFORATED STEEL STIFFNER POST.
- 2 1/4" X 2 1/4" X 36", 12 GA GALV. PERFORATED STEEL ANCHOR.
- 3/8" X 3 1/2", GALVANIZED HEX HEAD BOLT WITH LOCK WASHER, OR 5/16" CORNER BOLT.
- 7/16" X 5", GALVANIZED CARRIAGE WITH FLAT AND LOCK WASHER, 2 BOLTS PER RAIL PER POST.
- 2" X 8" CROSSRAILS WITH ALTERNATING RED AND WHITE STRIPES. ALL STRIPES SHALL HAVE RED AND WHITE ENCAPSULATED LENS SHEETING, OR ALUMINUM PANELS. ATTACHED WITH 3/4" #10 WOOD SCREWS.

2. SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS AND THE OREGON SUPPLEMENT.

3. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT STATE OF OREGON STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

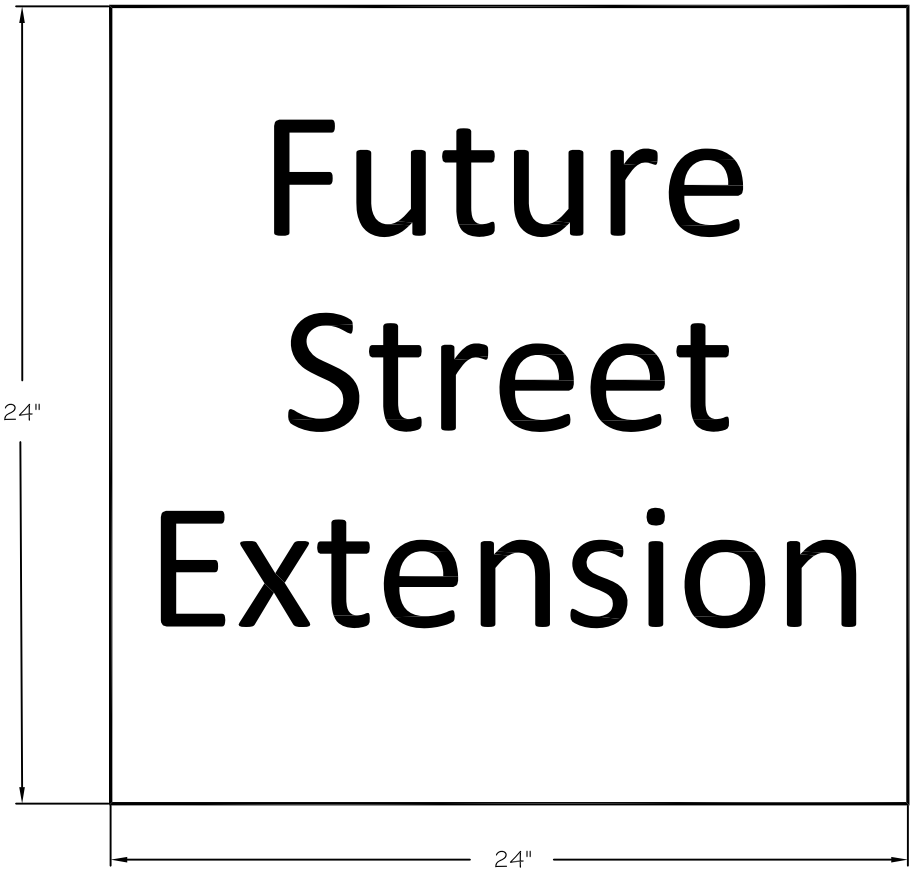
4. FOR EACH 4' OF PANEL OR SHEETING USE MINIMUM 15 SCREWS OR NAILS TO ATTACH.

5. INSTALL SIGN STREET EXTENSION SIGN DETAIL.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

STREET END BARRICADE
(TYPE 3)

DRAWN BY	PW	2/2025	R-1235
CHECKED BY	MWH	2/2025	



NOTES:

1. USE 3.5" TALL WHITE LETTERING ON GREEN BACKGROUND.
2. SIGN SHALL HAVE A HI-INTENSITY PRISMATIC FINISH MEETING ASTM 4956 SPEC TYPE 4 STANDARDS.
3. LETTERING SHALL BE HIGH INTENSITY WHITE USING 3M SCOTCHLITE BRAND.
4. SIGN SHALL BE SECURELY MOUNTED TO THE TYPE II OR TYPE III BARRICADE USING A MINIMUM OF FOUR 3/8" X 2" GALVANIZED HEX HEAD BOLT WITH LOCK WASHER AND NUT.
5. SIGN SHALL BE MOUNTED ON BARRICADE AS DIRECTED BY CITY'S AUTHORIZED REPRESENTATIVE ON ANY STREET PLANNED TO BE EXTENDED AT SOME TIME IN THE FUTURE.

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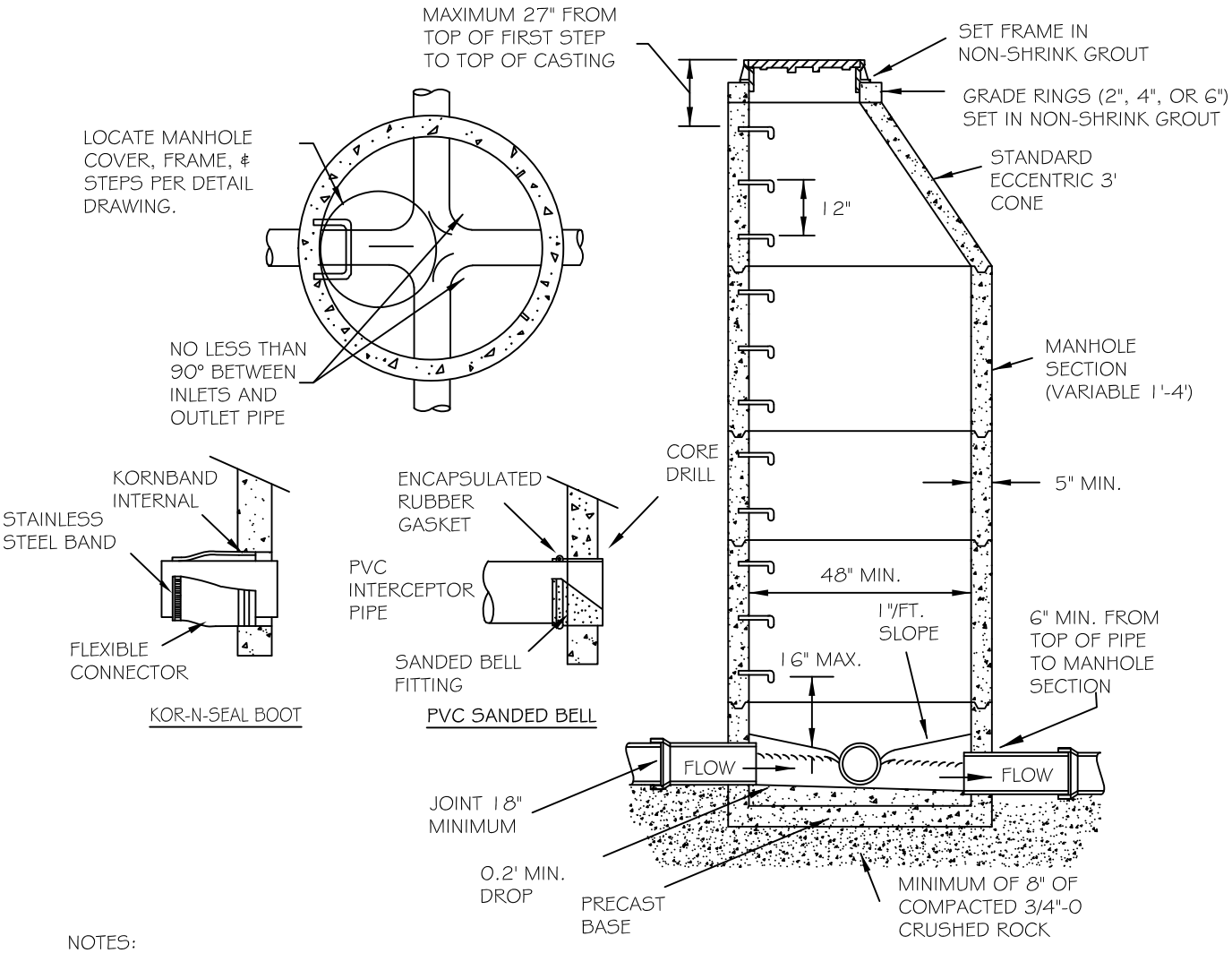
STREET EXTENSION SIGN

DRAWN BY	PW	2/2025
CHECKED BY	MWH	2/2025

R-1240



NOTES:

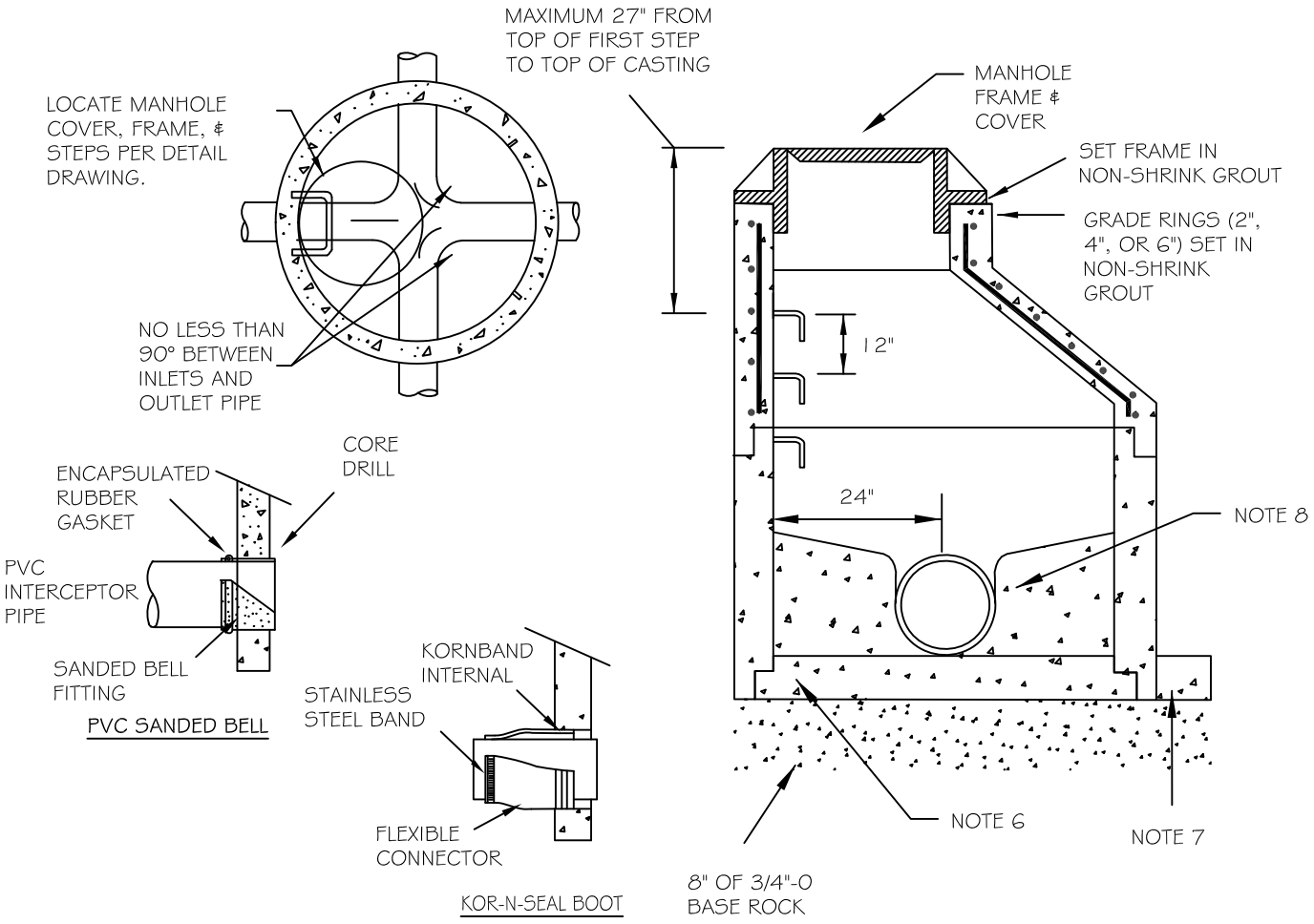
1. SEWER MANHOLE TO BE PREFORMED RUBBER O-RING GASKET OR MASTIC JOINTS. ALL MANHOLES SHALL CONFORM WITH ASTM C-478.
2. PREFORMED RUBBER O-RING GASKETS SHALL CONFORM WITH AASHTO M 315 AND ASTM C-443.
3. SEE MANHOLE FRAME AND COVER DETAIL DRAWING.
4. ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT.
5. CHANNELS SHALL BE 3/4 VERTICAL HEIGHT OF PIPE WITH A SMOOTH FINISH.
6. 18" MAXIMUM DROP BETWEEN INVERTS AND MIN. 0.20' FALL BETWEEN INLETS AND OUTLET.
7. 8" MINIMUM BETWEEN PIPE ACCESS HOLES INTO MANHOLE. DISTANCE MEASURED AT INSIDE OF MANHOLE OR PER MANUFACTURERS RECOMMENDATIONS.
8. PIPE ACCESSES INTO MANHOLES SHALL BE PREFORMED OR CORE DRILLED. HOLES SIZE TO EQUAL PIPE O.D. PLUS MANHOLE WALL THICKNESS. NO SAWING OR BREAKING OF MANHOLE SECTIONS IS ALLOWED.
9. MINIMUM HEIGHT OF STANDARD MANHOLE TO BE 5'.
10. ALL INTERIOR JOINTS AND CONNECTIONS SHALL BE WATERTIGHT. SANITARY MANHOLE JOINTS SHALL BE WRAPPED WITH EXTERNAL MASTIC AND INTERNALLY SEALED WITH STRONG-SEAL OR APPROVED EQUAL. SANITARY MANHOLES SHALL BE VACUUM TESTED.
11. GRADE RINGS AND CONE SECTION SHALL BE DESIGNED TO WITHSTAND AASHTO H-20 LOADS.
12. SEE MANHOLE STEP DETAIL DRAWING.
13. STANDARD MANHOLE TO BE USED OVER EXISTING MAINS AND FOR PIPE 24" OR LESS IN DIAMETER.
14. INSTALL TRACER WIRE THRU CONE OR TOP BARREL SECTION PICK HOLES. RUN WIRE UP OUTSIDE WALL FROM TOP OF PIPE TO PICK HOLES AND LEAVE A 24" LONG LOOP ACCESSIBLE FROM SURFACE AND NOT CREATING AN TANGLE HAZARD. SECURING TO MANHOLE STEP NEXT TO INSIDE WALL IS PREFERRED.

Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

STANDARD MANHOLE DETAIL SANITARY AND STORM

DRAWN BY	PW	3/2025	S-2000
CHECKED BY	MWH	3/2025	



NOTES:

1. SEWER MANHOLE TO BE PREFORMED RUBBER O-RING GASKET OR MASTIC JOINTS. ALL MANHOLES SHALL CONFORM WITH ASTM C-478.
2. PREFORMED RUBBER O-RING GASKETS SHALL CONFORM WITH AASHTO M 315 AND ASTM C-443.
3. SEE MANHOLE FRAME AND COVER DETAIL DRAWING.
4. ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT.
5. CHANNELS SHALL BE 3/4 VERTICAL HEIGHT OF PIPE WITH A SMOOTH FINISH.
6. STANDARD PRECAST BASE.
7. EXTENDED BASES WHERE REQUIRED BY THE GEOTECHNICAL ENGINEER.
8. CHANNELS SHALL BE $\frac{3}{4}$" VERTICAL HEIGHT OF PIPE WITH A SMOOTH FINISH.
9. 8" MINIMUM BETWEEN PIPE ACCESS HOLES INTO MANHOLE. DISTANCE MEASURED AT INSIDE OF MANHOLE OR PER MANUFACTURERS RECOMMENDATIONS.
10. PIPE ACCESSES INTO MANHOLES SHALL BE PREFORMED OR CORE DRILLED. HOLES SIZE TO EQUAL PIPE O.D. PLUS MANHOLE WALL THICKNESS. NO SAWING OR BREAKING OF MANHOLE SECTIONS IS ALLOWED.
11. MAXIMUM HEIGHT OF SHALLOW MANHOLE TO BE 5'.
12. ALL INTERIOR JOINTS AND CONNECTIONS SHALL BE WATERTIGHT. SANITARY MANHOLE JOINTS SHALL BE WRAPPED WITH EXTERNAL MASTIC AND INTERNALLY SEALED WITH STRONG-SEAL OR APPROVED EQUAL. SANITARY MANHOLES SHALL BE VACUUM TESTED.
13. GRADE RINGS AND CONE SECTION SHALL BE DESIGNED TO WITHSTAND AASHTO H-20 LOADS. ALL REINFORCEMENT SHALL BE GRADE 60.
14. SEE MANHOLE STEP DETAIL DRAWING.
15. SHALLOW MANHOLE TO BE USED OVER EXISTING MAINS AND FOR PIPE 24" OR LESS IN DIAMETER.
16. INSTALL TRACER WIRE THRU CONE OR TOP BARREL SECTION PICK HOLES. RUN WIRE UP OUTSIDE WALL FROM TOP OF PIPE TO PICK HOLES AND LEAVE A 24" LONG LOOP ACCESSIBLE FROM SURFACE AND NOT CREATING AN TANGLE HAZARD. SECURING TO MANHOLE STEP NEXT TO INSIDE WALL IS PREFERRED.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

SHALLOW MANHOLE DETAIL (< 5')
SANITARY AND STORM

DRAWN BY	PW	3/2025
CHECKED BY	MWH	3/2025

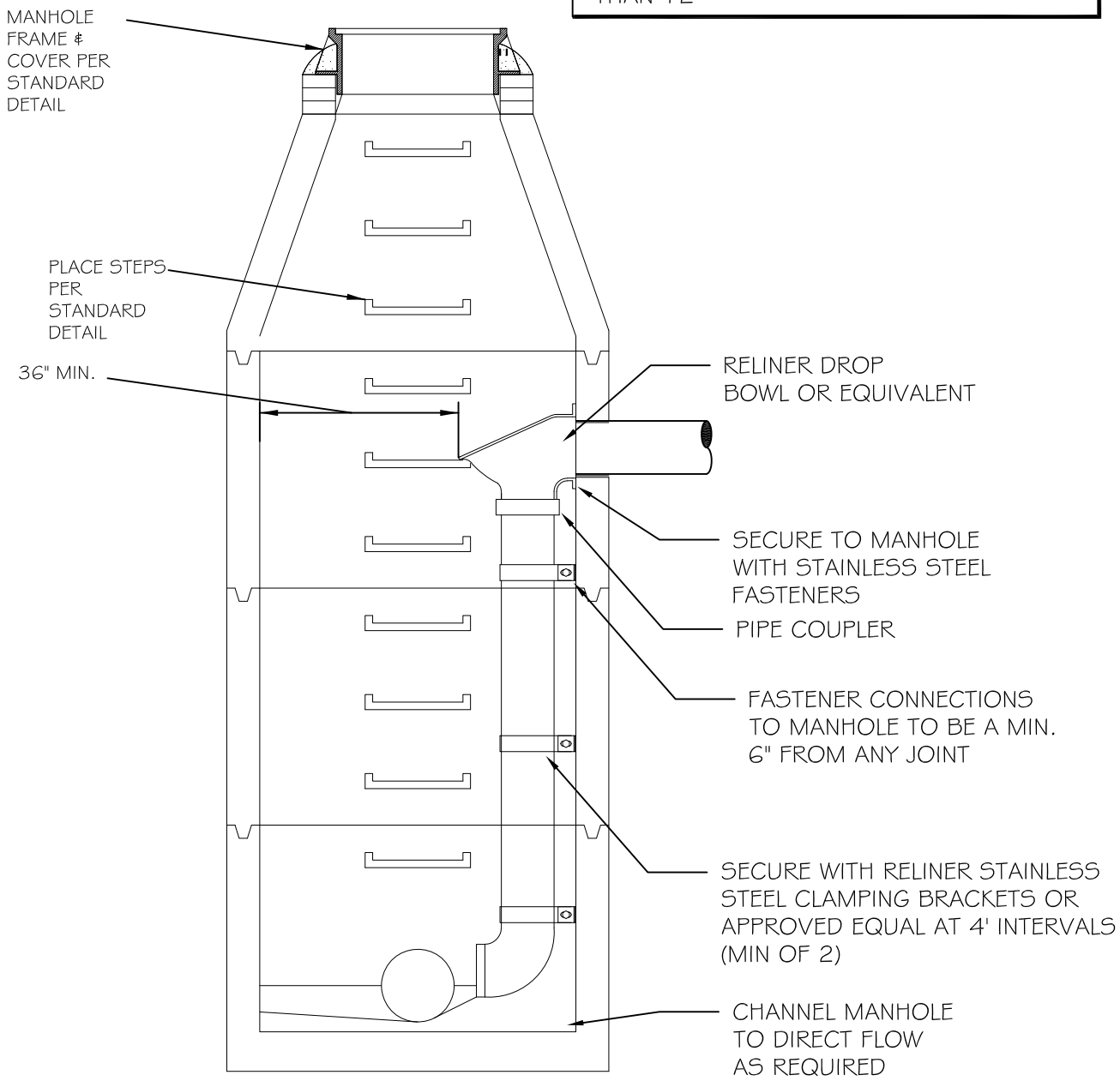
S-2005

NOTES:

1. MANHOLE TO CONFORM WITH STANDARD MANHOLE DETAIL.
2. DROP BOWL HOOD SHALL NOT BE INSTALLED UNLESS SPECIFICALLY CALLED OUT BY THE DESIGN ENGINEER. BASED ON DESIGN GRADES OR USE OF FORCE MAINS.

INLET PIPE DIA.	RELINDER DROP BOWL	DROP PIPE DIA.	MANHOLE MIN. DIA.
8"	A-6	6"	48"
10"	B-8	8"	48"
12"	B-10	10"	60"

CUSTOM DROP BOWLS SHALL BE DESIGNED FOR PIPE INLET DIA. LARGER THAN 12"

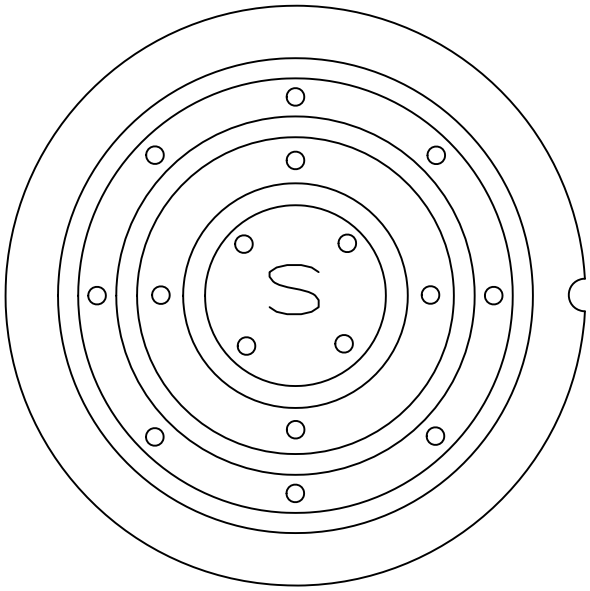


CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

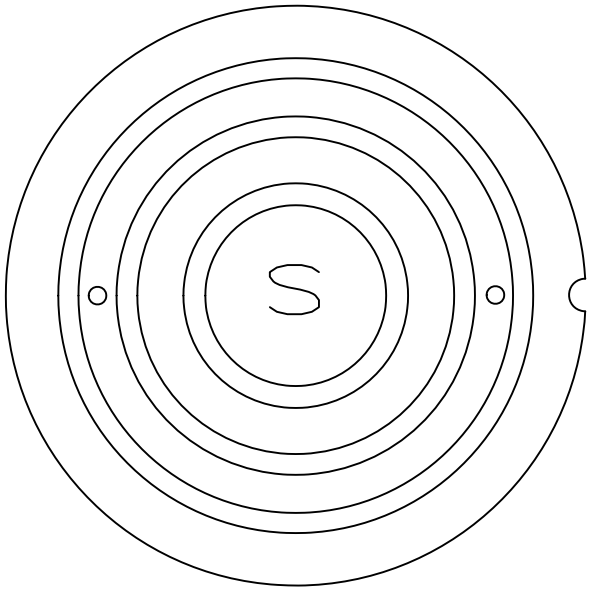
INSIDE DROP MANHOLE DETAIL
SANITARY AND STORM

DRAWN BY	PW	3/2025
CHECKED BY	MWH	3/2025

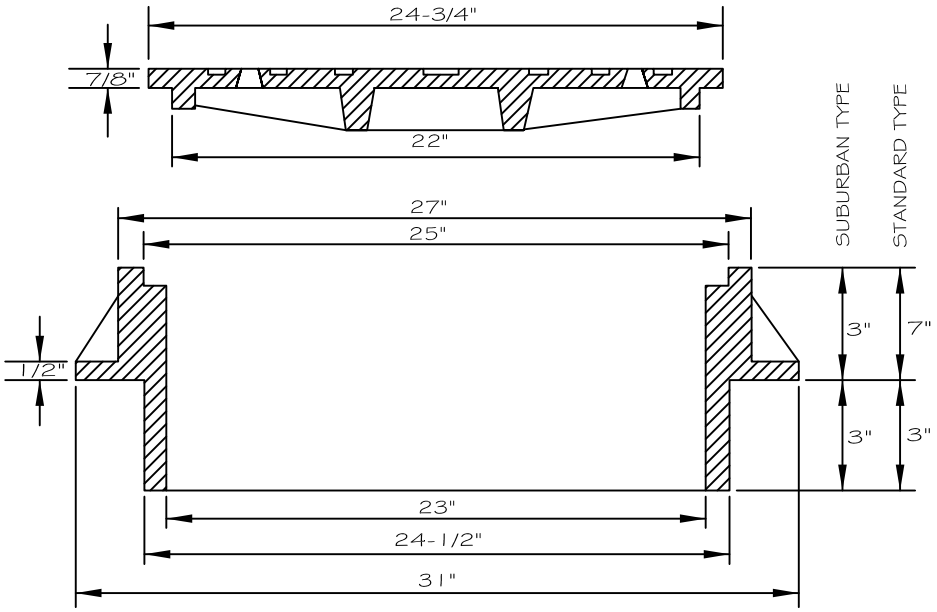
S-2010



STORM



SANITARY



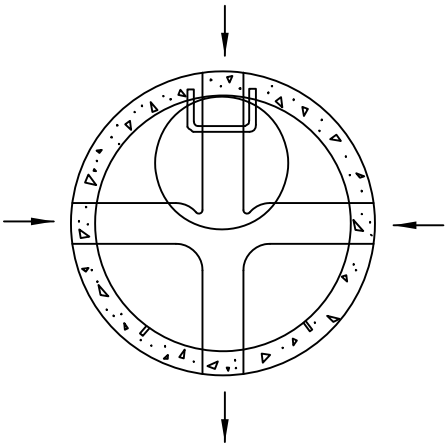
NOTES:
1. SUBURBAN TYPE NOT FOR USE IN PCC STREETS.
2. COVER AND FRAME SHALL BE GRAY CAST IRON ASTM A-48 CLASS 30.
3. COVER AND FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.
4. NOTCH LID FOR LIFTING HOOK.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

MANHOLE FRAME AND COVER
SANITARY AND STORM

DRAWN BY	PW	3/2025	S-2015
CHECKED BY	MWH	3/2025	

A



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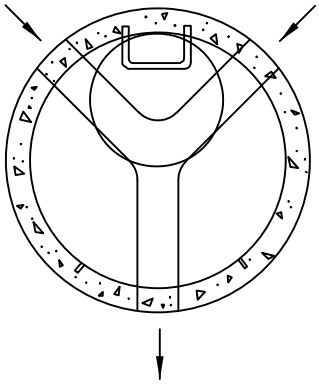

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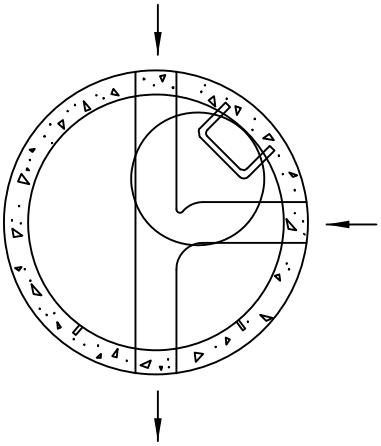

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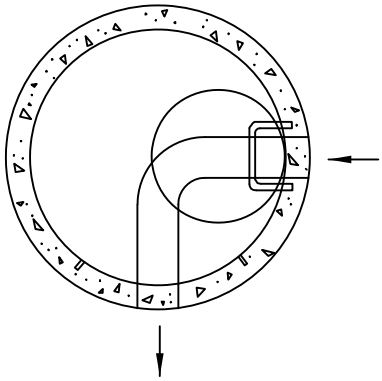

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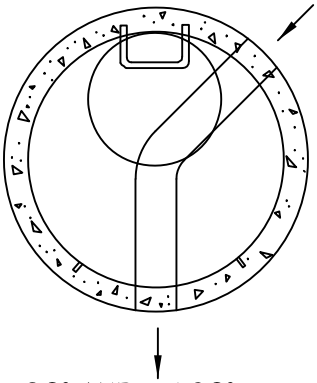
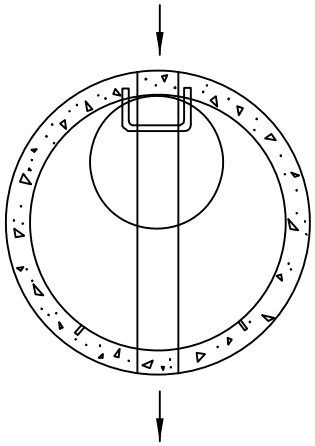


FOR ANGLES >90° AND <180°

F



NOTES:

1. FOR USE IN MANHOLES LESS THAN 5 FEET IN DEPTH MEASURED FROM THE RIM TO THE INVERT OUT.
2. MANHOLE FRAME AND COVER AS PER STANDARD DETAIL.
3. SEE MANHOLE STEP STANDARD DETAIL DRAWING.

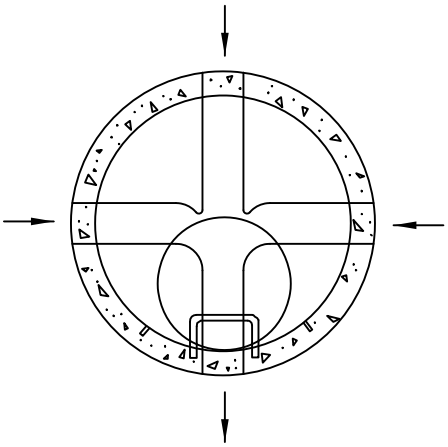
Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

MANHOLE ACCESS LOCATION (<5')
SANITARY AND STORM

DRAWN BY	PW	3/2025	S-2020
CHECKED BY	MWH	3/2025	

G



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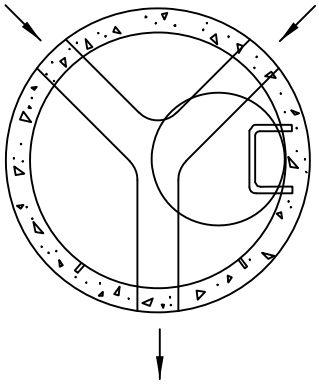

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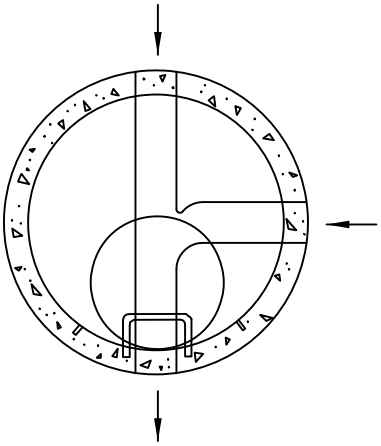

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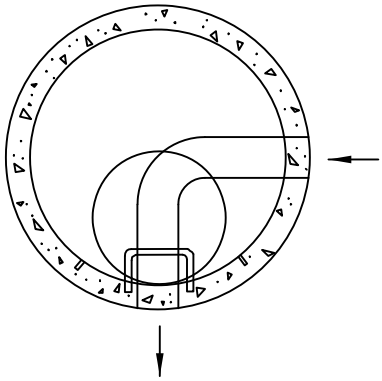
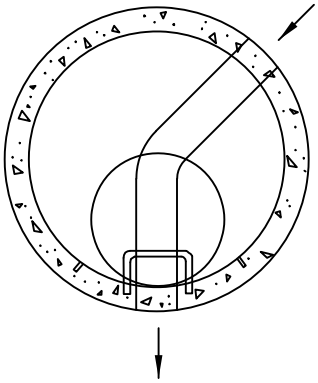
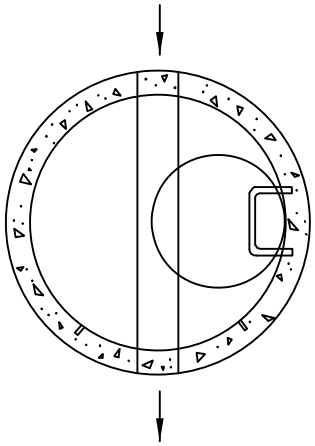


K



FOR ANGLES >90° AND <180°

L



NOTES:

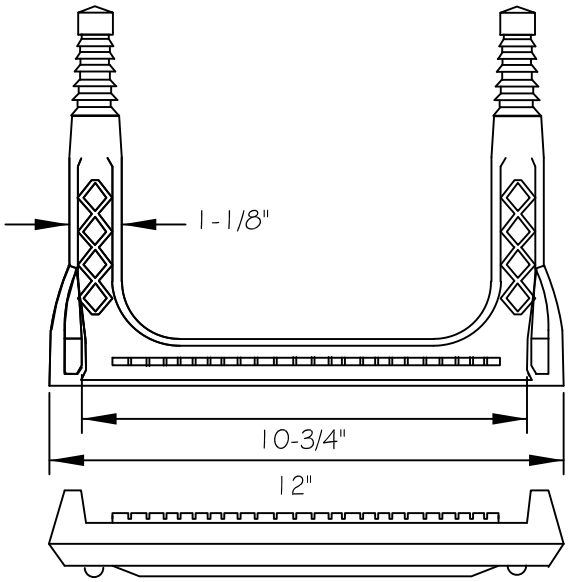
1. FOR USE IN MANHOLES LESS THAN 5 FEET IN DEPTH MEASURED FROM THE RIM TO THE INVERT OUT.
2. MANHOLE FRAME AND COVER AS PER STANDARD DETAIL.
3. SEE MANHOLE STEP STANDARD DETAIL DRAWING.

Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

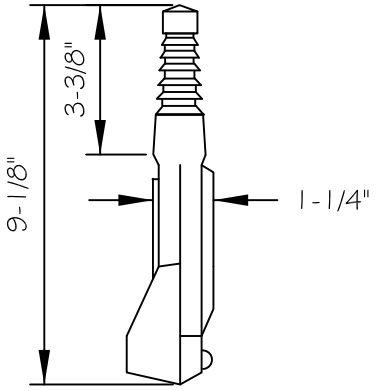
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

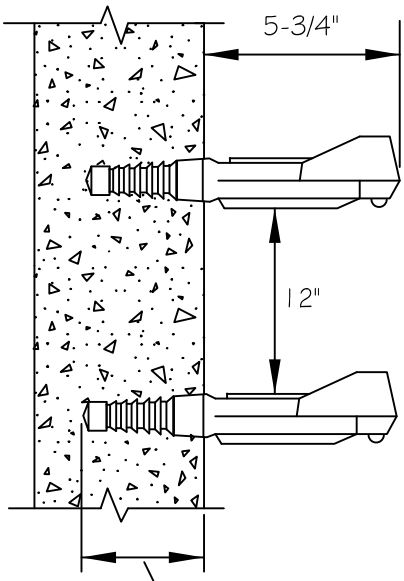
MANHOLE ACCESS LOCATION (>5')
SANITARY AND STORM

DRAWN BY	PW	3/2025	S-2025
CHECKED BY	MWH	3/2025	



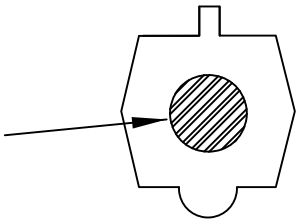
COPOLYMER
POLYPROPYLENE PLASTIC





3-3/8" FOR PLASTIC
SAFETY STEP

1/2" GRADE 60
REINFORCEMENT



NOTE:

1. STEPS IN PREFABRICATED MANHOLE SECTIONS MUST BE TIGHT AND FIRMLY EMBEDDED. THEY MUST ALSO MEET THE ASTM TEST FOR WITHSTANDING PULL-OUT.
2. TOP STEP SHALL BE NO GREATER THAN 27" FROM TOP OF CASTING.

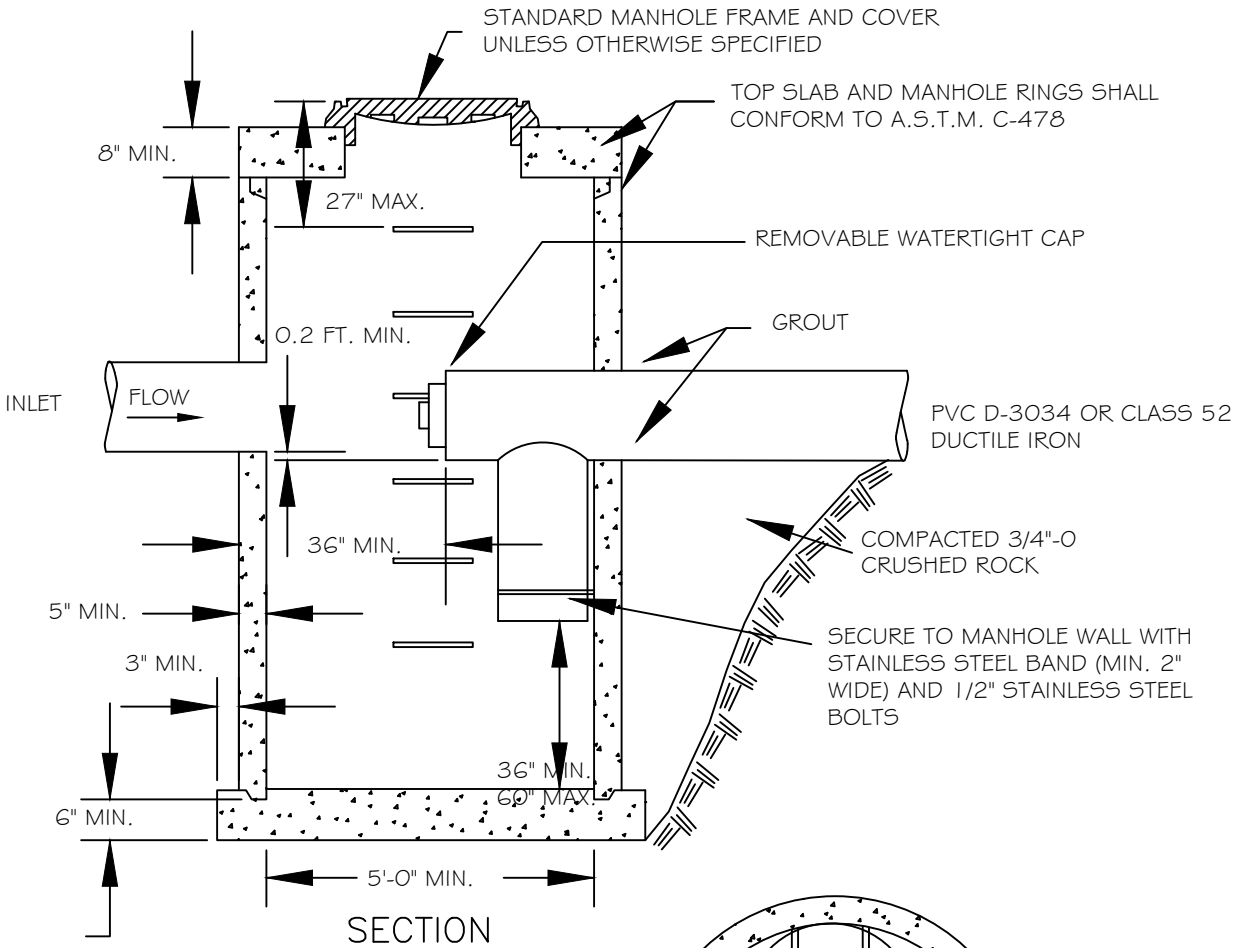
PLASTIC MATERIALS:

1. MUST CONFORM WITH ASTM C-478.
2. STEEL REINFORCING BAR MINIMUM ½" GRADE 60 MEETING REQUIREMENTS OF ASTM A615 AND ENCAPSULATED WITH INJECTION MOLDED COPOLYMER POLYPROPYLENE WITH SERRATED SURFACES.

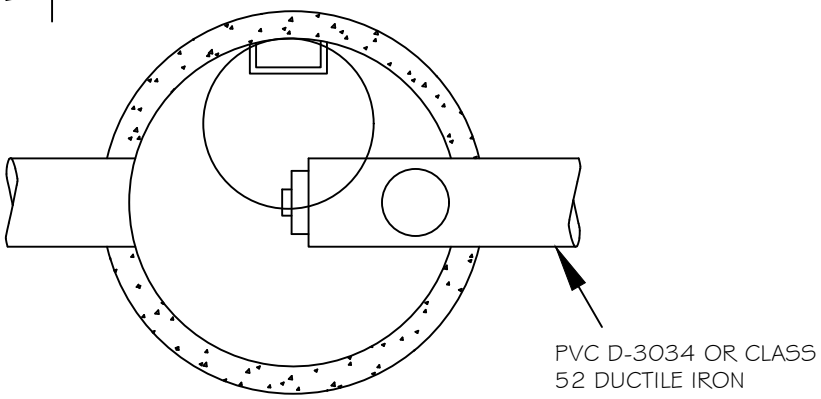
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

MANHOLE STEP DETAIL
SANITARY AND STORM

DRAWN BY	PW	3/2025	S-2030
CHECKED BY	MWH	3/2025	



SECTION
A–A



PLAN

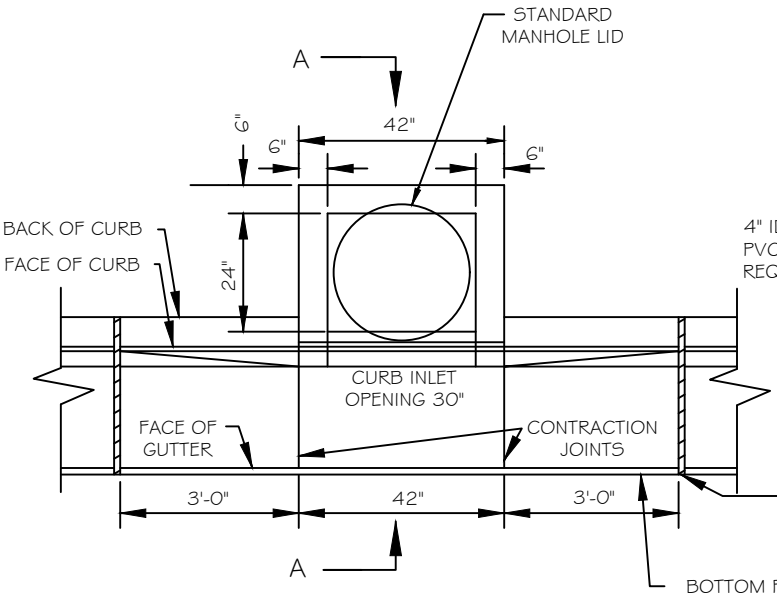
NOTES:

1. ALL PRECAST SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M. C-478. ALL POURED IN PLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 4000 PSI. AND 2" TO 4" SLUMP.
2. MANHOLE DIAMETER TO BE DETERMINED BY SIZE OF OUTLET PIPE. 12" - 18" PIPE = 48" DIA. MANHOLE. 24" - 30" PIPE = 60" DIA. MANHOLE. 36"+ PIPE = 72" DIA. MANHOLE. MAX. SUMP DEPTH 5'.
3. ALL STAINLESS STEEL PARTS SHALL BE A-304 GRADE.

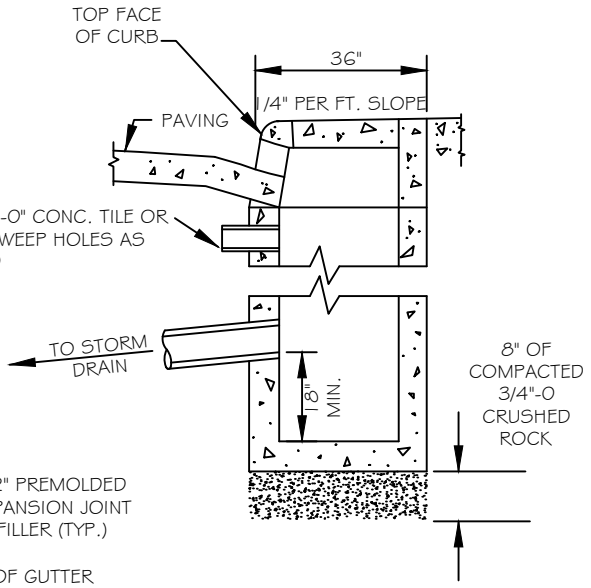
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

STORMWATER PRETREATEMENT MANHOLE

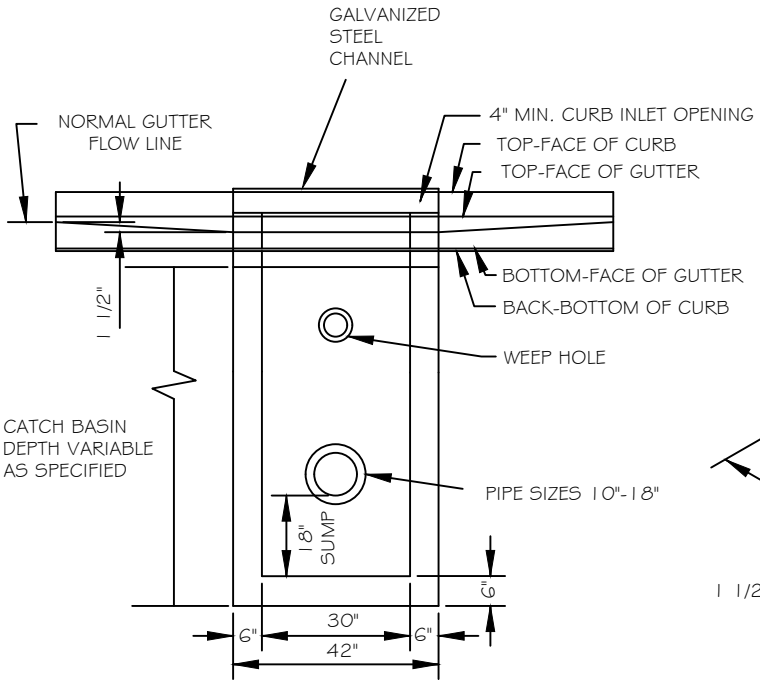
DRAWN BY	PW	3/2025	S-2035
CHECKED BY	MWH	3/2025	



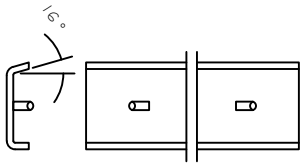
PLAN VIEW



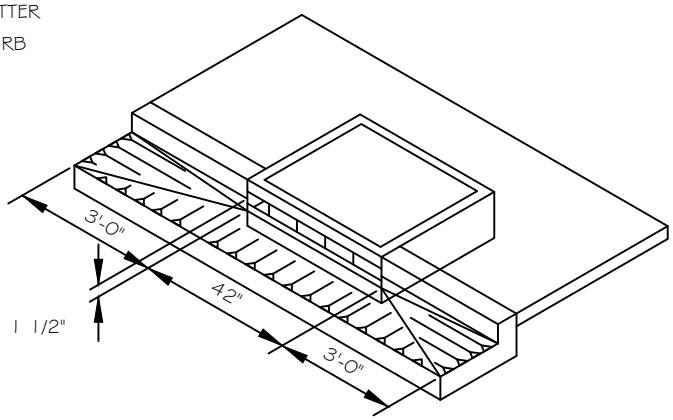
SECTION A-A



FRONT VIEW



CUSTOM STEEL CHANNEL DETAIL



PERSPECTIVE VIEW SHOWING DEPRESSED GUTTER AT CURB INLET

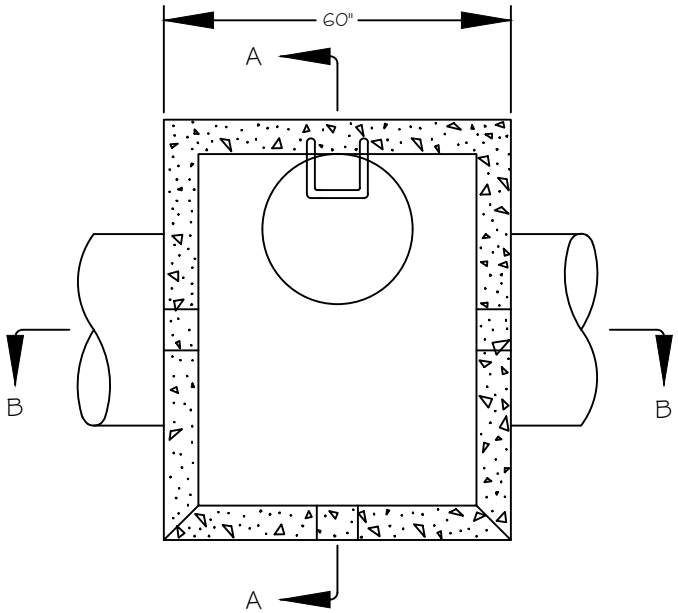
NOTES:
1. ALL FABRICATED METAL PARTS SHALL BE HOT-DIPPED GALVINIZED AFTER FABRICATION.
2. CONCRETE SHALL ATTAIN A MIN. COMPRESSIVE STRENGTH OF 3000 PSI. IN 28 DAYS.
3. PRECAST CURB INLET SHALL BE UTILITY VAULT 30" CURB INLET TOP #CI-30-23FC OR APPROVED EQUAL..
4. INSTALL STEPS WHEN DISTANCE FROM TOP OF LID TO FLOW LINE OF PIPE IS GREATER THAN 4 FEET.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

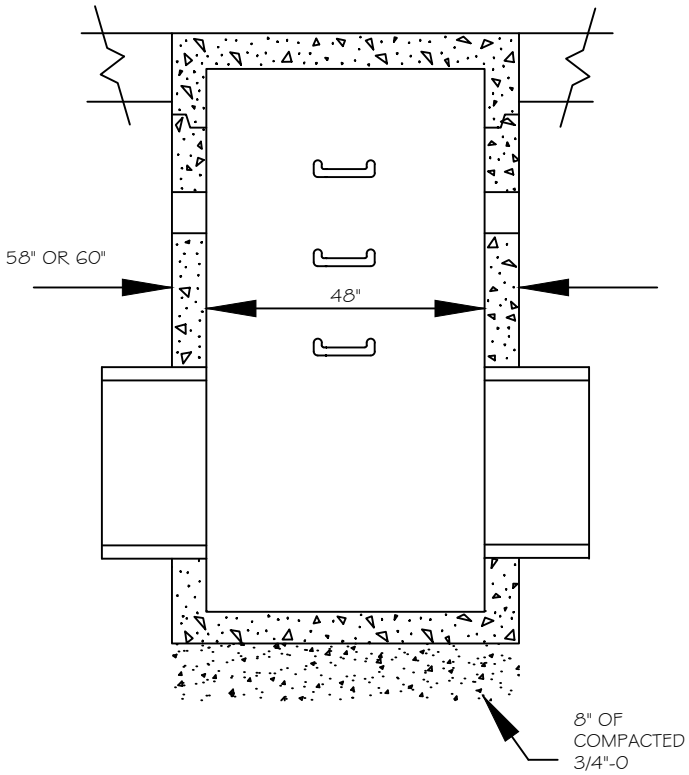
30" CURB INLET

DRAWN BY	PW	5/2025
CHECKED BY	MWH	5/2025

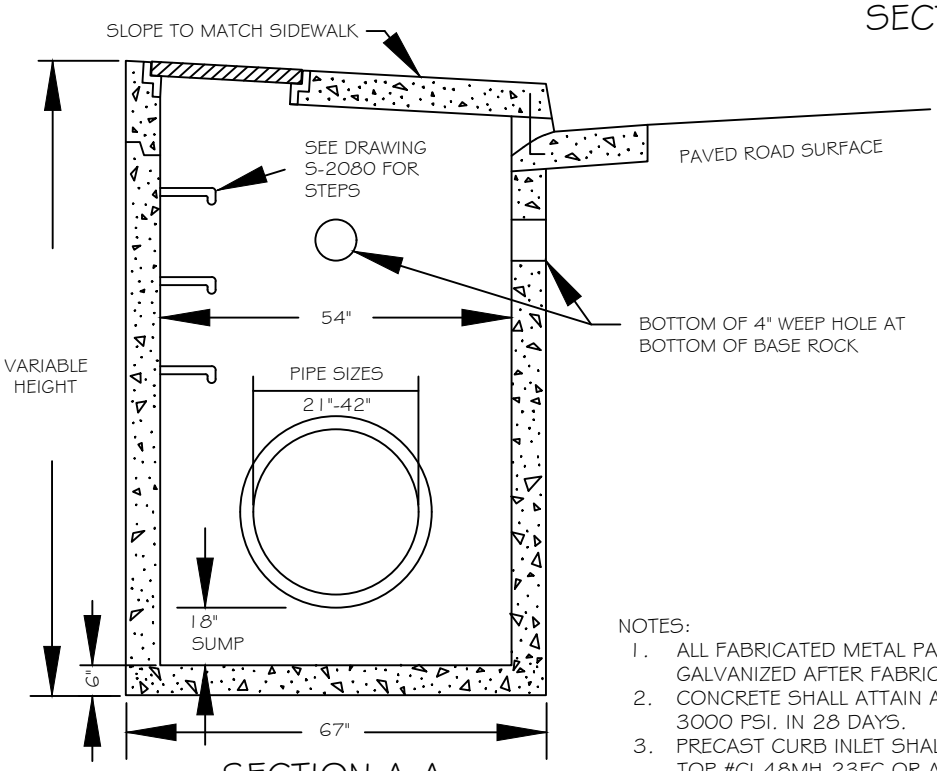
S-2040



PLAN VIEW



SECTION B-B



SECTION A-A

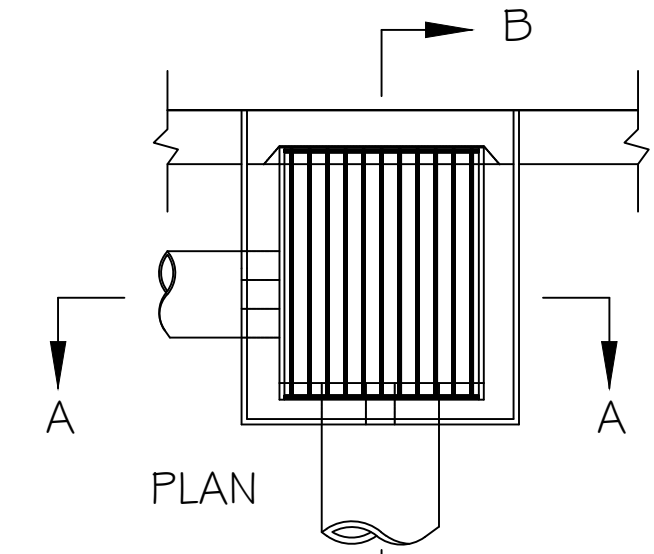
NOTES:

1. ALL FABRICATED METAL PARTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
2. CONCRETE SHALL ATTAIN A MIN. COMPRESSIVE STRENGTH OF 3000 PSI. IN 28 DAYS.
3. PRECAST CURB INLET SHALL BE UTILITY VAULT 48" CURB INLET TOP #CI-48MH-23FC OR APPROVED EQUAL.
4. NON-SUMP CATCH BASIN SHALL BE CHANNELED

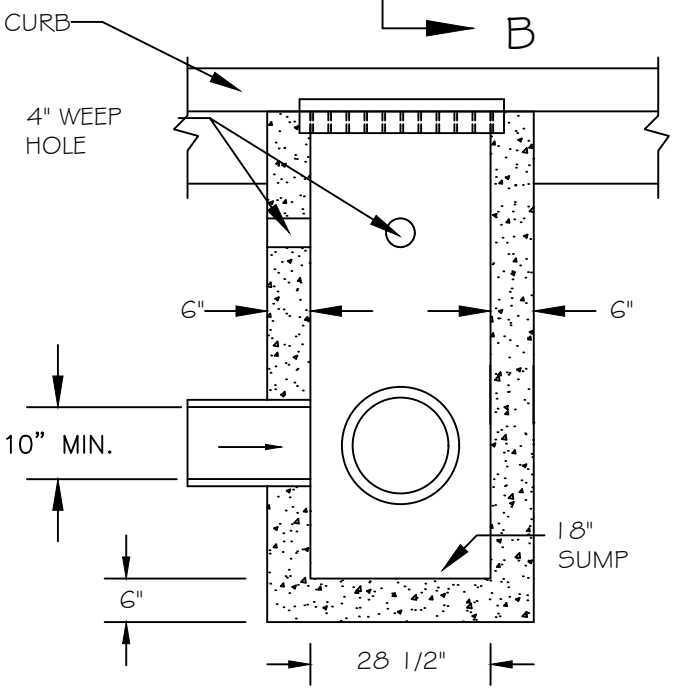
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

48" CURB INLET

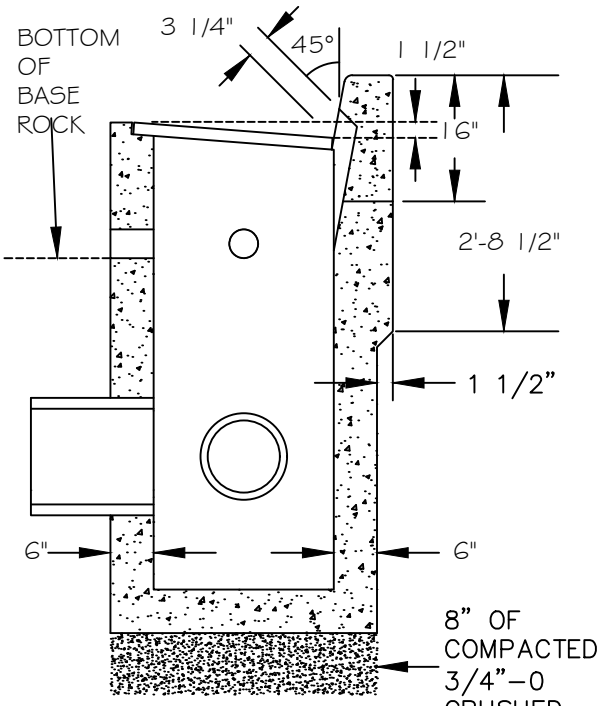
DRAWN BY	PW	5/2025	S-2045
CHECKED BY	MWH	5/2025	



SEE FRAME AND GRATE DETAIL



SECTION A-A



SECTION B-B

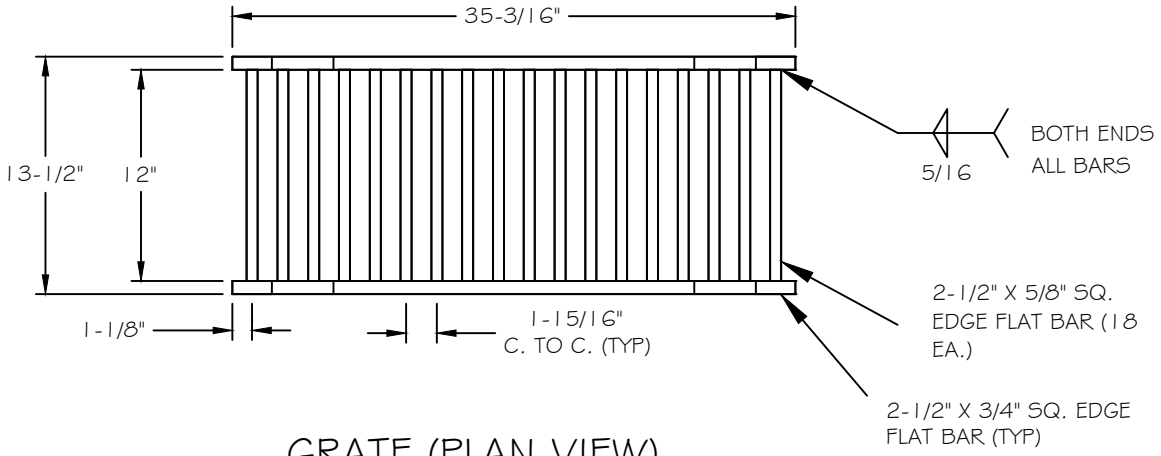
NOTES:

1. CATCH BASIN TO BE USED ONLY IN AREAS WERE GUTTER INLET CONFLICTS WITH UNDERGROUND UTILITIES AND WITH THE APPROVAL OF THE CITY'S AUTHORIZED REPRESENTATIVE.
2. CONCRETE SHALL ATTAIN A MIN. COMPRESSIVE STRENGTH OF 3000 PSI. IN 28 DAYS.
3. BATTER OF 1/4" TO 1" TO FACILITATE FORM REMOVAL WILL BE ALLOWED.
4. BOTTOM OF WEEP HOLE AT BOTTOM OF BASE ROCK.

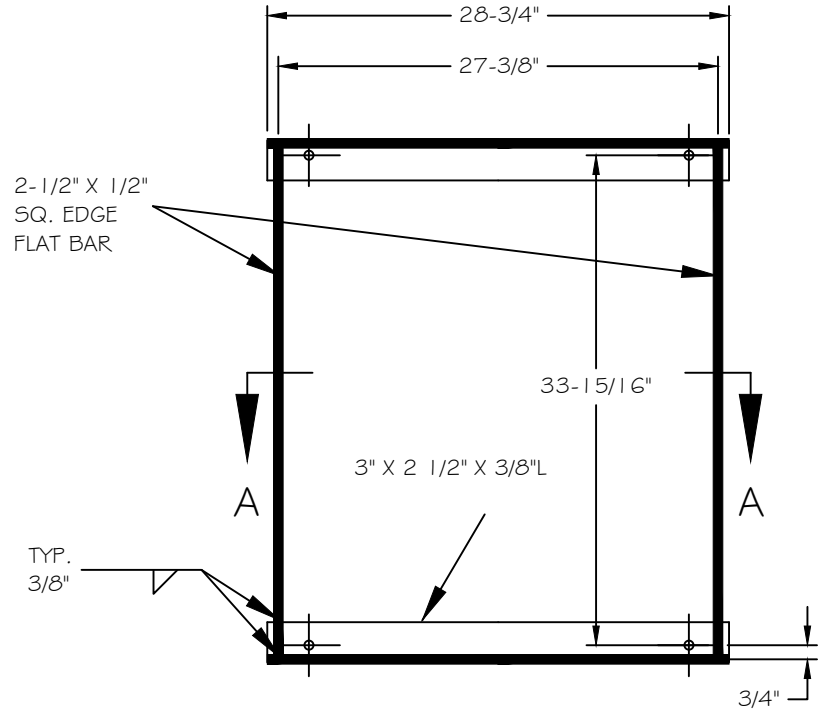
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

CATCH BASIN

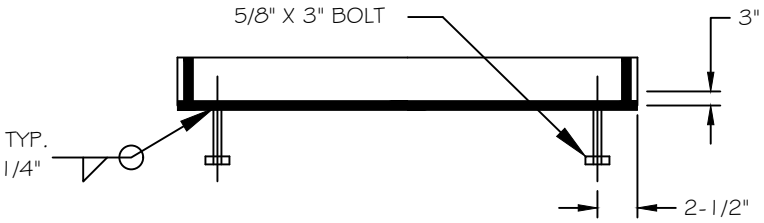
DRAWN BY	PW	5/2025	S-2050
CHECKED BY	MWH	5/2025	



GRATE (PLAN VIEW)



FRAME (PLAN VIEW)



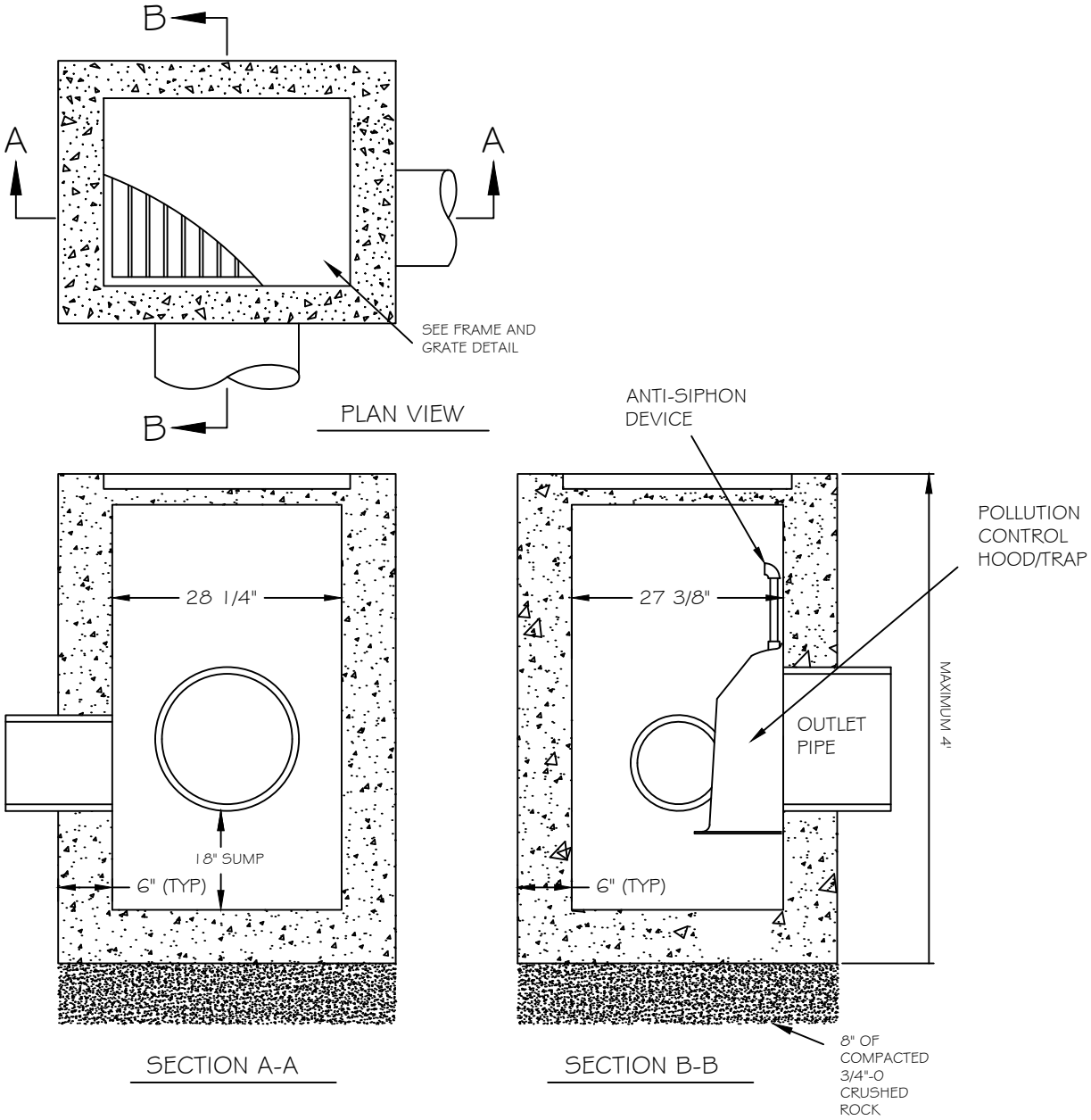
FRAME SECTION A-A

Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

CATCH BASIN FRAME AND GRATE

DRAWN BY	PW	5/2025	S-2055
CHECKED BY	MWH	5/2025	



NOTES:

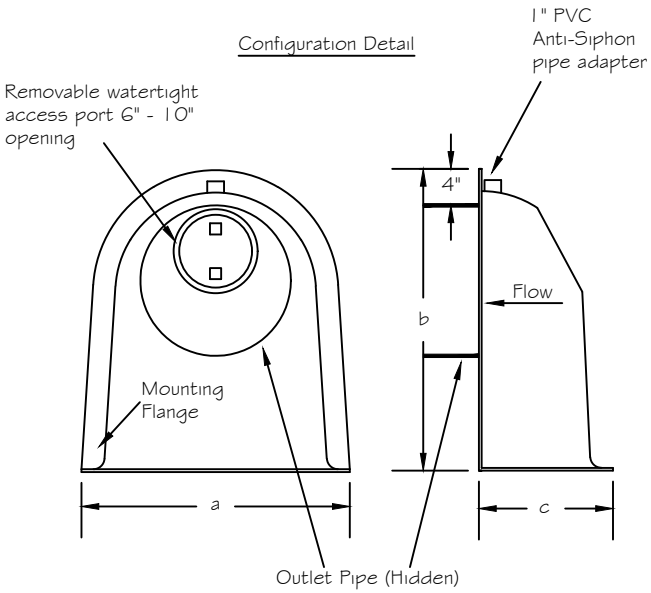
1. AREA DRAIN CONSTRUCTION IN ACCORDANCE WITH ASTM C-478 AND CONCRETE SHALL HAVE A MINIMUM BREAKING STRENGTH OF 3000 PSI. AFTER 28 DAYS.
2. PRECAST SHALL HAVE A MINIMUM WALL THICKNESS OF 5", REINFORCEMENT TO BE REBAR MEETING ASTM A615 GRADE 60 OR WELDED WIRE MEETING ASTM A497.
3. ALL HOODS/TRAPS FOR CATCH BASINS SHALL BE BEST MANAGEMENT PRODUCTS, INC OR APPROVED EQUAL.
4. ALL HOODS/TRAPS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, MOUNTING FLANGE, AND ANTI-SIPHON VENT. HOOD SIZE SHALL BE DETERMINED BY THE OUTLET PIPE DIAMETER.
5. SURFACE OF THE STRUCTURE WHERE HOOD IS MOUNTED SHALL BE SMOOTH AND FREE OF LOOSE MATERIAL. HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WITH STAINLESS STEEL BOLTS AND MANUFACTURER SUPPLIED OIL-RESISTANT GASKET.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

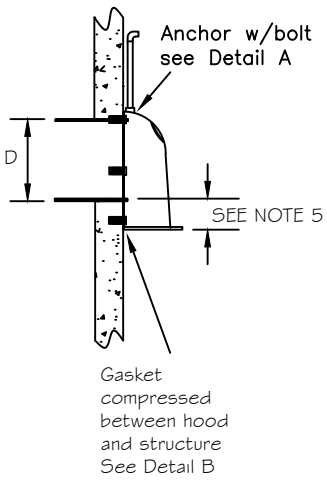
AREA DRAIN

DRAWN BY	PW	5/2025	S-2060
CHECKED BY	MWH	5/2025	

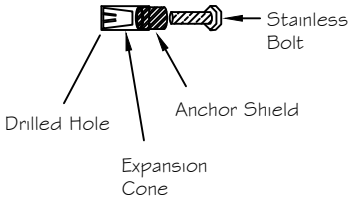
Configuration Detail



Installation Detail



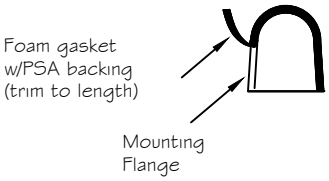
Detail A



Snout Specifications						
Outlet Pipe D	MH Size	Snout Model	Anchor Bolts Needed	Dimensions "a"	"b"	"c"
12" & 15"	48" X 60"	18R10	6	24.00	27.00	14.18
		w/18RRS Riser				
18" & 21"	48" X 60"	24R	8	30.00	34.00	18.00
		w/24RRS Riser				
24" & 27"	60" X 72"	30R	8	36.00	41.00	22.25
30" to 48"	72"	52R72				
		2 Piece	14	54.66	83.00	34.66
Note: Insertion depth (D) varies with outlet pipe diameter and snout model						

Installation Note: Position Hood such that bottom flange is below the pipe invert.

Detail B



NOTES:

1. ALL HOODS AND TRAPS FOR CATCH BASINS AND WATER QUALITY STRUCTURES SHALL BE AS MANUFACTURED BY BEST MANAGEMENT PRODUCTS, INC. (860)434-0277, (860)434-3195 FAX TOLL FREE: (800) 504-8008 OR (888) 354-7585 WEB SITE: www.bmpinc.com OR PRE-APPROVED EQUAL.
2. ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
3. ALL HOODS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT AS DRAWN. (SEE CONFIGURATION DETAIL)
4. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION.
5. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A DISTANCE OF 18" FROM I.E. OUT. FOR 18R AND 24R INSTALL RISER. FOR 30R MODEL, AN EXTENSION LESS THAN 18" IS ACCEPTABLE.
6. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 24" ACCORDING TO STRUCTURE CONFIGURATION.
7. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL.
8. THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3/8' STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET AS SUPPLIED BY MANUFACTURER. (SEE INSTALLATION DETAIL).
9. INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT. INSTALLATION KIT SHALL INCLUDE:

A. INSTALLATION INSTRUCTIONS
B. PVC ANTI-SIPHON VENT PIPE AND ADAPTER
C. OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING
D. 3/8" STAINLESS STEEL BOLTS
E. ANCHOR SHIELDS

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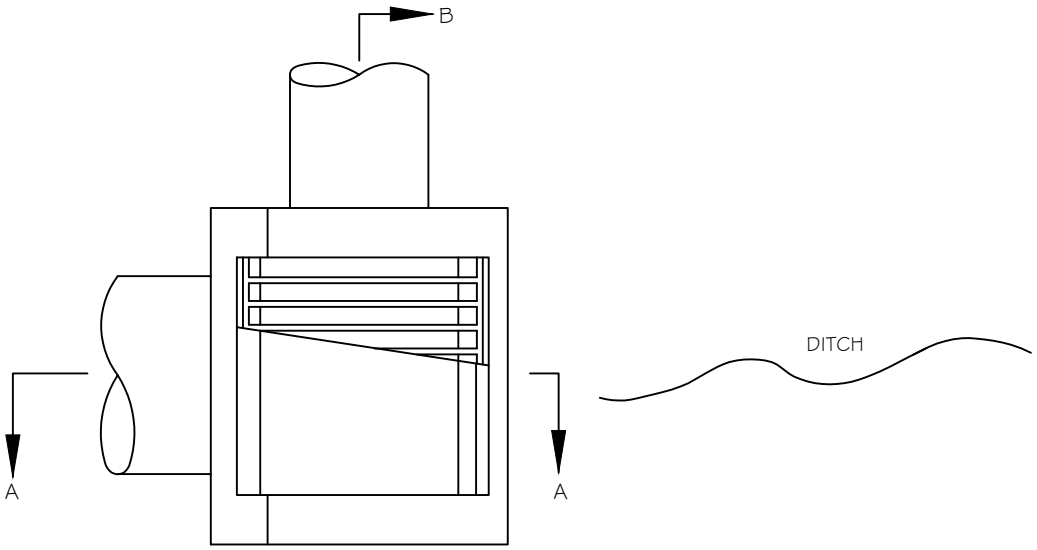
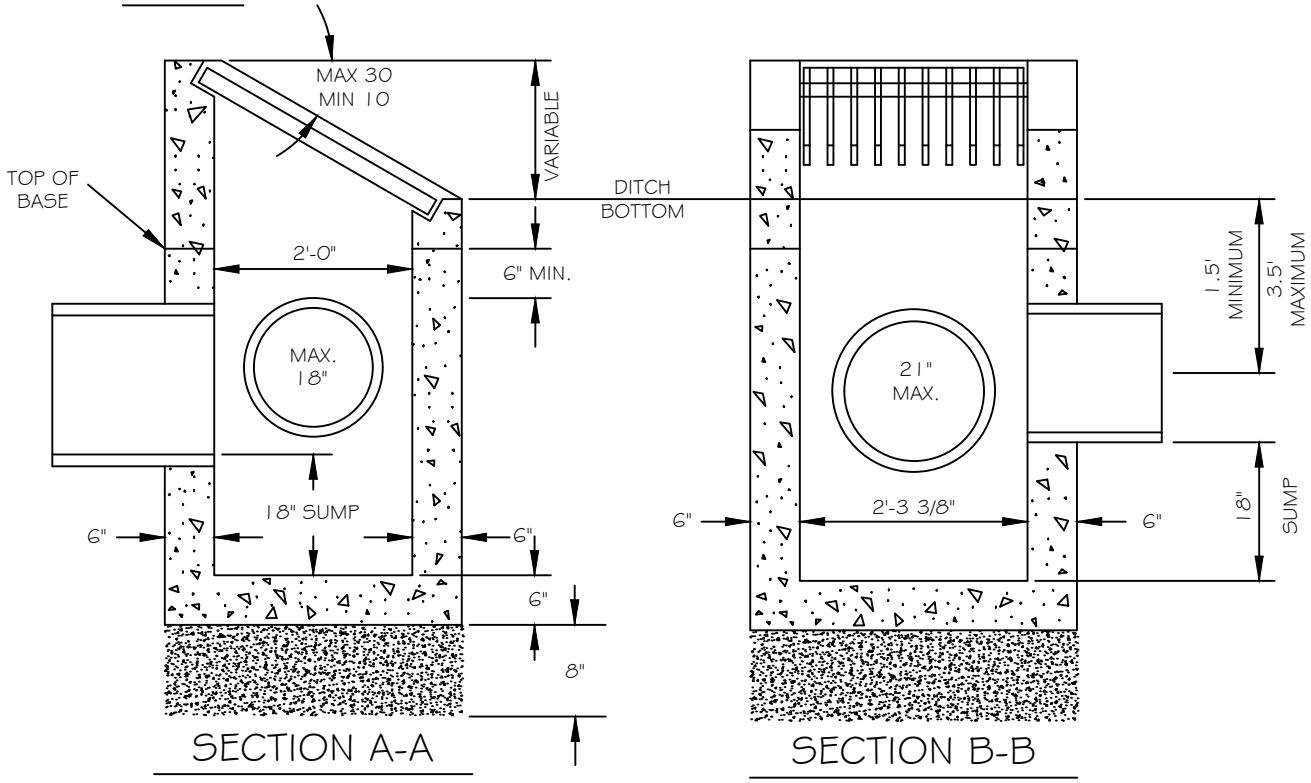
STORM PRETREATMENT SNOUT

DRAWN BY	PW	5/2025	S-2065
CHECKED BY	MWH	5/2025	



PLAN



SECTION A-A

SECTION B-B

NOTES:
1. DITCH INLET CONSTRUCTION IN ACCORDANCE WITH ASTM C-478.
2. REQUIRED TO BE BEDDED IN 8" OF COMPACTED 3/4"-0 CRUSHED ROCK BASE MATERIAL.
3. PRIOR APPROVAL REQUIRED FOR DITCH INLET STRUCTURES FOR PIPE SIZES 24" OR LARGER.
4. PRECAST DITCH INLET SHALL BE UTILITY VAULT ODOT TYPE G2 INLET OR APPROVED EQUAL.

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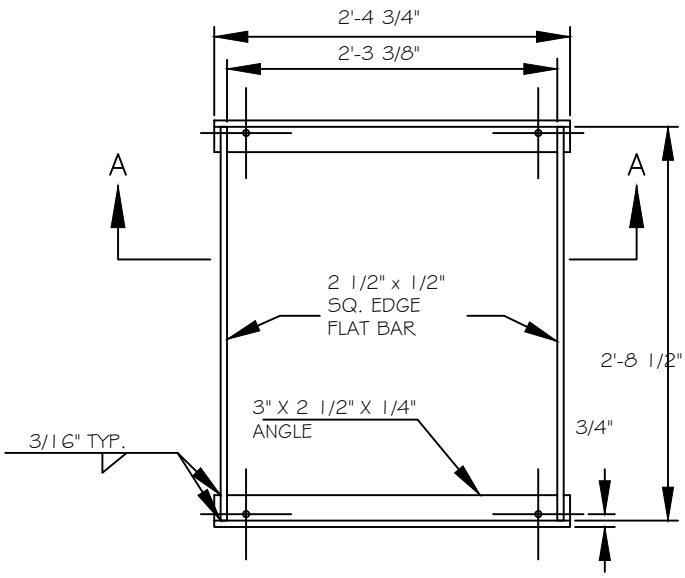
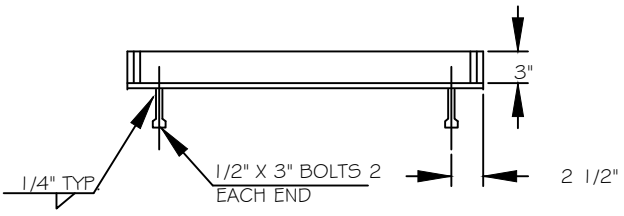
DEPARTMENT OF PUBLIC WORKS

DITCH INLET

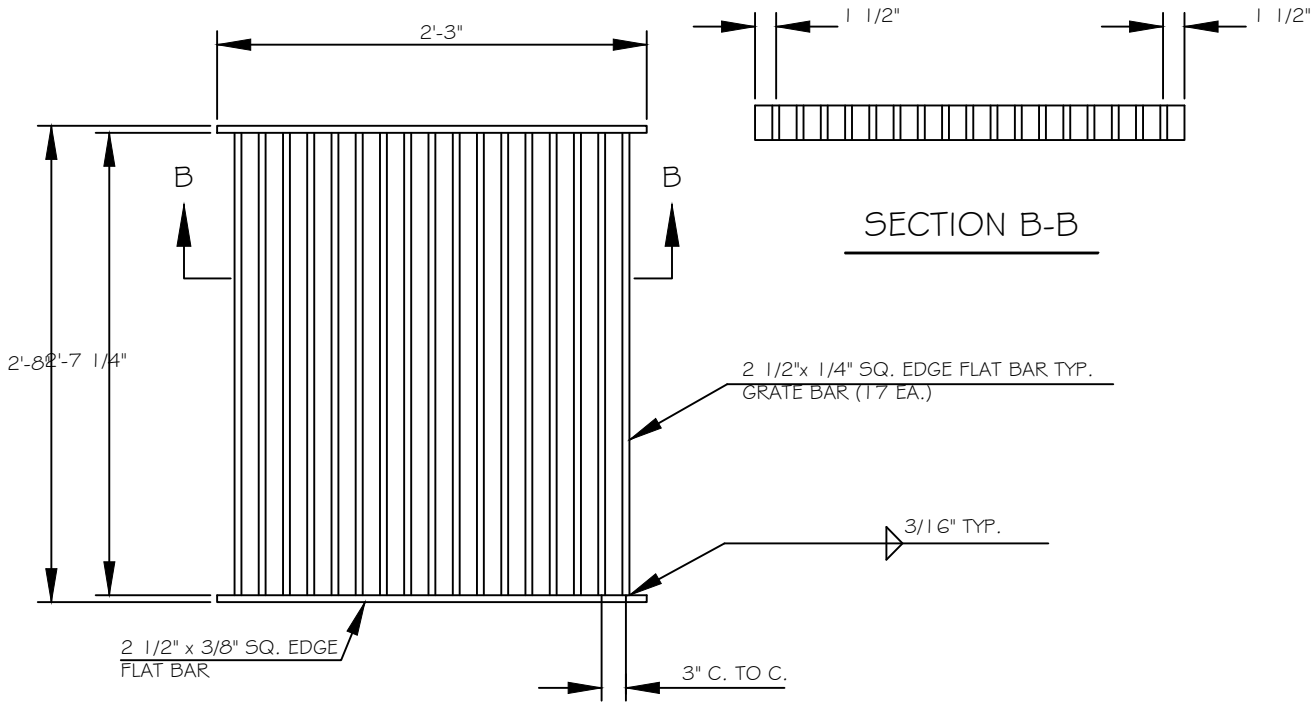
DRAWN BY	PW	5/2025	S-2070
CHECKED BY	MWH	5/2025	



PLAN



SECTION A-A



PLAN

SECTION B-B

NOTE:
FRAME AND GRATE TO BE FLAT BAR STEEL OR APPROVED EQUAL.

Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

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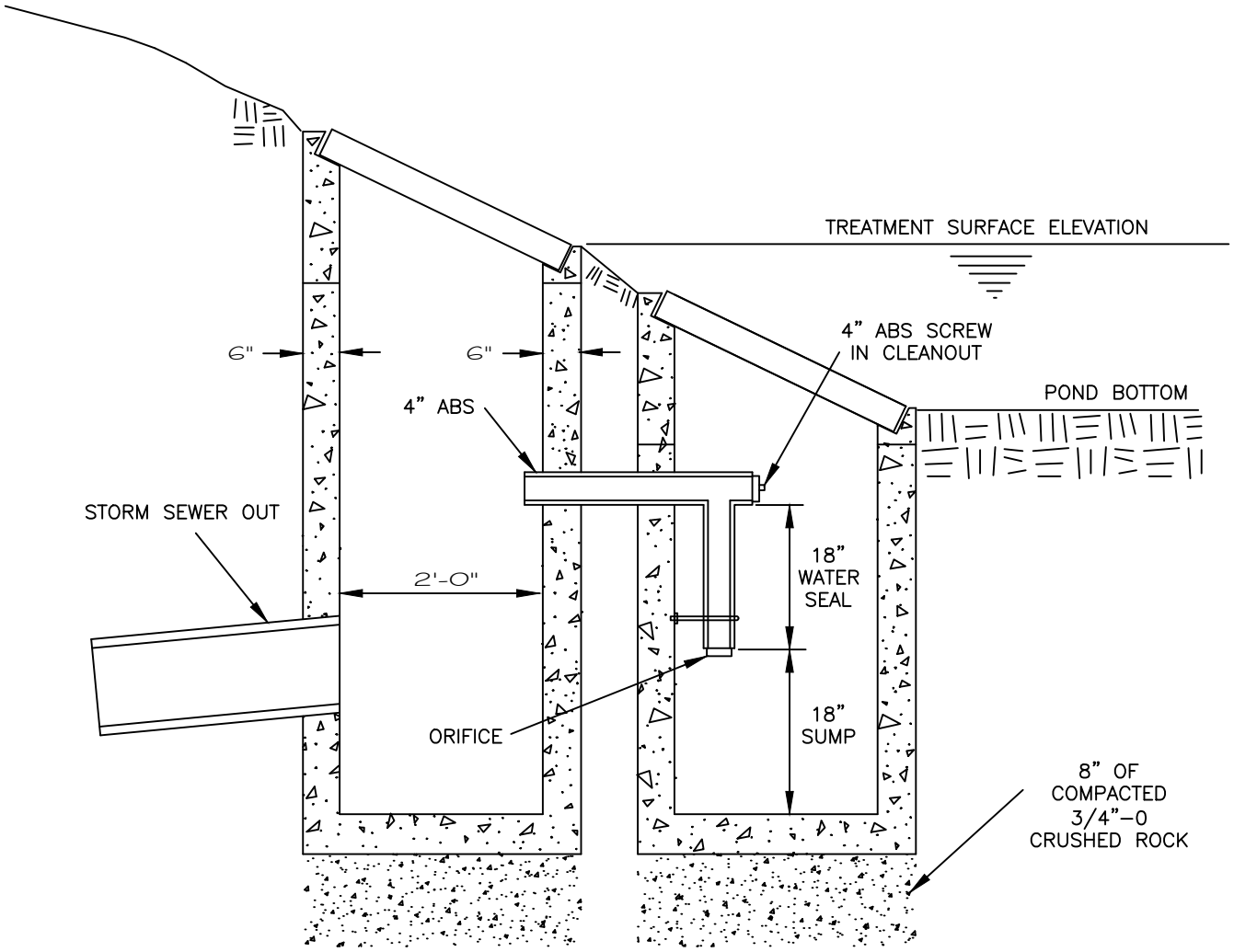
DEPARTMENT OF PUBLIC WORKS

DITCH INLET
FRAME AND GRATE

DRAWN BY	PW	5/2025	S-2075
CHECKED BY	MWH	5/2025	



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DEPARTMENT OF PUBLIC WORKS

WATER QUALITY POND OUTFLOW

DRAWN BY	PW	5/2025	S-2080
CHECKED BY	MWH	5/2025	

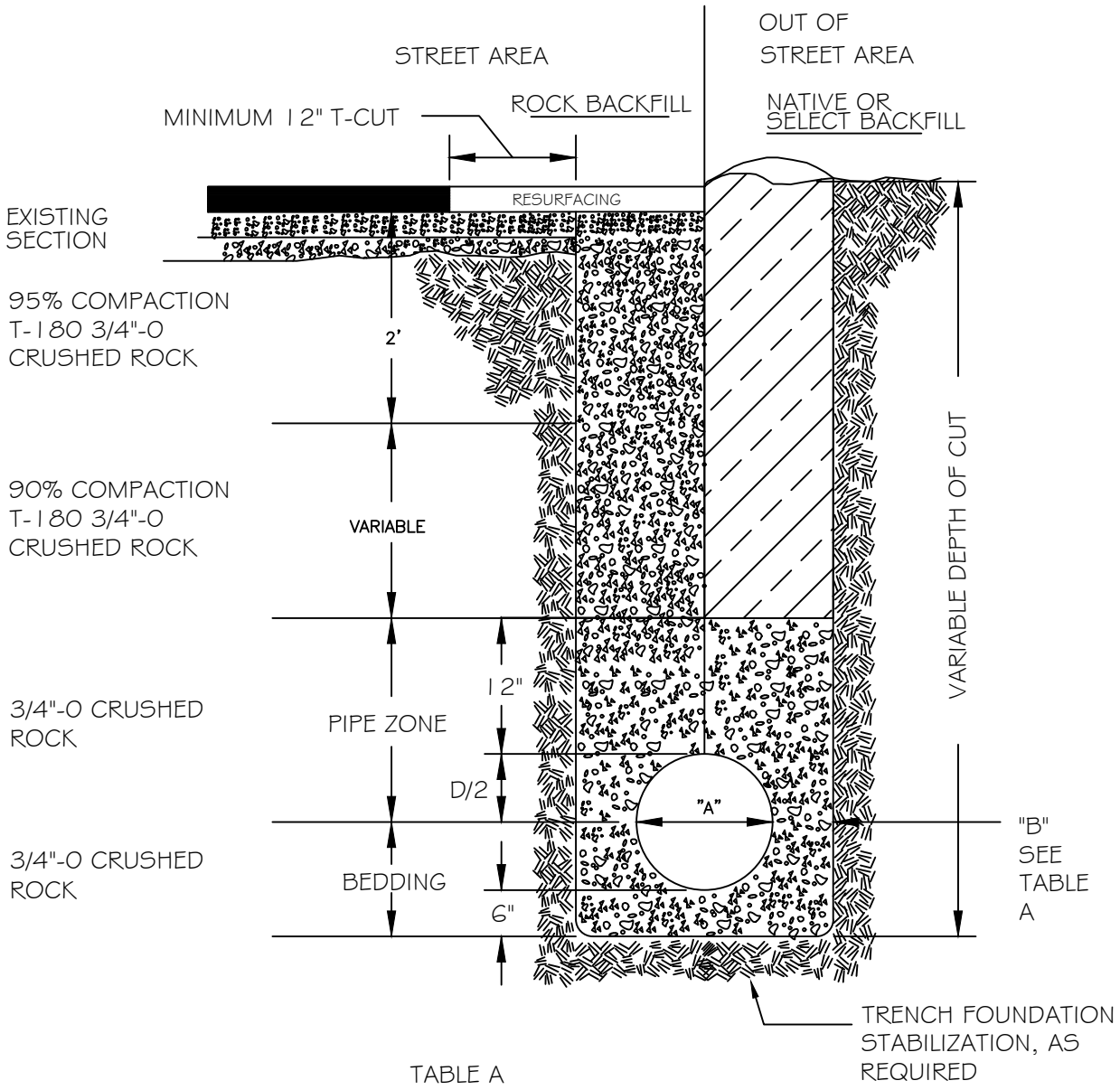

TABLE A

"A"	4"	6"	8"	10"	12"	15"	18"	21"	24"	30"	36"	42"	48"	54"	60"	66"	72"
"B"	6"	6"	6"	6"	6"	D/2	D/2	D/2	D/2	D/2	D/2	D/2	24"	24"	24"	24"	24"

BACKFILL IN STREET AREAS

1. IF S/W IS AGAINST CURB, FILL ROCK TO BACK OF S/W.
2. IF S/W IS NOT AGAINST CURB, FILL ROCK 2' BACK FROM CURB.
3. 12" TEE CUT TO BE MADE AFTER INSTALLATION AND COMPACTION OF CRUSHED AGGREGATE.

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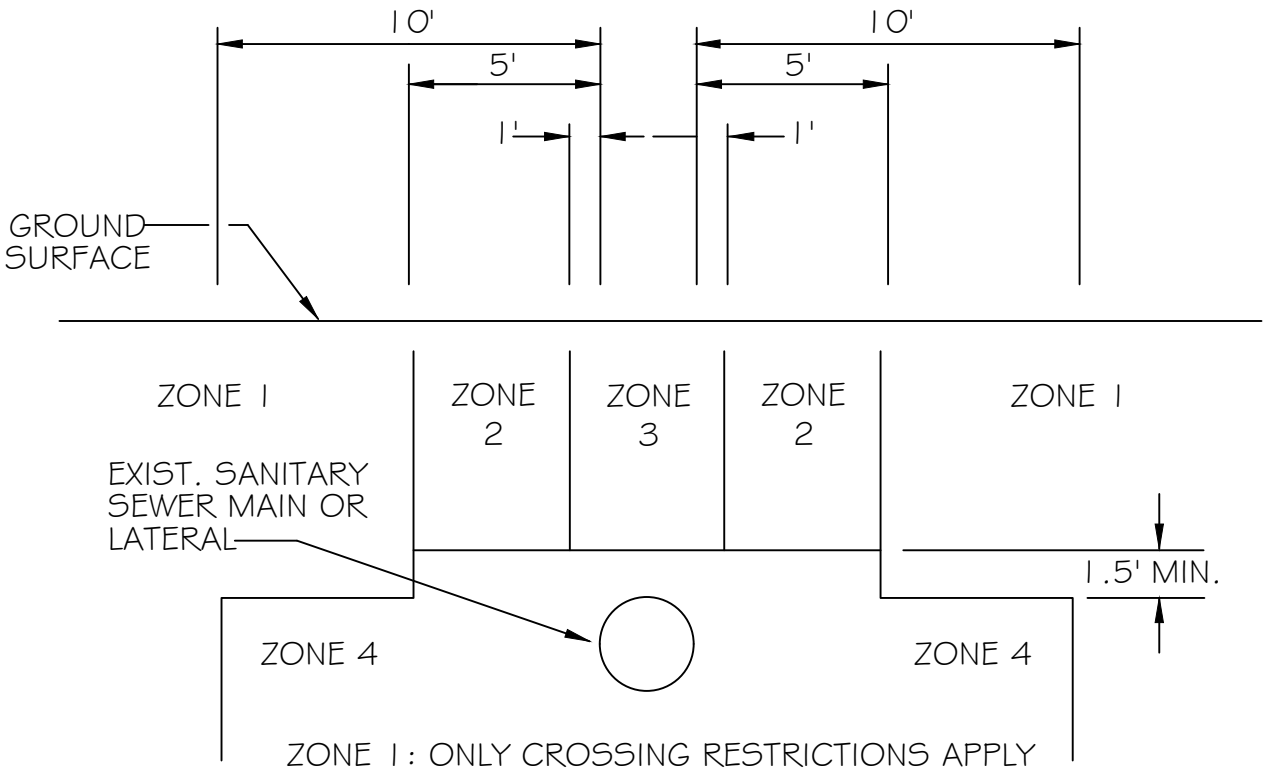
DEPARTMENT OF PUBLIC WORKS

TRENCH AND T-CUT
DETAIL

DRAWN BY	PW	5/2025
CHECKED BY	MWH	5/2025

S-2085



ZONE 1: ONLY CROSSING RESTRICTIONS APPLY

ZONE 2: CASE-BY-CASE DETERMINATION

ZONE 3: PARALLEL WATERLINE PROHIBITED

ZONE 4: PARALLEL WATERLINE PROHIBITED

NOTES:

1. WHERE THE PROPOSED WATERLINE WILL BE INSTALLED PARALLEL TO AN EXISTING GRAVITY SANITARY SEWER MAIN OR LATERAL LINE, THE SEPARATION BETWEEN THE TWO SHALL BE AS INDICATED ABOVE.

2. CROSSINGS:

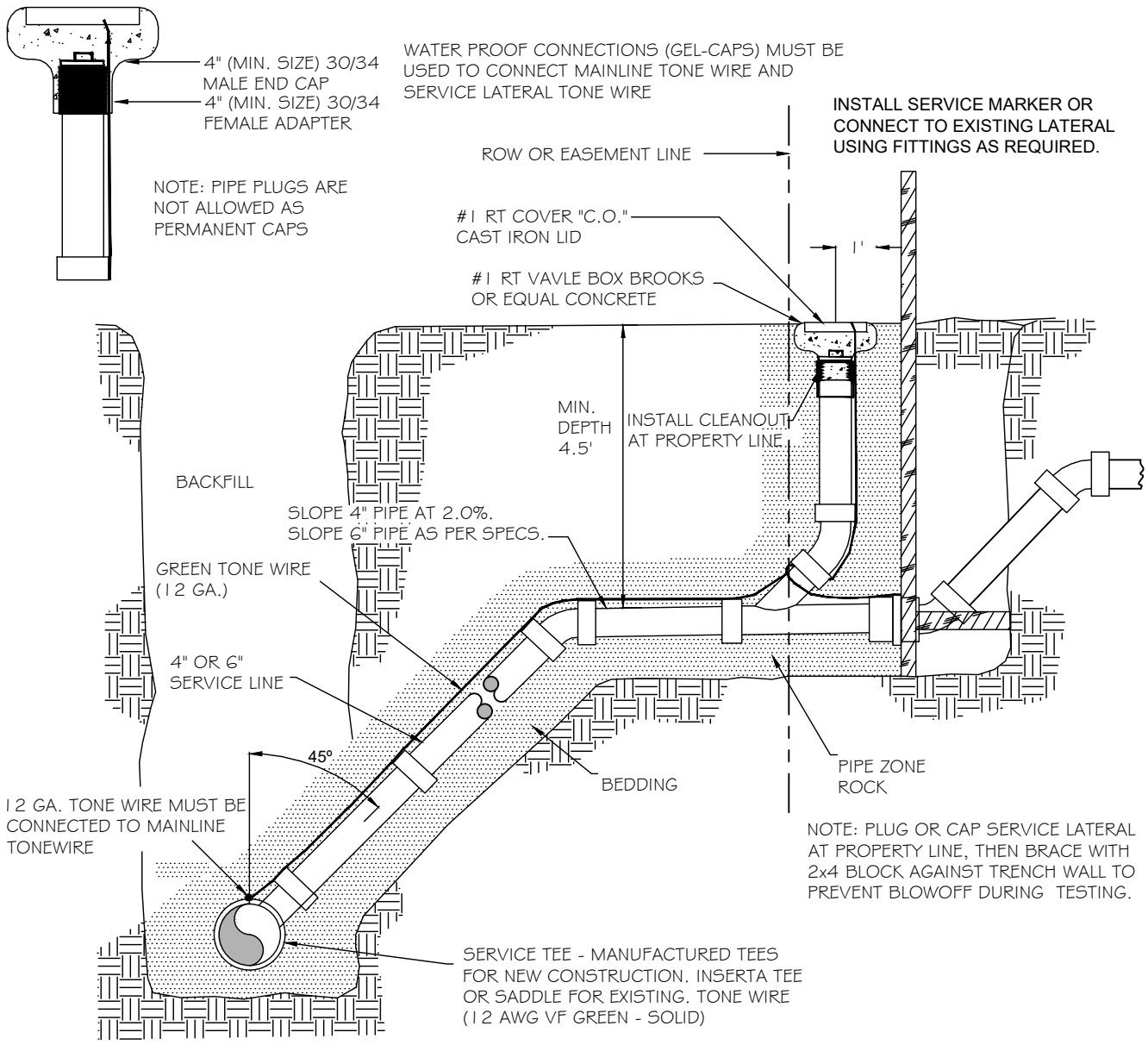
a.) WHEREVER POSSIBLE, THE BOTTOM OF THE WATERLINE SHALL BE 1.5 FEET ABOVE THE TOP OF THE SEWER LINE, AND ONE FULL LENGTH OF WATERLINE SHALL BE CENTERED AT THE CROSSING.

b.) WHERE IT IS NOT POSSIBLE FOR THE WATER LINE TO BE 1.5 FEET ABOVE THE SEWER LINE, OR THE WATERLINE PASSES UNDER THE SEWER LINE, THE EXISTING SEWER LINE SHALL BE EXPOSED FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE CROSSING, AND SHALL BE REPLACED WITH C-900 PVC OR CLASS 50 DUCTILE IRON PIPE AS APPROVED BY THE ENGINEER, AND A LENGTH OF WATER PIPE SHALL BE CENTERED AT THE CROSSING, OR AS APPROVED BY THE ENGINEER.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

SANITARY SEWER CROSSING

DRAWN BY	PW	5/2025	S-2090
CHECKED BY	MWH	5/2025	

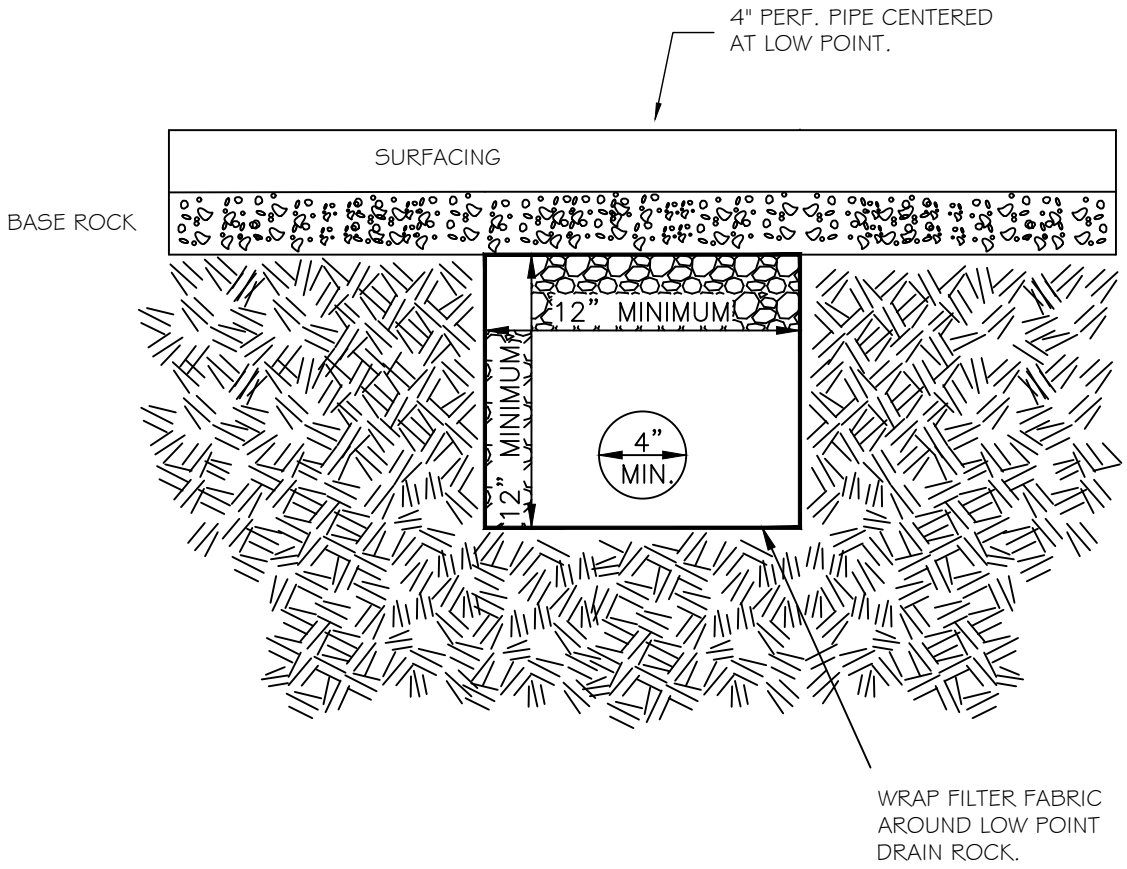


1. BEDDING FOR SERVICE LINES SHALL BE MIN. 6-INCHES OF 3/4"-0 CRUSHED ROCK.
2. TAPPING OF SEWER MAINS TO BE INSPECTED BY CITY FORCES.
3. IN NEW SUBDIVISIONS OR FOR UNUSED STUBS, MARK END OF SERVICE WITH PAINTED 2 x 4 STAKE (WHITE FOR STORM, GREEN FOR SANITARY). MARKER SHALL EXTEND AT LEAST 2 FEET ABOVE FINISHED GRADE. USING BLACK INDELIBLE MARKER, INDICATE DEPTH FROM TOP OF BOARD AND TYPE (SS FOR SANITARY, SD FOR STORM DRAIN).
4. IN EXISTING SERVICE AREAS, CONTRACTOR SHALL VERIFY DEPTH OF PRIVATE SEWER LATERAL DEPTH AT PROPERTY LINE. CONNECT TO SHALLOW SERVICES USING BENDS ON PRIVATE PROPERTY. CONNECT TO DEEP LINES BY INSTALLING SERVICE AT CONSTANT 2% SLOPE THROUGH CLEANOUT AND CONNECT TO SERVICE.
5. INSTALL A CONTINUOUS 12 GAUGE INSULATED COPPER TRACER WIRE ADJACENT TO SEWER LATERAL BETWEEN THE SEWER MAIN AND CLEANOUT AT BUILDING. (USE GREEN INSULATION FOR SEWER, WHITE FOR STORM)
6. ADJACENT SERVICE LINES TO HAVE 18" MINIMUM HORIZONTAL SEPARATION AT THE MAIN.
7. ANGLE AND BEND MAY BE REDUCED TO 22.5° WITH SPECIFIC APPROVAL FROM THE PUBLIC WORKS DIRECTOR.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

SEWER LATERAL

DRAWN BY	PW	5/2025	S-2100
CHECKED BY	MWH	5/2025	



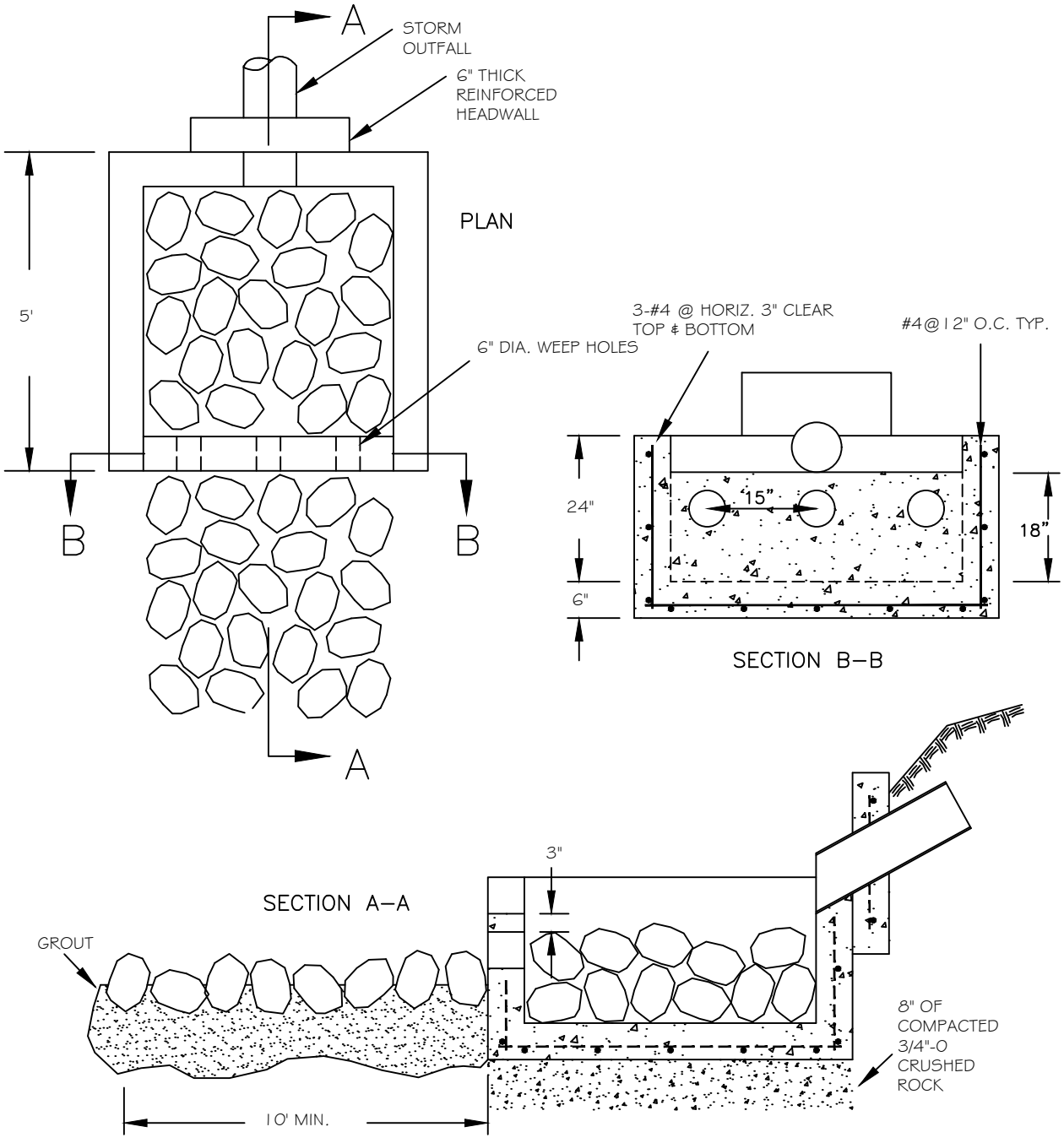
1. LOW POINT DRAIN SHALL BE INSTALLED TRANSVERSE ACROSS THE ROADWAY BETWEEN CATCH BASINS OR MANHOLES TO DRAIN GROUNDWATER FROM THE ROADWAY BASE.
2. PERFORATED PVC PIPE SHALL BE A MINIMUM OF 4 INCHES IN DIAMETER. ENGINEER SHALL SIZE DRAIN SIZE APPROPRIATE FOR GROUNDWATER AS LOCAL CONDITIONS WARRANT.
3. USE OPEN GRADED DRAINAGE ROCK MATERIAL, 1 INCH MINIMUM DIAMETER, AROUND PERFORATED PIPE.
4. DRAINAGE ROCK SHALL BE WRAPPED IN FILTER FABRIC WITH A MINUMUM 1 FOOT OVERLAP.
5. SUBGRADE GEOTEXTILE SHALL BE PLACED OVER FILTER FABRIC WRAP.
6. LOW POINT DRAIN SHALL BE INSTALLED INTO THE CENTER OF THE LOW POINT CATCH BASINS OR MANHOLES. POINTS OF CONNECTION SHALL BE SEALED DURING CONSTRUCTION USING NON-SHRINK GROUT.
7. BASE ROCK DRAINS SHALL NOT BE CONNECTED TO LOW POINT DRAINS.
8. SUBMIT DRAIN ROCK AND PERFORATED PIPE SUBMITTALS TO PUBLIC WORKS FOR APPROVALS.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

ROADWAY BASE LOW POINT DRAIN

DRAWN BY	PW	5/2025
CHECKED BY	MWH	5/2025

S-2105



NOTES:
1. RIP RAP SHALL BE 6" MIN. AND GROUTED IN PLACE, 3" THICK.
2. RIP RAP SHALL BE PRESSED INTO WET GROUT. SHOTCRETE WILL NOT BE ACCEPTED.
3. CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 3000 PSI. AT 28 DAYS.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

SWALE INFLOW SPREADER

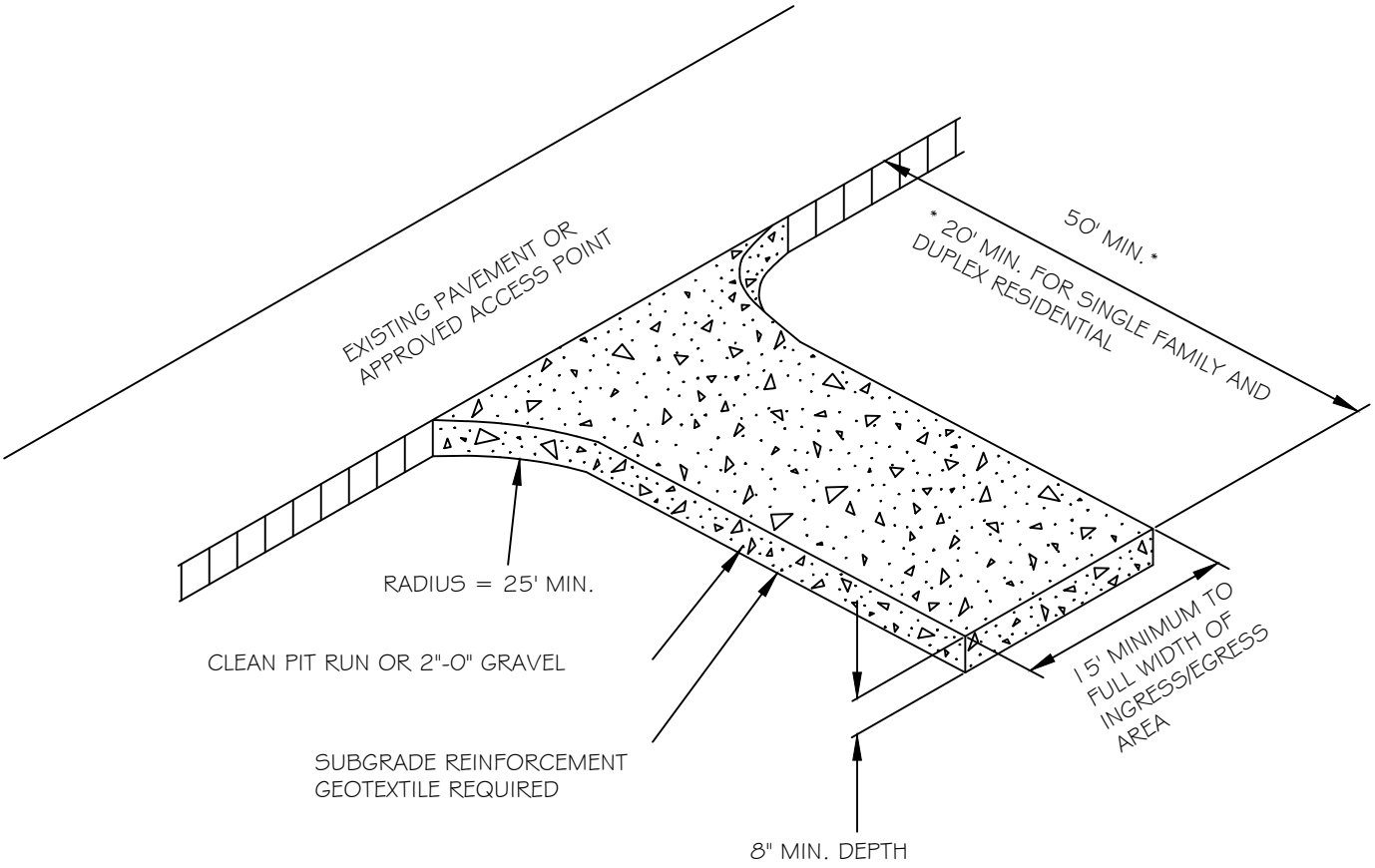
DRAWN BY	PW	5/2025	S-2110
CHECKED BY	MWH	5/2025	

NOTES:
CONTRACTOR TO REMOVE ACCUMULATED SEDIMENT FROM WHEEL WASH; MAY BE PIPED TO AN APPROVED SEDIMENT TRAP.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

WHEEL WASH

DRAWN BY	PW	5/2025	S-2115
CHECKED BY	MWH	5/2025	



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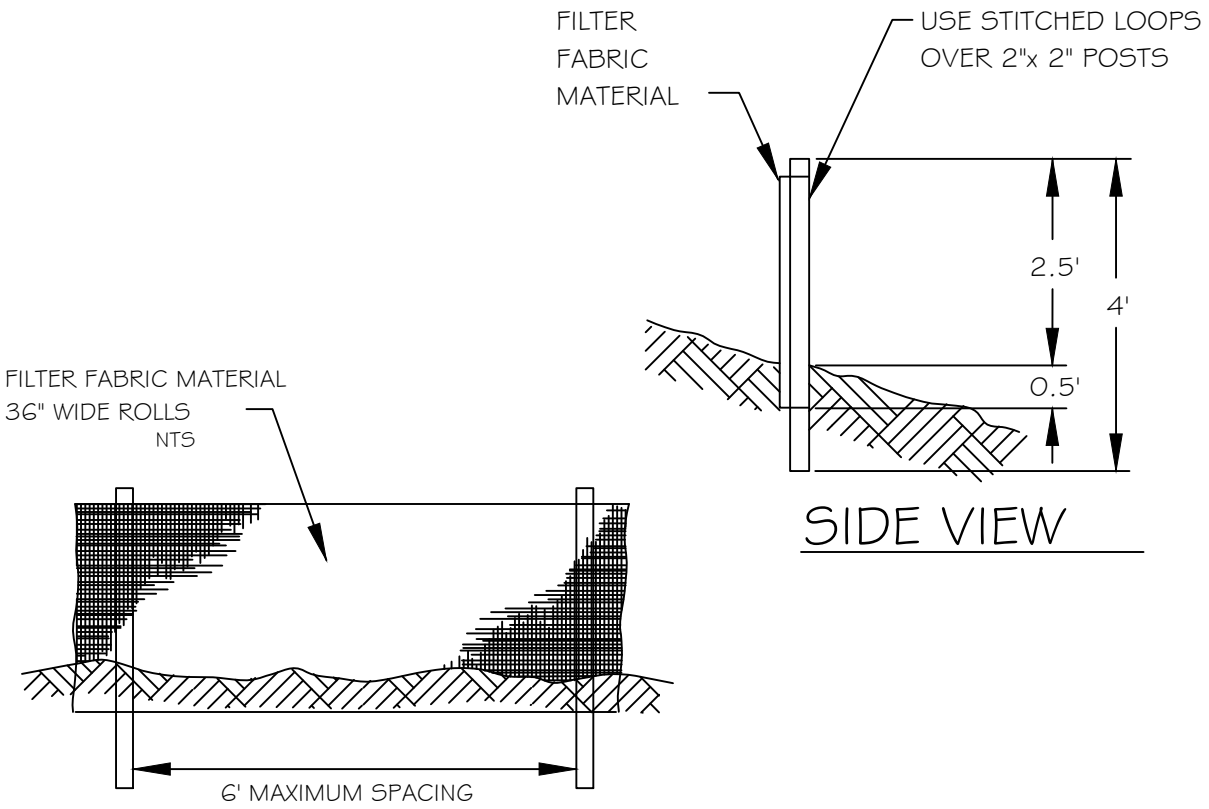
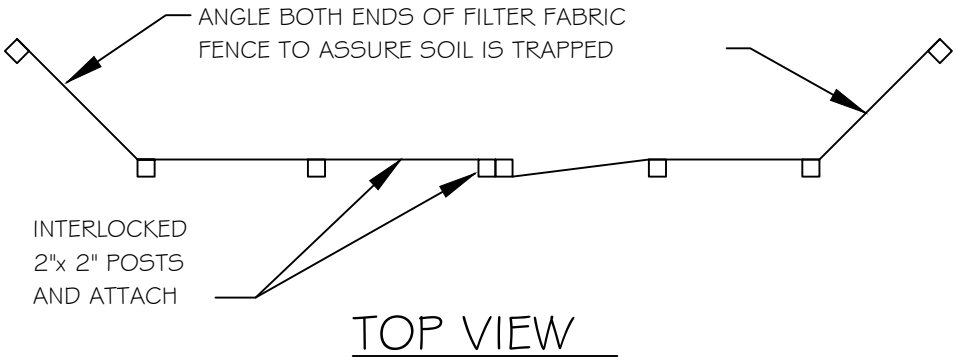
DEPARTMENT OF PUBLIC WORKS

GRAVEL CONSTRUCTION ENTRANCE

DRAWN BY	PW	5/2025	S-2120
CHECKED BY	MWH	5/2025	





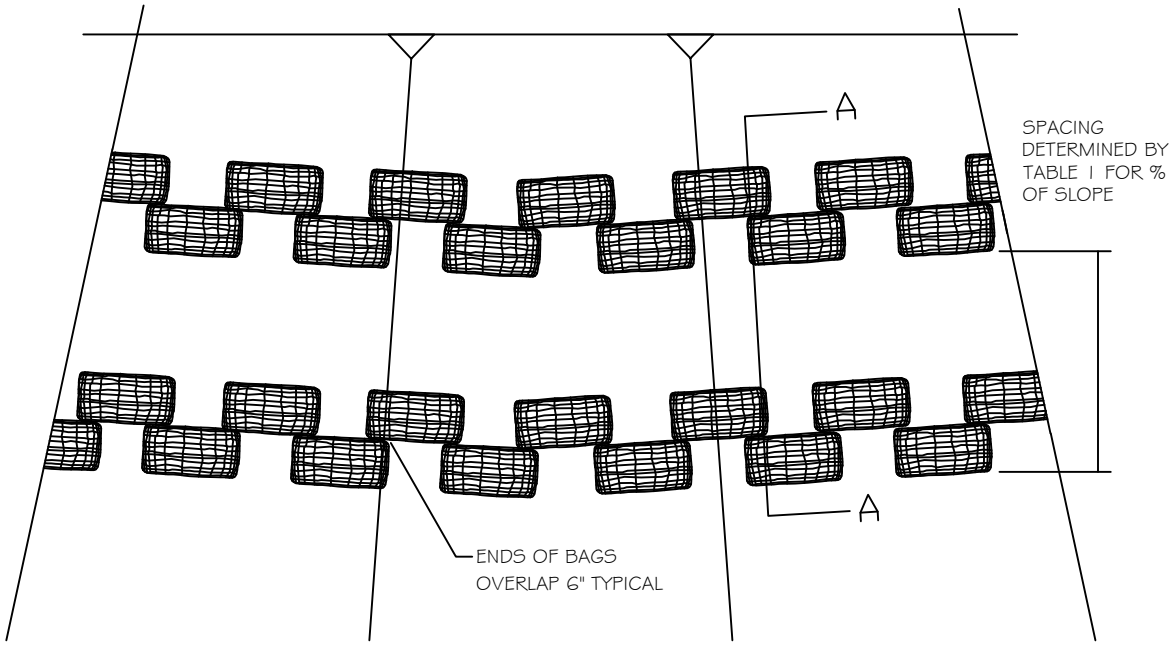
NOTE:

1. SEDIMENT FENCING SHALL BE INSTALLED AS PER MANUFACTURER RECOMMENDATIONS.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

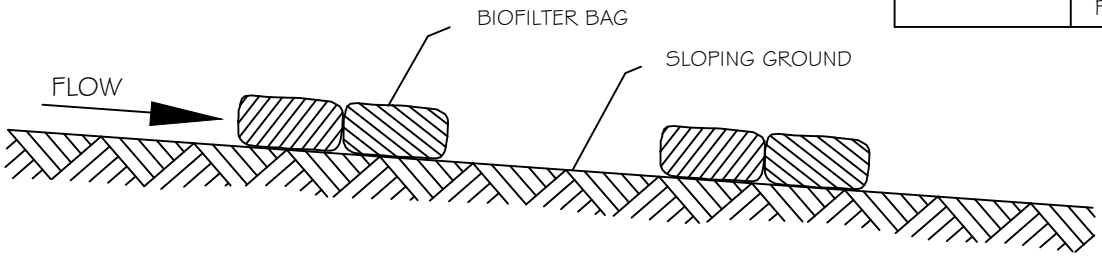
SEDIMENT FENCE

DRAWN BY	PW	5/2025	S-2125
CHECKED BY	MWH	5/2025	



PLAN VIEW

TABLE 1	
SLOPE	SPACING
< 2%	25'
2% - 3%	15'
>3%	NOT PERMITTED



SECTION A - A

ALTERNATE #1

NTS

NOTE:
STAKING OF BAGS SHALL BE REQUIRED USING (2) 1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.

CITY OF INDEPENDENCE
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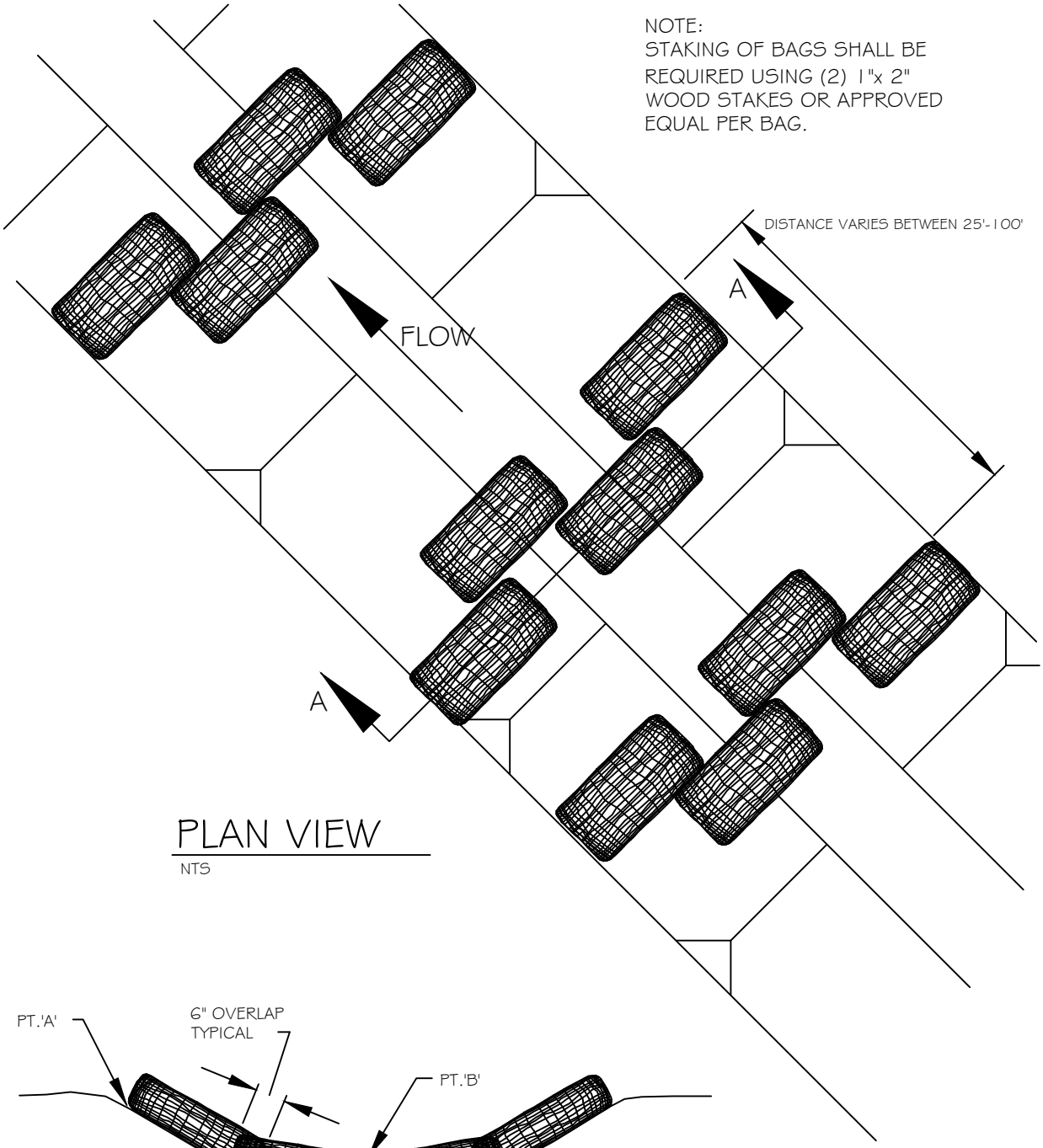
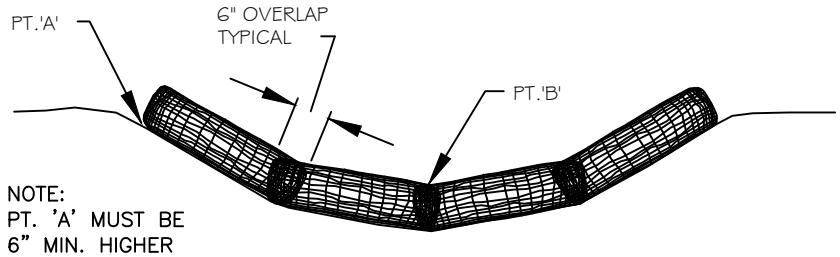
BIOFILTER BAG
OVERLAND FLOW

DRAWN BY	PW	5/2025	S-2130
CHECKED BY	MWH	5/2025	

NOTE:
STAKING OF BAGS SHALL BE REQUIRED USING (2) 1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.



PLAN VIEW
NTS



NOTE:
PT. 'A' MUST BE 6" MIN. HIGHER THAN PT. 'B'

SECTION A-A
NTS

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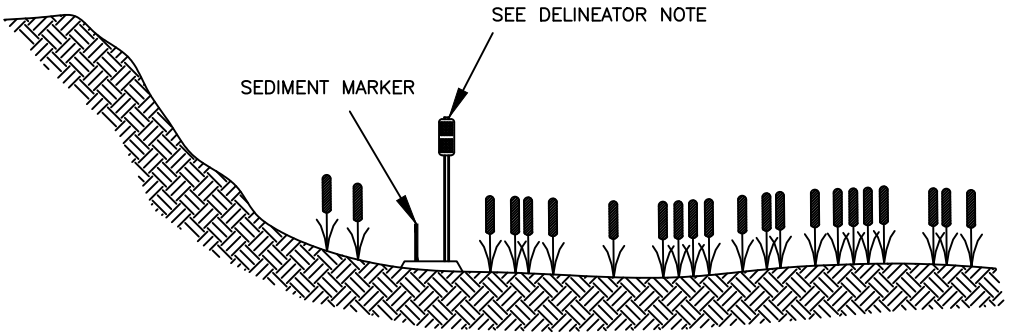
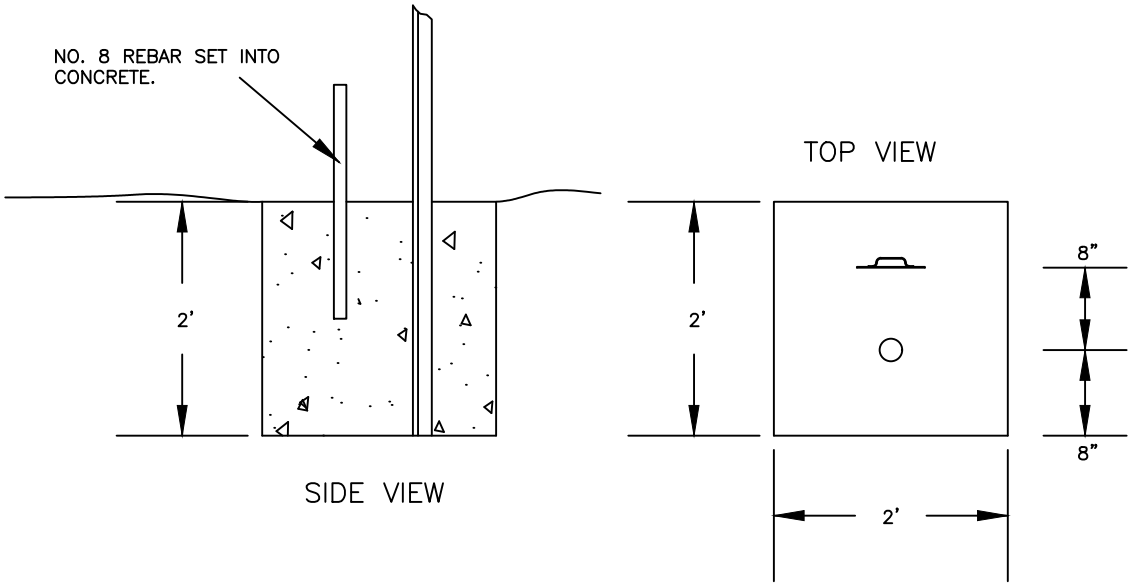
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

BIOFILTER BAG
DITCHES AND SWALES

DRAWN BY	PW	5/2025	S-2135
CHECKED BY	MWH	5/2025	





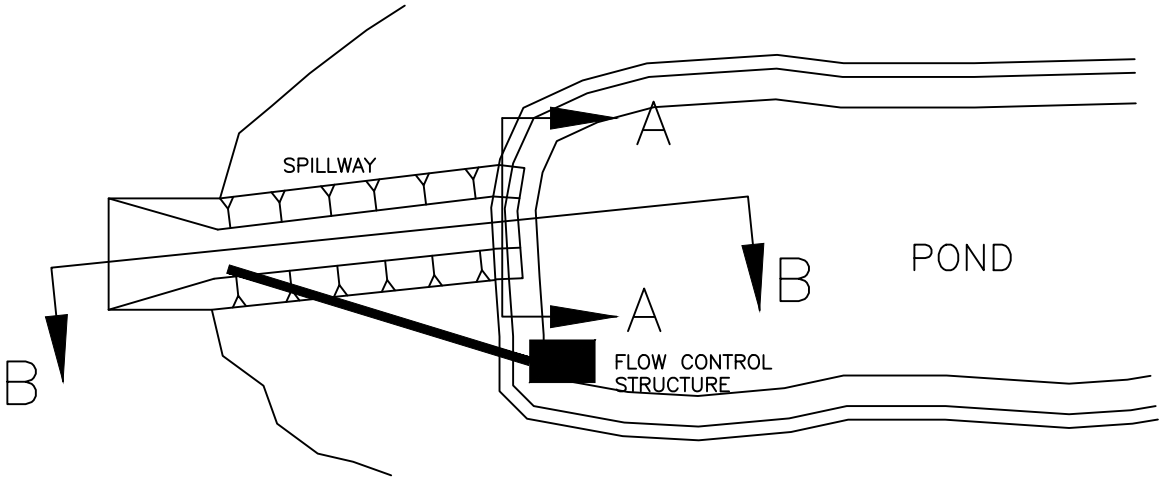
NOTES:
1. DELINEATOR SHALL MEET THE FOLLOWING REQUIREMENTS:
   - 7' TALL TYPE 1 TRAFFIC DELINEATOR
   - ALUMINUM TARGET
   - TWO 3"X4" WHITE REFLECTIVE SHEETS
2. SET DELINEATOR 2' INTO CONCRETE BASE.
3. FACE DELINEATOR TOWARD TOP OF BANK
4. SET SEDIMENT MARKER 1' INTO CONCRETE BASE IN FRONT OF DELINEATOR WHEN VIEWED FROM TOP OF BANK.

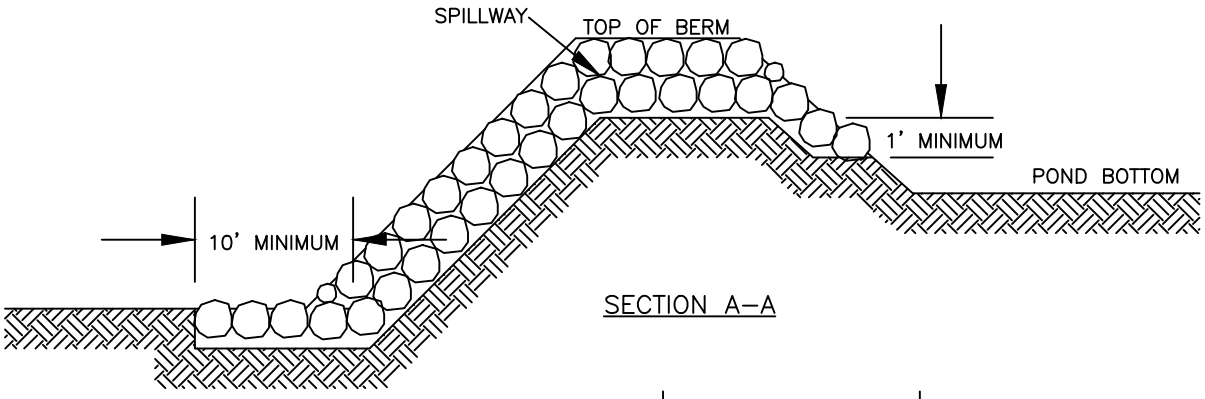
CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

DETENTION/WATER QUALITY POND
SEDIMENT MARKER

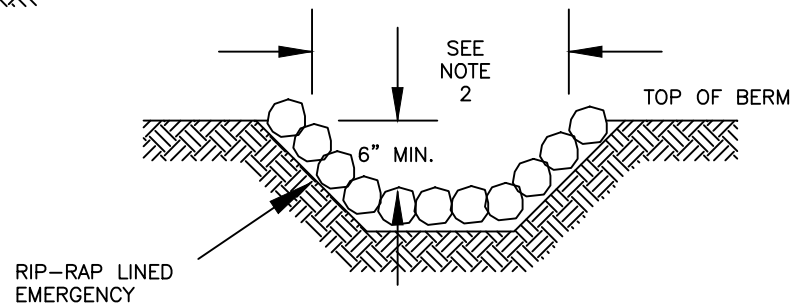
DRAWN BY	PW	5/2025
CHECKED BY	MWH	5/2025

S-2140





SECTION A–A



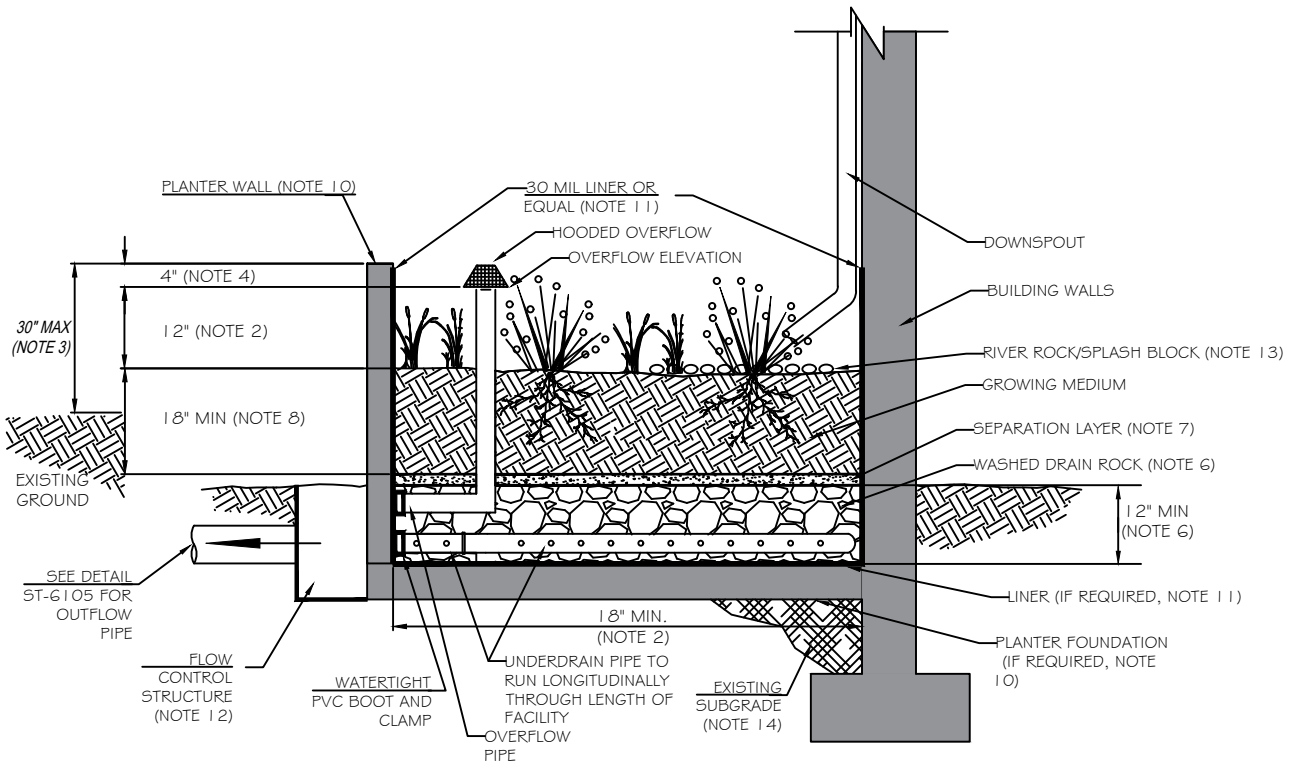
SECTION B–B

NOTES:
1. RIP-RAP SIZE PER DESIGN ENGINEER (CLASS 100 MINIMUM)
2. SPILLWAY SHALL BE DESIGNED TO ACCOMMODATE A 100 YEAR STORM EVENT. PROVIDE AN EMERGENCY SPILLWAY SIZED TO PASS THE 100-YEAR STORM EVENT OR AN APPROVED HYDRAULIC EQUIVALENT. THE EMERGENCY SPILLWAY SHALL BE LOCATED IN EXISTING SOILS WHEN FEASIBLE AND ARMORED WITH RIPRAP
3. RIP-RAP SHALL BE PRESSED INTO WET GROUT TO A DEPTH OF 1/2 THE DIAMETER OF THE RIP-RAP.
4. GROUTED RIP-RAP CHANNEL SHALL EXTEND A MINIMUM DEPTH OF 1' INTO POND AREA.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

DETENTION/WATER QUALITY POND
EMERGENCY OVERFLOW

DRAWN BY	PW	5/2025	S-2145
CHECKED BY	MWH	5/2025	



GENERAL NOTES:

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. WRAP UNDER-DRAIN IN FILTER FABRIC TO REDUCE TRANSPORT OF FINES.
2. **DIMENSIONS:**
   WIDTH: 18" MINIMUM
   DEPTH OF PLANTER (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION): 12"
   SLOPE OF PLANTER: 0.5% OR LESS
3. **HEIGHT/SETBACK**
   PLANTERS SHALL BE LESS THAN 30" IN HEIGHT ABOVE SURROUNDING AREA
   PLANTERS SHALL BE MINIMUM OF 5 FEET FROM PROPERTY LINE
4. **OVERFLOW:**
   INLET ELEVATION SHALL ALLOW FOR 4" OF FREEBOARD, MINIMUM
   PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE
5. **PIPING:**
   PERFORATED UNDER-DRAIN PIPING: SHALL RUN LONGITUDINALLY THROUGH LENGTH OF FACILITY, SHALL BE ABS SCH. 40, CAST IRON, OR PVC SCH.40, 6" MINIMUM DIAMETER. PIPING SHALL HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND. WRAP UNDER-DRAIN IN FILTER FABRIC TO REDUCE TRANSPORT OF FINES.
   OVERFLOW PIPING: SHALL BE ABS SCH.40, CAST IRON, OR PVC SCH.40 AND SHALL NOT BE PERFORATED. MINIMUM DIAMETER IS 6". PIPING SHALL HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
6. **DRAIN ROCK:**
   SIZE FOR FLOW-THROUGH PLANTER: 1 1/2" - 3/4" WASHED
   DEPTH: 12" MINIMUM
7. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
8. **GROWING MEDIUM:**
   DEPTH: 18" MINIMUM
   SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
   FACILITY SURFACE AREA MAY BE REDUCED BY 25% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
9. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
10. **PLANTER FOUNDATION AND WALLS:**
    MATERIALS SHALL BE 4" REINFORCED CONCRETE, STONE, BRICK, OR OTHER DURABLE MATERIAL.
    CONCRETE, BRICK, OR STONE WALLS SHALL BE INCLUDED ON FOUNDATION PLANS.
    INSTALL INVERTED CURB AS NEEDED BETWEEN PLANTER AND ROAD SUBGRADE.
    SUBMIT RETAINING WALL DESIGN IN ACCORDANCE WITH APPLICABLE STRUCTURAL CODES FOR REVIEW AND APPROVAL.
11. **WATERPROOF LINER (IF REQUIRED):**
    LINER SHALL BE 30 MIL PVC OR EQUIVALENT, FOR FLOW THROUGH FACILITIES.
    A WATERPROOF LINER IS NOT REQUIRED IF THE FOUNDATION OR WALL MATERIAL IS WATERPROOF REINFORCED CONCRETE OR APPROVED EQUAL.
12. **FLOW CONTROL** STRUCTURE. SEE DETAIL ST-6105.
13. **INSTALL RIVER ROCK** SPLASH PAD OVER A NON WOVEN GEO TEXTILE FABRIC TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" - 3", 4 SQUARE FEET, 6" DEEP.
14. **SEASONAL HIGH GROUNDWATER SEPARATION:**
    SEPARATION DISTANCE AS REQUIRED BY THE CITY.

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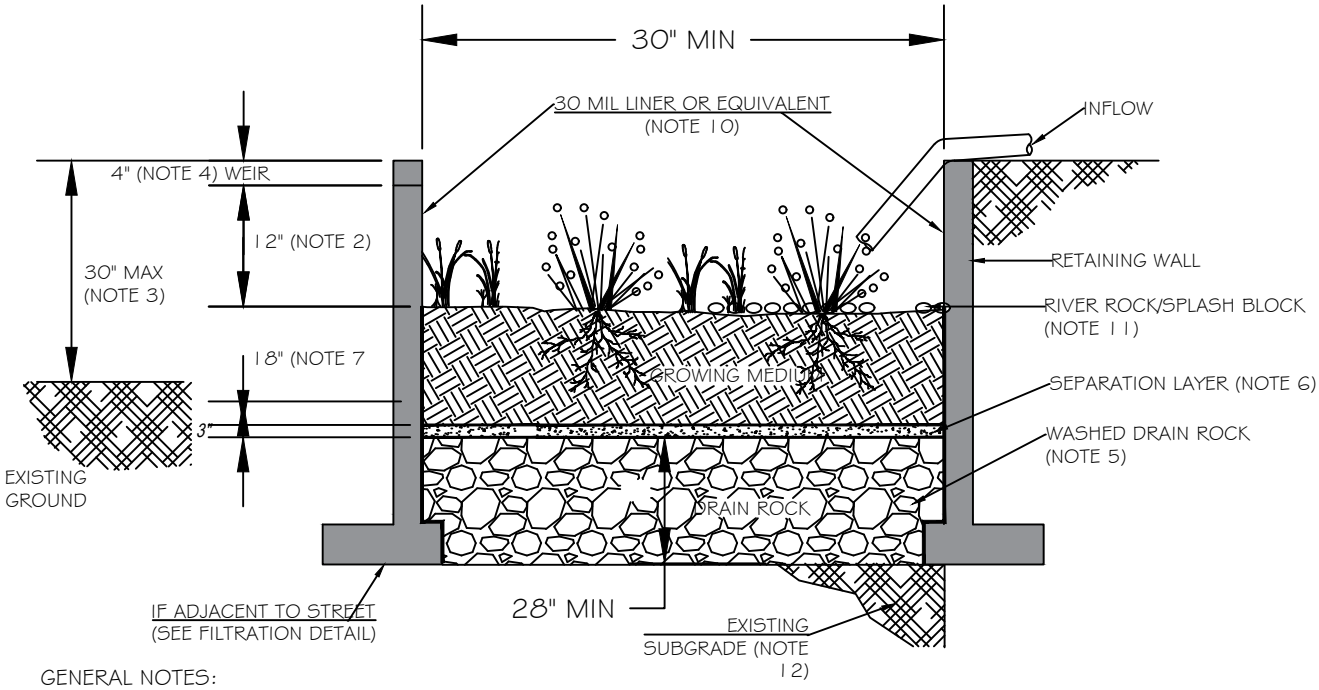
DEPARTMENT OF PUBLIC WORKS

STORMWATER PLANTER FILTRATION

DRAWN BY	PW	5/2025	S-2150
CHECKED BY	MWH	5/2025	



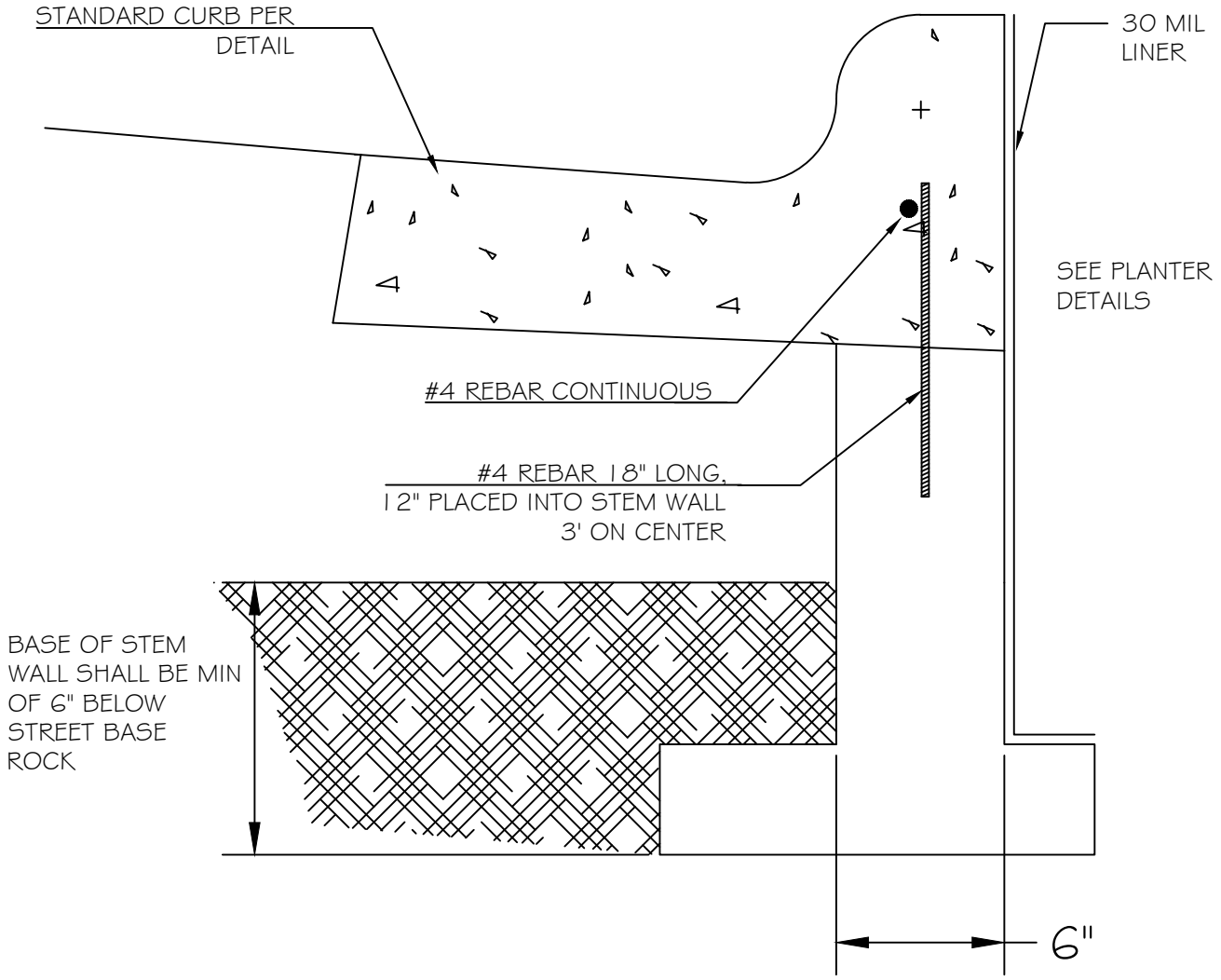
GENERAL NOTES:

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. DIMENSIONS:
   WIDTH: 30" MINIMUM
   DEPTH OF PLANTER (FROM TOP OF GROWING MEDIUM TO OVERFLOW WEIR ELEVATION): 12"
   SLOPE OF PLANTER: 0.5% OR LESS
3. SETBACKS:
   PLANTERS SHALL BE LESS THAN 30" IN HEIGHT ABOVE SURROUNDING AREA
   PLANTERS SHALL BE MINIMUM OF 5 FEET FROM PROPERTY LINE
4. OVERFLOW:
   WIER ELEVATION SHALL ALLOW FOR 4" OF FREEBOARD, MINIMUM
   SIZE OVERFLOW WEIR FOR 100 YEAR DESIGN STORM. IDENTIFY EMERGENCY OVERFLOW ROUTE ON STORMWATER MANAGEMENT PLAN.
5. DRAIN ROCK:
   SIZE: 1 1/2" - 3/4" WASHED
   DEPTH: 28" MINIMUM
6. SEPARATION BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. GROWING MEDIUM:
   DEPTH: 18" MINIMUM
   SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
   FACILITY SURFACE AREA MAY BE REDUCED BY 25% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. VEGETATION: FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. PLANTER WALLS:
   MATERIALS SHALL BE STONE, BRICK, CONCRETE OR OTHER DURABLE MATERIAL.
   CONCRETE, BRICK, OR STONE WALLS SHALL BE INCLUDED ON FOUNDATION PLANS.
   INSTALL INVERTED CURB AS NEEDED BETWEEN PLANTERS AND ROAD SUBGRADE.
   SUBMIT RETAINING WALL DESIGN IN ACCORDANCE WITH APPLICABLE STRUCTURAL CODES FOR REVIEW AND APPROVAL.
10. WATERPROOF LINER:
    LINER SHALL BE 30 MIL PVC OR EQUIVALENT, FOR FLOW THROUGH FACILITIES.
    A WATERPROOF LINER IS NOT REQUIRED IF THE FOUNDATION OR WALL MATERIAL IS WATERPROOF REINFORCED CONCRETE OR APPROVED EQUAL.
11. INSTALL RIVER ROCK SPLASH PAD OVER A NON WOVEN GEO TEXTILE FABRIC TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" - 3", 4 SQUARE FEET, 6" DEEP.
12. SEASONAL HIGH GROUNDWATER SEPARATION:
    SEPARATION DISTANCE AS REQUIRED BY CITY.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

STORMWATER PLANTER INFILTRATION

DRAWN BY	PW	5/2025	S-2155
CHECKED BY	MWH	5/2025	



NOTES:

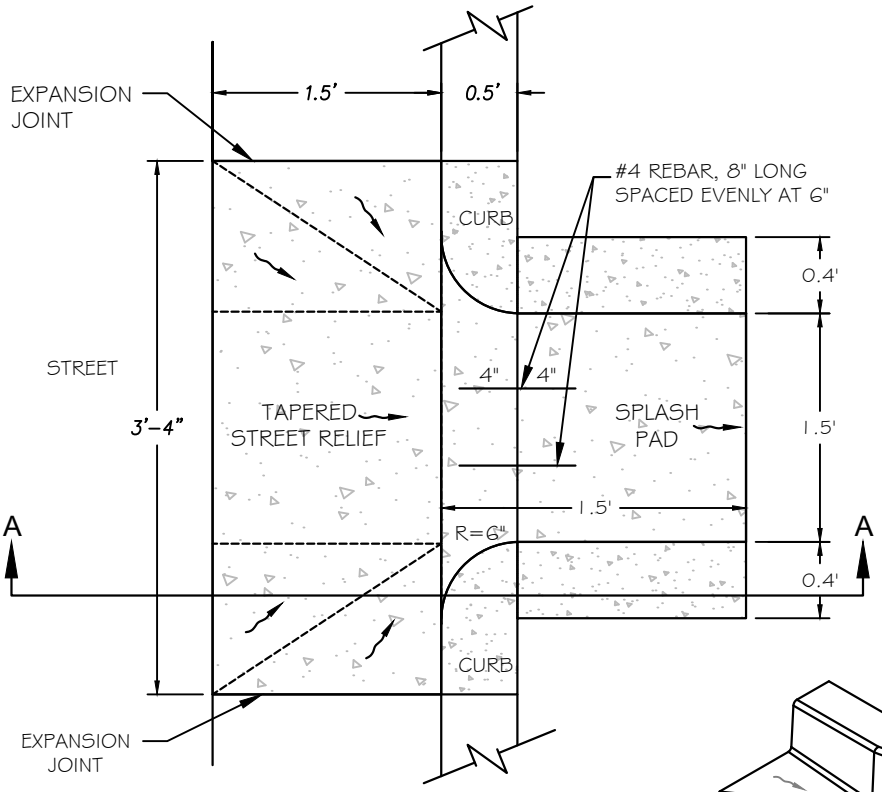
1. NO WEIR
2. ADD HOODED OVERFLOW WITH OUTLET TIED INTO ADJACENT CURB INLET

Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

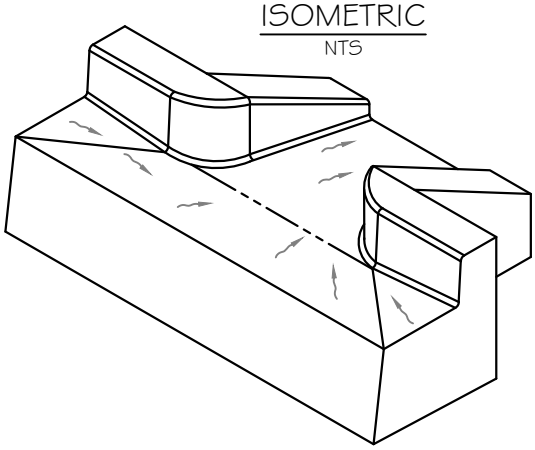
STORMWATER PLANTER
STEM WALL ADJACENT TO STREET

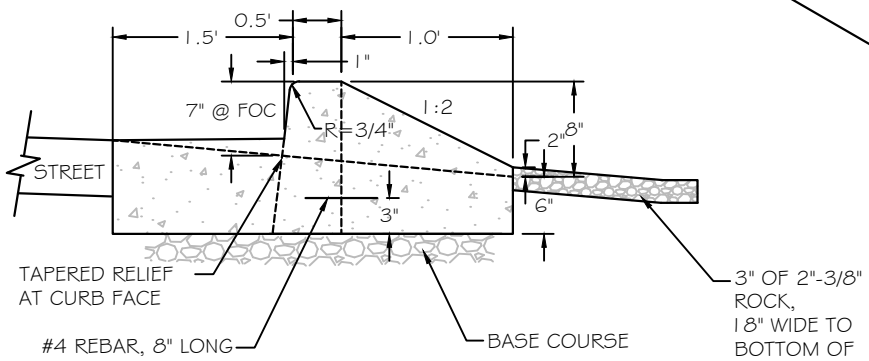
DRAWN BY	PW	5/2025	S-2160
CHECKED BY	MWH	5/2025	



SWALE INLET
NTS

ISOMETRIC
NTS





SECTION A-A
NTS

Notes:

1. Concrete shall be commercial mix, minimum compressive strength of 3300 PSI at 28 days and incorporate micro-reinforcement "Fibermesh 300" or approved equal.
2. Base rock to be 3/4"-0 compacted to 95% of AASHTO T-180 and shall be to sub grade, street structure, or 4" in depth, whichever is greater.
3. Base course shall be thoroughly watered immediately prior to placement of concrete when the measured or forecasted ascending air temperature is 80 degrees or greater.

Detail Drawing may not be altered or changed in any manner except by the Public Works Director. It is the responsibility of the user to acquire the most current version.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

STORMWATER SWALE INLET

DRAWN BY	PW	5/2025	S-2165
CHECKED BY	MWH	5/2025	

Stormwater Planters
Operations & Maintenance Plan

What to Look For	What to Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains and curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 to 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Slippage	-Stabilize 3:1 slopes/banks with plantings
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.
Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.
All seasons. Weed as necessary.

Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.
Access: Maintain ingress/egress to design standards.

Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

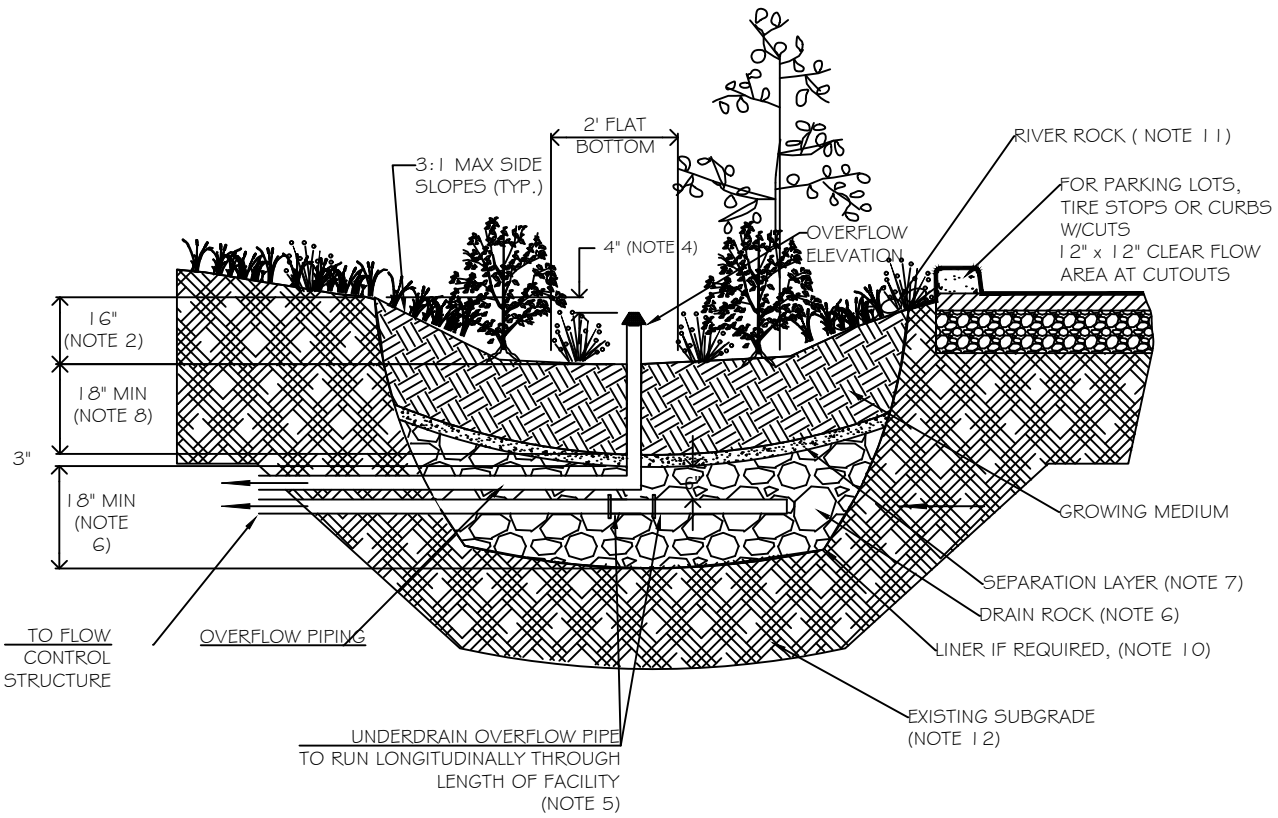
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact _____ for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

STORMWATER PLANTER
O & M PLAN

DRAWN BY	PW	5/2025	S-2170
CHECKED BY	MWH	5/2025	



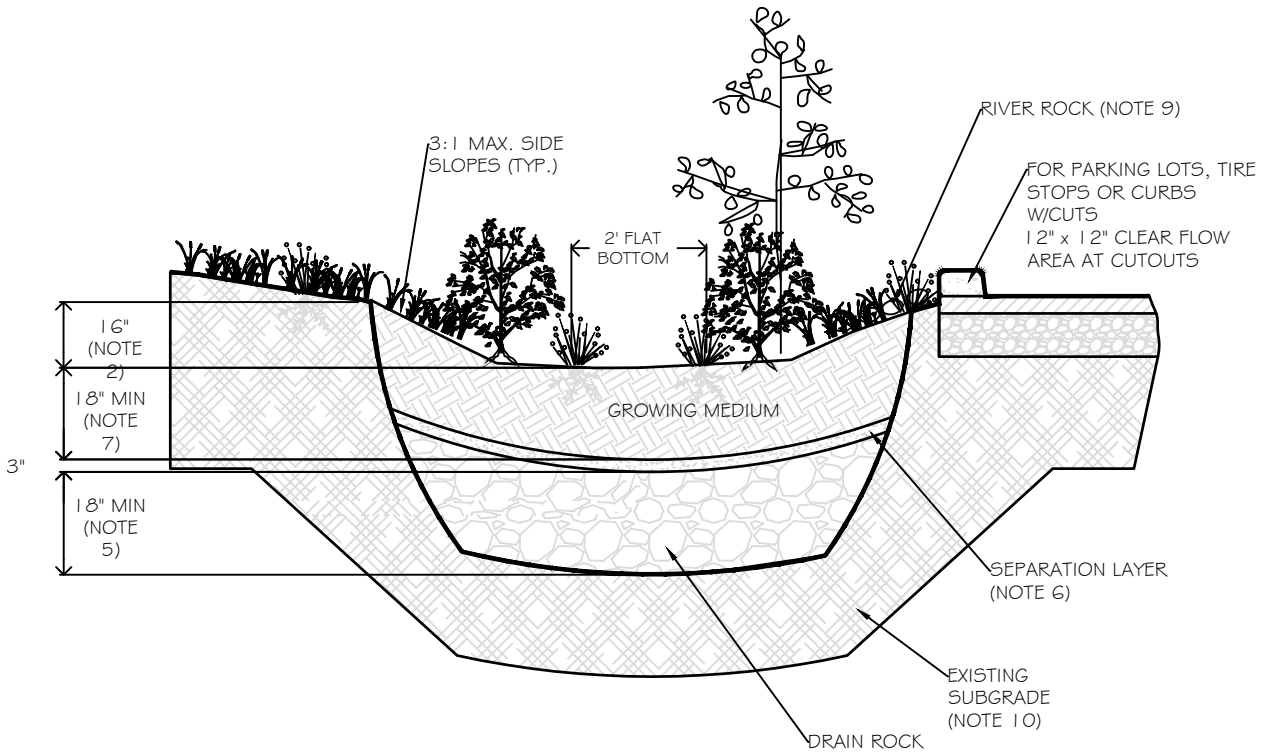
GENERAL NOTES:

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED RAIN GARDENS ARE PREFERRED TO MAXIMIZE ONSITE INFILTRATION.
2. DIMENSIONS:
   DEPTH OF BASIN (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION); 12"
   FLAT BOTTOM WIDTH: 2' MINIMUM
   SIDE SLOPES OF RAIN GARDEN: 3:1 MAXIMUM
   CENTERLINE SLOPE OF RAIN GARDEN: 0.5% OR LESS
3. SETBACKS:
   FILTRATION RAIN GARDEN SHALL BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES UNLESS APPROVED BY BUILDING OFFICIAL
4. OVERFLOW:
   OVERFLOW REQUIRED. INLET ELEVATION SHALL ALLOW FOR 4" OF FREEBOARD, MINIMUM.
   PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
5. PIPING:
   PERFORATED UNDER-DRAIN PIPING: SHALL RUN LONGITUDINALLY THROUGH LENGTH OF FACILITY, SHALL BE ABS SCH. 40, CAST IRON, OR PVC SCH.40. MINIMUM DIAMETER IS 6". PIPING SHALL HAVE 1% GRADE AN FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND. WRAP UNDER-DRAIN IN FILTER FABRIC TO REDUCE TRANSPORT OF FINES. OVERFLOW PIPING: SHALL BE ABS SCH. 40, CAST IRON, OR PVC SCH. 40 AND SHALL NOT BE PERFORATED. MINIMUM DIAMETER IS 6". PIPING SHALL HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
6. DRAIN ROCK:
   SIZE: 1 1/2" to 3/4"-0 WASHED
   DEPTH: 18" MINIMUM
7. SEPARATION BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
8. GROWING MEDIUM:
   DEPTH: 18" MINIMUM
   SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
   FACILITY SURFACE AREA MAY BE REDUCED BY 25% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
9. VEGETATION: FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS.
10. WATERPROOF LINER (IF REQUIRED): SHALL BE 30 MIL PVC OR EQUIVALENT.
11. INSTALL RIVER ROCK SPLASH PAD OVER A NON WOVEN GEO TEXTILE FABRIC TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" - 3", 4 SQUARE FEET, 6" DEEP.
12. SEASONAL HIGH GROUNDWATER SEPARATION:
    SEPARATION DISTANCE AS REQUIRED BY CITY.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

RAIN GARDEN FILTRATION

DRAWN BY	PW	5/2025	S-2175
CHECKED BY	MWH	5/2025	



GENERAL NOTES:

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED RAIN GARDENS ARE PREFERRED TO ALLOW MAXIMUM INFILTRATION.
2. DIMENSIONS:
   DEPTH OF BASIN (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION); 16"
   FLAT BOTTOM WIDTH: 2' MINIMUM
   SIDE SLOPES OF RAIN GARDEN: 0.5% OR LESS
3. SETBACKS (FROM MIDPOINT OF FACILITY):
   INFILTRATION RAIN GARDEN SHALL BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES
4. OVERFLOW:
   -EMERGENCY OUTFLOW PATH FOR THE 100 YEAR DESIGN STORM SHALL BE IDENTIFIED IN THE STORMWATER MANAGEMENT PLAN
5. DRAIN ROCK:
   SIZE: 1 1/2" TO 3/4" WASHED
   DEPTH: 18"
6. SEPARATION BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. GROWING MEDIUM:
   DEPTH: 18" MINIMUM
   SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
   FACILITY SURFACE AREA MAY BE REDUCED BY 25% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
8. VEGETATION: FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. INSTALL RIVER ROCK SPLASH PAD OVER A NON WOVEN GEO TEXTILE FABRIC TO TRANSITION FROM INLET TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3", 4 SQUARE FEET, 6" DEEP.
10. SEASONAL HIGH GROUNDWATER SEPARATION:
    SEPARATION DISTANCE AS REQUIRED BY THE CITY.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

RAIN GARDEN INFILTRATION

DRAWN BY	PW	5/2025	S-2180
CHECKED BY	MWH	5/2025	

Rain Gardens
Operations & Maintenance Plan

What to Look For	What to Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains and curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 to 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Slippage	-Stabilize 3:1 slopes/banks with plantings
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.
Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.
All seasons. Weed as necessary.

Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.

Access: Maintain ingress/egress to design standards.

Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

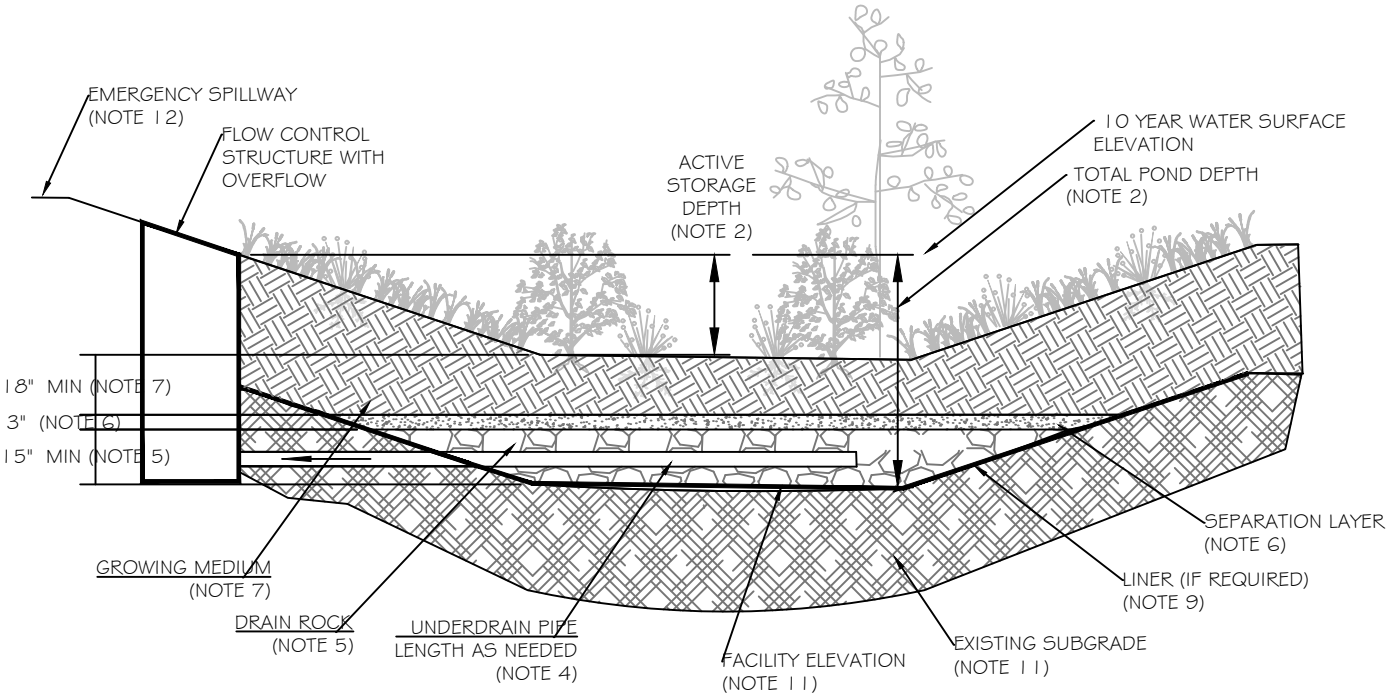
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact _____ for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

RAIN GARDEN
O & M PLAN

DRAWN BY	PW	5/2025	S-2185
CHECKED BY	MWH	5/2025	



GENERAL NOTES:

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED PONDS ARE PREFERRED TO ALLOW MAXIMUM INFILTRATION.
2. DIMENSIONS: ACTIVE STORAGE DEPTH: (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION); PER FACILITY SIZING MODEL TOTAL POND DEPTH: 4' MINIMUM, PER FACILITY SIZING MODEL. BOTTOM SLOPE: 2.0% OR LESS SIDE SLOPES OF DETENTION POND: 3:1 MAXIMUM
3. LOCATION/SETBACKS: DETENTION POND SHALL BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES UNLESS APPROVED BY BUILDING OFFICIAL.
4. PIPING: PERFORATED UNDER-DRAIN PIPING: SHALL BE ABS SCH. 40, CAST IRON OR PVC SCH. 40. 6" MINIMUM DIAMETER. PIPING SHALL HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND. WRAP UNDER-DRAIN PIPE IN FILTER FABRIC TO REDUCE TRANSPORT OF FINES. OVERFLOW PIPING: SHALL BE ABS SCH. 40, CAST IRON OR PVC SCH. 40 AND SHALL NOT BE PERFORATED. MINIMUM DIAMETER IS 6". PIPING SHALL HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
5. DRAIN ROCK: SIZE: 1 1/2" - 3/4"-0 WASHED. DEPTH: 15" MINIMUM
6. SEPARATION BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
7. GROWING MEDIUM: 18" MINIMUM. SEE STANDARDS USE SAND/LOAM/COMPOST 3-WAY MIX.
8. VEGETATION: FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
9. WATERPROOF LINER (IF REQUIRED): SHALL BE 30 MIL PVC OR EQUIVALENT FOR DETENTION POND.
10. INSTALL RIVER ROCK SPLASH PAD OVER A NON WOVEN GEO TEXTILE FABRIC TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3", 4 SQUARE FEET 6" DEEP.
11. SEASONAL HIGH GROUNDWATER SEPARATION: SEPARATION DISTANCE AS REQUIRED BY CITY.
12. EMERGENCY SPILLWAY SIZED TO CONVEY THE 100 YEAR DESIGN STORM. SEE PUBLIC WORKS STANDARDS.

CITY OF INDEPENDENCE
DEPARTMENT OF PUBLIC WORKS

DETENTION POND

DRAWN BY	PW	5/2025	S-2190
CHECKED BY	MWH	5/2025	

MANHOLE VACUUM TEST REPORT

Project Location: (City)	Project Name:
Inspector: (Print)	Date: (Separate Report Required for Each Test Session)
Testing Company: (Name & Phone #)	

Manhole No.	Manhole Diameter (inch)	Manhole Depth (ft)	Surface Restoration Complete?	Time Required[3] (sec)	Time to Drop from 10" Hg to 9" Hg (sec)	Results	Comments
			Yes / No			Pass / Fail	
			Yes / No			Pass / Fail	
			Yes / No			Pass / Fail	
			Yes / No			Pass / Fail	
			Yes / No			Pass / Fail	
			Yes / No			Pass / Fail	
			Yes / No			Pass / Fail	
			Yes / No			Pass / Fail	
			Yes / No			Pass / Fail	

1. All adjacent surface restoration shall be completed prior to conducting manhole acceptance tests, including finish paving and final adjustments to grade. Any test conducted prior to completion of surface restoration shall be considered informal, and will not count for acceptance.

2. The vacuum test head seal shall be inflated in accordance with the manufacturer's recommendations, but in all cases the grade rings and casting shall be included in the test. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9-inches.

3. The manhole shall pass if the time for the vacuum reading to drop to 9-inches meets or exceeds the values indicated on the following table. Times for deeper depths as required by the City Engineer. Note: Visible groundwater infiltration or leakage constitutes a failed test.

REQUIRED MANHOLE VACUUM TEST TIMES

Manhole Depth (feet)	Required Time (sec)		
	48-inch diameter	60-inch diameter	72-inch diameter
8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
18	40	52	65
20	45	59	73
22	50	65	81

SANITARY SEWER AIR TEST REPORT

Project Location:	Project Name:
Inspector: (Print)	Date: (Separate Report Required for Each Test Session)
TV Inspection Required? Yes / No	Mandrel Testing Completed? Date Completed or Scheduled:
Verify that all sewer laterals and associated cleanouts installed and cleanout risers are visible at or above finish grade? Yes / No	Verify that all franchise utilities which cross sewer laterals have been installed and trenches backfilled? Yes / No

Station (& Manhole #)		Main/ Lateral	Size & Material	Total Length (ft)	C[1]	K[1]	Test Time (Seconds) for Pressure Drop Shown (psi)			Comments
From	To						Required[2]	4.0 - 3.5	3.5 - 2.5	
		Main								Pass / Fail
		Laterals								
		Totals								
		Main								Pass / Fail
		Laterals								
		Totals								
		Main								Pass / Fail
		Laterals								
		Totals								
		Main								Pass / Fail
		Laterals								
		Totals								

[1] For C and K values, see table and formulas on reverse side.
[2] For total C ≤ 1.0, test time (seconds) required = 2 times K
For total C > 1.0, test time (seconds) required = 2 times (K/C)

TEST PROCEDURE

1. Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig (or higher pressure as required to address groundwater). *Increase the test pressure by 0.433 psi for each foot of average ground water depth over the exterior crown of the pipe under test, with the maximum test pressure not to exceed 9.0 psi.*
2. Add air slowly until the internal air pressure is raised to 4.0 psig (or higher pressure as required due to groundwater).
3. After required test pressure is reached, allow 2-minutes minimum for air temperature to stabilize, adding only the amount of air required to maintain pressure.
4. After the temperature stabilization period, disconnect the air supply.
5. Record the time required for the internal air pressure to drop from 3.5 psi (or higher as required due to groundwater backpressure) to 2.5 psi (or higher as required due to groundwater backpressure). If this time exceeds the required time (or if there is less than 1.0 psi pressure drop), the test is successful.

ACCEPTANCE: The tested sewer section shall be considered acceptable if the pressure drop during the test time is less than 1.0 psi from the starting pressure.

SEWER AIR TEST C AND K VALUES

Pipe Size (inch)	C-Value[1] per foot length	K-Value[2] per foot length
4	0.00155	0.176
6	0.00233	0.396
8	0.00311	0.704
10	0.00388	1.100
12	0.00466	1.584
15	0.00582	2.475
18	0.00699	3.564
21	0.00815	4.851

[1] $C = 0.0003882dL$ Where d = diameter (inches)
[2] $K = 0.011d^2L$ L = Length (ft)

Example:

Air Test a system consisting of two mainline segments as follows:
Segment 1: 395 feet of 8-inch mainline, 100 feet of 4-inch laterals, and 35 feet of 6 inch laterals.
Segment 2: 200 feet of 8-inch mainline, 30 feet of 4-inch laterals, and 20 feet of 6 inch laterals.

Station (& Manhole #)		Main/ Lateral	Size & Material	Total Length (ft)	C[1]	K[1]	Test Time (Seconds) for Pressure Drop Shown (psi)			Comments
From	To						Required[2]	4.0 - 3.5	3.5 - 2.5	
0+00 MH A1	3+95 MH A2	Main	8" PVC	395	1.227	278.1	310/1.46= 212			Pass / Fail
		Laterals	4" PVC 6" PVC	100 35	0.155 0.082	17.6 13.86	212*2= 414 sec			
		Totals			1.464	309.54				
3+95 MH A2	5+95 MH A3	Main	8" PVC	200	0.621	140.8	2*154= 308 sec			Pass / Fail
		Laterals	4" PVC 6" PVC	20 30	0.047 0.047	5.28 7.92				
		Totals			0.714	154.0				

Note: For total C □ 1.0, test time (seconds) required = 2 times K
For total C > 1.0, test time (seconds) required = 2 times (K/C)

The tested sewer section shall be considered acceptable when tested as described herein if the section under test does not loose air at a rate greater than 0.0015 cfm per square foot of internal sewer surface.

SANITARY SEWER MANDREL TEST REPORT

Project Location: (City)	Project Name:
Inspector: (Print)	Date: (Separate Report Required for Each Test Session)
Mandrel Diameters Verified? Yes / No	

Station (& Manhole #)		Size & Material	Length (ft)	Results	Backfill Compaction Completed?	Date Sewer Flushed & Cleaned	Comments
From	To						
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		
				Pass / Fail	Yes / No		

1. Mandrel testing shall conducted on a manhole to manhole (or cleanout) basis and shall be done after the line has been completely flushed out with water.

2. Mandrel testing shall be conducted after trench backfill and compaction has been completed.

3. The mandrel diameter shall be 95% of the pipe initial inside diameter. The inspector shall verify the diameter of each mandrel used during each test session.

SEWER PIPELINE TV INSPECTION REPORT *(sample only)*

Page ___ of ____

Date:	Client: City:					Basin No.	
Technician:	Inspector:		Weather:	Cleaned By:		Report No.	Tape No.
From M.H. #: Street:	Pipe Dia. (in)	Joint Length (ft)	Section Length (ft)	Joint Type:	Pipe Material	To M.H. #: Street:	

PIPELINE DATA;

Cleanliness: _______________

Alignment: _______________

Grade: _______________

Age: _______________

%Est. Leaking Joints: _________

Other:_________________________

____

PROBLEM CODE LEGEND:

BP = Broken Pipe
CC = Circumferential Crack
LC = Longitudinal Crack
G = Break in Grade
L = Leak
PJ = Pulled Joint
PT = Protruding Tap
ST = Service Tap
SL = Service Left
SR = Service Right
RT = Roots
U = Unpassable

PIPE MATERIAL **LEGEND:**

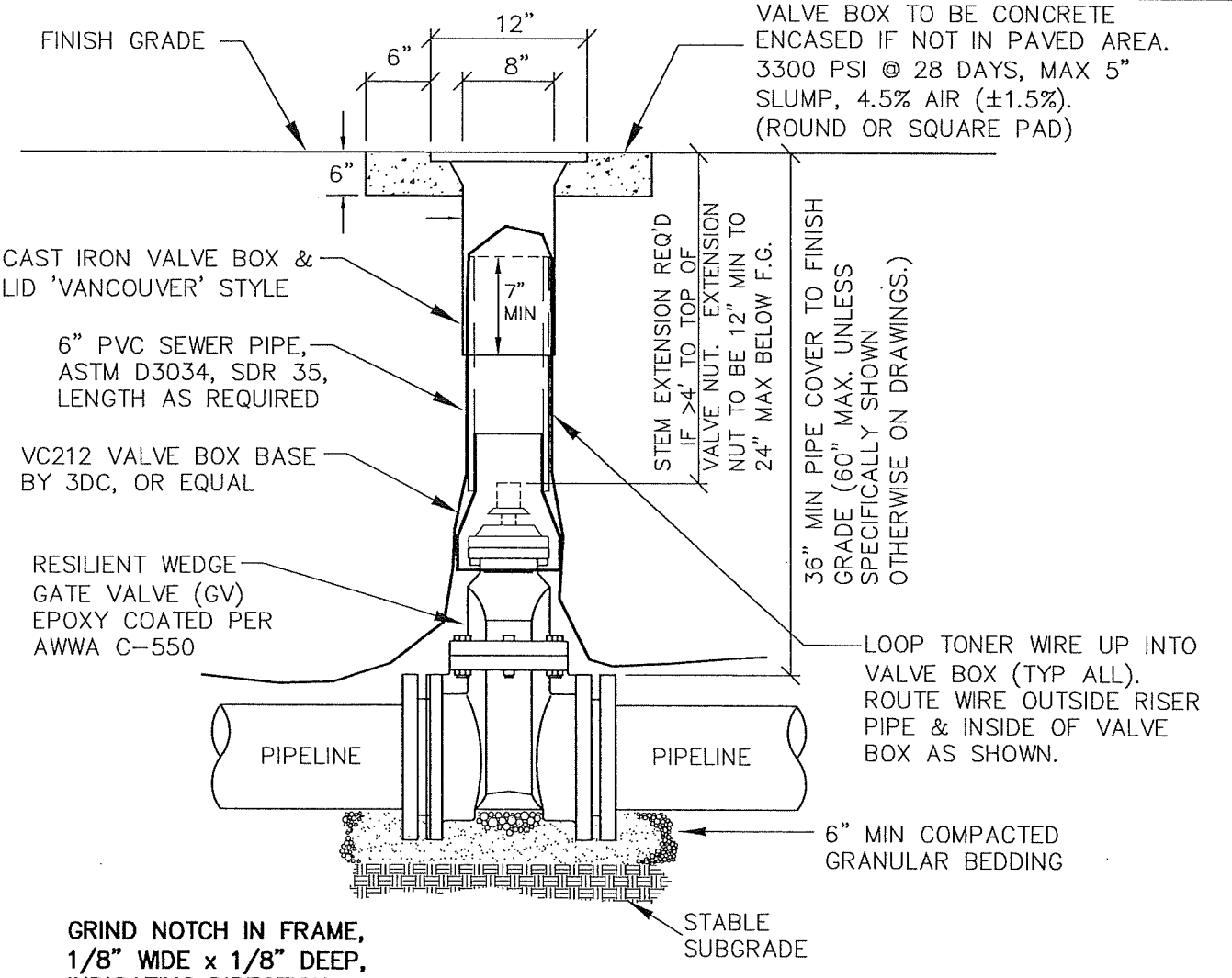
AC = Asbestos Cement
CIP = Cast Iron Pipe
C(M) = Conc., Mortor Joint
C(R) = Conc., Rubr. Gasket Jnt
DI = Ductile Iron Pipe
PVC = Polyvinylchloride Pipe
TC = Terra Cotta
VC = Vitrified Clay

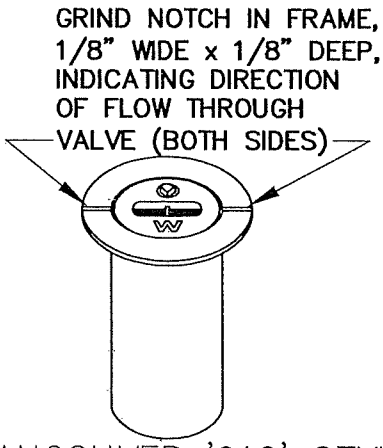
TURNAROUND:

Requested (Date/time):________

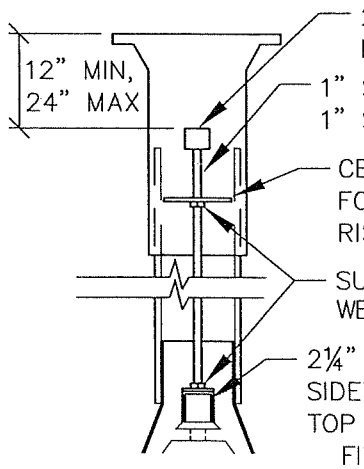
Authorized (Date/time):

Footage	Problem Code	Comments	I/I (gpm)





VANCOUVER '910' STYLE
18" TALL VALVE BOX



STEM EXTENSION

NOTES:

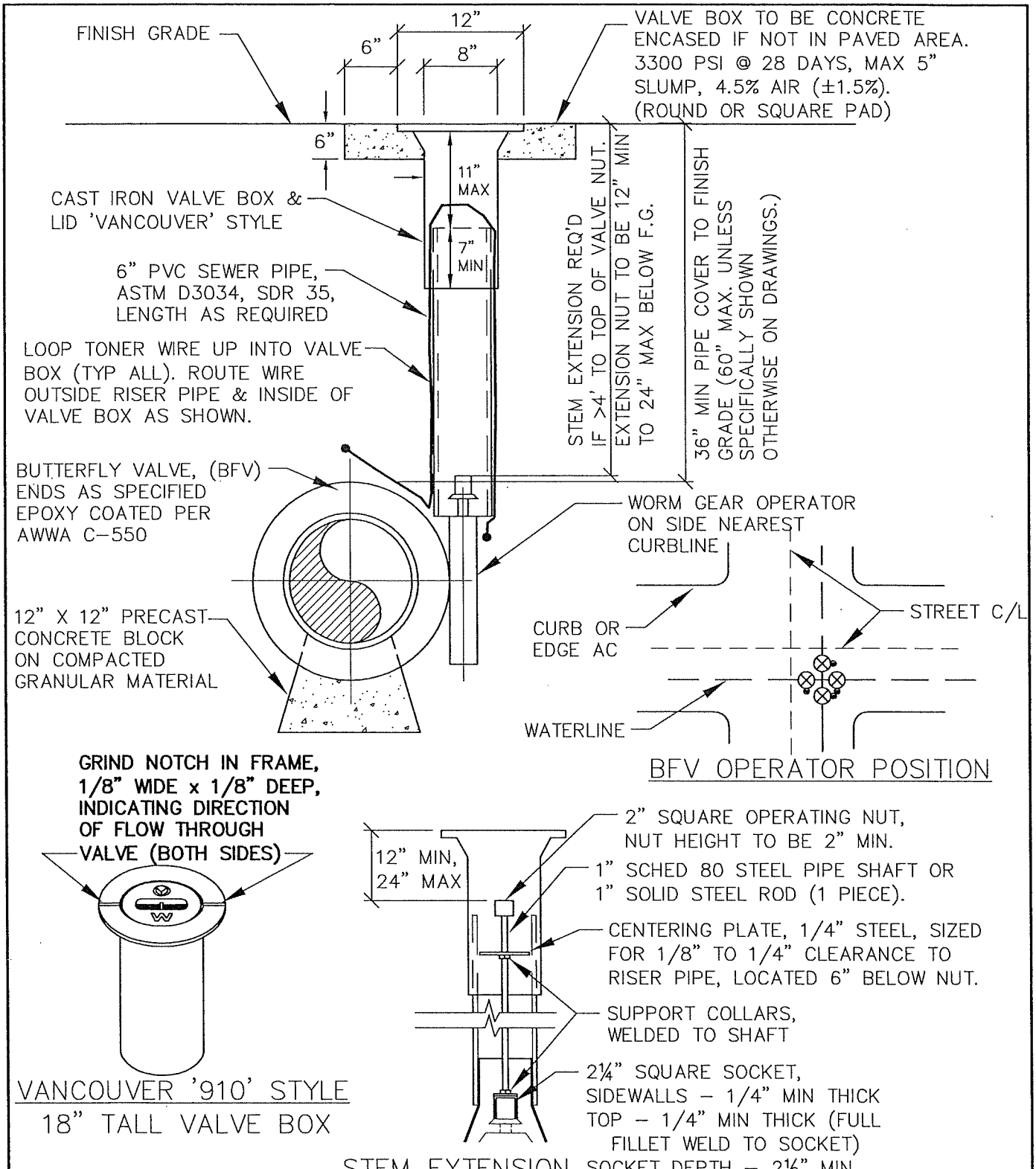
1. GV SHALL CONFORM TO AWWA C-509.
2. VALVE BOXES SHALL BE PLUMB AND CENTERED DIRECTLY OVER THE VALVE NUT, INSTALLED ON VALVE BOX BASE AS SHOWN.
3. VALVE BOX TOP SHALL BE ADJUSTED TO FINISHED GRADE.
4. PVC SHALL BE ONE CONTINUOUS PIECE, NO BELLS OR COUPLERS.
5. VALVE BOX LIDS ON PRESSURE SEWERS TO READ "S" OR "SEWER".
6. COMPLETELY CLEAN OUT ALL VALVE BOX COVER PICKHOLES PRIOR TO REQUESTING FINAL INSPECTION.

LAST REVISION DATE:	JO #
DEC 2022	STANDARD

GATE VALVE AND VALVE BOX DETAIL

(NTS)

	DETAIL NO.
INDEPENDENCE, OR	501



NOTES:

1. BFV SHALL BE SHORT BODY TYPE B PER AWWA C-504.
2. VALVE BOXES SHALL BE PLUMB AND CENTERED DIRECTLY OVER THE VALVE NUT.
3. VALVE BOX TOP SHALL BE ADJUSTED TO FINISHED GRADE.
4. PVC SHALL BE ONE CONTINUOUS PIECE, NO BELLS OR COUPLERS.
5. BFV ACTUATOR TO BE LOCATED ON THE CURBLINE SIDE OF WATERLINE AS SHOWN. INSTALL DI SPOOLS OR FLEX ADAPTER IF REQUIRED FOR ACTUATOR CLEARANCE.
6. COMPLETELY CLEAN OUT ALL VALVE BOX COVER PICKHOLES PRIOR TO REQUESTING FINAL INSPECTION.

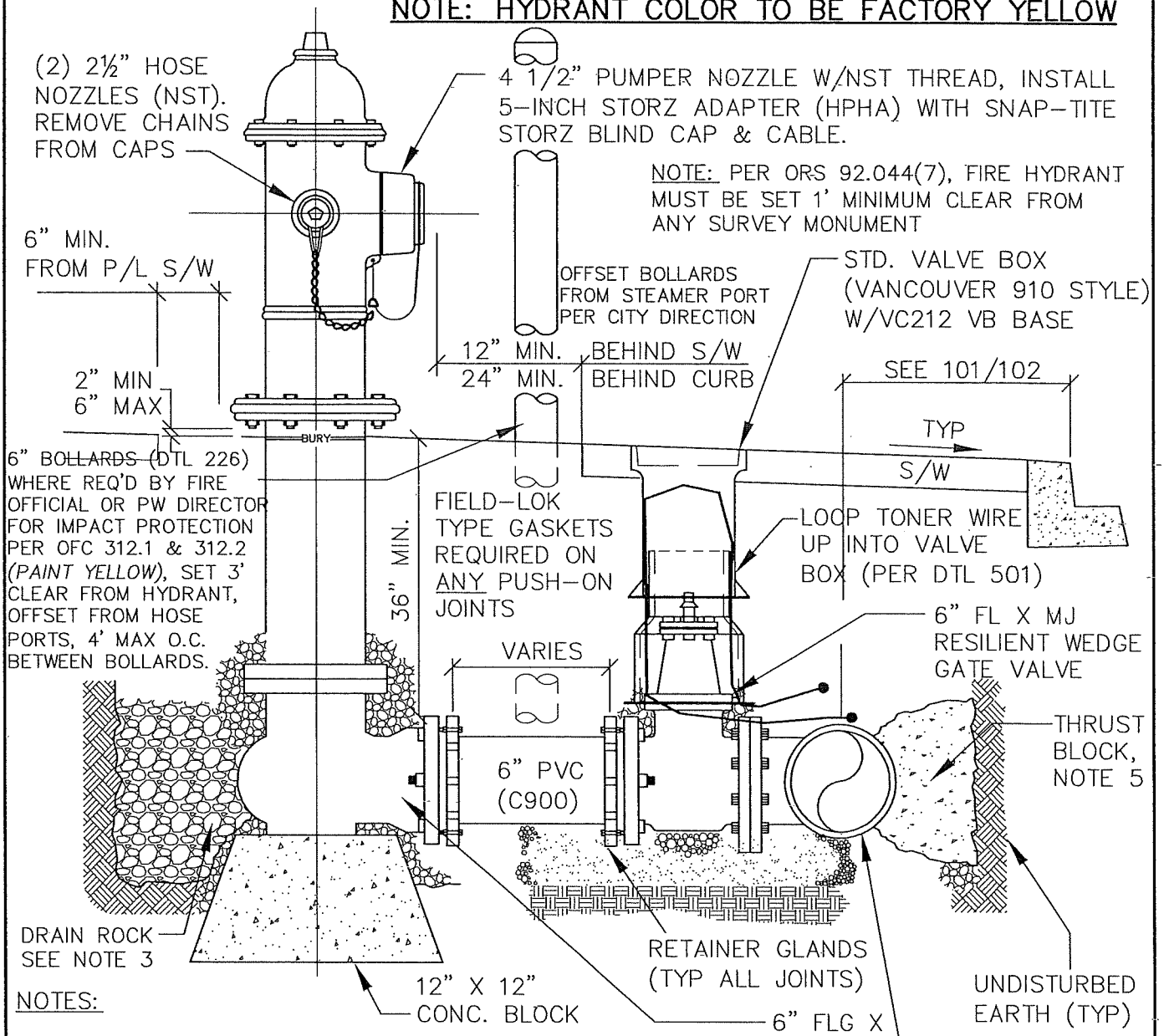
LAST REVISION DATE:	JO #
DEC 2022	STANDARD

BUTTERFLY VALVE AND VALVE BOX DETAILS

(NTS)

INDEPENDENCE, OR	DETAIL NO. 502

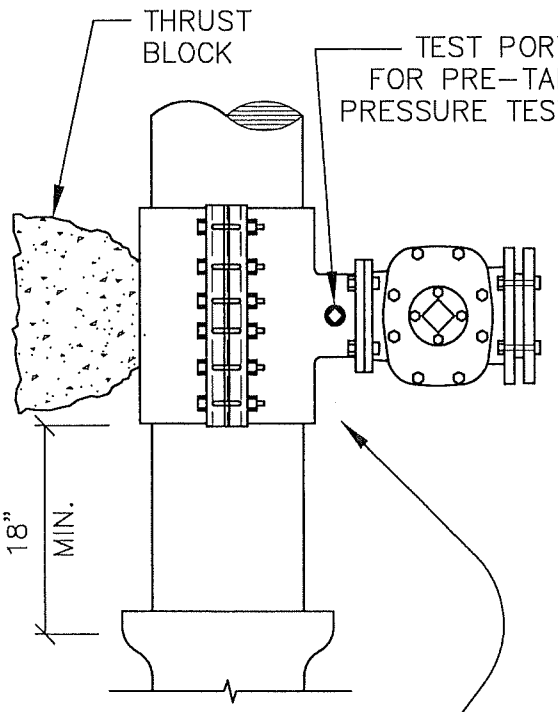
NOTE: HYDRANT COLOR TO BE FACTORY YELLOW



NOTES:

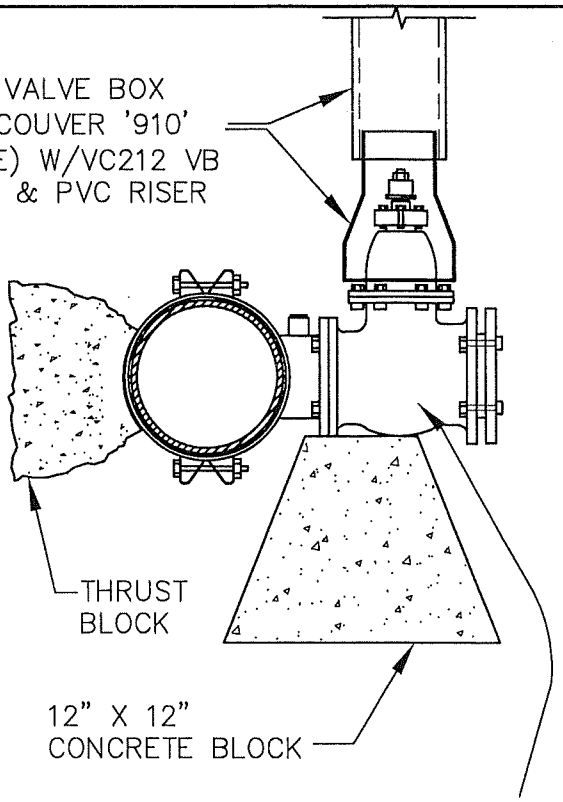
1. HYDRANTS TO BE WATEROUS PACER WITH FULL SIZE (5¼") FOOT VALVE.
2. **ALL FITTINGS IN CONTACT WITH CONCRETE SHALL BE WRAPPED IN PLASTIC.** HYDRANT DRAIN HOLES TO REMAIN OPEN TO DRAIN ROCK AND OPERATIONAL.
3. 1-1/2" TO 3/4" CLEAN DRAIN ROCK SHALL BE PLACED TO A MIN. OF 6" ABOVE DRAIN OUTLET.
4. WHERE PLANTER STRIP EXISTS, HYDRANT SHALL BE PLACED SO FRONT PORT IS A MIN. OF 24" BEHIND FACE OF CURB.
5. THRUST BLOCK AT STANDARD 6" FIRE HYDRANT TEE SHALL HAVE MIN. 3.7 SQ. FT. BEARING AREA.
6. ALL HYDRANTS SHALL BE SET PLUMB.
7. FOR HYDRANT LEADS LONGER THAN 30', AN ADDITIONAL GATE VALVE SHALL BE PROVIDED WITHIN 3 FT. OF THE HYDRANT.
8. RESTRAIN ALL JOINTS ON ALL HYDRANT LEADS. RETAINER GLANDS SHALL TO BE USED IN LEIU OF THRUST BLOCK BEHIND HYDRANT.
9. PAINT CURB (TOP & FACE) RED 10 FEET EACH WAY FROM HYDRANT & INSTALL REFLECTIVE BLUE TRAFFIC MARKER @ STREET CENTERLINE.

LAST REVISION DATE: SEPT 2022	
STANDARD FIRE HYDRANT ASSEMBLY (NTS)	
INDEPENDENCE, OR	DETAIL NO. 503



ROMAC SST/SSTIII, MUELLER H304, JCM MODEL 432 OR APPROVED EQUAL (STAINLESS STEEL SLEEVE AND STAINLESS STEEL FLANGE)

TOP VIEW



RESILIENT WEDGE GATE VALVE (FL x MJ UNLESS OTHERWISE NOTED ON PLANS)

SIDE VIEW

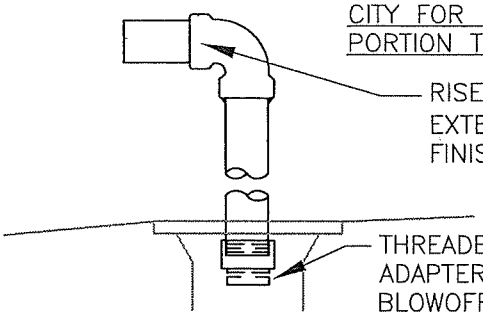
NOTES:

1. WATER MAIN SHALL BE CLEANED & SPRAYED WITH CHLORINE SOLUTION IN TAP AREA BEFORE ATTACHING SLEEVE.
2. TAPPING SLEEVE SHALL BE ALL STAINLESS STEEL WITH FULL PERIMETER GASKET.
3. TAPPING VALVE SHALL BE EPOXY COATED PER AWWA C-550.
4. PRE-TAP PRESSURE TEST. SLEEVE AND VALVE SHALL BE PRESSURE TESTED BEFORE MAKING TAP. PRESSURE TEST AND TAP SHALL BE MADE IN THE PRESENCE OF AN AUTHORIZED WATER SYSTEM REPRESENTATIVE.
5. APPROVED TAPPING MACHINE SHALL BE USED TO MAKE TAP.
6. 3/4" GRANULAR BACKFILL SHALL BE PLACED AND COMPACTED TO 92% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-180.
7. THRUST BLOCKING PER DETAIL 510.
8. TAP SHALL BE MADE NO CLOSER THAN 18" FROM THE NEAREST JOINT.
9. **SLEEVE AND VALVE SHALL BE WRAPPED WITH 8 MIL PLASTIC PRIOR TO CONCRETE PLACEMENT.**
10. CONCRETE BLOCK(S) SHALL COMPLETELY SUPPORT TAPPING TEE AND VALVE.
11. CONTRACTOR SHALL COORDINATE ALL TAPS WITH CITY AND PERFORM ALL TAPS WITH PUBLIC WORKS STAFF PRESENT.
12. ALL TAPPING EQUIPMENT (AND ANY TOOL COMING IN CONTACT WITH THE PIPE THOUGH THE TAPPING SLEEVE) SHALL BE CHLORINE DISINFECTED WITH A 300 MG/L CHLORINE SOLUTION.

LAST REVISION DATE: SEPT 2018	
TAPPING TEE AND VALVE (NTS)	
INDEPENDENCE, OR	DETAIL NO. 505

BLOW-OFF SIZES REQUIRED (ASSUMES 40 PSI RESIDUAL PRESS.)	
MAIN SIZE	BLOW-OFF SIZE
6" – 8"	2"
10" – 12"	4"
>12"	BY ENGR.

PROVIDE ONE RISER ASSEMBLY TO CITY FOR EACH 3 BLOWOFFS OR PORTION THEREOF.

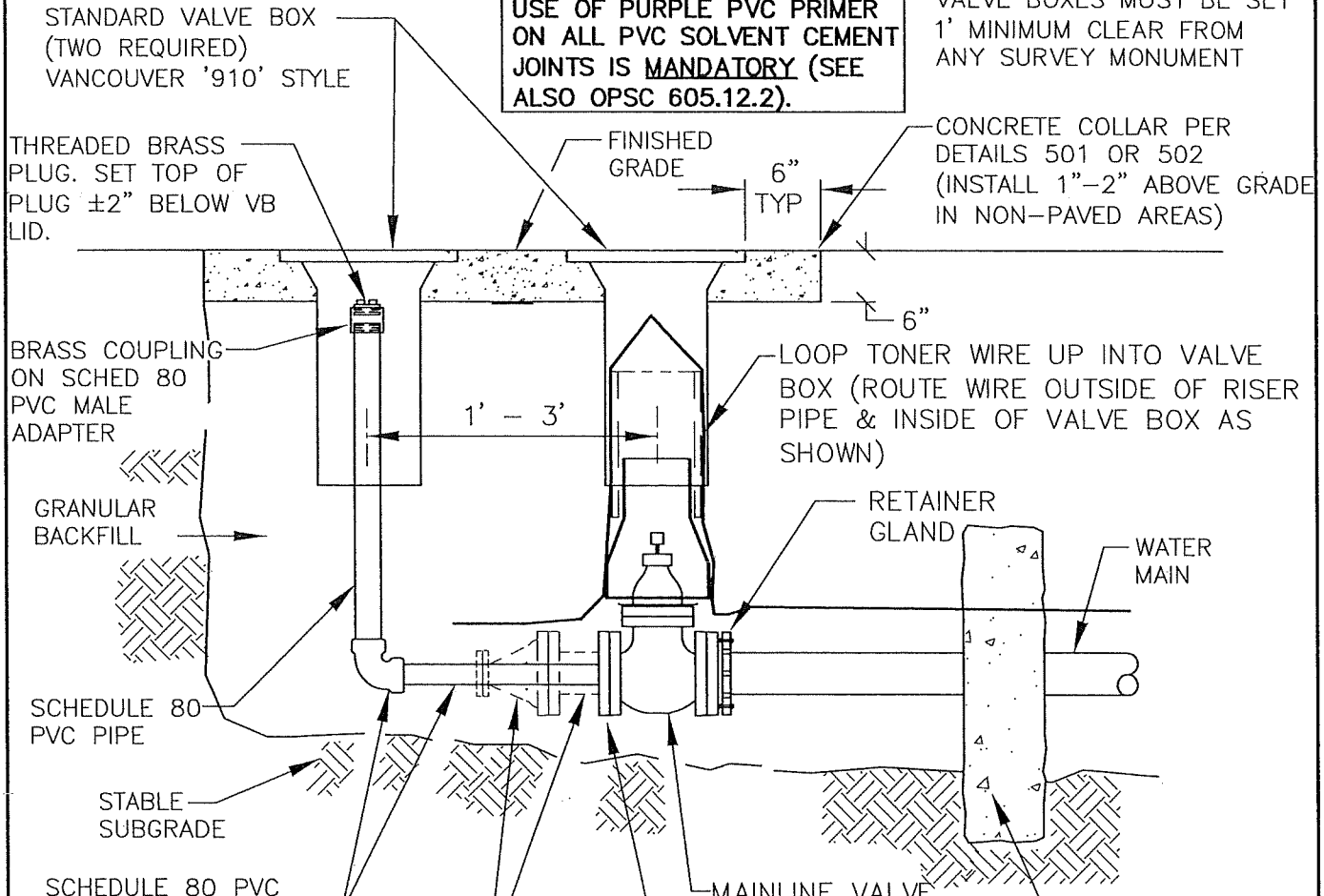


RISER ASSEMBLY

(BY CONTRACTOR)

USE OF PURPLE PVC PRIMER ON ALL PVC SOLVENT CEMENT JOINTS IS MANDATORY (SEE ALSO OPSC 605.12.2).

NOTE: PER ORS 92.044(7), VALVE BOXES MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT



ALL CONCRETE SHALL BE 3300 PSI @ 28 DAYS, MAX 5" SLUMP, 4.5% AIR (±1.5%).

NOTES:

1. BACKFILL WITH GRANULAR BACKFILL.
2. REQUIRED ON ALL LINES WHICH MAY BE EXTENDED IN FUTURE OR AS DIRECTED BY CITY ENGINEER.
3. ALL CONCRETE TO BE 3500 PSI @ 28 DAYS.
4. FLANGED DUCTILE IRON PIPE AND FITTINGS MAY BE REQUIRED FOR 4" & LARGER BLOWOFFS.

LAST REVISION DATE: AUG 2022	

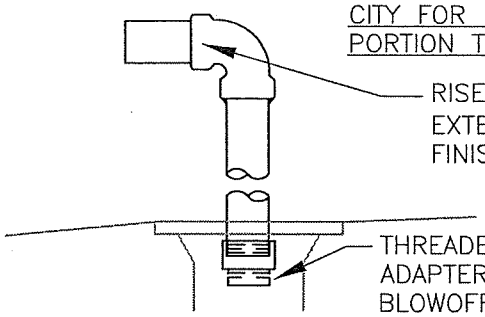
MAINLINE BLOWOFF ASSEMBLY

(NTS)

INDEPENDENCE, OR	DETAIL NO. 506

PROVIDE ONE RISER ASSEMBLY TO CITY FOR EACH 3 BLOWOFFS OR PORTION THEREOF.

NOTE: PER ORS 92.044(7), VALVE BOXES MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

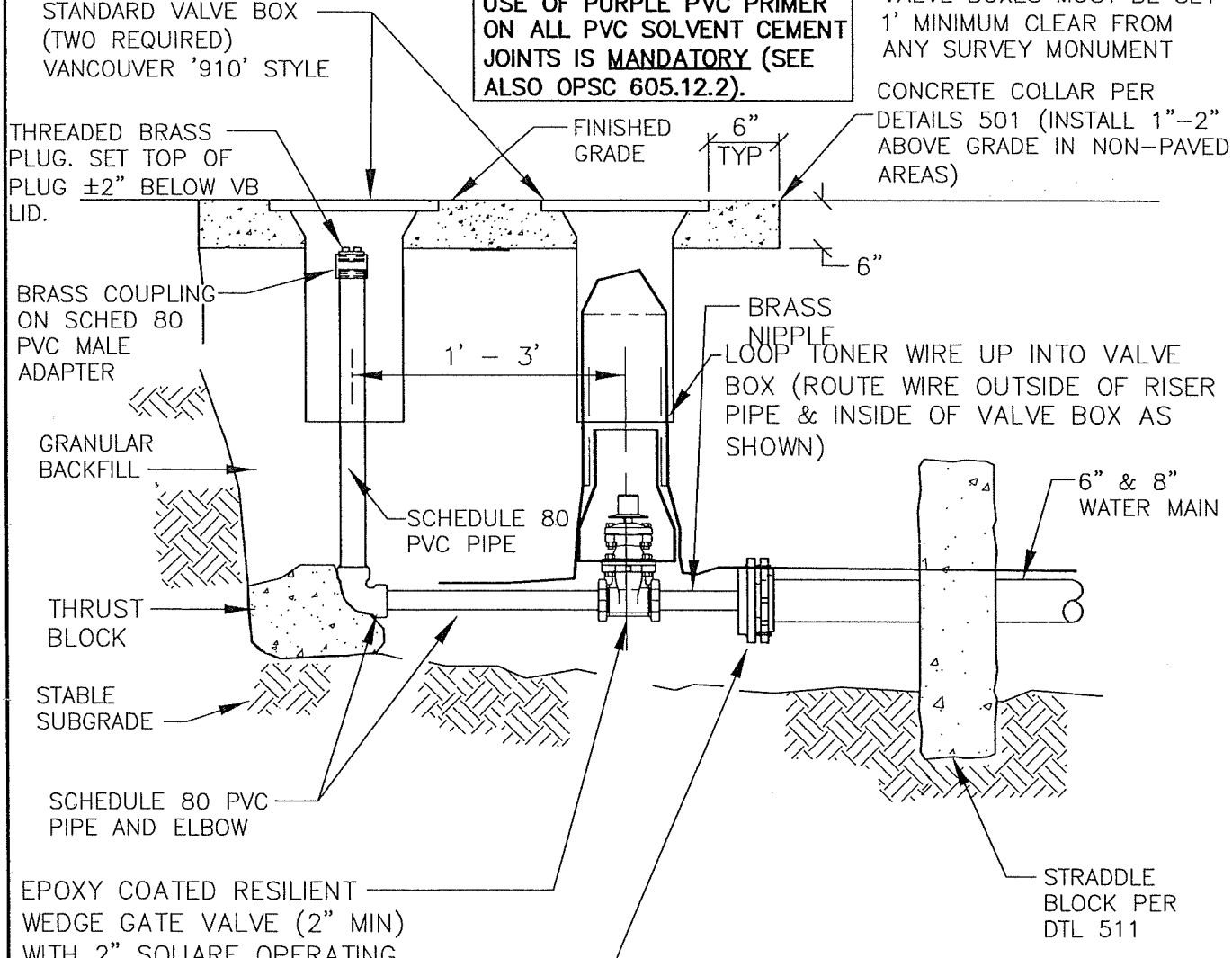


RISER ASSEMBLY

(BY CONTRACTOR)

USE OF PURPLE PVC PRIMER ON ALL PVC SOLVENT CEMENT JOINTS IS MANDATORY (SEE ALSO OPSC 605.12.2).

NOTE: PER ORS 92.044(7), VALVE BOXES MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

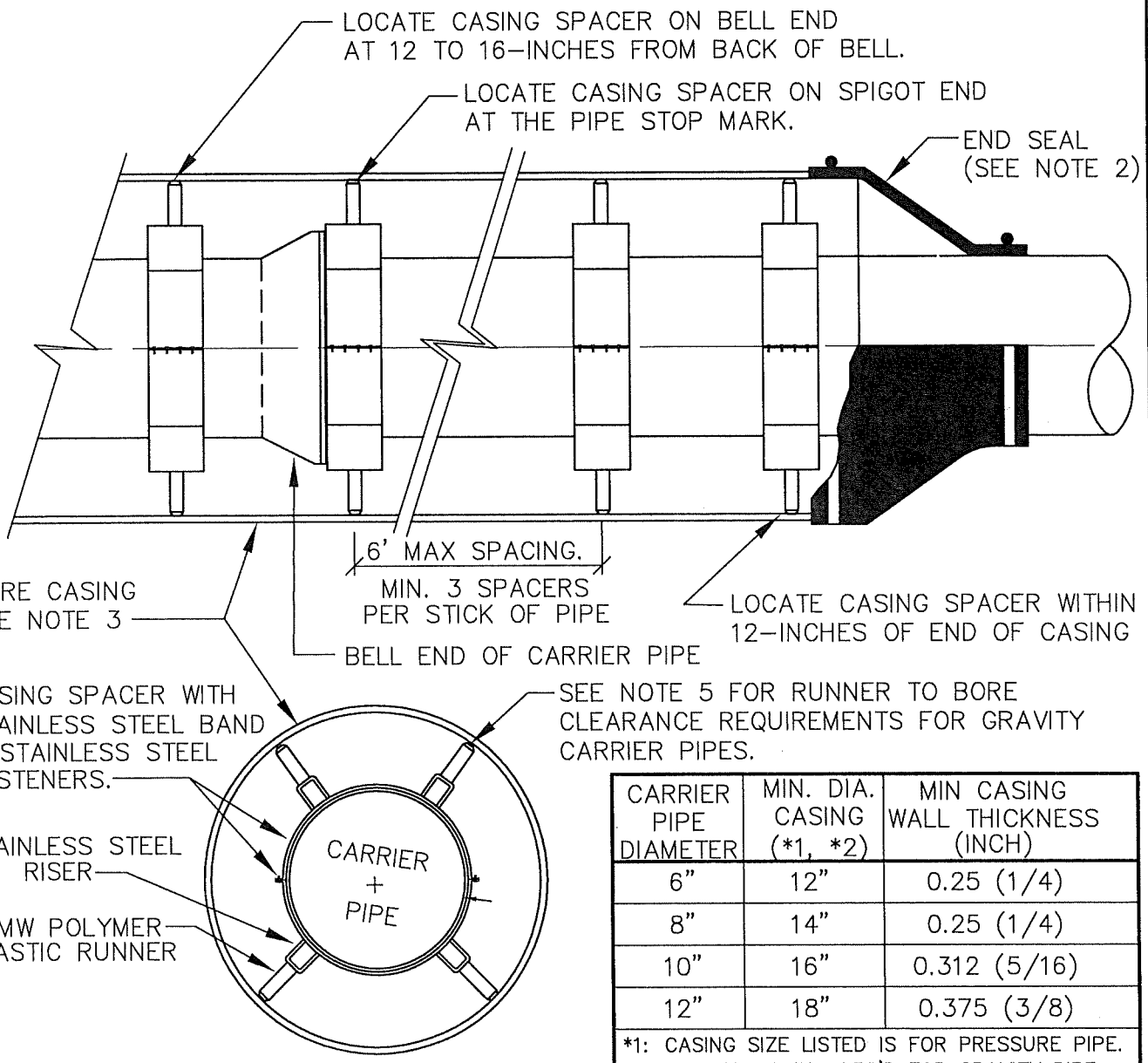


ALL CONCRETE SHALL BE 3300 PSI @ 28 DAYS, MAX 5" SLUMP, 4.5% AIR (±1.5%).

NOTES:

1. BACKFILL WITH GRANULAR BACKFILL.
2. ALLOWED ONLY ON PERMANENT DEAD END LINES IN CUL–DE–SACS WHICH CANNOT BE EXTENDED IN THE FUTURE.
3. ALL CONCRETE TO BE 3500 PSI @ 28 DAYS.
4. 2" BLOWOFF SIZE ASSUMES 40 PSI RESIDUAL PRESSURE.

LAST REVISION DATE: AUG 2022	
STANDARD BLOWOFF WITH PLUGGED END (NTS)	
INDEPENDENCE, OR	DETAIL NO. 507



CARRIER PIPE DIAMETER	MIN. DIA. CASING (*1, *2)	MIN CASING WALL THICKNESS (INCH)
6"	12"	0.25 (1/4)
8"	14"	0.25 (1/4)
10"	16"	0.312 (5/16)
12"	18"	0.375 (3/8)

*1: CASING SIZE LISTED IS FOR PRESSURE PIPE. LARGER DIA CASING REQ'D FOR GRAVITY PIPE.
*2: SEE PWDS 5.8.m FOR GRAVITY PIPE CASING SIZE REQUIREMENTS OR LARGER CASING SIZES.

NOTES:

1. CASING SPACERS – APS MODEL SSI, CALPICO M–SS SERIES OR APPROVED EQUIV. 4"–18" CARRIER PIPE, USE 8" WIDE BAND. >18" CARRIER PIPE, USE 12" WIDE BAND.
2. SEAL BOTH ENDS OF BORE CASING WITH END SEALS. WITHOUT SAND FILL, USE APS MODEL AZ OR APPROVED EQUIV. FASTEN TO CASING AND CARRIER PIPE WITH ST. STEEL BANDS. WITH SAND FILL, USE GROUT END CAPS (PLUG VENT TUBES AFTER SAND FILL)
3. CASING SHALL BE WELDED SMOOTH STEEL PIPE CONFORMING TO ASTM A–53, GRADE B OR APPROVED EQUIVALENT (Fy = 35,000 psi).
4. CARRIER PIPE DIAMETER & MATERIAL AS PER DWGS.
5. FOR GRAVITY SEWER OR STORM CARRIER PIPES, THE CASING ANNULAR SPACE SHALL BE COMPLETELY FILLED WITH SAND TO PREVENT FLOATATION OF CARRIER PIPE BY GROUNDWATER.
6. CARRIER PIPE SHALL BE COMPLETELY FILLED WITH WATER PRIOR TO INSTALLING OR BLOWING SAND.
7. INCREASE CASING DIA AS REQ'D TO ALLOW TRIMMING OF CASING SPACERS ON GRADE CRITICAL BORES

LAST REVISION DATE:	
AUG 2018	

BORE CASING, CARRIER PIPE AND CASING SPACER DETAIL

(NTS)

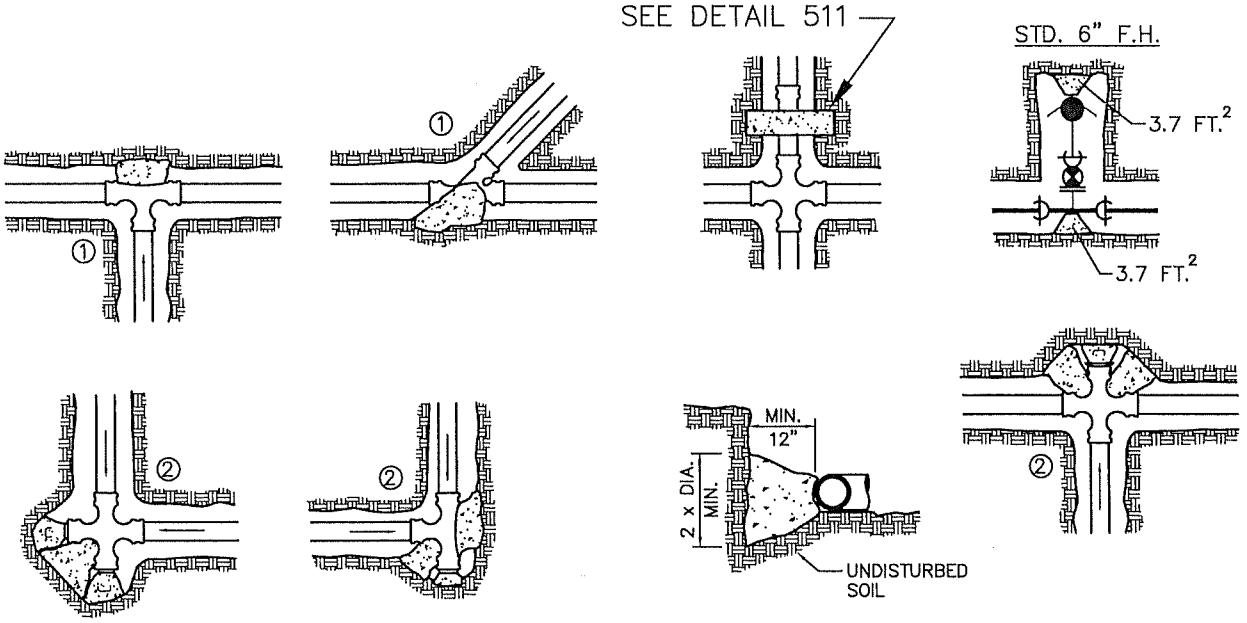
INDEPENDENCE, OR	DETAIL NO. 508

FITTING SIZE (Inches)	TEE, WYE, & ① HYDRANTS	90° BEND ② PLUGGED CROSS TEE PLUGGED–RUNS	45° BEND ③	22 1/2° BEND ③	11 1/4° BEND ③
2	*	*	*	*	*
4	1.7	2.4	1.3	*	*
6	3.7	5.3	2.9	1.5	*
8	6.7	9.5	5.1	2.7	1.3
10	10.5	14.8	8	4.1	2
12	15.1	21.3	11.6	5.9	2.9
16	26.8	37.9	20.5	10.4	5.2
18	33.9	47.9	25.9	12.8	6.7
LARGER	* *	* *	* *	* *	* *
	BEARING AREA OF THRUST BLOCKS (sq. ft.)				

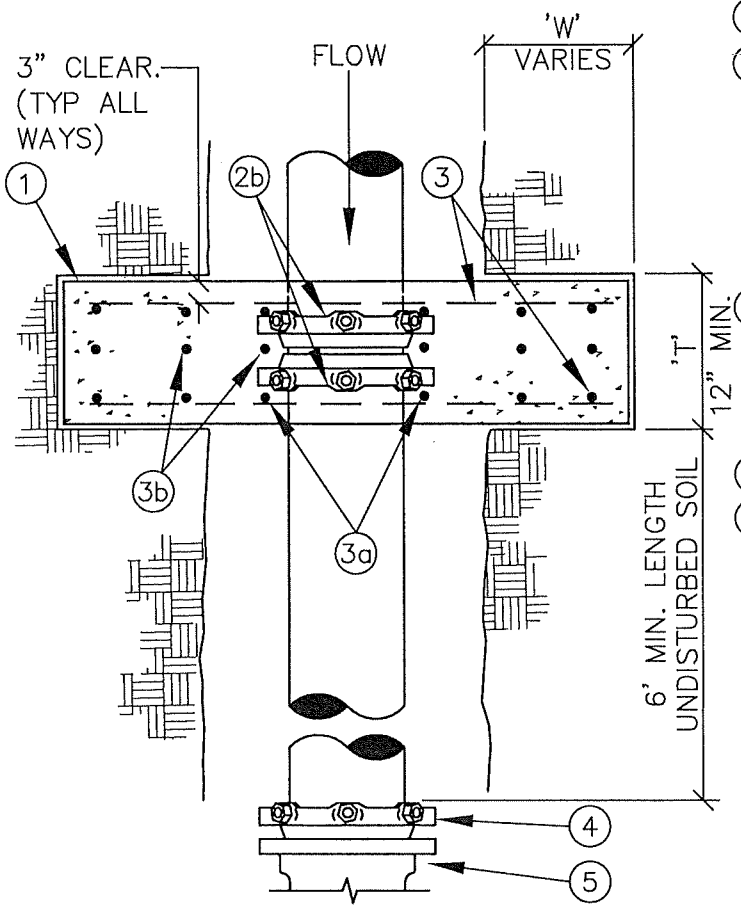
1. ALL VALUES ARE BASED ON THE FOLLOWING ASSUMPTIONS:
   AVG. PRESSURE = 100 PS1 x 2 (safety factor); 1500 PSF SOIL BEARING CAPACITY;
   NORMAL DISTRIBUTION SYSTEM DESIGN VELOCITY NOT TO EXCEED 5 FPS.
2. **ALL FITTINGS SHALL BE WRAPPED IN PLASTIC PRIOR TO PLACEMENT OF CONCRETE.**
3. BEARING SURFACE OF THRUST BLOCKING SHALL BE AGAINST UNDISTURBED SOIL.
4. TRUCK–MIXED CONCRETE MIX SHALL HAVE A MIN. 28 DAY STRENGTH OF 3500 PSI (5" MAX SLUMP). USE OF HAND–MIXED SACK–CRETE TYPE CONCRETE REQUIRES WRITTEN CITY APPROVAL PRIOR TO USE, AND SHALL BE 4000 PSI MIX, MIXED WITH MIN AMOUNT OF WATER NECESSARY FOR WORKABILITY (5" MAX SLUMP). USE OF DRY SACK–CRETE MIX (BAGS OR LOOSE MIX) IS PROHIBITED FOR PERMANENT THRUST RESTRAINT.
5. ALL PIPE ZONES SHALL BE BACKFILLED WITH GRANULAR BACKFILL AND COMPACTED.
6. THRUST BLOCKS FOR PLUGGED CROSS AND PLUGGED TEE SHALL HAVE #4 REBAR LIFTING LOOPS INSTALLED AS SHOWN.
7. VERTICAL THRUST DETAILS–SEE DWG. 512.
8. STRADDLE BLOCK DETAILS–SEE DWG. 511.

* BLOCK TO UNDISTURBED TRENCH WALLS

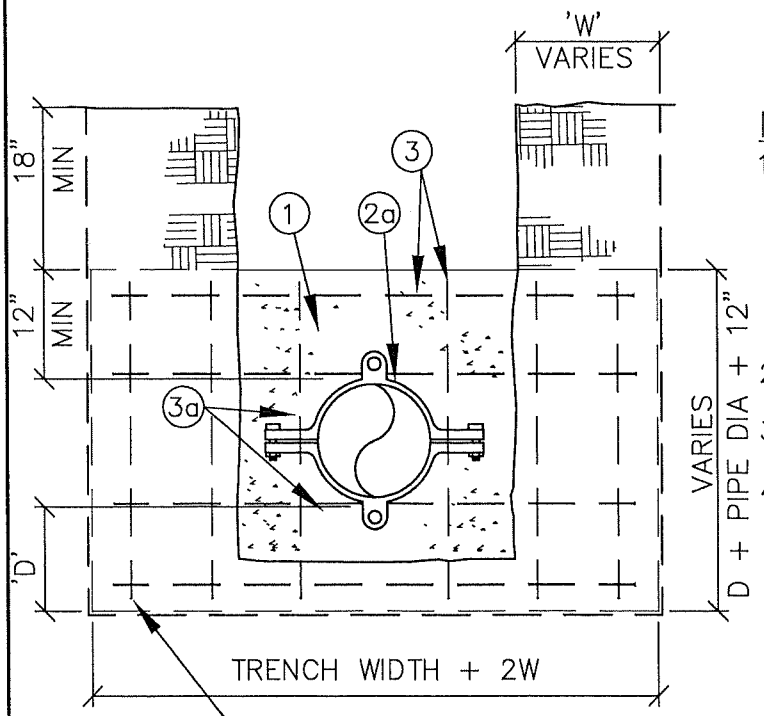
* * THRUST BLOCKS FOR PIPES LARGER THAN 18" WILL BE INDIVIDUALLY DESIGNED BY THE ENGINEER.



LAST REVISION DATE: AUG 2018	
HORIZONTAL THRUST BLOCKING (NTS)	
INDEPENDENCE, OR	DETAIL NO. 510



TOP VIEW



FRONT VIEW

MATERIALS

(1) CONCRETE STRADDLE BLOCK.

(2) –EITHER **(2a)** ONE SERRATED–LOCK STYLE SPLIT–RING RESTRAINT HARNESS (ROMAC 600 OR EQUAL), OR **(2b)** TWO RETAINER GLAND WEDGE–STYLE RESTRAINTS, SET OPPOSED (EBBA MEGA–LUG OR EQUAL).
–WEDGE STYLE RESTRAINTS SHALL BE WRAPPED WITH PLASTIC PRIOR TO CONCRETE PLACEMENT.

(3) ≤12" PIPE, #4 REBAR @12" O.C. E.W., **(3a)** INSTALL REBAR EACH SIDE OF RESTRAINT FITTING INSIDE CONCRETE AS SHOWN. **(3b)** INSTALL 3 MATS OF REBAR FOR PIPE LARGER THAN 12" DIAMETER.

(4) RETAINER GLAND, ON ADJACENT FITTING.

(5) MJ FITTING, BEND, VALVE OR BLOWOFF.

PIPE SIZE	'W'	'D'	'T'
6"	12"	8"	12"
8"	16"	10"	12"
10"	20"	12"	12"
12"	24"	18"	18"
14"&16"	**28"**	**24"**	**18"**
18"	**32"**	**30"**	**18"**
>12"	**SIZE TO BE VERIFIED BY DESIGN ENG (NOTE 1).**		

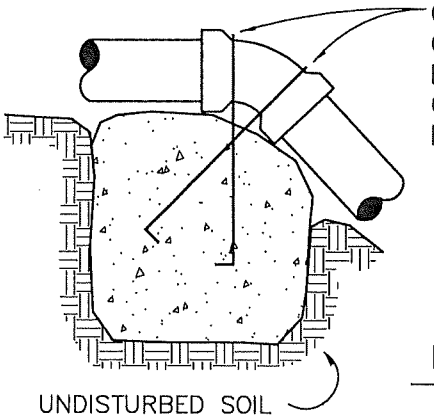
NOTES:

1. STRADDLE BLOCKS FOR >12" PIPE SHALL BE VERIFIED INDIVUALLY FOR APPLICATION BY THE DESIGN ENGINEER AND SHALL BE BASED ON THE FOLLOWING:
   a.) 200 PSI WATER TEST PRESSURE.
   b.) SOIL BEARING CAPACITY, REBAR SIZE & SPACING VERIFIED BY THE ENGINEER.
2. BEARING AREA OF BLOCK SHALL BE AGAINST UNDISTURBED SOIL.
3. STRADDLE BLOCK SHALL HAVE A MINIMUM OF 18" COVER.
4. CONCRETE SHALL HAVE A MIN. 28 DAY STRENGTH OF 3300 PSI.

LAST REVISION DATE: DEC 2021	
STRADDLE BLOCK FOR 12" AND SMALLER PIPE (NTS)	
INDEPENDENCE, OR	DETAIL NO. 511

NOTES:

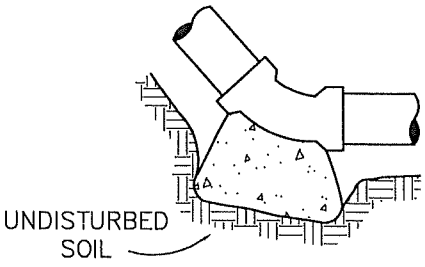
1. GRAVITY VERTICAL THRUST BLOCKS SHALL BE DESIGNED BY THE ENGINEER.
2. **KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES. FITTINGS SHALL BE WRAPPED IN PLASTIC PRIOR TO PLACEMENT OF CONCRETE.**
3. CONCRETE THRUST BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH.
4. CONCRETE MIX SHALL HAVE A MIN. 28 DAY STRENGTH OF 3000 P.S.I.
5. THRUST BLOCK VOLUMES FOR VERTICAL BENDS HAVING UPWARD RESULTANT THRUSTS ARE BASED ON TEST PRESSURE OF 150 P.S.I.G. AND THE WEIGHT OF CONCRETE = 4050 LBS./CU.YD.
6. VERTICAL BENDS THAT REQUIRE A THRUST BLOCK VOLUME EXCEEDING 5 CUBIC YARDS REQUIRE SPECIAL BLOCKING DETAILS. SEE PLANS FOR VOLUMES SHOWN INSIDE HEAVY LINE IN TABLE.
7. ALL REBAR SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM-123 (MIN. 3.4 MIL). REBAR SHALL BE BENT BEFORE GALVANIZATION, AND LAST 4" OF BAR SHALL BE BENT 90 DEGREES WITH A 1/2" RADIUS BEND. REBAR SHALL BE TIGHTLY FIT TO RESTRAINED FITTING.
8. FOR HORIZONTAL THRUST BLOCK DETAILS SEE DRAWING NO. 510.



PROFILE

GRAVITY VERTICAL THRUST BLOCK

SIZED LIKE HORIZONTAL THRUST BLOCKS



PROFILE

NORMAL VERTICAL THRUST BLOCK

VOLUME OF THRUST BLOCK IN CUBIC YARDS (VERTICAL BENDS)			
FITTING SIZE	BEND ANGLE		
	45°	22 1/2°	11 1/4°
4	1.1	0.4	0.2
6	2.7	1.0	0.4
8	4.0	1.5	0.6
10	6.0	2.3	0.9
12	8.5	3.2	1.3
14	11.5	4.3	1.8
16	14.8	5.6	2.3

FITTING SIZE	ROD SIZE	EMBED-MENT
12" AND LESS	#6	30"
14" – 16"	#8	36"

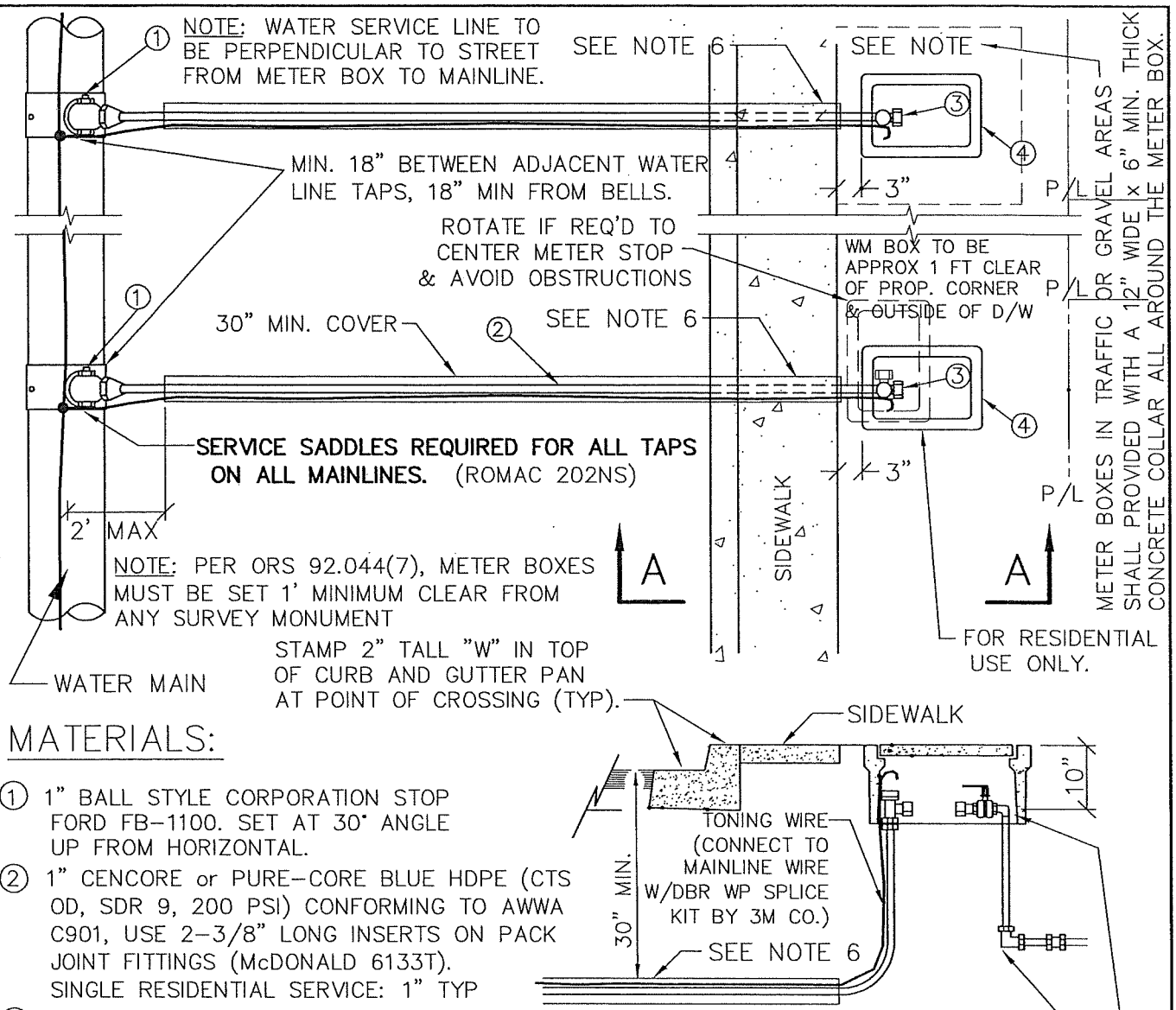
LAST REVISION DATE: AUG 2018

VERTICAL THRUST BLOCKING

(NTS)

INDEPENDENCE, OR

DETAIL NO. 512



MATERIALS:

① 1" BALL STYLE CORPORATION STOP FORD FB-1100. SET AT 30° ANGLE UP FROM HORIZONTAL.

② 1" CENCORE or PURE-CORE BLUE HDPE (CTS OD, SDR 9, 200 PSI) CONFORMING TO AWWA C901, USE 2-3/8" LONG INSERTS ON PACK JOINT FITTINGS (McDONALD 6133T). SINGLE RESIDENTIAL SERVICE: 1" TYP

③ 1" BALL STYLE LOCKING ANGLE METER STOP, FORD BA43-444WPJ OR EQUAL. PROVIDE ALL METER STOPS WITH 1" x 3/4" METER ADAPTER (FORD A24 OR EQUAL).

④ WATER METER BOX PER PWDS 5.8.h.1 (13"x24" ID, H20): -ARMORCAST A6001868x12 W/ A6001866/A6000487 LID. PROVIDE ALL METER BOXES WITHOUT KNOCKOUTS (RADIO-READ HEADS).

SECTION A-A

NOTES:

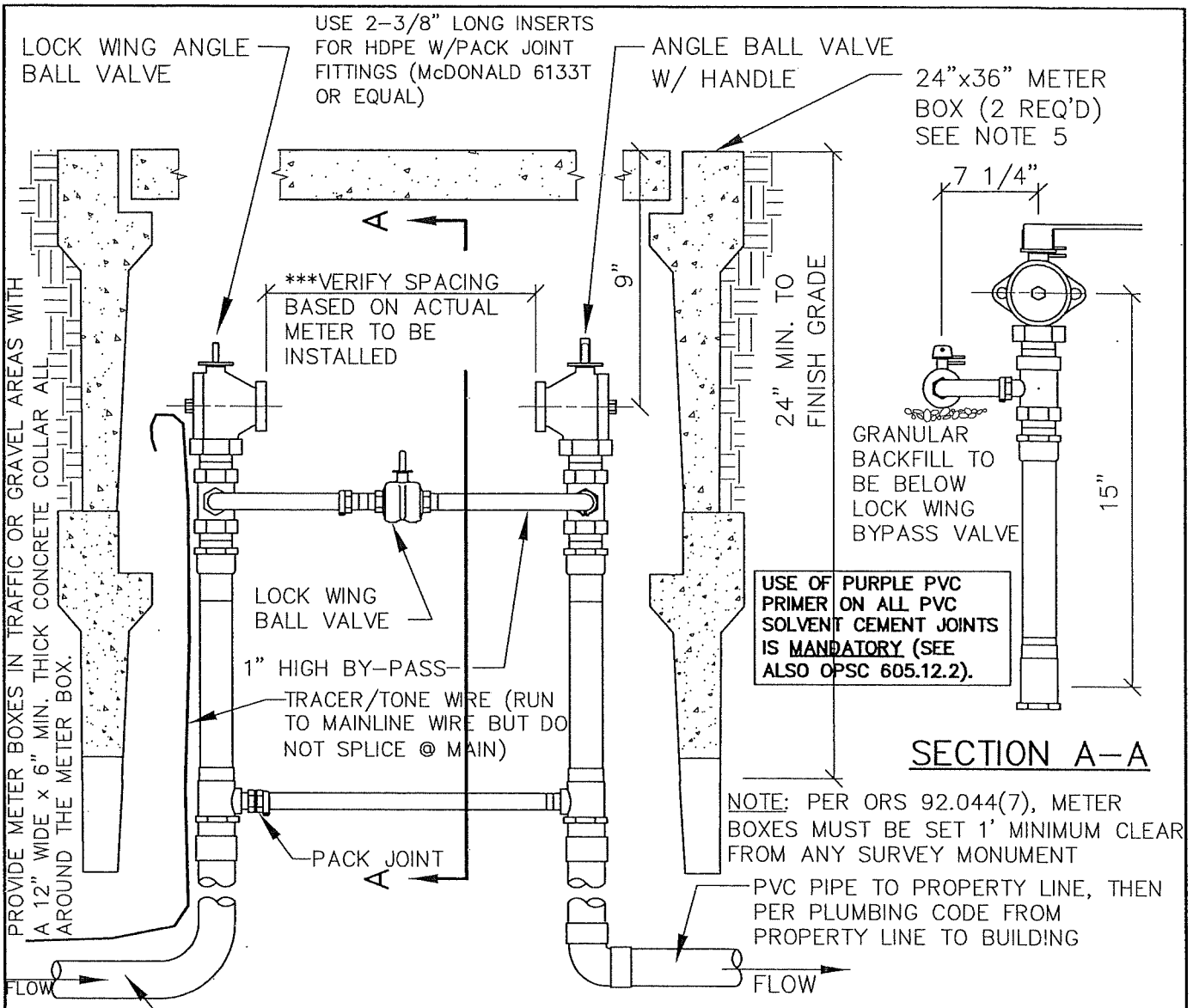
1. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE PUBLIC WORKS DIRECTOR.
2. ALL PIPE AND BACKFILL ZONES SHALL BE BACKFILLED USING 3/4" MINUS GRANULAR MATERIAL AND COMPACTED TO 92% MAX. DENSITY DETERMINED BY AASHTO T-180.
3. SET FRONT OF METER BOX BEHIND BACK OF SIDEWALK LOCATION AS SHOWN.
4. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY.
5. 1½-INCH MIN. PIPE SIZE FOR COMMERCIAL SERVICES.
6. FAR SIDE COMMERCIAL SERVICES SHALL BE INSTALLED IN A 4" MIN DIA SCHED 40 PVC SLEEVE WHICH BEGINS 2' FROM MAIN AND EXTENDS TO BACK OF FAR SIDE SIDEWALK.
7. RUN TRACER WIRE FROM METER BOX TO MAIN, USE TYPE DBR DIRECT BURY SPLICE KIT BY 3M (OR EQUAL), AT SPLICE TO MAINLINE WIRE.

LAST REVISION DATE: DEC 2022	

TYPICAL 1" WATER SERVICE (HDPE SERVICE LINE)

(NTS)

INDEPENDENCE, OR	DETAIL NO. 515



NOTES:

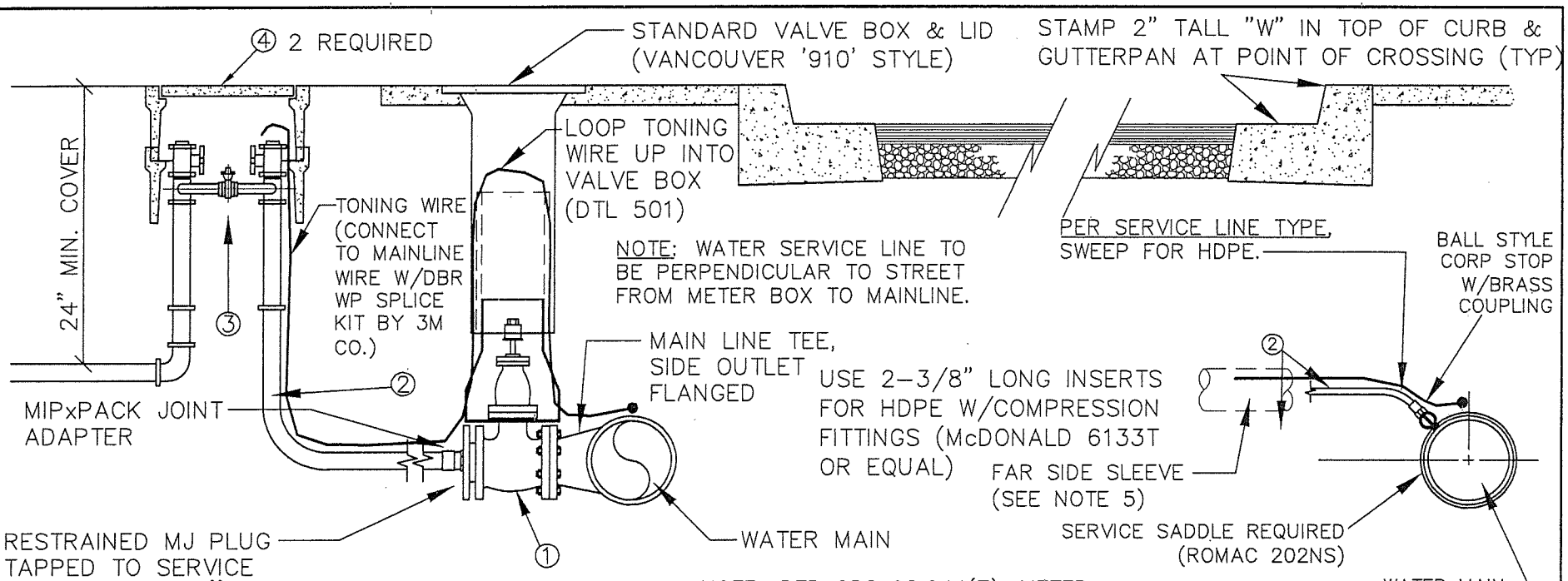
1. METERSET TO BE FORD 70 SERIES COPPERSETTER, #VBB86-15HB-11-66 (1½") OR #VBB87-15HB-11-77 (2") WITH RAISED LOCKING BYPASS OR APPROVED EQUAL.
2. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE CITY ENGINEER.
3. ALL PIPE AND BACKFILL ZONES SHALL BE BACKFILLED USING 3/4" MINUS GRANULAR MATERIAL AND COMPACTED TO 92% OPTIMUM DENSITY PER AASHTO T-180.
4. SET FRONT OF METER BOX 3-INCHES FROM SIDEWALK (TYPICAL). NO METERS ON PRIVATE PROPERTY WITHOUT A RECORDED EASEMENT.
5. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY. METER BOX PER PWDS 5.8.H.1 (24"x36" ID, H20, GREY)
   - ARMORCAST A6001974x12 W/ A6001975/A6000482 LID. PROVIDE LID WITHOUT KNOCKOUTS (RADIO-READ SENSOR).
6. COPPERSETTER, METER BOX, & ALL FITTINGS PROVIDED BY CONTRACTOR. CONTRACTOR TO VERIFY DIMENSIONS & CLEARANCE BASED ON ACTUAL METER TO BE PROVIDED BY THE CITY. WATER METER INSTALLED BY CONTRACTOR UNDER CITY INSPECTION & APPROVAL.
7. SEE DETAIL 517 FOR TAPPING REQUIREMENTS.
8. **THREADED FEMALE PVC FITTINGS ARE NOT ALLOWED.**

LAST REVISION DATE:	
AUG 2022	

1-1/2" AND 2" METER SET W/1" HIGH BY-PASS (HDPE SERVICE LINE)

(NTS)

INDEPENDENCE, OR	DETAIL NO. 516



2" & LARGER SERVICE

NOTE: PER ORS 92.044(7), METER BOXES MUST BE SET 1' MINIMUM CLEAR FROM ANY SURVEY MONUMENT

1-1/2" SERVICE

MATERIALS

① FLG X MJ RESILIENT WEDGE GATE VALVE PER AWWA C-509. 4" DIA. OR SERVICE SIZE, WHICHEVER IS LARGER. EPOXY COATED PER AWWA C-550.

② CENCORE or PURE-CORE BLUE HDPE (CTS, DR 9, 200 PSI, ≤2"ϕ) W/OUT JOINTS PER DETAIL 516 (30" MIN COVER TO METER). FOR SERVICES >2"ϕ, USE CL 52 DI PIPE. FOR SERVICES ≤2"ϕ, SEE DTL 516 FOR CONFIG. AT METER BOX.

③ METER STOP ASSEMBLY W/BYPASS PER PUBLIC WORKS REQUIREMENTS. SEE DETAIL 516 FOR 1-1/2 & 2" SERVICES (DTL 523-526 FOR LARGER).

④ METER BOX FOR 1-1/2" AND 2" SHALL BE PER DETAIL 516. USE TRAFFIC RATED VERSION OF BOX/LID FOR TRAFFIC AREAS. METER VAULT FOR LARGER SERVICE PER PUBLIC WORKS REQUIREMENTS. PROVIDE W/OUT SENSOR KNOCKOUT.

NOTES

1. SUBSTITUTES FOR ANY MATERIAL SHOWN SHALL BE APPROVED BY THE CITY ENGINEER.
2. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING 3/4" MINUS GRANULAR MATERIAL AND COMPACTED TO 95% MAX DENSITY AS DETERMINED BY ASHTO T-180.
3. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER AND FITTING ASSEMBLY.
4. CUSTOMER SHALL INSTALL AN APPROVED BACKFLOW PREVENTION DEVICE ON PRIVATE PROPERTY IMMEDIATELY DOWNSTREAM OF WATER METER IF REQUIRED BY PUBLIC WORKS.
5. FAR SIDE COMMERCIAL SERVICES SHALL BE INSTALLED IN A 4" MIN DIA SCHED 40 PVC SLEEVE WHICH BEGINS 12" FROM MAIN AND EXTENDS TO BACK OF FAR SIDE SIDEWALK.
7. METER BOXES IN TRAFFIC OR GRAVEL AREAS SHALL PROVIDED WITH A 12" WIDE x 6" MIN. THICK CONCRETE COLLAR ALL AROUND THE METER BOX.

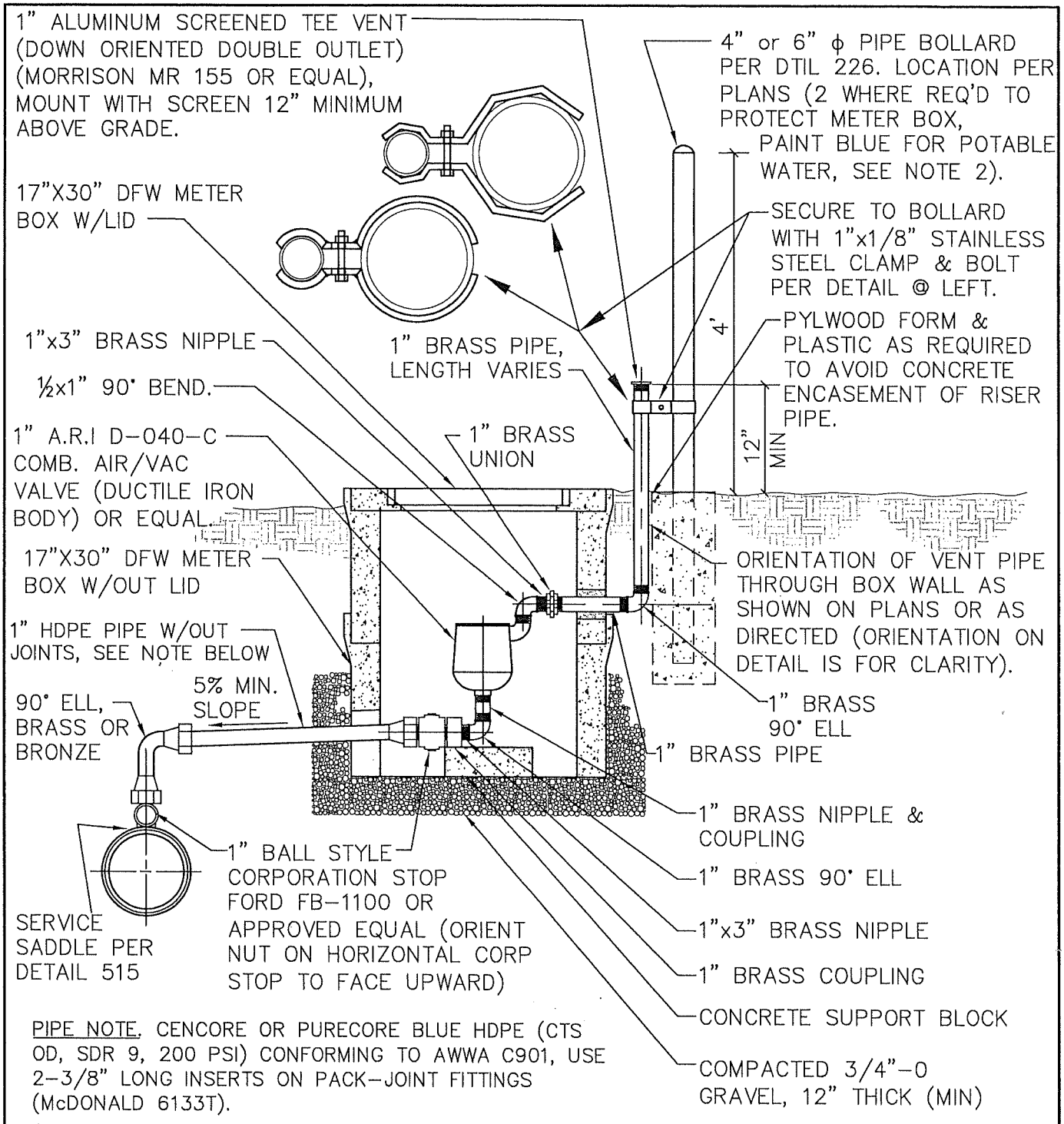
INDEPENDENCE, OR

TAPPING REQUIREMENTS, 1-1/2" AND LARGER SERVICE (HDPE or DI SERVICE LINE)

(NTS)

LAST REVISION DATE: DEC 2022

DETAIL NO. 517



PIPE NOTE. CENCORE OR PURECORE BLUE HDPE (CTS OD, SDR 9, 200 PSI) CONFORMING TO AWWA C901, USE 2-3/8" LONG INSERTS ON PACK-JOINT FITTINGS (McDONALD 6133T).

NOTES:

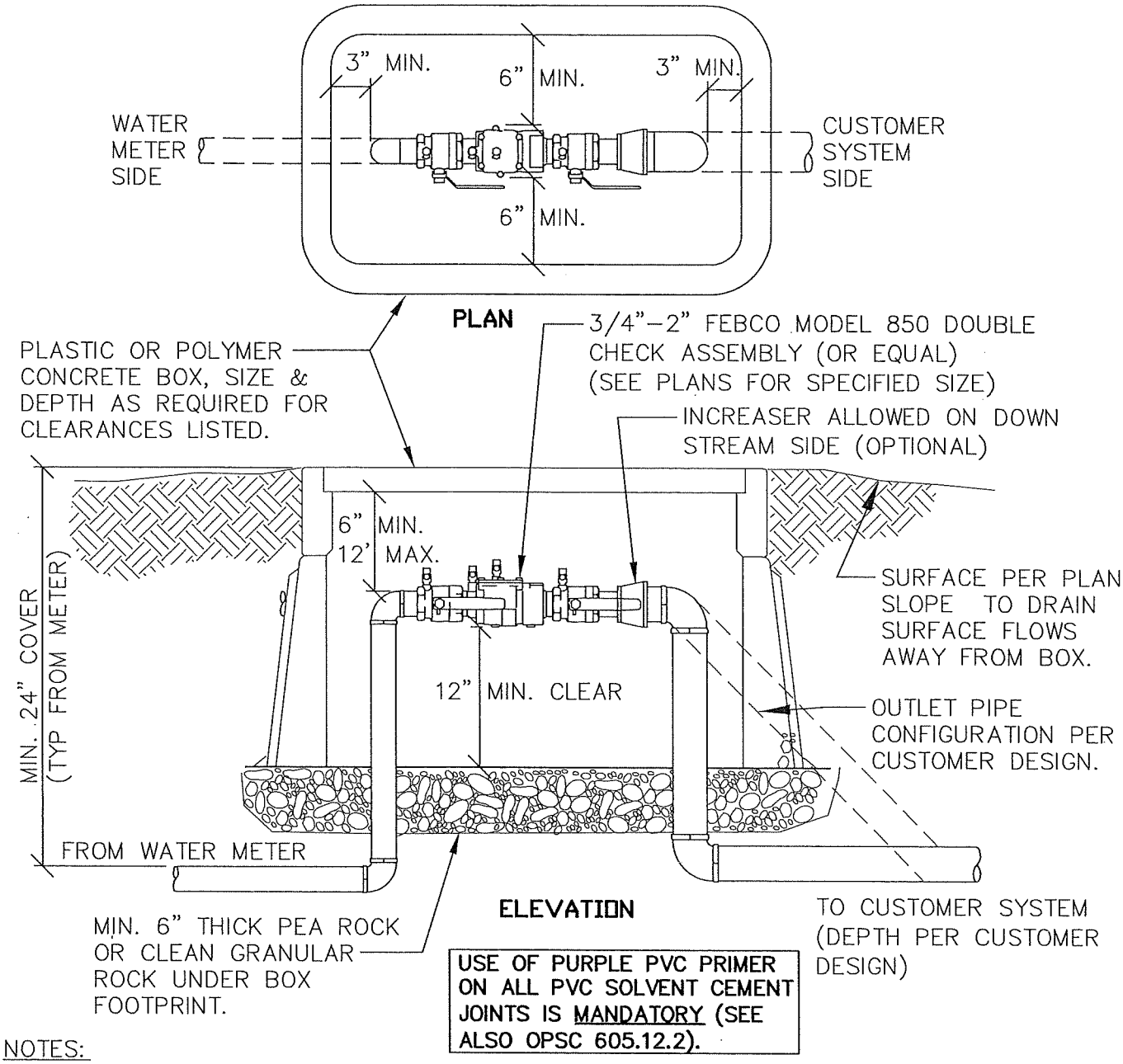
1. RISER SHALL BE PROTECTED FROM VEHICULAR OR PEDESTRIAN TRAFFIC AS APPROVED BY THE CITY ENGINEER & PUBLIC WORKS.
2. PAINT BOLLARD & TOP SAFETY BLUE FOR POTABLE WATER APPLICATIONS.
3. WHERE ARV ASSEMBLIES ARE INSTALLED ADJACENT TO FENCES, BOLLARDS SHALL BE SET 3" MIN CLEAR FROM FENCE UNLESS OTHERWISE APPROVED BY PROPERTY OWNER.
4. EXACT LOCATION OF RISER PENTRATION THROUGH BOX & BOLLARDS TO BE VERIFIED IN FIELD WITH CITY ENGINEER & PUBLIC WORKS PRIOR TO RISER & BOLLARD INSTALLATION.

LAST REVISION DATE: MAR 2020	JO #

1" COMBINATION AIR RELEASE VALVE (CARV)

(NTS)

INDEPENDENCE, OR	DETAIL NO. 518



USE OF PURPLE PVC PRIMER ON ALL PVC SOLVENT CEMENT JOINTS IS MANDATORY (SEE ALSO OPSC 605.12.2).

NOTES:

1. VERIFY THE ENCLOSURE/BOX DIMENSIONS & DEPTH ARE ADEQUATE FOR CLEARANCES SHOWN, BASED ON THE SIZE OF THE DCA AND FITTINGS ACTUALLY PROVIDED & INSTALLED.
2. ENCLOSURE/BOX SHALL BE CENTERED OVER THE COMPLETED DOUBLE CHECK ASSEMBLY.
3. PER OAR 333-61-0071, DCA SHALL NOT BE SUBJECT TO CONTINUOUS IMMERSION.
4. DCA's SHALL BE INSTALLED ABOVE THE 100 YEAR FLOOD LEVEL UNLESS OTHERWISE APPROVED IN WRITING BY THE PUBLIC WORKS DIRECTOR.
5. BYPASS LINES AROUND DOUBLE CHECK ASSEMBLIES ARE NOT ALLOWED.
6. DCA's SHALL BE PROVIDED WITH BRASS OR PLASTIC PLUGS IN ALL TEST PORTS.
7. DCA SHALL BE LOCATED ON PRIVATE PROPERTY, AND SHALL NOT BE INSTALLED IN SIDEWALKS OR AREAS SUBJECT TO VEHICULAR TRAFFIC.
8. THE PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN A MINIMUM OF 3 FEET OF MAINTENANCE ACCESS WORKING CLEARANCE AROUND DCA ENCLOSURES/BOXES.
9. PRIOR TO REQUESTING APPROVAL OR FINAL INSPECTION BY THE CITY, CONTRACTOR SHALL HAVE DCA TESTED, AND COPIES OF TEST REPORTS PROVIDED TO PUBLIC WORKS.
10. PROPERTY OWNER SHALL BE RESPONSIBLE TO PROVIDE FREEZE PROTECTION DURING COLD WEATHER PERIODS AS NECESSARY.

LAST REVISION DATE:	JO #
AUG 2022	STANDARD

2" AND SMALLER DOUBLE CHECK VALVE ASSEMBLY (DCA)

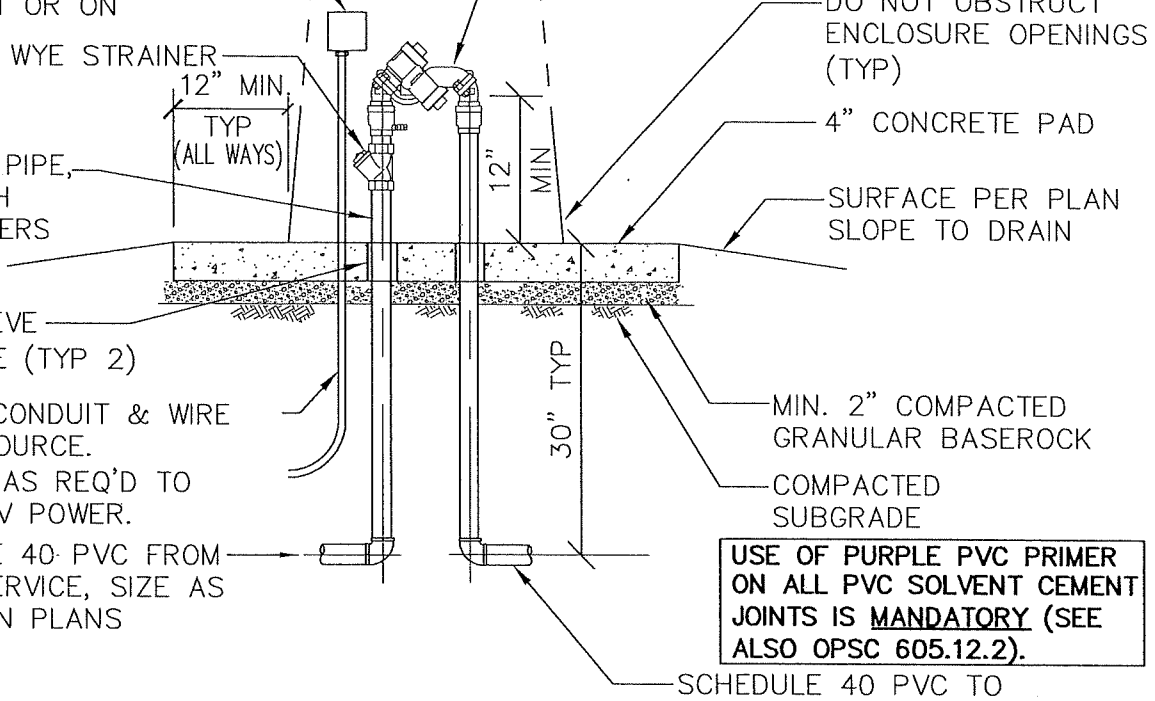
(NTS)

INDEPENDENCE, OR	DETAIL NO. 531

PAD MOUNTED FIBERGLASS INSULATED ENCLOSURE W/HEATER, HOT BOX MODEL AS SHOWN ON TABLE (OR APPROVED EQUIVALENT). ANCHOR ENCLOSURE TO CONCRETE PAD PER MANUFACTURER'S REQUIREMENTS.

RPBA DIAMETER	HOT BOX MODEL
1"	HB1
1½"	HB1
2"	HB1.5

NOTE: VERIFY HB SIZE FOR OTHER CONFIGURATION OR MODEL OF RPBA DEVICE, TO ENSURE 3" MIN CLEARANCE AT EACH END (OAR 333-061-0071).



USE OF PURPLE PVC PRIMER ON ALL PVC SOLVENT CEMENT JOINTS IS MANDATORY (SEE ALSO OPSC 605.12.2).

NOTES:

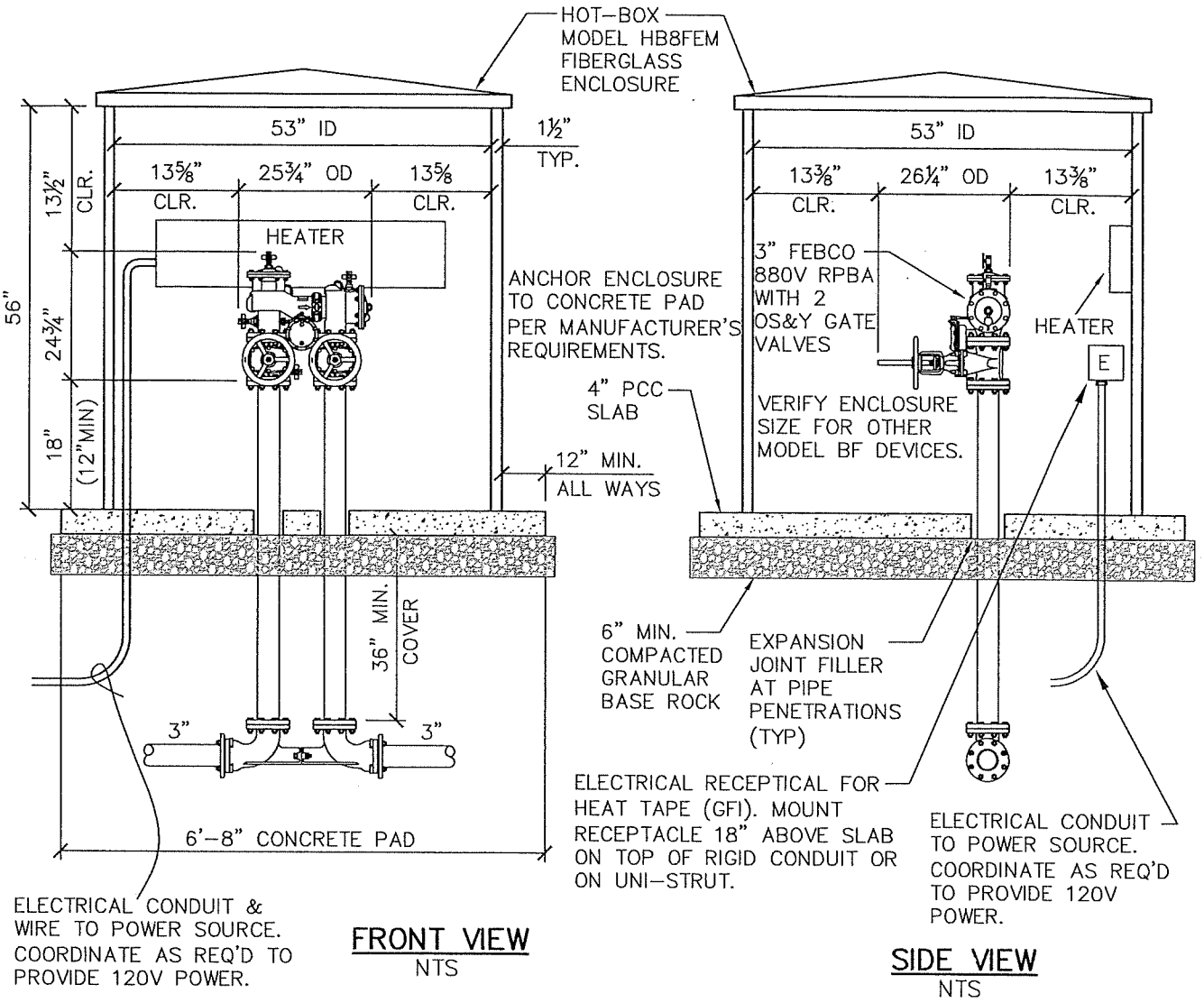
1. RPBA- REDUCED PRESSURE BACKFLOW ASSEMBLY.
2. INSTALLATION OF RPBA & ENCLOSURE SHALL MEET OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES REQUIREMENTS.
3. CONTRACTOR SHALL HAVE RPBA TESTED AND CERTIFIED PRIOR TO APPROVAL BY THE CITY, AND COPIES OF TEST REPORTS PROVIDED TO CITY.
4. RPBA & ENCLOSURE SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
5. VAULTS SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL OTHER VAULTS OR STRUCTURES.
6. VERIFY ENCLOSURE DIMENSIONS ARE ADEQUATE FOR CLEARANCE BASED ON HEIGHT OF REDUCED PRESSURE ASSEMBLY.
7. ENCLOSURE SHALL BE CENTERED OVER THE COMPLETED REDUCED PRESSURE BACKFLOW ASSEMBLY.
8. POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQUIREMENTS.
9. ALL CONCRETE SHALL BE 3,300 PSI @ 28 DAYS, MAX 5" SLUMP, 4.5% AIR (±1.5%).
10. HOT BOX DRAINAGE OPENINGS SHALL NOT BE OBSTRUCTED BY GRADING OR PLANTINGS.
11. RPBA SHALL BE INSTALLED A MIN. OF 12 INCHES ABOVE THE 100-YEAR FLOOD ELEVATION AS DETERMINED BY FEMA.
12. FINISH GRADE TO SLOPE AWAY FROM ENCLOSURE SLAB AT 2% MIN. SLOPE.
13. AFTER CONSTRUCTION COMPLETION & ACCEPTANCE, PROPERTY OWNER IS RESPONSIBLE TO ENSURE FREEZE PROTECTION IS PLUGGED IN & WORKING DURING COLD WEATHER PERIODS AS NECESSARY.

LAST REVISION DATE:	JO #
AUG 2022	STANDARD

2" AND SMALLER REDUCED PRESSURE BACKFLOW ASSEMBLY

(NTS)

INDEPENDENCE, OR	DETAIL NO. 541



FRONT VIEW
NTS

SIDE VIEW
NTS

NOTES:

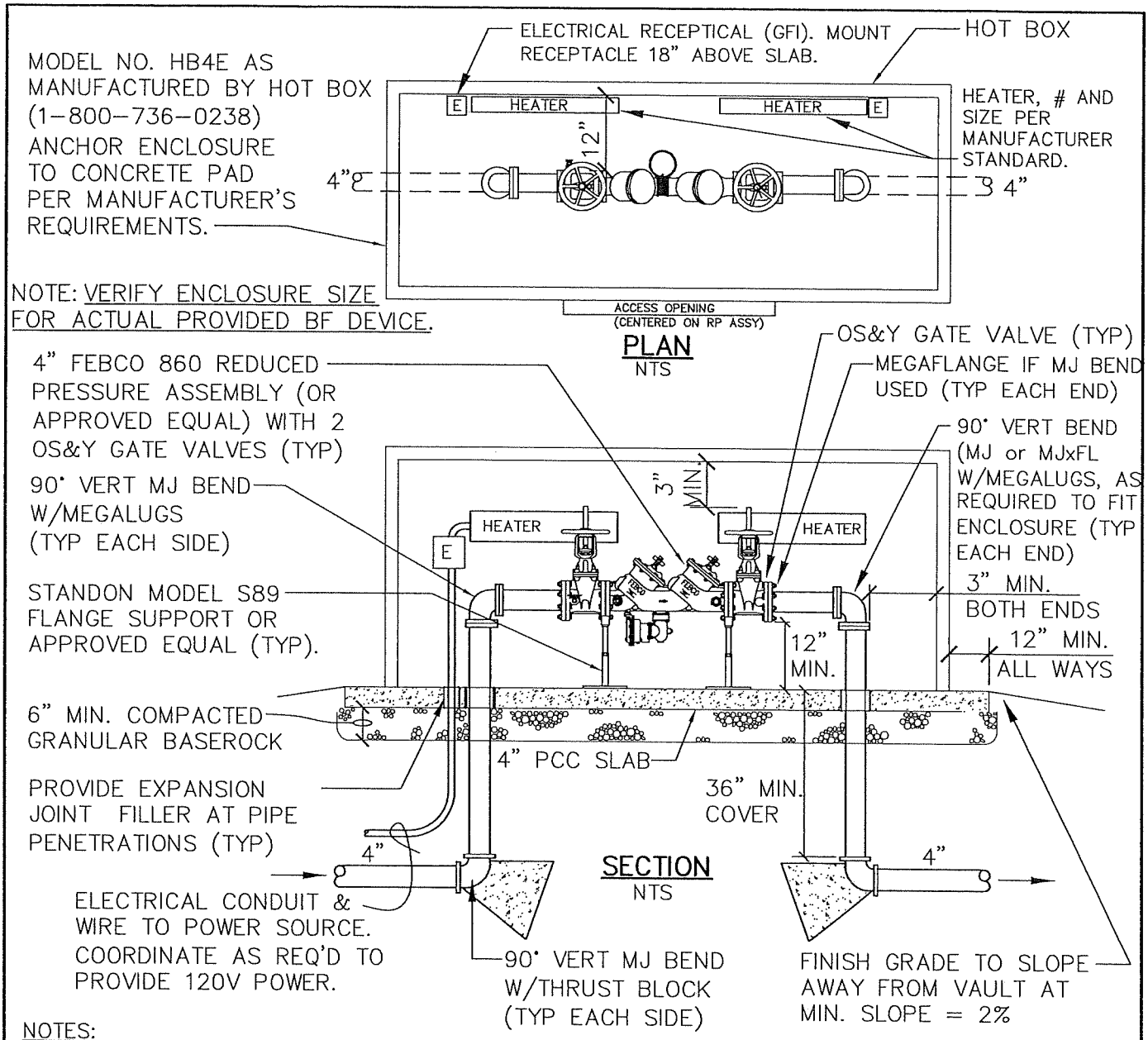
1. RPBA- REDUCED PRESSURE BACKFLOW ASSEMBLY.
2. INSTALLATION OF RPBA & ENCLOSURE SHALL MEET OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES REQUIREMENTS.
3. CONTRACTOR SHALL HAVE RPBA TESTED AND CERTIFIED PRIOR TO APPROVAL BY THE CITY, AND COPIES OF TEST REPORTS PROVIDED TO CITY.
4. RPBA & ENCLOSURE SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
5. ENCLOSURES SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL OTHER VAULTS OR STRUCTURES.
6. VERIFY ENCLOSURE DIMENSIONS ARE ADEQUATE FOR CLEARANCE BASED ON HEIGHT OF REDUCED PRESSURE ASSEMBLY.
7. ENCLOSURE SHALL BE CENTERED OVER THE COMPLETED REDUCED PRESSURE BACKFLOW ASSEMBLY.
8. POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQUIREMENTS.
9. ALL CONCRETE SHALL BE 3,300 PSI @ 28 DAYS, MAX 5" SLUMP, 4.5% AIR (±1.5%).
10. HOT BOX DRAINAGE OPENINGS SHALL NOT BE OBSTRUCTED BY GRADING OR PLANTINGS.
11. RPBA SHALL BE INSTALLED A MIN. OF 12 INCHES ABOVE THE 100-YEAR FLOOD ELEVATION AS DETERMINED BY FEMA.
12. FINISH GRADE TO SLOPE AWAY FROM ENCLOSURE SLAB AT 2% MIN. SLOPE.
13. RISER PIPES & ABOVE GRADE PIPING SHALL BE DUCTILE IRON (CL 52 MIN).

LAST REVISION DATE:	JO #
SEPT 2021	

3" REDUCED PRESSURE ASSEMBLY

(NTS)

SUBLIMITY, OR	DETAIL NO. 543



NOTES:

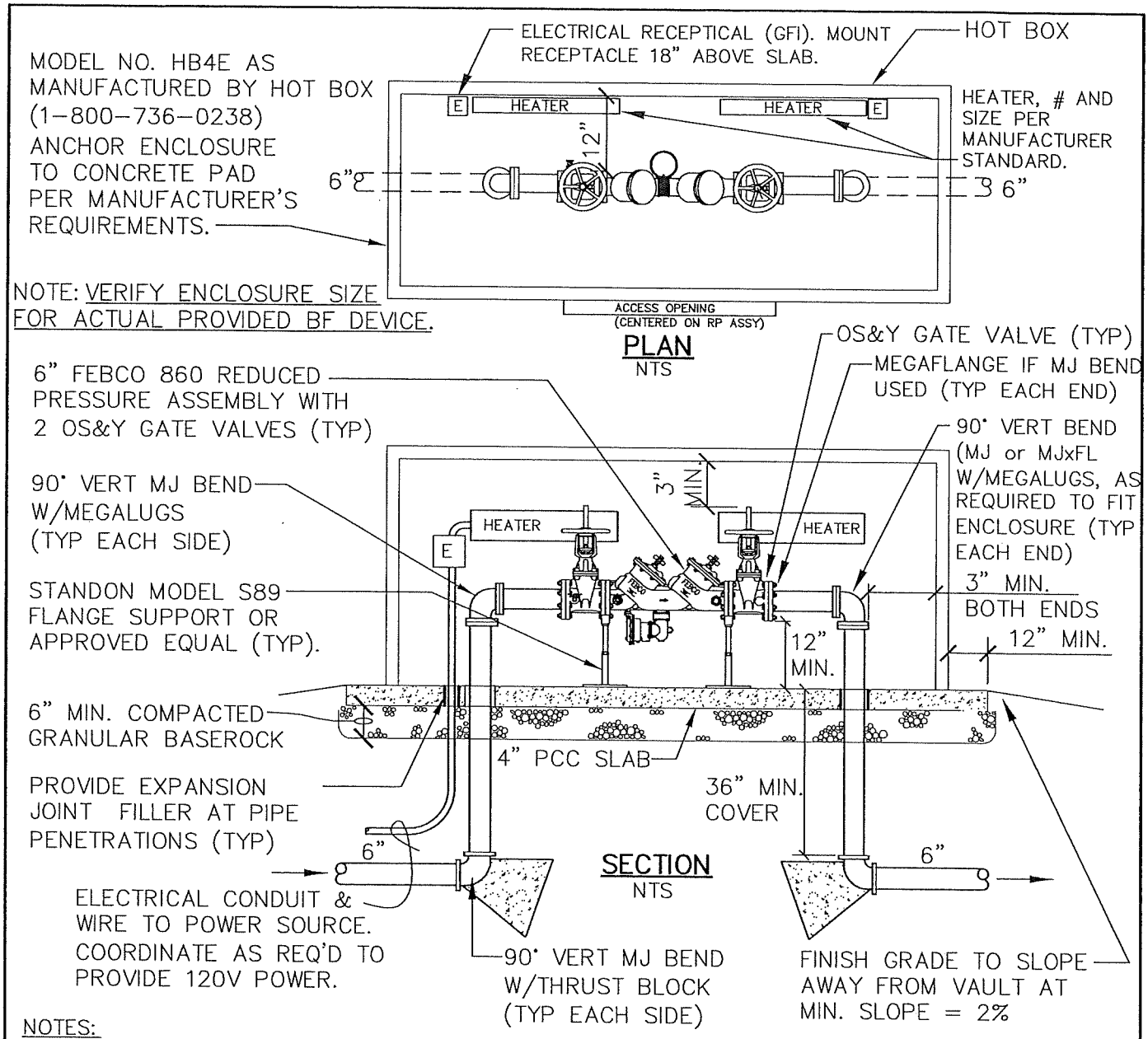
1. RPA- REDUCED PRESSURE ASSEMBLY
2. INSTALLATION OF RPA & ENCLOSURE SHALL MEET OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES REQUIREMENTS.
3. CONTRACTOR SHALL HAVE RPA TESTED AND CERTIFIED PRIOR TO APPROVAL BY THE CITY, AND COPIES OF TEST REPORTS PROVIDED TO CITY.
4. RPA & ENCLOSURE SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
5. ENCLOSURE SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL OTHER VAULTS OR STRUCTURES.
6. VERIFY ENCLOSURE DIMENSIONS ARE ADEQUATE FOR CLEARANCE BASED ON DIMENSIONS OF REDUCED PRESSURE ASSEMBLY PROVIDED.
7. ENCLOSURE SHALL BE CENTERED OVER THE COMPLETED REDUCED PRESSURE ASSEMBLY (LENGTH-WISE).
8. POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQUIREMENTS.
9. 'E' INDICATES THE ELECTRICAL RECEPTACLE. IT SHALL BE MOUNTED A MIN. OF 18" ABOVE THE SLAB.
10. ALL CONCRETE SHALL BE 3,300 PSI @ 28 DAYS, MAX 5" SLUMP, 4.5% AIR (±1.5%).
11. HOT BOX DRAINAGE OPENINGS SHALL NOT BE OBSTRUCTED BY GRADING OR PLANTINGS.
12. RPA SHALL BE INSTALLED A MIN. OF 12 INCHES ABOVE THE 100-YEAR FLOOD ELEVATION AS DETERMINED BY FEMA.
13. RISER PIPES & ABOVE GRADE PIPING SHALL BE DUCTILE IRON (CL 52 MIN).

LAST REVISION DATE:	JO #
SEPT 2021	STANDARD

4" REDUCED PRESSURE ASSEMBLY

(NTS)

	DETAIL NO.
SUBLIIMITY, OR	544



NOTES:

1. RPA– REDUCED PRESSURE ASSEMBLY
2. INSTALLATION OF RPA & ENCLOSURE SHALL MEET OREGON HEALTH AUTHORITY, DRINKING WATER SERVICES REQUIREMENTS.
3. CONTRACTOR SHALL HAVE RPA TESTED AND CERTIFIED PRIOR TO APPROVAL BY THE CIT, AND COPIES OF TEST REPORTS PROVIDED TO CITYY.
4. RPA & ENCLOSURE SHALL CONFORM TO REQUIREMENTS OF PUBLIC/PRIVATE AGENCIES HAVING JURISDICTION.
5. ENCLOSURE SHALL HAVE A MINIMUM OF 3' CLEARANCE FROM ALL OTHER VAULTS OR STRUCTURES.
6. VERIFY ENCLOSURE DIMENSIONS ARE ADEQUATE FOR CLEARANCE BASED ON DIMENSIONS OF REDUCED PRESSURE ASSEMBLY PROVIDED.
7. ENCLOSURE SHALL BE CENTERED OVER THE COMPLETED REDUCED PRESSURE ASSEMBLY (LENGTH-WISE).
8. POWER SHALL BE INSTALLED IN SCHEDULE 40 RIGID CONDUIT PER NEC REQUIREMENTS.
9. 'E' INDICATES THE ELECTRICAL RECEPTACLE. IT SHALL BE MOUNTED A MIN. OF 18" ABOVE THE SLAB.
10. ALL CONCRETE SHALL BE 3,300 PSI @ 28 DAYS, MAX 5" SLUMP, 4.5% AIR (±1.5%).
11. HOT BOX DRAINAGE OPENINGS SHALL NOT BE OBSTRUCTED BY GRADING OR PLANTINGS.
12. RPA SHALL BE INSTALLED A MIN. OF 12 INCHES ABOVE THE 100-YEAR FLOOD ELEVATION AS DETERMINED BY FEMA.
13. RISER PIPES & ABOVE GRADE PIPING SHALL BE DUCTILE IRON (CL 52 MIN).

LAST REVISION DATE:	JO #
SEPT 2021	STANDARD

6" REDUCED PRESSURE ASSEMBLY

(NTS)

SUBLIMITY, OR	DETAIL NO. 545

WATERLINE PRESSURE TEST REPORT

Project Location:	Project Name:	Date:
Inspector: (Print)	**Waterline to be tested.** From Station:	To Station:
Verify that all in-line valves, including hydrant mainline valves, are open? Yes / No		
Verify that all corp stops are open? Yes / No		
Verify that pressure gauge is mounted at high point of line to be tested? Yes / No If no, correct for elevation difference ***(ie. add 0.433 psi per foot elevation difference)***.		
System Static Pressure (psi):	Starting Pressure (psi): ***(greater of 150 psi or 1.5 times static)***	Ending Pressure (psi):
Pipe Lengths & φ's:	Starting Time:	Ending Time (***2 hours minimum***):
Volume Required to Reach Initial Test Pressure (gal):	Allowable Leakage (gal): ***(2 times table or calculated value below)***	Measured Leakage (gal):
TEST RESULTS: Pass / Fail		

ALLOWABLE LEAKAGE PER 1,000 FEET OF PIPELINE - *gph* *(NOTE: double the values from table below for a 2 hour test)*

Test Pressure ***psi***	**NOMINAL PIPE DIAMETER - *in.***									
	3	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**
200	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12
175	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98
150	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84

If the pipeline under test contains various diameters, the allowable leakage shall be the sum of the allowable leakage for each size.
No additional leakage allowance will be given for fire hydrant assemblies or valves.

Sample: 700' 8" and 55' 6" pipe. → → 0.74 gph / 1,000' * 700') + (0.55 gph / 1,000' * 55') = 0.548 gph * 2 hours = ~1.1 gallon allowable leakage loss.

Allowable leakage based on : $L = SD(P)^{1/2}/133{,}200$
Where:
L = allowable leakage, in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of the pipe, in inches
P = test pressure during the leakage test, in psig

Regardless of leakage, maximum pressure drop during test period shall not exceed 5 psi over the 2 hour test period .
Any visible leaks shall be repaired regardless of the whether or not the pipeline meets leakage allowance.

TEST PROCEDURE

1. Apply hydrostatic pressure by pumping water from an auxiliary supply basin. Accurately determine the amount of water required to reach the initial test pressure by refilling the supply basin with a calibrated container following pressurization of pipeline.
2. Monitor test pressure for 2 hour period.
3. At the completion of the test period, re-pressurize the pipeline by pumping water from the auxiliary supply basin *(mark the water surface level in the auxiliary supply basin prior to re-pressurization)*.
4. **Accurately determine the amount of water required to reach the test pressure by refilling the supply basin *to the marked line* with a calibrated container following re-pressurization of pipeline.** If the measured leakage is less than the allowable leakage, the test is successful.

Reference: For summary of disinfection & bacteriological testing procedures, see construction notes under Appendix B.