

Murray City Corporation
4646 South 500 West
Murray, Utah 84123
Phone 801.270.2440
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MURRAY

Engineering Specifications & Requirements

Murray City Engineering Division

Trae Stokes, City Engineer
Phone 801.270.2440

Amended March 2024

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MURRAY

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Engineering Fee Schedule



MURRAY

The following fee schedule is dated July 1, 2022 and may vary. Please verify fees with the Engineering Division.

Subdivision Plat and Plan Review Fees

○ Lot Split	\$300.00
○ Subdivision	\$500.00 plus \$100 per lot
○ Planned Unit Development—Detached SFD	\$500.00 plus \$100 per lot
○ Planned Unit Development—Attached SFD	\$500.00 plus \$50 per lot
○ Condominium	\$500.00
○ Amended Plats	\$300.00 plus \$50 per lot

Engineering Construction Inspection of Roads and Utility Improvements

New Lots	\$150.00 per lot
P.U.D.	\$600.00 per acre

Storm Water Impact Fee

\$183 for each ERU. One ERU is defined as 3400 square feet of impervious area which is the average impervious area on a Single Family Lot in Murray.

Excavation / Encroachment Permit & Agreement

Roadway Excavation < 500 square feet	\$250.00
Roadway Excavation > 500 square feet	\$400.00
Non-Improved Areas – No Excavation	\$200.00
Residential Street Improvement Permit	\$25.00
Encroachment Violation Fee	\$100 per day

Land Disturbance Permit

SWPPP Review & Permit (1 acre or more)	\$200.00
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Floodplain Development Permit

Application Review & Processing	\$200.00
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New Parking Lot Review Fee

New Parking Lot (less than 1 acre)	\$200.00
New Parking Lot (greater than 1 acre)	\$400.00

License to Permit Encroachment in City Easement & PUE

License Agreement	\$500.00
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Request to Vacate City Right-of-Way / Surplus City Property

Application & Processing	\$500.00
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Standards and Specifications

General

All works within Murray City right-of-way must conform to Murray City Standards and the latest APWA of Utah *Manual of Standards and Specifications*. Traffic Control Plans must conform to the latest Manual of Uniform Traffic Control Devices (MUTCD). Copies of Murray City Standard Drawings may be obtained in this section of this guidance document or the Murray City website www.murray.utah.gov.

Contained within this section are the following Standards:

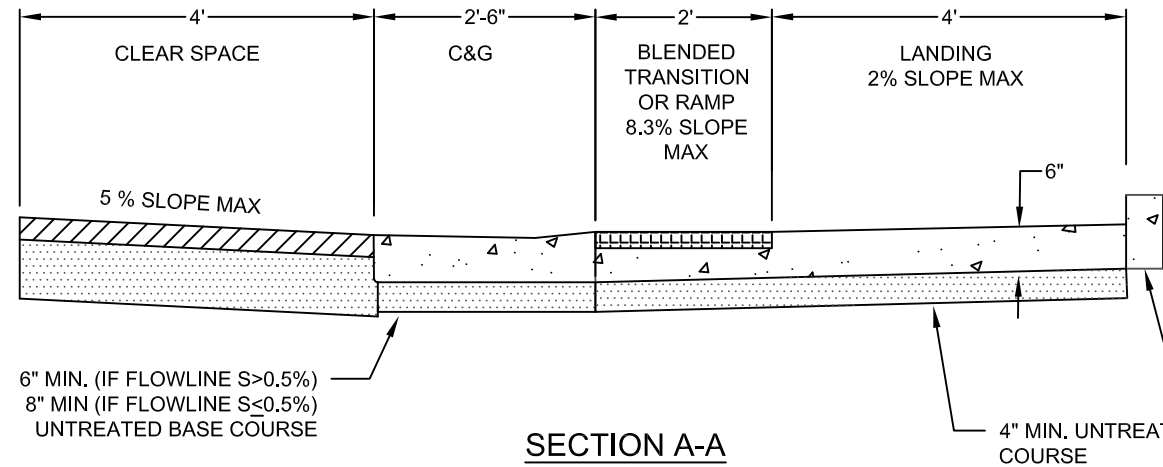
Standard Drawings.....	4—13
Roadway Moratoriums.....	14
Cold Weather Concrete Placement.....	15—19
Access Management.....	20
Crosswalk Guidelines and Standards.....	21— 22

Murray City Sewer, Stormwater and Water departments each have their own guidance documents and specifications that must be followed. For assistance, please refer to the following links from the Murray website:

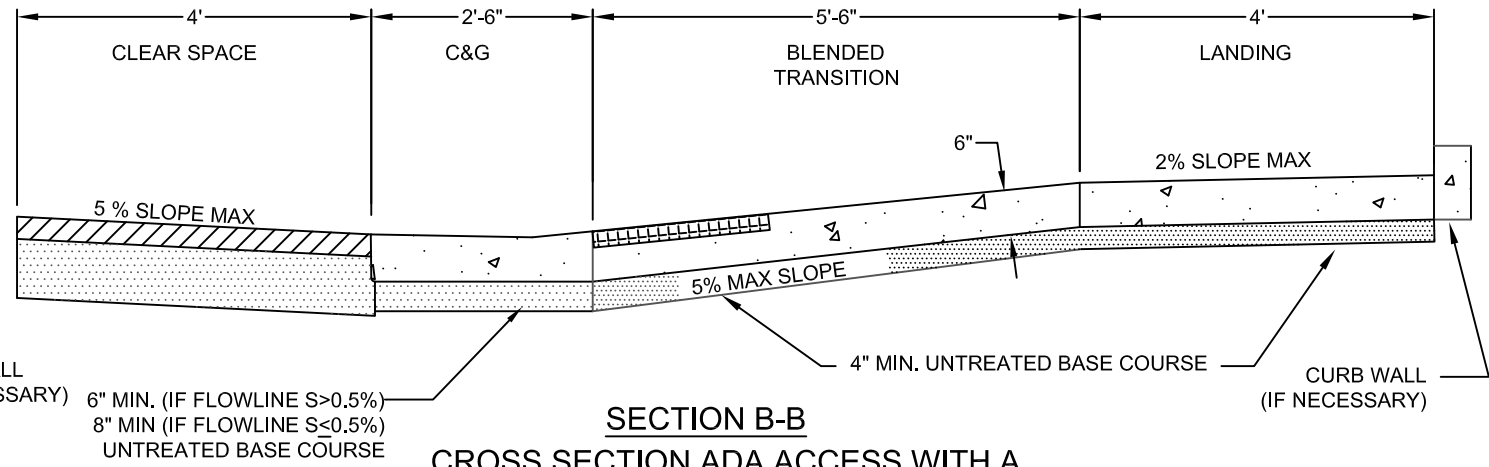
Sewer: <http://murray.utah.gov/index.aspx?NID=227>

Stormwater: <http://www.murray.utah.gov/index.aspx?nid=156>

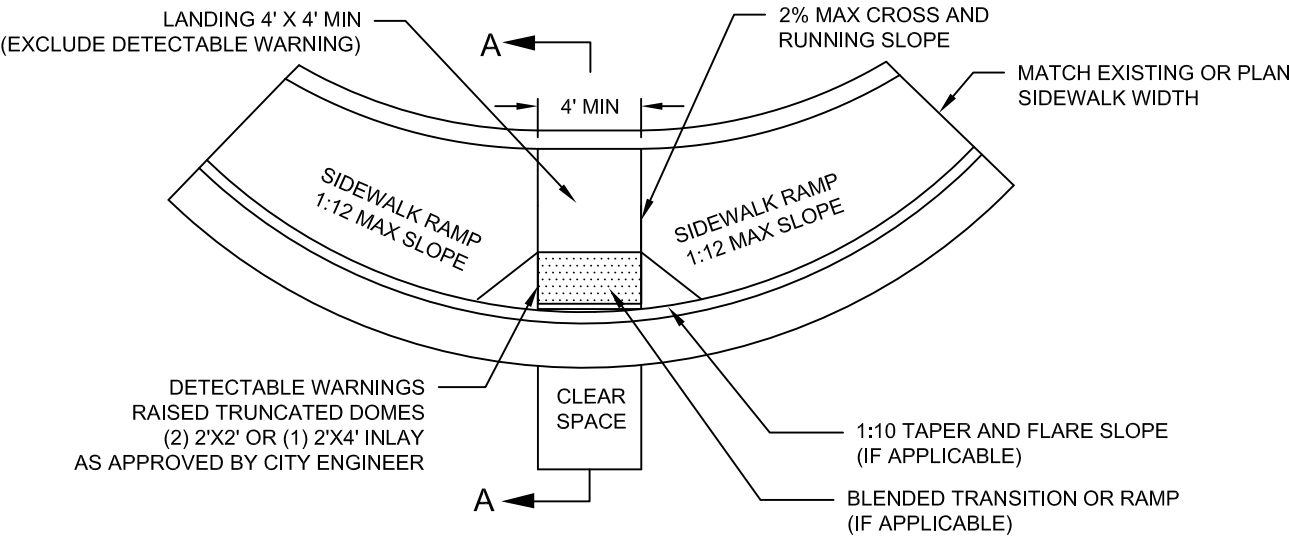
Water: <http://www.murray.utah.gov/index.aspx?NID=234>



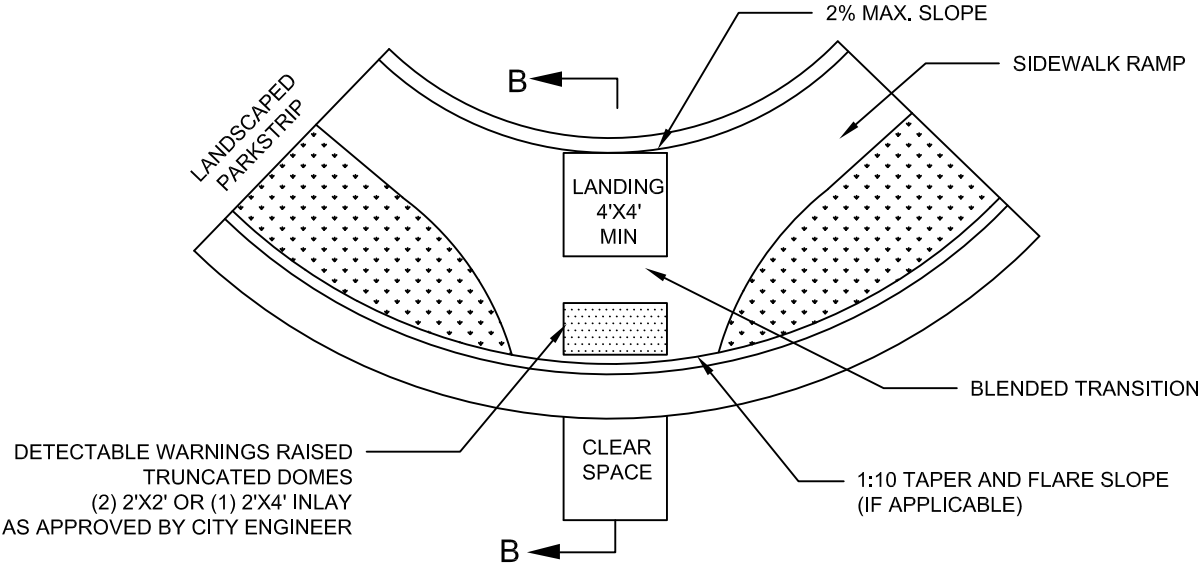
SECTION A-A
CROSS SECTION ADA ACCESS WITHOUT
A PARK STRIP



SECTION B-B
CROSS SECTION ADA ACCESS WITH A
PARK STRIP



ADA ACCESS RAMP WITHOUT A PARK STRIP



ADA ACCESS RAMP WITH A PARK STRIP

GENERAL NOTES

- ALL CURB, GUTTER, SIDEWALK AND DRIVE APPROACHES SHALL BE DESIGNED AND STAKED BY A LICENSED ENGINEER OR LAND SURVEYOR AND SHALL SUBMIT A PLAN AND PROFILE DRAWING TO THE CITY ENGINEER FOR APPROVAL.
- THE CITY ENGINEER WILL REQUIRE A LAYOUT INSPECTION.
- 24 HR . NOTICE WILL BE REQUIRED FOR ALL CONCRETE INSPECTIONS. THE INSPECTOR MAY INSPECT THE FOLLOWING:
 - DENSITY TESTS
 - GRADE VERIFICATION
 - SLUMP TESTS
 - CONCRETE
 - CONCRETE SHALL BE CLASS 4000 AS PER APWA SECTION 03 30 04
 - CONCRETE SHALL BE 6.5 BAG MIX
 - SLUMP SHALL BE LESS THAN 4"
 - AIR ENTRAINMENT SHALL BE 6% +/- 1%
- CURB AND GUTTER SHALL BE APWA STANDARD PLAN NO. 205 TYPE A.
- SIDEWALK SHALL ADHERE TO APWA STANDARD PLAN 231. SIDEWALK SHALL BE 5" THICK FOR ALL SIDEWALK IN RESIDENTIAL AREAS AND 5" IN COMMERCIAL . DRIVE APPROACHES SHALL BE 6" THICK FOR RESIDENTIAL AND 8" FOR COMMERCIAL, OR SPECIFIED BY PROJECT ENGINEER.
- FLARED DRIVE APPROACH SHALL BE APWA STANDARD PLAN NO. 221.
- WATERWAY SHALL BE APWA STANDARD PLAN NO. 211.
- REINFORCEMENT STEEL SHALL MEET REQUIREMENTS OF APWA SECTION 03 20 00.
- SIDEWALK RAMP DETECTABLE WARNINGS SHALL BE RED RAISED TRUNCATED DOMES.
- SIDEWALK RAMP DETECTABLE WARNINGS SHALL BE 2'X4' INLAYS AND SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO INSTALLATION
- CONCRETE PLACED IN COLD WEATHER CONDITIONS WILL BE PLACED IN ACCORDANCE WITH ACI 306R REQUIREMENTS.
- SEE APWA STANDARD PLANS 235 TO 238 FOR ADDITIONAL INSTALLATION DETAILS.
- TYPE D CURB AND GUTTER INSTALLATION MUST BE APPROVED IN WRITING BY THE CITY ENGINEER PRIOR TO INSTALLATION.

MAXIMUM SLOPES

	RUNNING SLOPE	CROSS SLOPE
LANDING	1:48 (2%)	1:48 (2%)
RAMP	1:12 (8.33%)	1:48 (2%)
CLEAR SPACE	1:20 (5%)	1:48 (2%)
BLENDED TRANSITION	1:20 (5%)	1:48 (2%)

DATE	REVISIONS	MADE BY
4/10	GENERAL REVISIONS	MSP
4/15	GENERAL REVISIONS	CTZ
4/19	GENERAL REVISIONS	CTZ

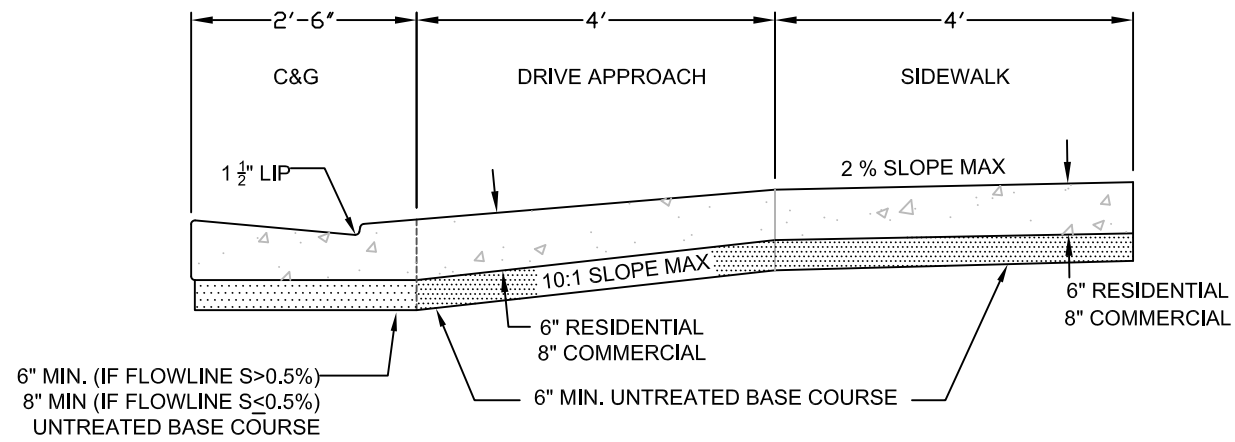


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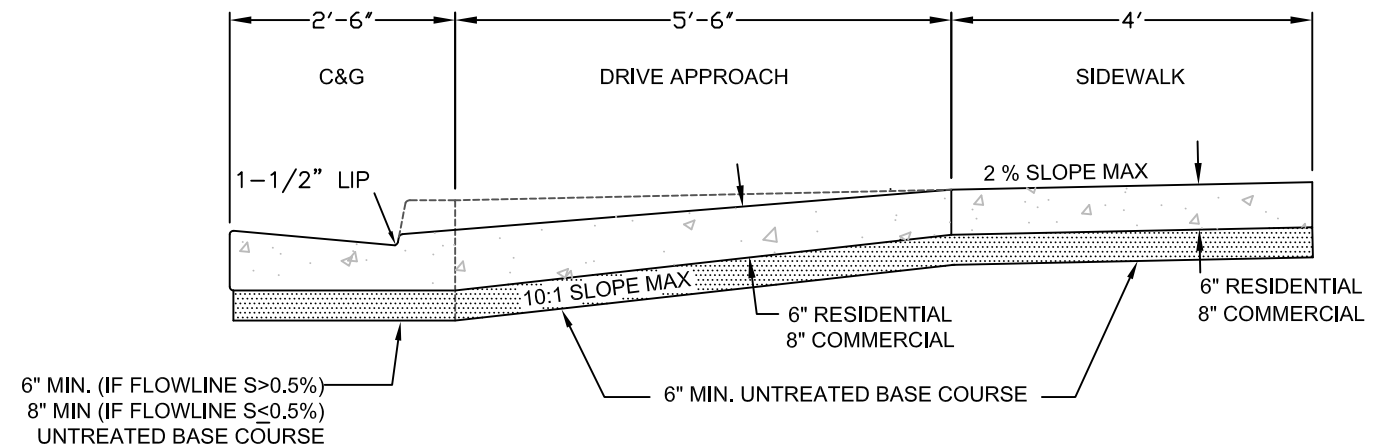
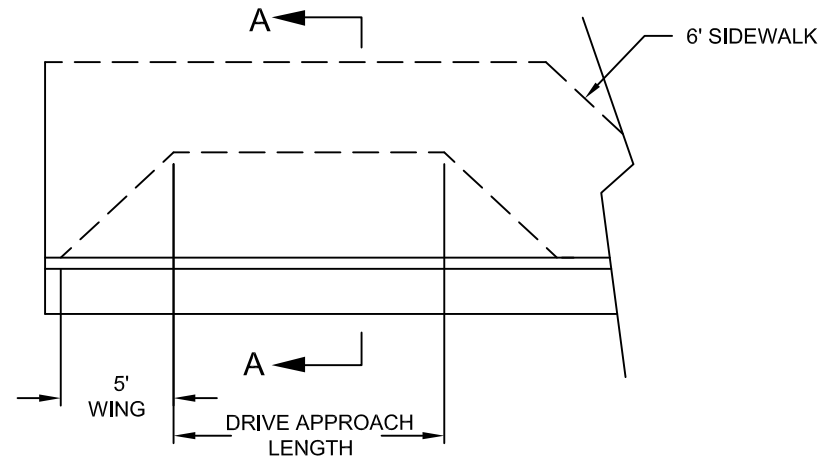
MURRAY CITY

ADA ACCESS SIDEWALK RAMP

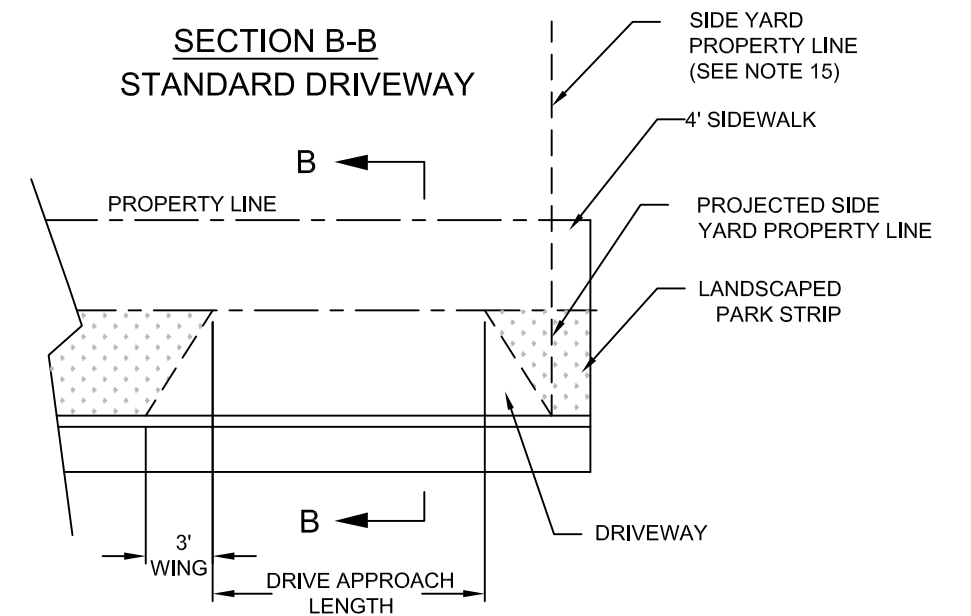
DETAILS C - 1



SECTION A-A
6' SIDEWALK TRANSITION AT DRIVEWAY



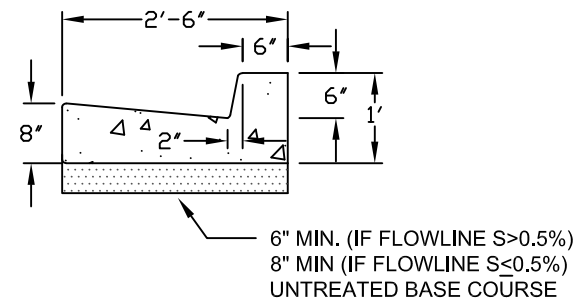
SECTION B-B
STANDARD DRIVEWAY



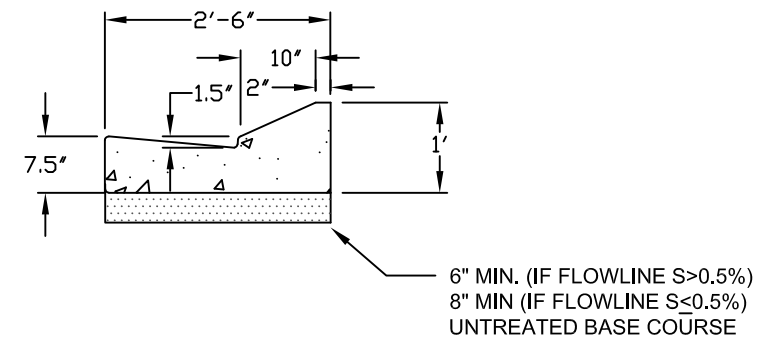
DRIVE APPROACH LENGTHS

RESIDENTIAL	12' MIN. - 30' MAX.
COMMERCIAL	25' MIN. - 50' MAX.

CURB AND GUTTER
TYPE A



CURB AND GUTTER
TYPE D



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- 24 HR . NOTICE WILL BE REQUIRED FOR ALL CONCRETE INSPECTIONS. THE INSPECTOR MAY INSPECT THE FOLLOWING:
 - DENSITY TESTS
 - GRADE VERIFICATION
 - SLUMP TESTS
 - AIR ENTRAINMENT TESTS
 - EXPANSION JOINT PLACEMENT
 - COMPRESSION CYLINDER TESTS
- CONCRETE
 - CONCRETE SHALL BE CLASS 4000 AS PER APWA SECTION 03 30 04
 - CONCRETE SHALL BE 6.5 BAG MIX
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- REINFORCEMENT STEEL SHALL MEET REQUIREMENTS OF APWA SECTION 03 20 00.
- SIDEWALK RAMP DETECTABLE WARNINGS SHALL BE RED RAISED TRUNCATED DOMES.
- SIDEWALK RAMP DETECTABLE WARNINGS SHALL BE 2'X4' INLAYS AND SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO INSTALLATION.
- DRIVE APPROACH SHALL NOT EXTEND BEYOND THE PROJECTED SIDE YARD PROPERTY LINE.

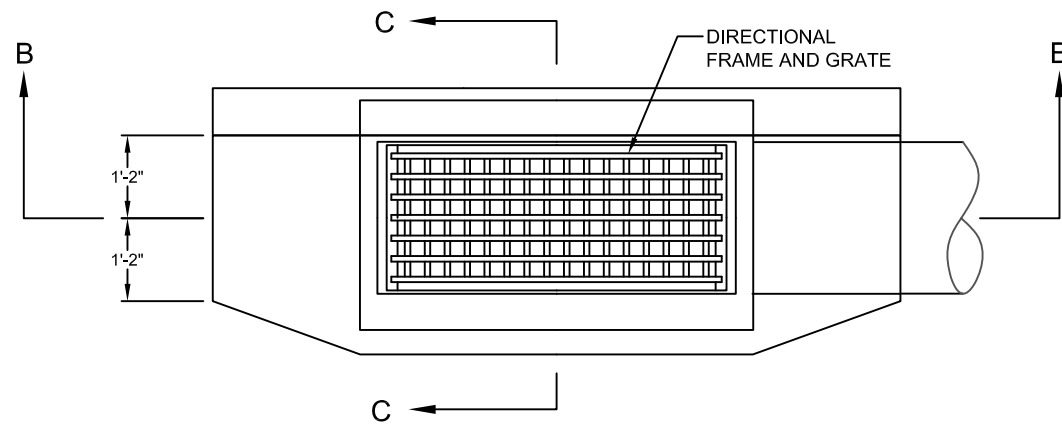
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5/30/01	GENERAL REVISIONS	JTS
4/5/04	RAMP UPDATES	JTS
12/28/04	GENERAL REVISIONS	JKS
4/10	GENERAL REVISIONS	MSP
4/15	GENERAL REVISIONS	CTZ
4/19	GENERAL REVISIONS	CTZ



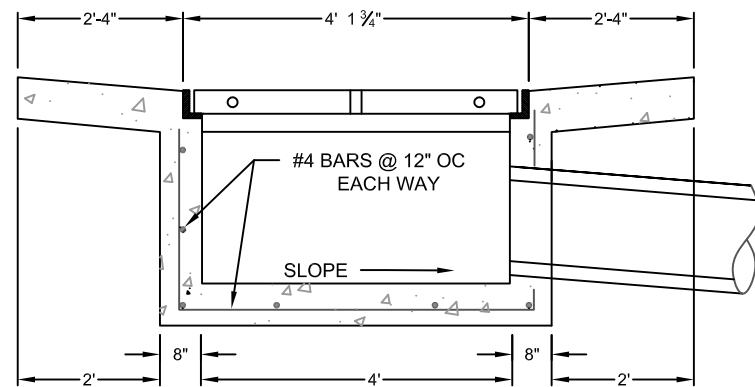
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801 270-2400

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SIDEWALK DRIVE APPROACH
SIDEWALK RAMP

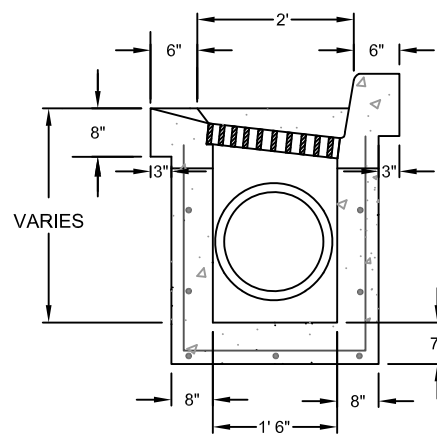
DETAILS C - 2



PLAN



SECTION B - B

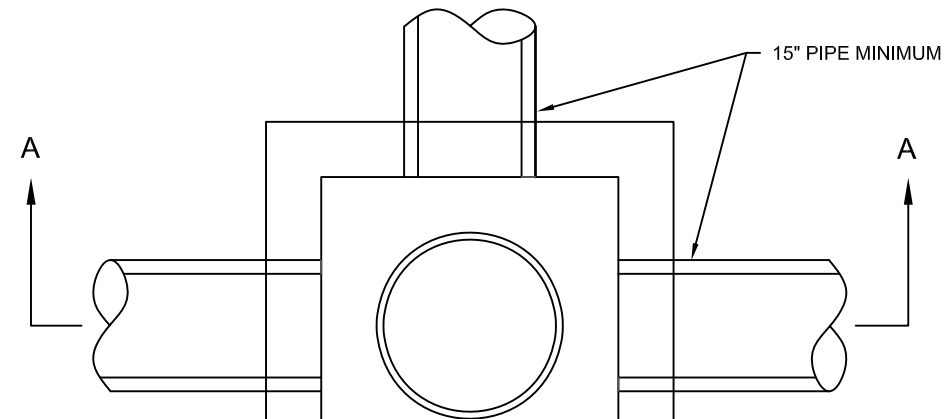


SECTION C - C

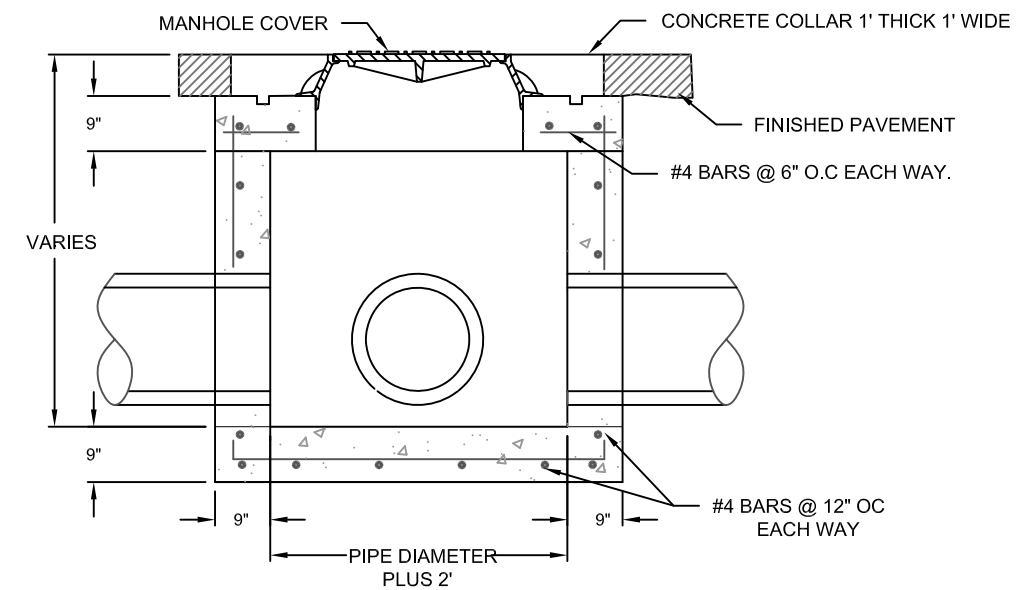
CATCH BASIN

GENERAL NOTES

1. CONCRETE SHALL BE CLASS 4000 AS PER APWA SECTION 03 30 04.
2. REINFORCEMENT SHALL BE ASTM A 615, GRADE 60, DEFORMED BARS AS PER APWA SECTION 03 20 00.
3. BACKFILL WITH GRADE 1 UNTREATED BASE COURSE AS PER APWA 32 11 23 2.1.
4. MANHOLE COVER SHALL BE APWA STANDARD PLAN NO. 302.
5. GRADE RINGS SHALL BE APWA STANDARD PLAN NO. 361.
6. CONCRETE COLLAR SHALL BE APWA STANDARD PLAN NO. 362.
7. DIRECTIONAL GRATE AND FRAME SHALL BE APWA STANDARD PLAN NO. 309 OR 310.
8. EXTEND BOX 6" BELOW PIPE INVERT FOR SEDIMENT CONTROL.



PLAN



SECTION A-A

CLEANOUT BOX

DATE	REVISIONS	MADE BY
5/30/01	GENERAL REVISIONS	JTS
4/5/04	RAMP UPDATES	JTS
12/28/04	GENERAL REVISIONS	JKS
4/10	GENERAL REVISIONS	MSP
5/19	GENERAL REVISIONS	CTZ

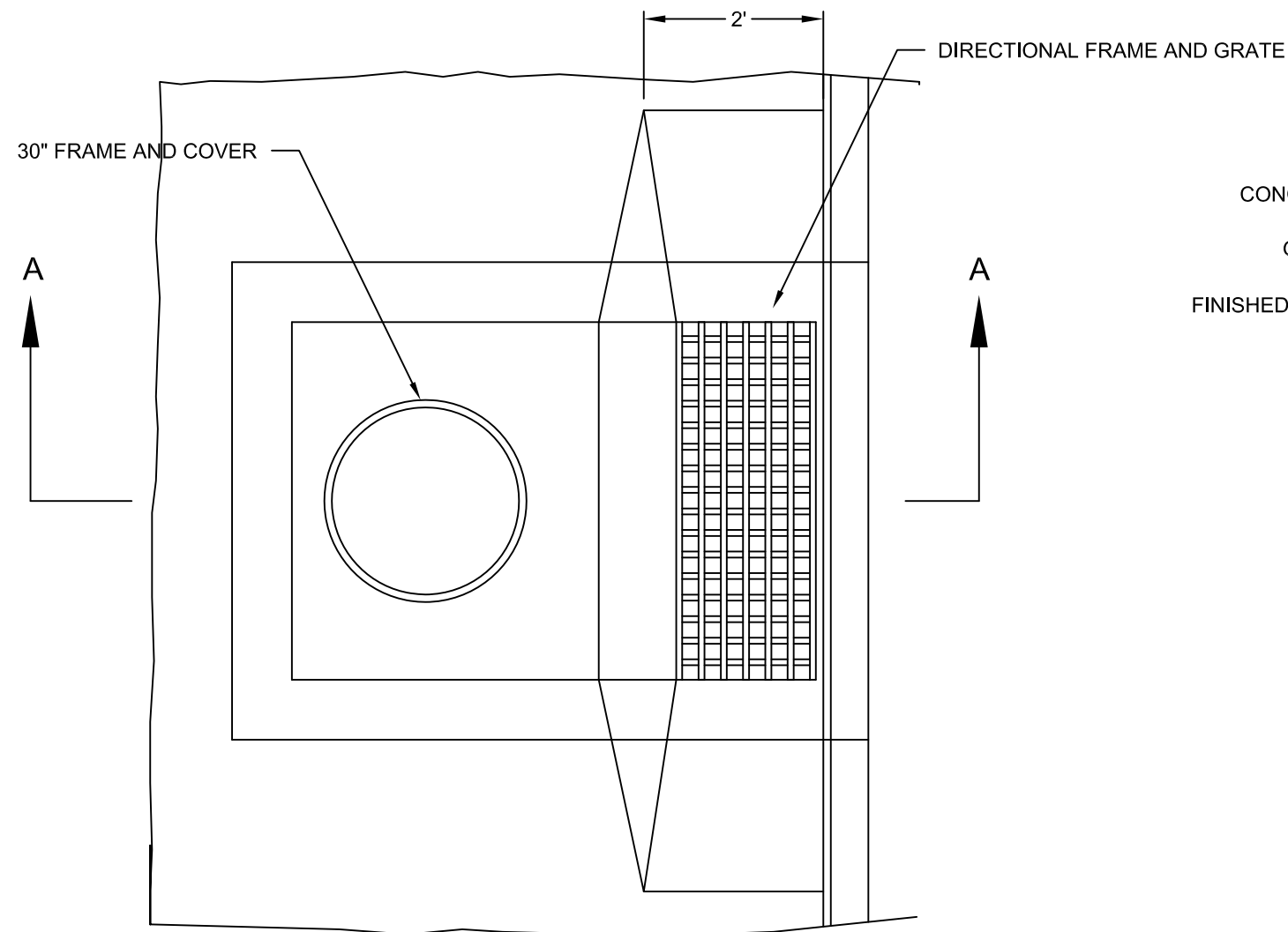


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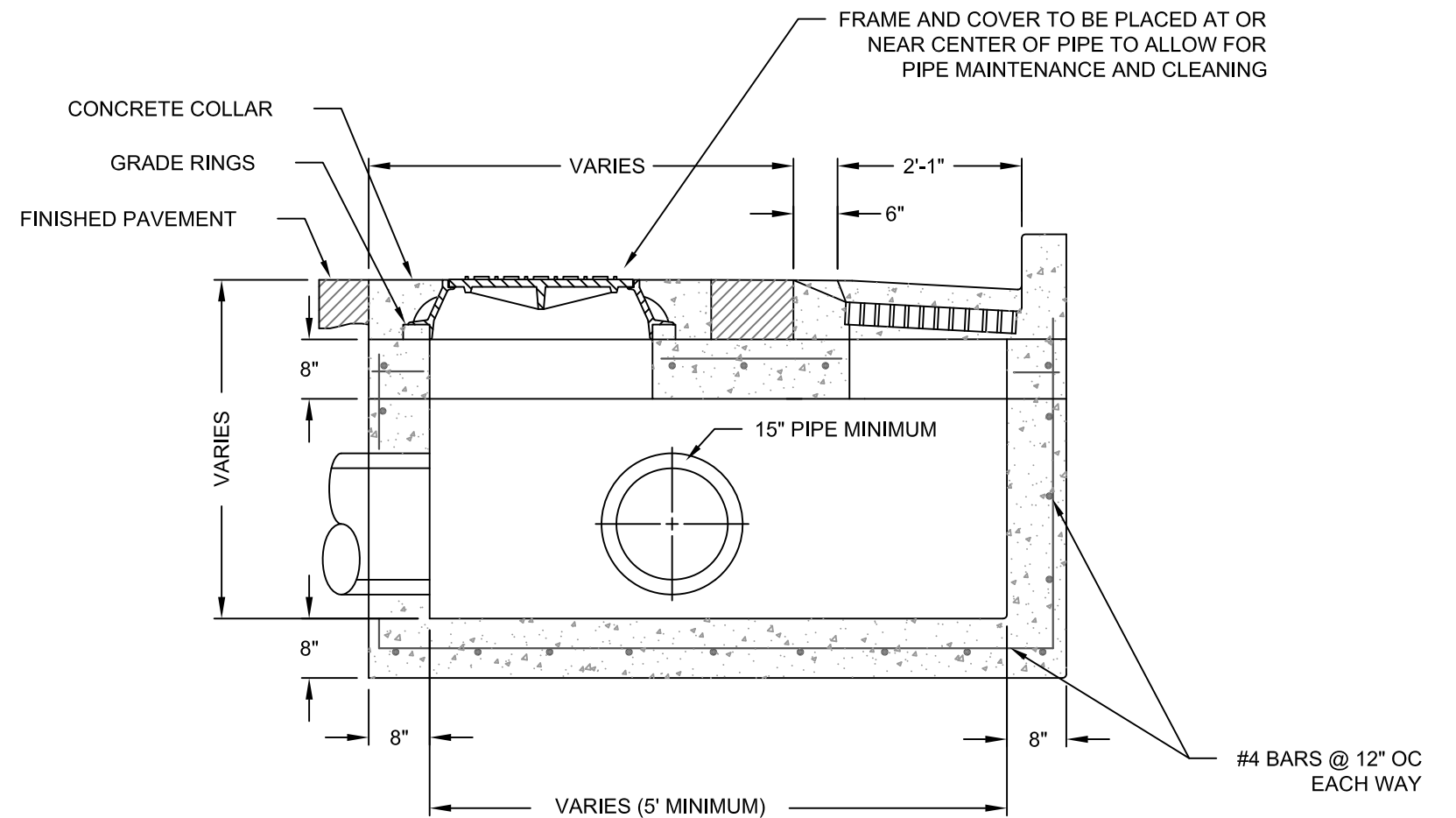
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CATCH BASIN AND
CLEANOUT

DETAILS C - 3



PLAN



SECTION A - A

COMBINATION INLET/CLEANOUT BOX

GENERAL NOTES

1. CONCRETE SHALL BE CLASS 4000 AS PER APWA SECTION 03 30 04.
2. REINFORCEMENT SHALL BE ASTM A 615, GRADE 60, DEFORMED BARS AS PER APWA SECTION 03 20 00.
3. BACKFILL WITH GRADE 1 UNTREATED BASE COURSE AS PER APWA 32 11 23 2.1.
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8. EXTEND BOX 6" BELOW PIPE INVERT FOR SEDIMENT CONTROL.

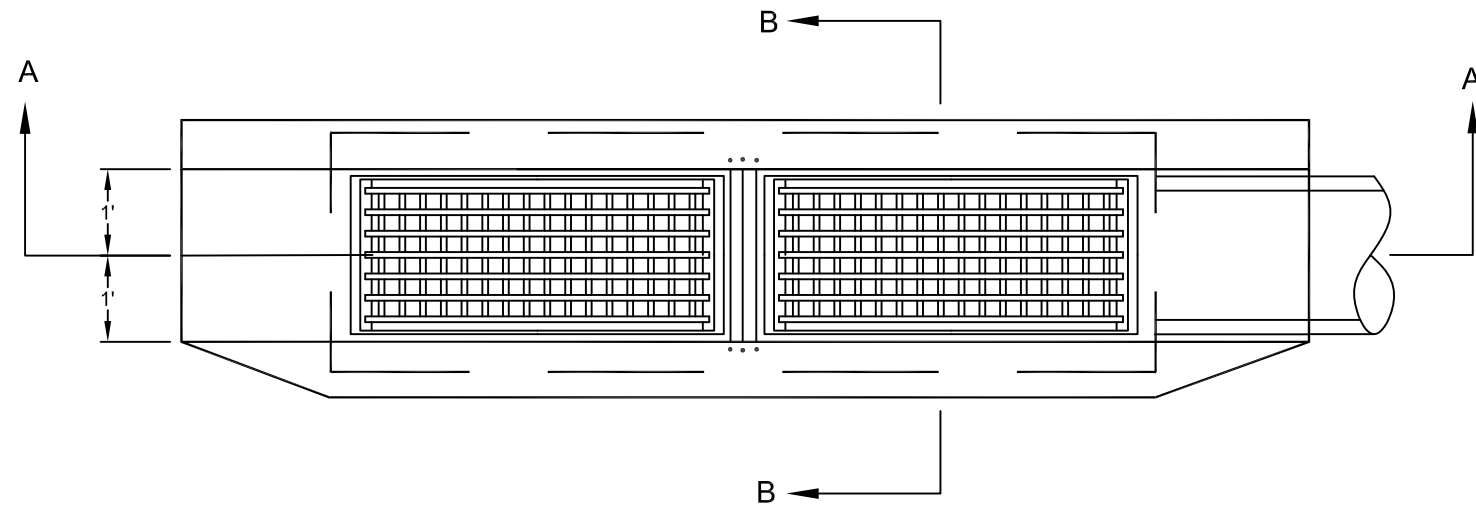
DATE	REVISIONS	MADE BY
5/30/01	GENERAL REVISIONS	JTS
4/5/04	TITLE BLOCK REVISIONS	JTS
6/30/10	GENERAL REVISIONS	MSP



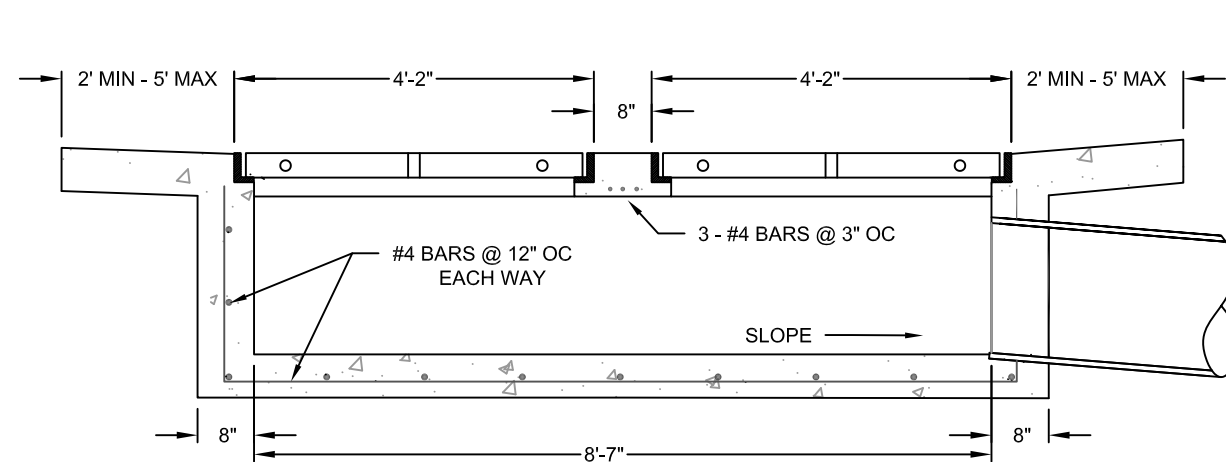
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COMBINATION
INLET/CLEANOUT BOX

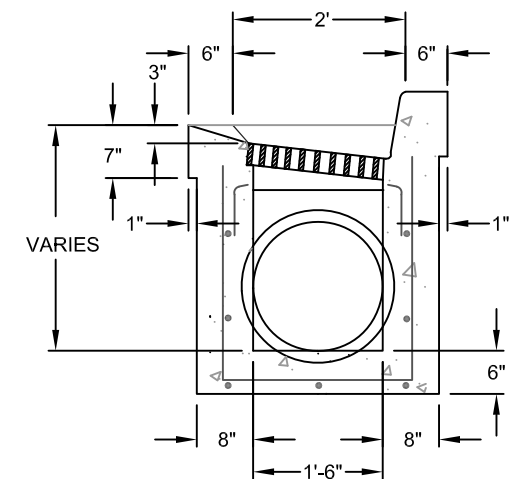
C-4



PLAN



SECTION A - A



SECTION B - B

DOUBLE INLET CATCH BASIN

GENERAL NOTES

1. CONCRETE SHALL BE CLASS 4000 AS PER APWA SECTION 03 30 04.
2. REINFORCEMENT SHALL BE ASTM A 615, GRADE 60, DEFORMED BARS AS PER APWA SECTION 03 20 00.
3. BACKFILL WITH GRADE 1 UNTREATED BASE COURSE AS PER APWA 32 11 23 2.1.
4. DIRECTIONAL GRATE AND FRAME SHALL BE APWA STANDARD PLAN NO. 309 OR 310.
5. EXTEND BOX 6" BELOW PIPE INVERT FOR SEDIMENT CONTROL.

DATE	REVISIONS	MADE BY
4/10	GENERAL REVISIONS	MSP
1/13	GENERAL REVISIONS	MSP
4/19	GENERAL REVISIONS	CTZ

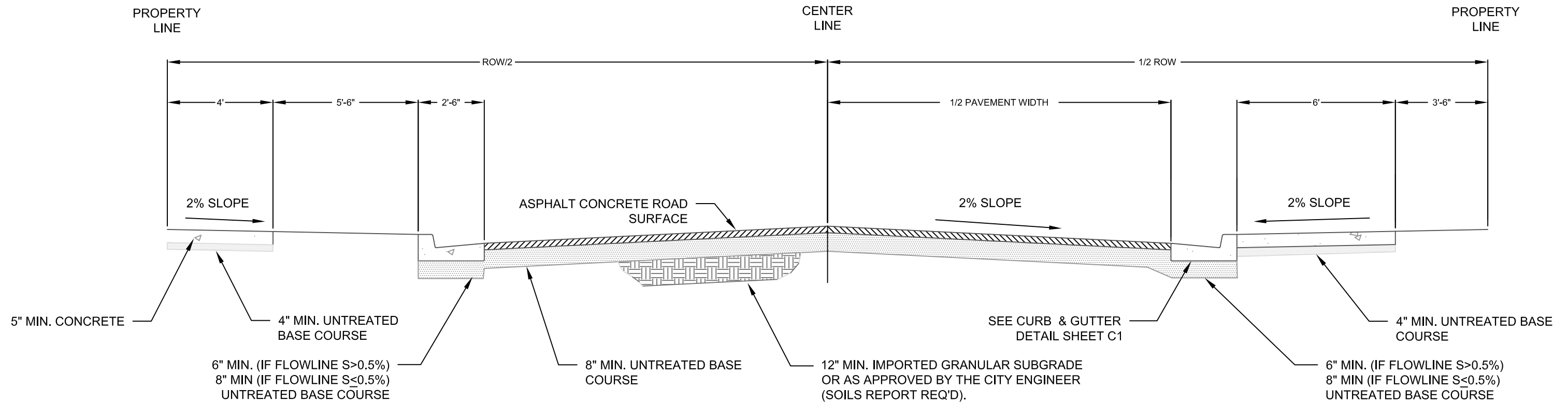


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DOUBLE INLET CATCH BASIN

DETAILS C - 4A



ROADWAY SECTION ROW*

*SIDEWALK, PARK STRIP AND ROAD WIDTHS VARY IN THE MU, TOD AND MCCD ZONES

ROADWAY SECTION				
CLASSIFICATION	ROW (FT)	PAVEMENT WIDTH (FT)	LANES	PAVEMENT THICKNESS (IN)
ALLEY	25 TO 30	22 TO 25	2	3
RESIDENTIAL	49 TO 50	25 TO 26	2	3
MINOR COLLECTOR	60	35 TO 36	2	4
MAJOR COLLECTOR	66 TO 80	40 TO 60	2 TO 5	5 TO 6
MINOR ARTERIAL	66 TO 80	40 TO 60	3 TO 5	6 TO 7

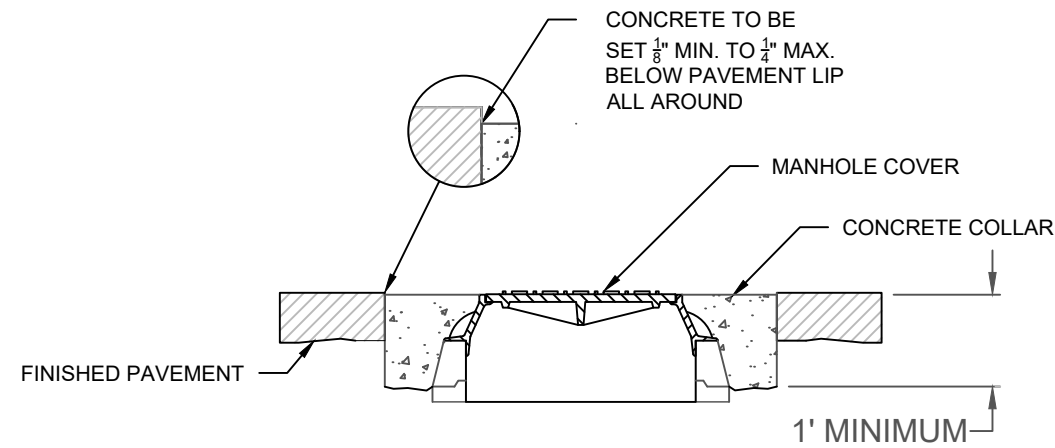
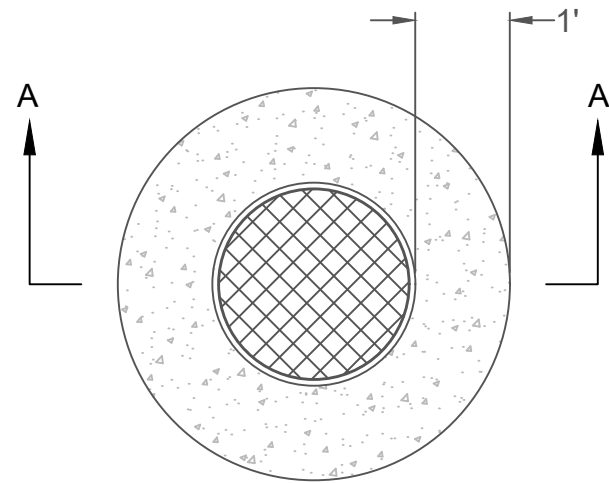
DATE	REVISIONS	MADE BY
4/10	GENERAL REVISIONS	MSP
4/15	GENERAL REVISIONS	CTZ
4/19	GENERAL REVISIONS	CTZ



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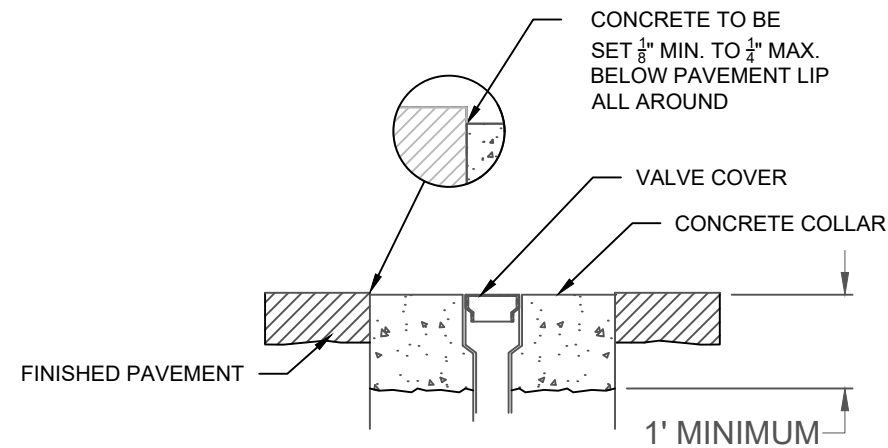
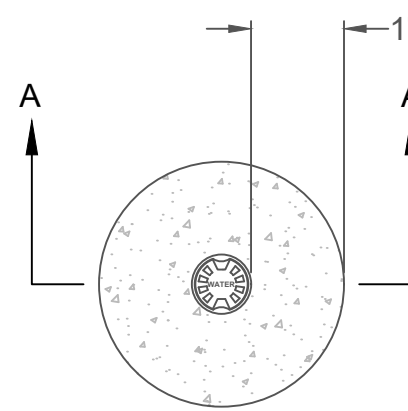
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ROADWAY DETAIL
DETAILS C - 5



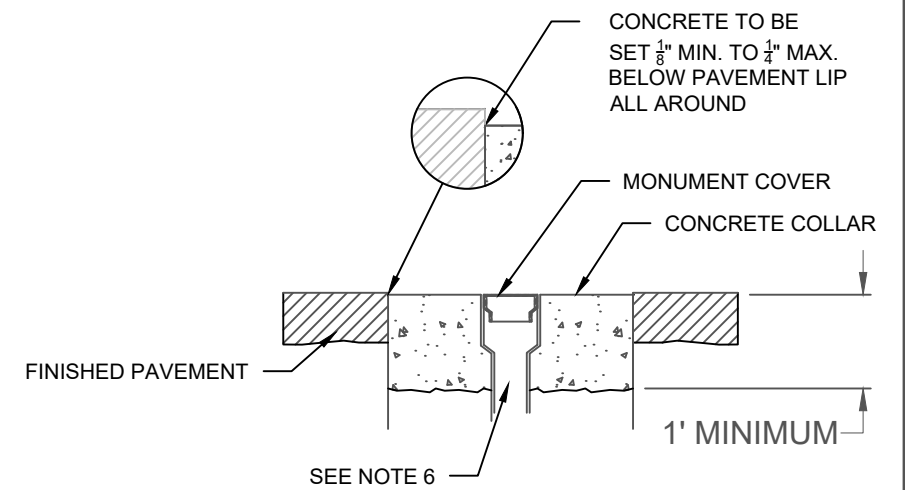
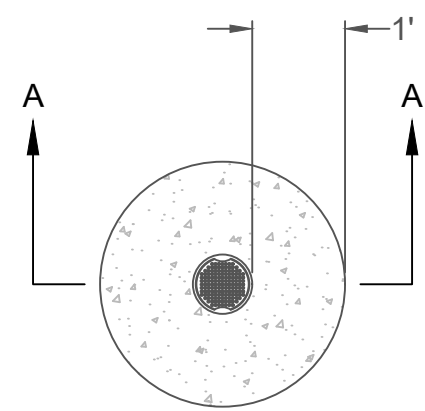
SECTION A-A

MANHOLE COLLAR



SECTION A-A

WATER VALVE COLLAR



SECTION A-A

SURVEY MONUMENT
COLLAR

GENERAL NOTES

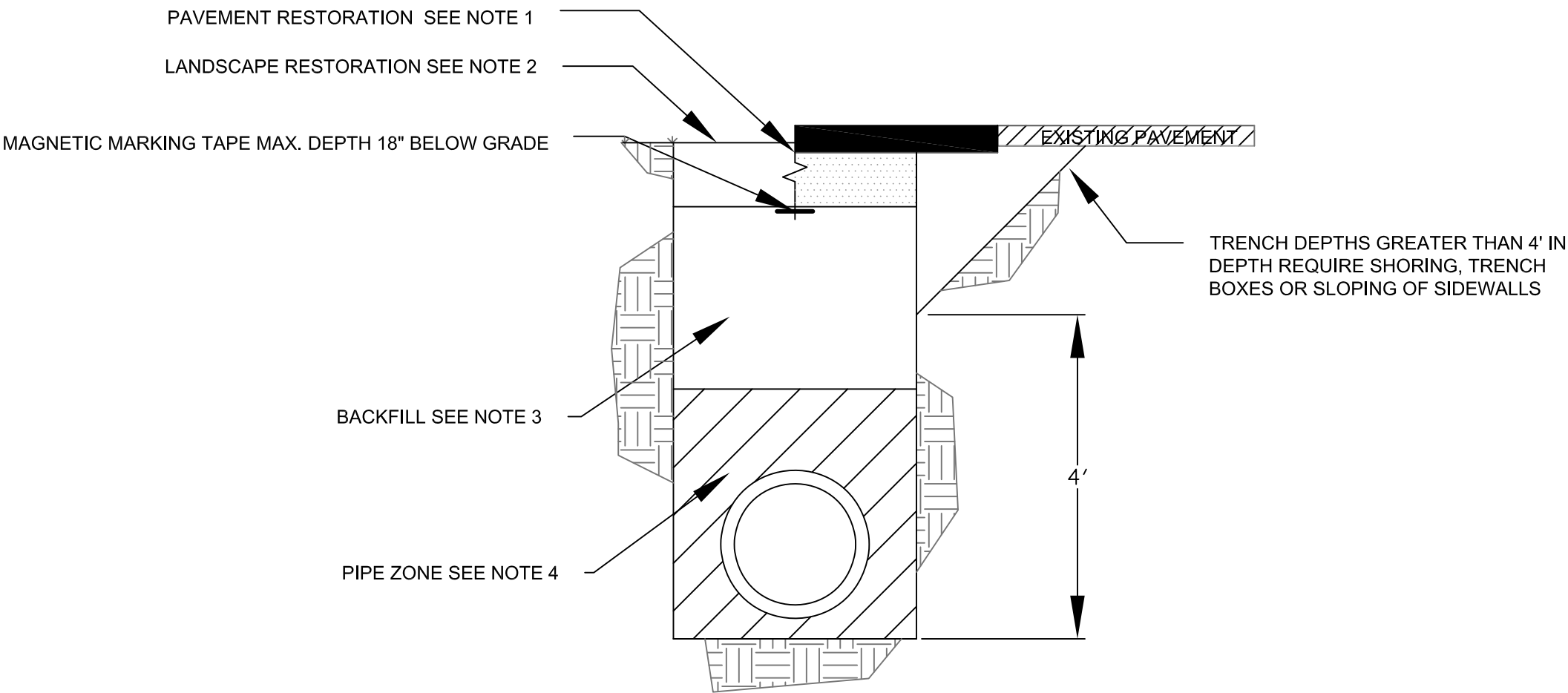
1. CONCRETE SHALL BE CLASS 4000 AS PER APWA SECTION 03 30 04. U-CART OR HAND MIXED CONCRETE WILL NOT BE ACCEPTED.
2. REINFORCEMENT SHALL BE ASTM A 615, GRADE 60, DEFORMED BARS AS PER APWA SECTION 03 20 00.
3. BACKFILL WITH GRADE 1 UNTREATED BASE COURSE AS PER APWA 32 11 23 2.1.
4. GRADE RINGS SHALL BE APWA STANDARD PLAN NO. 361
5. CONCRETE COLLAR SHALL BE APWA STANDARD PLAN NO. 362 ACCEPT FOR THE FOLLOWING: CONCRETE TO BE SET $\frac{1}{8}$ " MIN. TO $\frac{1}{4}$ " MAX. BELOW PAVEMENT LIP ALL AROUND.
6. SEE APWA STANDARD PLANS 273 AND 274 FOR MOUNMENT INSTALLATION DETAILS.
7. SALT LAKE COUNTY SURVEYOR MUST BE CONTACTED (385-468-8240) PRIOR TO MONUMENT INSTALLATION, REMOVAL OR RECONSTRUCTION.

DATE	REVISIONS	MADE BY
6/15/10	GENERAL REVISIONS	MSP
4/06/15	GENERAL REVISIONS	CTZ
5/01/19	GENERAL REVISIONS	CTZ
12/01/23	DEPTH OF COLLAR	STN



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MURRAY CITY
MANHOLE AND VALVE
COLLAR DETAIL
DETAILS C-6



TRENCH BACKFILL

NOTES

- 1. DO NOT INSTALL ASPHALT OR CONCRETE SURFACING UNTIL TRENCH COMPACTION IS ACCEPTED BY ENGINEER.
SEE PLAN 255 OR 256 OF 2017 APWA STANDARD PLANS.
- 2. PROVIDE 4" OF COMPACTED TOPSOIL AND MATCH TO EXISTING GRADE. PLACE VEGETATION TO MATCH PRE-EXISTING CONDITIONS.
- 3. GRANULAR BACKFILL BORROW MATERIAL TO BE A-1 CLASSIFICATION WITH A MAXIMUM PARTICLE SIZE OF 2 ".
UNCOMPACTED LIFT THICKNESS TO BE A MAXIMUM OF 8" AND PLACED ACCORDING TO 2007 APWA SECTION 31 05 15.
FLOWABLE FILL TO BE LOW STRENGTH (60 PSI) PER APWA SECTION 31 05 15.
- 4. PIPE ZONE MATERIAL TO BE PLACE ACCORDING TO 2017 APWA STANDARD PLAN 382.

DATE	REVISIONS	MADE BY
2/13	GENERAL REVISIONS	MSP
2/18	GENERAL REVISIONS	CTZ
5/19	GENERAL REVISIONS	CTZ



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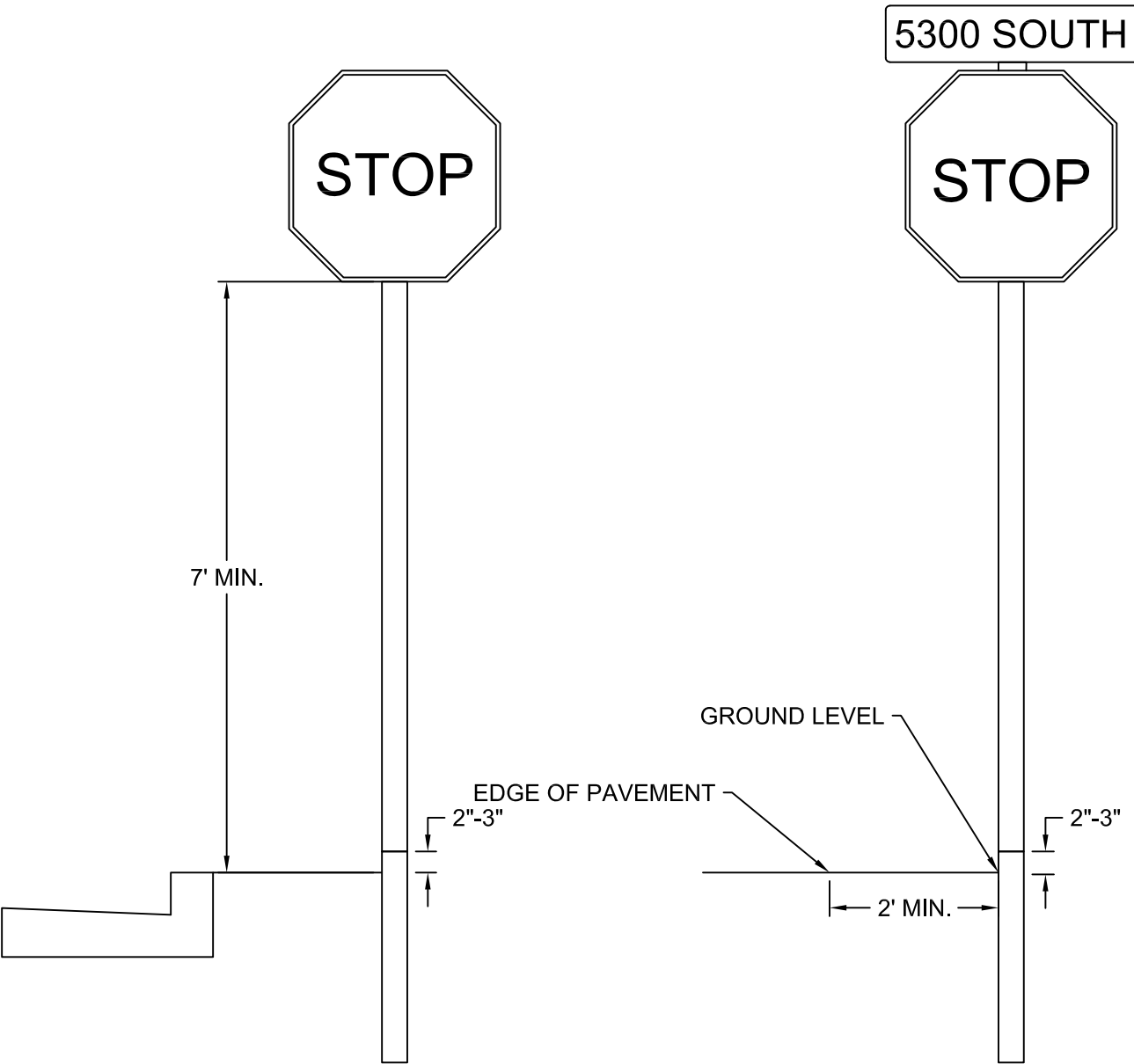
MURRAY CITY

TRENCH BACKFILL

DETAIL C - 7

GENERAL NOTES

- 1. SIGNS SHALL BE PLACED IN CONFORMANCE WITH THE LATEST M.U.T.C.D.
- 2. STREET MARKERS SHALL BE MADE EITHER BY HIGH QUALITY INK ON REFLECTIVE SHEETING OR ON GREEN E.C. FILM OVERLAY ON A WHITE DIAMOND GRADE REFLECTIVE SHEETING.
- 3. SIGN BLANK SHALL BE HIGH TENSILE DEGREASED ALUMINUM WITH ALOODINE FINISH. THICKNESS SHALL BE 0.08.
- 4. EACH SIGN SHALL CONSIST OF TWO SIGN BLANKS RIVETED TOGETHER AND MOUNTED AS REQUIRED.
- 5. SIGNS ON PRIVATE ROADS WHEN REQUIRED BY THE CITY ENGINEER SHALL MEET ALL SPECIFICATIONS OF STANDARD SIGNS EXCEPT OVERLAY WITH LEGEND SHALL BE BLUE.
- 6. ALL STREETS WITH NAMES SHALL ALSO HAVE COORDINATE DESIGNATION.
- 7. THE CITY ENGINEER SHALL BE CONTACTED PRIOR TO MAKING SIGNS TO VERIFY CORRECT STREET NAMES.
- 8. 30" STOP SIGN DIAMOND GRADE
- 36" YIELD SIGN DIAMOND GRADE
- 30" X 30" WARNING SIGN DIAMOND GRADE
- 24 X 30" SPEED LIMIT DIAMOND GRADE
- 9. IF PLACEMENT STANDARDS CANNOT BE MET, CONTACT CITY ENGINEER.
- 10. IF INSTALLING SIGNS ACCORDING TO THIS STANDARD CAUSES THE SIGN TO BE OBSTRUCTED OR THE VISIBILITY IS IMPAIRED IN ANY WAY, CONTACT THE CITY ENGINEER FOR AND NECESSARY MODIFICATIONS.
- 11. BLUE STAKES SHALL BE NOTIFIED FOR UTILITY LOCATIONS BEFORE ANY INSTALLATION.



INSTALLATION DETAILS

DATE	REVISIONS	MADE BY	MURRAY CITY		
			SIGN INSTALLATION AND GENERAL NOTES		
			DETAILS C-8		



MURRAY

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ENGINEERING DEPARTMENT

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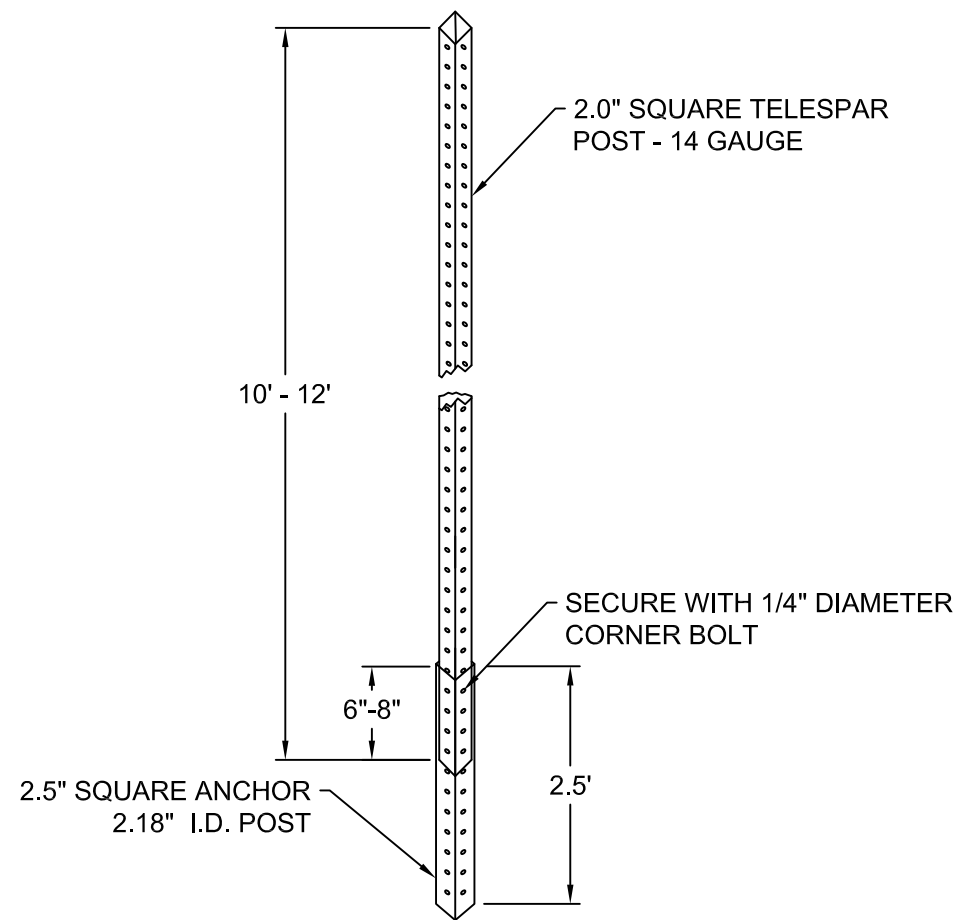
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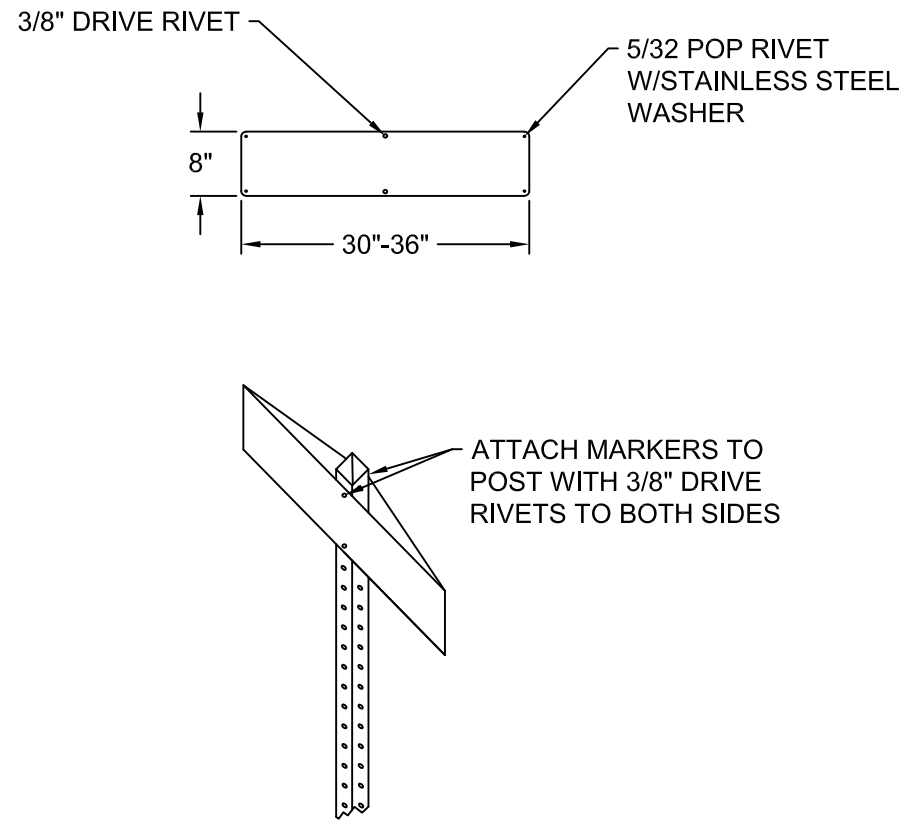
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SIGN INSTALLATION AND GENERAL NOTES

DETAILS C-8



POST AND ANCHOR PLACEMENT



SIGN MOUNTING



LETTERING HEIGHTS

DATE	REVISIONS	MADE BY



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MURRAY CITY
POST AND SIGN
MOUNTING DETAIL
DETAILS C-9

Standards and Specifications (continued)

Murray City Moratorium Standard

This standard applies to new streets, streets that have been reconstructed, overlaid streets and streets that have been slurry sealed.

- **New Streets/Reconstructed Streets:** New streets/reconstructed streets shall not be cut for (3) years from the time of completed construction.
- **Overlaid Streets:** Overlaid streets shall not be cut for (3) years from the time the street was overlaid.

If an emergency utility cut is absolutely necessary within the three year moratorium period, the Special Restoration Standard will apply. This Special Restoration Standard continues for (3) years after the moratorium ends for all New Streets and Overlaid Streets. **The engineer reserves the right to require an overlay over the full width of the street to restore the roadway to the original condition**

Special Restoration Standard

This standard applies to new streets, streets that have been reconstructed, overlaid, and slurried streets.

Prior to the mill and overlay, the trench will be reconstructed per City Standards. The patch shall be placed in compliance with APWA plan no. 255 entitled 'Asphalt Concrete "T" Patch.

- **New Streets/Reconstructed Streets:** (For Three years after moratorium ends), the asphalt surface shall be milled down a minimum depth of two (2) inches fifteen (15) feet each way of the edge of the cut. Milling shall be done in widths equivalent to existing striped traffic lanes. The engineer reserves the right to require an area length greater than fifteen (15) feet each way of cut or a depth greater than two (2) inches if deemed appropriate to restore the roadway to the original condition.
- **Overlaid Streets:** (For three years after moratorium ends), the asphalt surface shall be milled down a minimum depth of two (2) inches fifteen (15) feet each way of the edge of the cut. Milling shall be done in widths equivalent to existing striped traffic lanes. The engineer reserves the right to require an area length greater than fifteen (15) feet each way of cut or a depth greater than two (2) inches if deemed appropriate to restore the roadway to the original condition.
- **Slurried Streets:** (For one year after placement only), an area not less than fifteen (15) feet from the edge of the cut (full traffic lane width) shall be re-slurry sealed with an approved Type II slurry.

Between November 15th and March 15th/Emergency Permits Only

- Between November 15th and March 15th, Road Cut Permits will only be issued for emergency utility repairs and will be reviewed on a case by case basis. Any exceptions will need to be approved by the City Engineer and Public Works Director. It's the responsibility of the applicant / utility company to comply with any special conditions imposed by the City regarding restoration of the roadway for emergency cuts. Asphalt placed between November 15th and March 15th will be considered temporary and will need to be replaced when weather conditions are suitable.

Standards and Specifications (continued)

Cold Weather Concrete Placement

Cold weather is defined as for more than 3 consecutive days the average air temp is less than 40° F and does not raise above 50° F in a 12 hour period. The following are highlights of requirements of APWA 03 30 04 - 10 and ACI 306R-88 Standards concerning placement of concrete in cold weather conditions.

Once temperatures go below 50° F:

If an admixture is added to the concrete a new mix design must be submitted to the ENGINEER for evaluation. APWA 03 30 04 1.3 D.

Ground surface and sub-grade, not limited to the standard 4"-6" of road base, must be at least 35°F but not higher than placement temps. Blankets may be placed over work area for a few days prior to placement but in most cases external heat must be applied. ACI 306R-88 Chapter 4.

Cement content must be increased to a 7.5 bag/yd³ mix. APWA 03 30 04 2.5 E1.

Non chloride admixtures may be used but placement, curing and protection requirements must be observed. APWA 03 30 10 3.4 A2.

Temperature of concrete as placed should be as close to the minimum recommended value as possible (55° F) ACI 306R-88 Chapter 3.1.

Concrete must reach a minimum strength of 500 psi to protect the concrete from 1 freeze cycle. ACI 306R-88 Chapter 5.

If subject to more than one cycle of freezing the concrete must reach a minimum of 3,500 psi before being exposed to ambient air temperatures. ACI 306R-88 Chapter 2.6.

Concrete must be protected at least the number of days required in Table 5.3 of ACI 306R-88 Chapter 5.

Minimum exposure temperatures for concrete slabs will be determined from Tables 7.3.1-7.3.4.

Concrete should not be exposed to temperatures 20°F above the minimum placement temperatures. ACI 306R-88 Chapter 7.4.

The temperature of the concrete and the ambient air and recorded at least twice in 24 hr period. Temperatures should be taken at more than one location, on edges and corners.

Combustion heaters need to be vented to prevent carbonation (carbon dioxide reacting with calcium hydroxide to form calcium carbonate) of concrete which causes a weak and dusty surface. ACI 306R-88 Chapter 7.4.

If concrete temperature is greater than 60° F and the air temperature is 50° F the concrete needs to be protected from drying by using a curing compound or steam heating ACI 306R-88 Chapter 8.2.



Standards and Specifications (continued)

Cold Weather Concrete Placement

TABLES FROM ACI 306R

Table 3.1 - Recommended concrete temperatures

Line	Air temperature	Section size, minimum dimension, in. (mm)			
		< 12 in. (300 mm)	12-36 in. (300-900 mm)	36-72 in. (900-1800 mm)	> 72 in. (1800 mm)

Minimum concrete temperature as placed and maintained

1	-	55 F (13 C)	50 F (10 C)	45 F (7 C)	40 F (5 C)
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Minimum concrete temperature as mixed for indicated air temperature*

2	Above 30 F (- 1 C)	60 F (16 C)	55 F (13 C)	50 F (10 C)	45 F (7 C)
3	0 to 30 F (- 18 to -1 C)	65 F (18 C)	60 F (16 C)	55 F (13 C)	50 F (10 C)
4	Below 0(- 18 C)	70 F (21 C)	65 F (18 C)	60 F (16 C)	55 F (13 C)

Maximum allowable gradual temperature drop in first 24 hr after end of protection

5	-	50 F (28 C)	40 F (22 C)	30 F (17 C)	20 F (11 C)
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*For colder weather a greater margin in temperature is provided between concrete as mixed and required minimum temperature of fresh concrete in place.

Table 5.1 - Length of protection period required to prevent damage from early-age freezing of air entrained concrete

Line	Exposure	Protection period at temperature indicated in Line 1 of Table 3.1, days*	
		Type I or II cement	Type III cement, or accelerating admixture, or 100 lb/yd ³ (60 kg/m ³) of additional cement
1	Not exposed	2	1
2	Exposed	3	2

*A day is a 24-hr period.



Cold Weather Concrete Placement

Table 5.3 - Length of protection period for concrete placed during cold weather

Line	Service category	Protection period at temperature indicated in Line 1 of Table 3.1, days*	
		Type I or II cement	Type III cement, or accelerating admixture, or 100 lb/ yd ³ (60 kg/m ³) of additional cement
1	1 - no load, not exposed	2	1
2	2 - no load, exposed	3	2
3	3 - partial load, exposed	6	4
4	4 - full load	See Chapter 6	

*A day is a 24-hr period.

Standards and Specifications *(continued)*

Access Management

Access Management is to serve as a standard to ensure efficient and safe travel on Murray City streets while at the same time providing access for developmental use such as businesses and residences. In general access management provides for the least amount of access and greatest mobility on a freeway or arterial and the most amount of access and least mobility on collector or local streets. This document will describe the standards across all functional roadway classifications located within Murray City.

Roadway Classifications

Transportation facilities are separated into classifications based upon use, roadway geometry and traffic volume. Table 1 below is adapted from the 2006 Murray Transportation Plan and defines the functional classification of the roadways contained within Murray City.

Table 1 Classification Characteristics

Roadway Classification	Use		Dimensions		Volume
	Trip Length (Miles)	Design Speed (MPH)	Lane Width (Feet)	Number of Lanes	Average Daily Trips (ADT in Thousands)
Freeway	>5	>65	12	6-8	80
Expressway	>5	55-65	12	5-6	75
Major Arterial	1-2	45-55	12	6	15-50
Minor Arterial	>1	40-45	12	3-5	10-25
Major Collector	1	30-40	12	2-5	3.5-10
Minor Collector	1	25-35	11-12	2-3	1.5-3.5
Local Street	<1	20-30	10-12	2	<1.5

Access Management for Freeways, Expressways and Major Arterials:

The Utah Department of Transportation (UDOT) is responsible the maintenance and design of interstates and state highways within these classifications. Any access proposed will be subject to review and approval by UDOT. Refer to UDOT's Access Management Plan (R930-6) for access management within these roadways.

Access Management for Minor Arterials, Collectors and Local Streets:

Murray City roadways are composed of minor arterials, major/minor collectors and local (neighborhood) streets. As mentioned previously in this document, the higher order classification of roadway, the more limited the access. Guidelines for these streets are developed in concert with Murray City Code, the UDOT Access Management Plan (R930-6), and general traffic engineering principles. In general, the following requirements should be incorporated into development plans and coordinated with Murray City Planners and Engineering. At the determination of the City Engineer, a traffic study may be required to determine impacts and mitigation of new or modified access points on the roadway system.

Typically, a Traffic Impact Study (TIS) is required for any proposed development that generates 100 or more peak hour trips.

Standards and Specifications (continued)

Access Management

Access Requirements

Access Spacing:

Table 2 summarizes the minimum spacing for signals, streets and driveways for each roadway classification and is adapted from UDOT's access management guidelines. These distances were derived for the maximum amount of flow while maintaining access. Uniform signal spacing allows for maximum progression of traffic along a corridor, signal spacing less than the minimums shown may result in poor progression and increased delays due to drivers encountering red signals. Minimum street spacing is measured from edge to edge and not on the centerlines.

Table 2 Access Spacing Requirements

Roadway Classification	Minimum Signal Spacing (Feet)	Minimum Street Spacing (Feet)	Minimum Driveway Spacing (Feet)	Minimum Spacing Crossroad to Drive Access
Minor Arterial	2640	660	300	100
Major Collector	1320	330	150	85
Minor Collector	1320	250	85	50
Local Street	N/A	250	N/A	20

Arterial Connections:

For a drive access on a collector or local street that connects to arterial roadway, the minimum spacing from the arterial roadway to the drive access is 100 feet measured from the point of intersection of the right-of-way lines.

Sight Distance:

Access designs must meet AASHTO sight distance guidelines. Objects that obstruct or limit sight distance such as advertising signs, business signs, street signs, structures, trees and plantings must be designed, placed and maintained to meet minimum sight distance requirements for vehicles.

Signing:

All signs that serve the general public (coordinate markers, stop signs, yield signs, etc.) must conform to the current MUTCD standards.

Railroads:

No access may be located within 250 feet of an at-grade railroad crossing. Access distances may be greater depending on roadway geometry and access category spacing. Refer to UDOT rule R930-5 and R930-6 for additional information.

Standards and Specifications (continued)

Access Management

Driveways

Driveway access in Murray City is controlled by permit through the Public Works Department. Businesses, multi-family residential developments and new construction must complete the [Excavation/Encroachment Permit Application](#) available through Murray City Engineering. Additional Planning and Engineering level approvals may also be required for new developments and Non-Residential driveway access changes.

Residents in existing single-family residential lots may apply for the [Street Improvement Permit](#) through Murray City Engineering to modify an existing or construct a new driveway. Table 3 summarizes Murray City Code regarding the location and widths of driveways for each property utilization.

Table 3 Access Requirements

Lot Use	Driveway Width		Driveway Spacing (feet)
	Min (Feet)	Max (Feet)	
Single Family Residential	12	30	Two driveways (max.) per property – 35 foot spacing for circular drives
Multi-Family Residential	20	30	85 - 300
Non-Residential (Any access not included above)	25	50	85 - 300

A minimum distance of 5 feet from the property line is required for all driveways unless a reciprocal easement is provided. When appropriate, it is desired for shared or combined driveways within a lot or multiple lots to promote circulation and minimize conflict points and impacts to arterial or collector streets.

Local and Collector Street Corners

For Single Family corner lots on a local road, the distance from the crossroad to the driveway must be a minimum of 20 feet measured from the point of intersection of the right-of-way lines. However, it is encouraged to locate driveways to the opposite side of the property away from the corner.

For Single Family corner lots on a collector road, the distance from the crossroad to the driveway must be a minimum of 50 feet measured from the point of intersection of the right-of-way lines.

For Multi-Family and Non-Residential uses with an ADT<100, the distance from the crossroad to the driveway access must be a minimum of 50 feet measured from the point of intersection of the right-of-way lines.

For Multi-Family and Non-Residential uses with an ADT>100, the distance from the crossroad to the driveway access must be a minimum of 85 feet measured from point of intersection of the right-of-way lines.

Standards and Specifications (continued)

Crosswalk Guidelines and Standards

Engineering Study

An Engineering Study is required for new crosswalks. The objective is to determine where marked pedestrian crosswalks are appropriate, where marking or signing is ineffective and when additional treatments should be applied. An engineering study should be completed to determine the need of any marked crosswalk and should, at a minimum include the following information:

- Roadway geometry
- Motorist sight distance
- Traffic and pedestrian volume data
- Site characteristics and observations
- Posted speed limits, design speed, average speed and 85th percentile speed
- Crash history

Crosswalks should be avoided in locations with the following characteristics:

- Inadequate stopping sight distance for motorists
- Inadequate visibility for pedestrians
- Heavy truck traffic
- High vehicle turning movements
- High vehicular speeds
- Inadequate lighting

Crosswalk Installation Criteria

Mid-Block Locations

- Adequate stopping sight distance for design speed of the roadway must be achieved
- 20 or more pedestrian crossings in a one hour time frame or
- 15 or more elderly and/or child pedestrian crossings per hour or
- 60 or more pedestrian crossings in a 4 hour time period or
- A pedestrian destination such as a school, park, retail shops, office building or trail
- Mid-block crosswalks should not be installed within a reasonable distance of an established crossing or signalized intersection (600 feet).
- Mid-block crosswalk spacing should be at least 600 feet. In very urban, heavy pedestrian areas of the City, mid-block crosswalk spacing may be reduced to 300 feet
- Mid-block crosswalks must be signed and striped as per MUTCD requirements
- For higher speed and higher volume roads, a center island refuge and/or pedestrian activated flasher system (RRFB) or (HAWK) should be considered

Signalized Intersections

- Crosswalks should be installed on every approach that has pedestrian indications
- Crosswalks should not be signed at signals
- Crosswalk striping should be parallel with stop bars
- Crosswalk striping should be straight and run from pedestrian ramp to pedestrian ramp

Standards and Specifications (continued)

Crosswalk Guidelines and Standards

Unsignalized Intersections

- 10 or more pedestrian crossings in a one hour time frame
- Crosswalks should only be used at the stop controlled approaches to the intersections
- Crosswalks should not be signed at unsignalized intersections

Crosswalks should be evaluated and installed as per the Manual on Uniform Traffic Control Devices (MUTCD)

School Crosswalks

- School crosswalk locations should be evaluated and installed as per Part 7 of the Utah Manual on Uniform Traffic Control Devices

Standards

- Manual on Uniform Traffic Control Devices (MUTCD)
- Utah Manual on Uniform Traffic Control Devices
- AASHTO A Policy on Geometric Design of Highways and Streets
- AASHTO Guide for the Development of Bicycle Facilities

References

- NCITE. *Guidance for the Installation of Pedestrian Crossing Facilities*, January 2009
- Federal Highway Administration. *Manual on Uniform Traffic Control Devices for Streets and Highways*. Washington D.C., 2009
- Virginia Department of Transportation. *Guidelines for the Installation of Marked Crosswalks*, May 2007
- City of Boulder Colorado. *Pedestrian Crossing Treatment Installation Guidelines*, November 2011



Permits

General

All works within Murray City right-of-way require permit approval. Fees are enumerated on the following pages. An Excavation/Encroachment Permit is required for any work performed within Murray City right of way. This may include potholing, utility trenching, sidewalk and curb removal or repair, roadway work, etc. A Street Improvement Permit may exclude individual residents from the Excavation/Encroachment Permit in cases such as: adding a driveway, sidewalk repair/replacement, driveway repair/replacement, and driveway widening. A Land Disturbance Permit is required for all sites exceeding one acre. Special cases may warrant sites less than an acre to also require a Land Disturbance Permit. The Land Disturbance Permit is intended to preserve the quality of storm water as required by the State of Utah.

Contained within this section are the following Permit Requirements:

Excavation/Encroachment Permit.....	24
Land Disturbance Permit.....	25
Street Improvement.....	26—27
Floodplain/Floodway Permit.....	28

Excavation/Encroachment Permit

An excavation/encroachment permit is required for any work in Murray City's right of way in accordance with Murray City Code 12.16.020 (Ord. 09-06 § 2: Ord. 99-04 § 2: Ord. 95-14 § 3: prior code § 29-35). The Permit and Bond form can be obtained from the Murray City Public Works Department located at 4646 South 500 West, Murray, Utah 84123. The forms can also be obtained on the Murray City website at <http://murray.utah.gov>.

Application Process

1. Fill out an Application for Excavation/Encroachment Permit.
2. Applicant must read and agree to meet all Murray City road cut standards and specifications published by Murray City Engineering department.
3. Include required submittals, to include but not limited to:
 - a. Bond. Murray City Corporation will supply the bond form. The form can be obtained from the Murray City Public Works Department located at 4646 South 500 West, Murray, Utah 84123 or on the Murray City website www.murray.utah.gov (Original Copies Only, No Faxes).
 - b. Insurance. Insurance certificates are obtained from your insurance carrier company (Original Copies Only, No Faxes).
 - c. Traffic Control Plan. The applicant shall also submit a formal traffic control plan which must meet the department's approval as a condition for the issuance of the permit. Traffic control plan must meet MUTCD standards.
4. Once the excavation/encroachment permit application is completed correctly and all required submittals are included, it will be submitted to the appropriate person for review. In some cases a pre-construction meeting may be requested by the City Engineer or Construction Inspector.
5. Permit Fees. The applicant shall pay the Public Works Department the following fee deposit before a permit will be issued; these fees are non-refundable.
 - a. For excavations within asphalt or concrete, \$200.00 minimum.
 - b. For excavations within park strip or unpaved right-of-way, \$100.00 minimum.
 - c. Encroachment, \$100.00 minimum.

Land Disturbance Permit

Per the [Stormwater Guidance Manual](#), a Land Disturbance Permit may be required in accordance with Murray City Code 13.52.030 for the following cases:

1. Land disturbing activity of one acre of land or more.
2. Land disturbing activity of less than one acre of land if such activity is part of a larger common plan of development that affects one acre of land or more.
3. Land disturbing activity of less than one acre of land, if the division determines that such activity poses a unique threat to water or public health and safety.

It is unlawful to commence work prior on a development site without first obtaining a Land Disturbance Permit (Ord. 08-03 § 2). The Permit form following this page can be obtained from the Murray City Public Works Department located at 4646 South 500 West, Murray, Utah 84123. The forms can also be obtained on the Murray City website at <http://murray.utah.gov>.

Application Process

1. Fill out an application for a Land Disturbance Permit.
2. Submit a sediment and erosion control plan (SWPPP) per Murray City Code 13.52.050.
3. Complete SWPPP Completion and Preconstruction Checklist associated with the Permit.
4. Permit Fees. The Permit requires payment of a \$100.00 application fee.
5. Submit performance security or performance bond with application.
6. Obtain approval from Murray City Engineering and Stormwater.

Street Improvement Permit

Sidewalk Replacement Projects

The City allocates funds to repair damaged sidewalks and reduce tripping hazards on public sidewalks throughout the City. Murray City has a database of City sidewalk conditions and the Engineering Division prioritizes replacement projects so that areas with the greatest number of trip hazards and the highest pedestrian use are repaired first. Additionally, when trip hazards are reported to the City, the location is entered into our database, the hazard is inspected and painted yellow to designate caution for pedestrians using the sidewalk. The locations are then prioritized, added to our replacement projects and are repaired when crews and funds are available.

This work will be contracted out on a yearly basis with as many hazards repaired as funds allow. It is anticipated that this project will continue from year to year until all hazards are repaired. This process is no cost to the resident.

Deteriorated Sidewalk, Drive Approach, Curb and Gutter Repair Program for Murray City Residents

Murray City does not generally remove and replace curb and gutter or driveway approaches except when the roadway is repaved or completely rebuild. If a resident wants to individually replace their curb and gutter, driveway approach or sidewalk that is not on the prioritized list or the resident does not want to wait for the project to be done by the City, they need to follow the procedure outlined on the following page for the Street Improvement Permit. If curb, sidewalk, or drive approaches are in anyway deteriorated, damaged or a hazard, Murray City may participate in the removal. The Permit be obtained from the Murray City Public Works Department located at 4646 South 500 West, Murray, Utah 84123. The forms can also be obtained on the Murray City website at <http://murray.utah.gov>.

Street Improvement Permit

Application Process

1. Fill out an application for the Street Improvement Permit.
2. Applicant must read and agree to meet all permit General Requirements as listed below:
 - a. *Untreated Road Base.* Untreated road base must meet AASHTO M 145 classification A-1. Place material per (APWA Section 32 05 10). Road base shall be compacted to 95% of the modified proctor density as determined by ASTM 1557. Do not use gravel as a substitute for untreated road base. Compaction testing may be required and shall be conducted by a certified materials testing lab.
 - b. *Sidewalk.* Residential sidewalk must have 4 inches of compacted road base. Concrete must be 5 inches thickness placed with 6 ½ Bag Class 4000 concrete, (APWA Section 03 30 04). Expansion must be placed every 50 feet.
 - c. *Saw-cut Driveway Approach.* Saw-cut driveway approach must be done by a licensed concrete cutting company
 - d. *Residential Driveway Approach.* A residential driveway approach must have 6 inches of compacted road base. Concrete must be 6 inches thickness placed with 6 ½ Bag Class 4000 concrete, (APWA Section 03 30 04). Minimum of (12') in width with a maximum of (30') in width.
 - e. *30" Curb and Gutter.* Curb and gutter must have 8 inches of compacted road base. Concrete must be placed APWA Plan No. 205 Type A curb and gutter. Concrete must be placed with 6 ½ Bag Class 4000 (APWA Section 03 30 04).
 - f. *Concrete Placement.* Before any concrete is placed the resident or contractor must call for an inspection 24 hours prior to placement. It is the contractor's responsibility to adhere to Murray City Standards and Specifications regarding concrete placement. If Murray City Standards are not followed, the concrete done will be removed and replaced at the expense of the applicant.
 - g. *Asphalt patchwork.* Asphalt patch work will be done by the Murray City Street Department or by an approved asphalt paving company.
 - h. *Clean Up.* Upon completion of the excavation and patchwork the area shall be swept and returned to original condition.
3. **Permit Fees.** The Permit requires payment of a \$25.00 application fee (Ordinance 12.12.040).
4. Meet with Murray Engineering Division on site to review damaged concrete and explain applicable specifications for placement and restoration.
5. The resident will hire a licensed contractor at their expense for placement of new concrete.
6. Resident will be responsible for restoration of landscape.

Floodplain/Floodway Permit

The Floodplain Development Permit is the mechanism by which our community evaluates any and all impacts of activities proposed within our regulated floodplains. All activities must be in compliance with the City's Floodplain Damage Prevention Ordinance and all applicable County and State requirements. The National Flood Insurance Program provides flood insurance to individuals at much lower premiums than could otherwise be purchased through private insurers, and makes certain federal funds available to communities. In order for citizens to be eligible for the Nation Flood Insurance rates, or for communities to receive certain kinds of federal funds, the community must agree to meet minimum floodplain standards. This permit is a tool to ensure that the activities in our community comply with the Floodplain Damage Prevention Ordinance.

Application Process

1. Contact the Murray Floodplain Administrator at 801-270-2440 if the site development meets the following conditions as defined by FEMA in Title 44 of the Code of Federal Regulations Part 59.1 : any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations, or storage of equipment or materials. Other human activities that are considered development include but are not limited to: alterations of a structure through additions, demolition and remodeling, fences, retaining walls, moving/placement of remanufactured or mobile homes, campgrounds, storage of equipment, vehicles or materials (storage yards, salvage yards).
2. Complete Application provided by the Floodplain Administrator. No work may start until a permit has been issued.



Subdivisions

General

Following approval for from the Murray City Planning Commission, the Engineering Division will review plats and plans associated with the subdivision application. Details for completing an application can be found here:

<https://murray.utah.gov/DocumentCenter/View/651/Subdivision-Review-Application>.

Contained within this section are the following:

Subdivision Plat Review Process and Preconstruction Checklist.....	30
Sample Plat.....	31

Subdivision Plat Review Process and Preconstruction Checklist

The Engineering Division will begin final review of plats and related improvement plans when the plats have received final City Planning Commission approval. The Owner/Developer and Engineer need to incorporate all planning level comments and requirements into the plat and improvement plans and submit the plans to the Engineering Division for final review. Engineering plat and plan reviews are done in the order they are received. Typical reviews can take 2 to 4 weeks depending on completeness of the submittal and the responsiveness of the owner/developer and design professionals in addressing review comments. Below is a checklist of items that are typically required prior to recording the final plat and beginning construction.

- ◇ A Subdivision Application with the Planning Division
- ◇ A PDF and 2 full size copies of the subdivision plat and improvement plans issued for review. An AutoCAD file of the plat may also be required to verify lot dimensions and setback requirements. Please email PDF's and AutoCAD files to tstokes@murray.utah.gov.
- ◇ Irrigation company approval letters for all ditch piping and relocations, if required.
- ◇ State Stream Alteration Permit and County Flood Control Permit, if required.
- ◇ UDOT Permit and approval for any development fronting or accessing a State roadway.
- ◇ UDOT approval for any development located within 1000 feet of an existing at grade rail crossing.
- ◇ Final Traffic Impact Study, if required.
- ◇ A Cost Estimate of all public roadway and utility improvements in the subdivision and an Escrow Security Agreement for these improvements.
- ◇ A Declaration for any condominium or townhome development.
- ◇ A final PDF and 2 full size copies of the subdivision plat and improvement plans issued for construction. This set should incorporate all review comments.
- ◇ Will serve letter from water and sewer utility providers. This is required for Salt Lake County Health Department signature on the plat.
- ◇ A mylar copy of the plat. The plat needs be stamped and signed by the Surveyor, the County Health Department, Owner and non-City utility providers prior to obtaining final City signatures.
- ◇ Review fee. Upon payment, the plat can be record at the County Recorder's office.
- ◇ A Land Disturbance Permit for any new development greater than 1 acre in size.
- ◇ A preconstruction meeting with City Engineering Division, Inspection and Utility Staff.
- ◇ A City Excavation Permit for any construction in existing City right-of-ways.

Murray City Engineering Department



MURRAY