

CITY OF MESQUITE, TEXAS

PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION

CITY CONTRACT NO. 2023-007



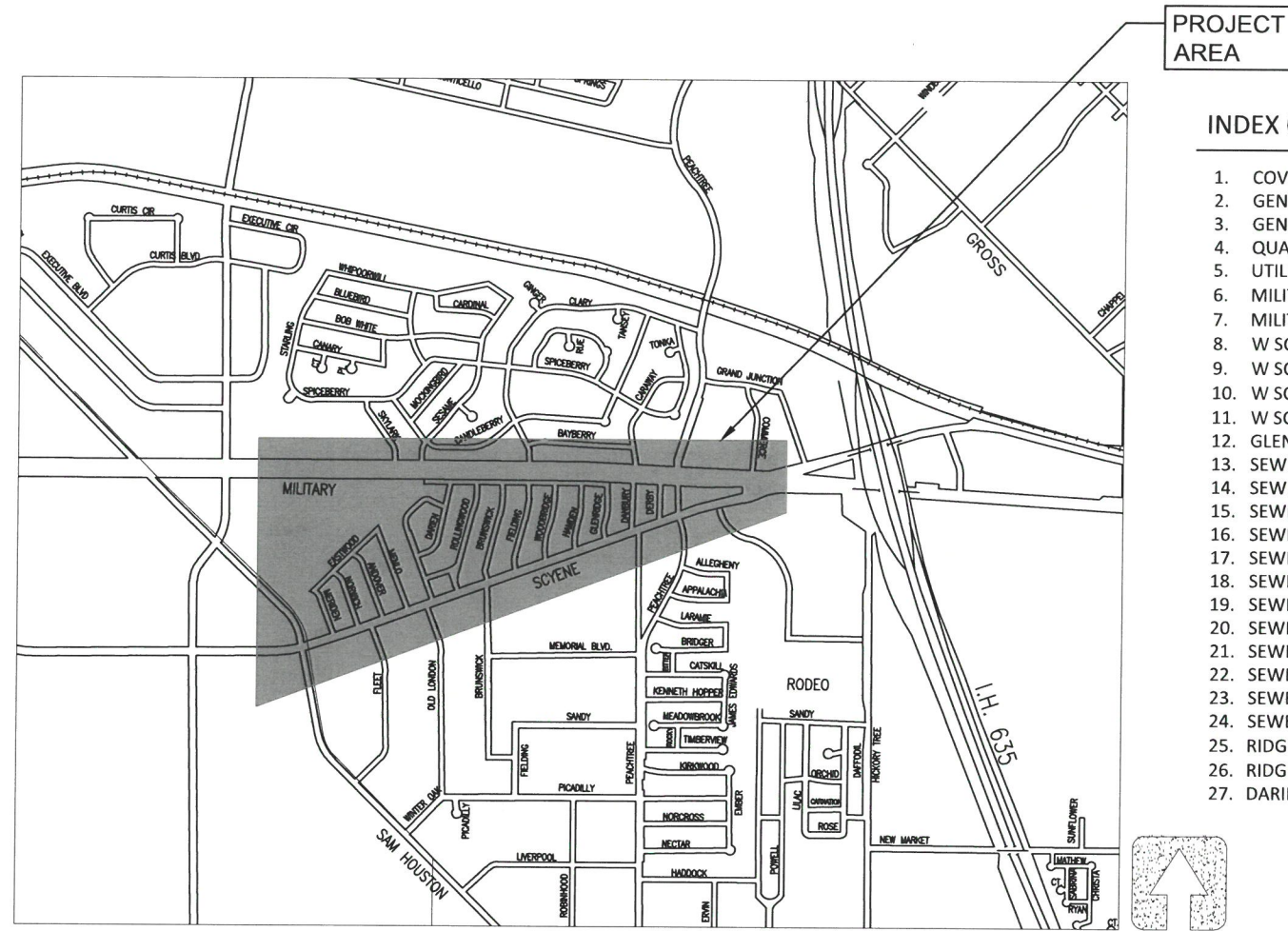
CITY OFFICIALS

DANIEL ALEMAN, JR.
JEFF CASPER
KENNY GREEN
JENNIFER VIDLER
TANDY BOROUGHS
B.W. SMITH
DEBBIE ANDERSON

MAYOR
DISTRICT 1
DISTRICT 2
DISTRICT 3
DISTRICT 4
DISTRICT 5
DISTRICT 6

CLIFF KEHELEY
CURTIS CASSIDY, P.E., CFM

CITY MANAGER
PUBLIC WORKS
DIRECTOR



LOCATION MAP

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CITY OF MESQUITE

Public Works Department - Engineering Division
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Ph: 972-216-6955

OCTOBER 2022



Lisa Ann Crossman
10/12/22

GENERAL NOTES FOR CONSTRUCTION ACTIVITIES:

1. All work shall conform to the City of Mesquite's General Design Standards. In the event an item of work is not covered in the Plans or the City of Mesquite General Design Standards, the most current North Central Texas Council of Governments (NCTCOG) Standard Specifications for Public Works Construction and the most current version of Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges shall apply with concurring notification to the City Engineer and the Project Engineer. The City Engineer shall have final decision on all construction materials, methods, and procedures.
2. All contractors and developers, with their employees and agents, shall comply with all applicable Federal, State and Local safety laws and regulations, including but not limited to the Occupational Safety and Health Act of 1970, and ordinances rules, regulations and orders of any public authority having jurisdiction for the safety of persons or property to protect them from death, injury, damage or loss
3. All communication between the City and the Contractor shall be through the Engineering Construction Inspector and City Engineer only. It is the responsibility of the contractor to contact the appropriate department for inspections of work not falling under the Engineering Construction Permit.
4. Prior to construction, contractor shall have in their possession all necessary permits, plans, licenses, etc. Contractor shall have at least one set of approved Engineering plans and specifications on-site at all times.
5. It is the Contractor's responsibility to notify utility companies to arrange for exact locations at least 48 hours prior to beginning construction. The completeness and accuracy of the utility data shown on the plans is not guaranteed. The contractor is responsible for verifying the depth and location of existing underground utilities prior to excavating, trenching, or drilling and shall be required to take any precautionary measures to protect all lines shown and / or any other underground utilities not on record or not shown on the plans. The contractor will be responsible for damages to utilities if the damage is caused by negligence or failure to have locates performed.
 - i. Texas 811 811
 - ii. City of Mesquite Utilities 972-216-6940
 - iii. City of Mesquite Traffic 972-216-6278
5. Verification of the condition of existing City utilities prior to connections shall be the responsibility of the contractor. The contractor shall request for line locates as directed in item #4.
6. Contractor shall locate and protect all existing landscape irrigation systems. Damage to existing irrigation systems shall be restored to equal or better condition by a licensed irrigator at the contractors expense.
7. Contractor shall be responsible for any damage to existing facilities or adjacent properties during construction. Any removal or damage to existing facilities or adjacent properties shall be replaced or repaired to equal or better condition by the contractor. The Contractor shall coordinate all repairs to private property with the property owner. Contractor shall pay and/or settle with private property owner for all costs related to any damage. For more detail, refer to **NCTCOG 107.24**.
8. Testing and inspection of materials shall be performed by a commercial testing laboratory approved by the City. Contractor shall furnish materials or specimens for testing, and shall furnish suitable evidence that the materials proposed to be incorporated into the work are in accordance with the specifications. All testing and re-testing costs shall be the responsibility of the contractor. For more detail, refer to **NCTCOG 106.5**.
9. Contractor shall notify the City at least 48 hours prior to beginning any construction.
10. All shop drawings, working drawings or other documents which require review by the City shall be submitted by the contractor sufficiently in advance of scheduled construction to allow no less than 10 business days for review and response by the City.
11. Contractor shall be responsible for all required construction surveying and staking and shall notify the City of any discrepancies prior to proceeding with any work. For more detail, refer to **NCTCOG 105.4**.
12. Contractor shall be responsible for protecting all survey markers including iron rods, property corners, or survey monuments within the limits of construction and outside right-of-way during construction. Any survey markers disturbed during construction shall be replaced by the contractor at no cost to the City.
13. Contractor shall not store materials, equipment or other construction items on adjacent properties or right-of-way without the prior written consent of the property owner and the City. The Project shall not be accepted until the contractor provides a letter from the property owner stating they are satisfied with the condition of the property.
14. Unusable excavated material, or construction debris shall be removed and disposed of offsite at an approved disposal facility by the contractor.

15. All signage shall be installed in accordance with the latest edition of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

GENERAL NOTES FOR EROSION CONTROL/STORM WATER POLLUTION PREVENTION:

16. The contractor shall comply with the City of Mesquite's Storm Water Ordinance, the TDPES General Construction Permit TXR150000 and any other State and/or Local regulations.
17. Contractor is responsible for keeping streets and driveways adjacent to the project free of mud and debris at all times. Contractor shall clean up and remove all loose material resulting from construction operations. Stockpiling or staging of materials will not be allowed in right-of-way without prior authorization. The contractor shall take all available precautions to control dust. Any dirt, mud, debris tracked offsite shall be cleaned up by the contractor immediately.
18. All erosion control devices shown on the plans released for construction shall be installed in accordance with the SWP3 sequencing prior to commencing any earth disturbing activities. Failure to install the erosion control devices before starting the earth disturbing activities may result in sanctions including, but not limited to, withholding of release of construction permits, inspections, payment of City funded portions of the project, suspension of construction activities, or citations. Erosion control devices shall be installed and maintained in compliance with the project plans, City Stormwater ordinance and/or SWP3 and Construction General Permit. The contractor shall inspect the site daily and keep the site free of trash and construction debris.
19. Contractor must execute and keep a copy of the Construction Site Notice (CSN) for those activities disturbing more than 1 acres and a Notice of Intent (NOI) for those activities disturbing 5 acres or more.

GENERAL NOTES FOR TRAFFIC CONTROL:

20. Contractor shall provide the Project Engineer with a traffic control plan at least 10 business days before any work on a City street. Traffic control measures shall conform to the latest revision of the Texas Manual on Uniform Traffic Control Devices (TMUTCD)
21. Contact Traffic Engineering Division, 972-216-6917, at least 48 hours prior to work requiring the removal or relocation of traffic signs, traffic control equipment or other traffic control appurtenances. Only City traffic personnel shall remove traffic signs.
22. In the event the construction work requires the closure of an existing street, alley, or fire lane, the contractor shall request the road closure through the City Inspector a minimum of 48 hours in advance of the requested closure. Closures will not be allowed prior to 9:00 a.m. or after 3:30 p.m., Monday through Friday unless otherwise approved by the City. In the event a driveway(s) needs to be closed, the contractor shall request the driveway closure through the City inspector, who will in turn notify dispatch and other pertinent City departments. Closures are prohibited during school zones times in and around schools.
23. If the construction zone affects the movements of pedestrians, adequate pedestrian access and walkways shall be provided in accordance with the Disabilities Act Accessibility Guidelines, PROWAG, TAS and the TMUTCD. Where developments occur within 0.5 miles of a school site, temporary sidewalks must be constructed connecting the development to the school site. The route shall be approved by the City Engineer. Temporary sidewalks may be constructed with materials other than concrete. The material shall be approved by the City Engineer and be an all-weather material of a color and texture distinctly different from the permanent sidewalk.
24. Overnight lane closures shall be approved by City prior closing the lane. Any lane or shoulder closure on an Arterial road that extends into the night shall require the mandatory use of arrow boards.

GENERAL NOTES FOR PAVING

25. Absolutely no earthwork, lime application, or other preparation of the subgrade for paving of streets, alleys, sidewalks, trails, fire lanes or other transportation related flatwork shall be initiated without authorization from the City. The City will authorize the subgrade work in preparation for paving after utility trench backfill testing has been completed and verified to meet the City requirements.
26. All sidewalks shall comply with the Americans with Disabilities Act and the Texas Architectural Barriers Act. The City of Mesquite has NOT reviewed these plans for compliance with the Americans with Disabilities Act, Texas Architectural Barriers Act, or any other accessibility legislation, and does not warranty or approve these plans for any accessibility standards. Prior to project acceptance, the Contractor shall submit to the City documentation that the project was inspected by a Registered Accessibility Specialist, registered with the Texas Department of

- Licensing and Regulation certifying the project is in compliance with the requirements of the Texas Architectural Barriers Act.
27. All concrete paving (streets, alleys, sidewalks, driveways) within City ROW shall have a 28 day minimum compressive strength of 4,000 psi, containing a minimum of 6 sacks of cement per cubic yard, with a slump range of 1" to 3" slump for machine pours and 3" to 5" slump for hand pours unless otherwise noted in the General Design Standards. All materials and requirements for concrete shall conform to the requirements of the current NCTCOG Item "Portland Cement Concrete Pavement" with the exception that fly ash may be substituted for up to 20% of the cement content requirement at 1 to 1.25 cement to fly ash substitution rate.
 28. All concrete must be mechanically vibrated. The forming of new street and alley pavement is by using the Slip Form method. Concrete shall be hand placed at intersections and miscellaneous areas.
 29. Temperature during concrete placement:
 - a. The temperature of concrete as placed shall not exceed 95°F.
 - b. No concrete shall be placed on a frozen subgrade
 - c. If the ambient air temperature is less than 40°F and dropping concrete shall not be placed.
 - d. If concrete is placed and there is an anticipated low temperature of less than 40°F within 5 days after placement the concrete must be covered and kept at a temperature of no less than 50°F.
 - e. In all cases, concrete should not be kept at a temperature of less than 50°F for a period of 5 days' minimum.
 27. Reinforcing shall conform to ASTM A 615 and be a minimum grade of 60 per ASTM A 370. Reinforcing steel bar laps are to be 30 bar diameters or 15" per ACI 318, whichever is greater. A minimum of 50% of rebar intersections are to be secured with tie wire and supported with chairs. All reinforcement shall be free from rust, scale, oil, paint and other substances which prevent bonding to the concrete. Unless otherwise specified, steel shall be placed at 1/2 the pavement depth.
 28. White curing compound is to be applied, per manufacturer's recommendations, to all exposed concrete surfaces (including backs of curbs) immediately after completion of finishing operations, per ASTM C-309, Type 2, NCTCOG Section 303.2.13.1.1.
 29. No vehicle traffic shall be permitted on newly paved areas for seven days after concrete pour or until 3,000 psi is achieved.
 30. All fill and lime subgrades shall be placed in maximum 8" compacted lifts and be compacted to 95% standard proctor at a moisture range of 0% to 6% of optimum moisture. Moisture level must be maintained, by wetting or application of asphalt emulsion prime coat (0.25 to 0.50 gal/sy) if necessary, until placing of concrete paving.

GENERAL NOTES FOR TRENCHING AND CONFINED SPACE

31. All excavation and trench operations shall be conducted in accordance with 29 Code of Federal regulations (CFR), Part 1926, Subpart P and all other applicable State and City regulations. Prior to commencing any excavation or trenching operation, the Contractor shall submit to the City Engineer a plan sealed by a Texas Licensed Professional Engineer indicating the intended procedures to be used by the Contractor to comply with OSHA requirements. Such plan shall further identify the "Competent Person" as required by paragraph 1926.651(k)(1) that will work with each crew. An affidavit from the Contractor indicating the competent person must be submitted with the trench safety plan to the City Engineer. A copy of the trench safety plan must be on the job at all times. The City reserves the right to deny payment for any construction activities in excavations or trenches that are not in accordance with the submitted plan. The City does not approve or disapprove Trench Safety Plans, but will retain a file copy.
32. Implementation of trench safety shall comply with submitted trench safety design plan. Submit designated competent person who will be on-site full time and is capable of identifying existing and predictable hazards in surrounding or work conditions which are unsanitary, hazardous, or dangerous to employees and who has the authorization to take prompt corrective measures to eliminate them. Install, operate, maintain, adjust, and remove trench safety equipment, and precautions in accordance with trench safety design.
33. All entry into confined spaces conducted in accordance with 29 Code of Federal regulations (CFR), Part 1910.147 P and all other applicable State and City regulations. Prior to commencing any confined space entry, the Contractor shall submit to the City Engineer a copy of the confined space entry plan with a completed permit.

GENERAL NOTES FOR UTILITIES

34. All water and wastewater mains that are proposed to be abandoned within street ROW and less than 10 feet in depth, under any major intersections, or in areas that could impact major infrastructure, shall be abandoned by draining the existing main and cutting and filling the existing main with grout.

MATERIAL	DESIGNATION	TEST	FREQUENCY	REQUIRED TESTING	
				REQUIREMENTS	NOTES
SUBGRADE	ASTM D-6938	IN-PLACE DENSITY AND WATER CONTENT	EVERY 300 LINEAR FEET ¹	MOISTURE CONTENT: 0%-6% OF OPTIMUM; DENSITY: 95% OF STANDARD PROCTOR	EVERY 8" LIFT
		LIME STABILIZED SUBGRADE - DEPTH CHECK		DEPTH OF STABILIZATION AS SPECIFIED PER PLANS	
		LIME STABILIZED SUBGRADE - SIEVE ANALYSIS		1.75" SIEVE: 100% PASSING; NO. 4 SIEVE: 60%	
	ASTM D-698	PROCTOR	EVERY NEW MATERIAL SOURCE	1"-3" MACHINE POURS; 3"-5" HAND POURS	
CONCRETE PAVING	ASTM C-143	SLUMP OF PORTLAND CEMENT CONCRETE	FIRST TRUCK EACH DAY + 1	MINIMUM 3%	
	ASTM C-231	CONCRETE AIR CONTENT BY PRESSURE METHOD (FOR FRESH CONCRETE)	EVERY 150CY	95 F MAX (HOT WEATHER) AND 50 F MIN (COLD WEATHER)	
	ASTM C-1064	TEMPERATURE OF FRESHLY MIXED PORTLAND CEMENT CONCRETE	EVERY TRUCK	3 CYLINDERS TAKEN FROM FIRST TRUCK EVERY DAY + 3	1 BROKEN AT 7 DAYS AND THE OTHER 2 BROKEN AT 28 DAYS; IF NEEDING TO GET TRAFFIC ON PAVEMENT FASTER THEN ADDITIONAL CYLINDER BROKEN AT 3 DAYS
	ASTM C-39	COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS	EVERY 150CY	4,000 PSI MINIMUM FOR TRAFFIC; 4,000 PSI MINIMUM AT 28 DAYS	4" DIAMETER TAKEN 28 DAYS AFTER POUR
	ASTM C-42	OBTAINING AND TESTING DRILLED CORES OF CONCRETE	EVERY 300 LINEAR FEET ¹	DEPTH OF PAVEMENT AS SPECIFIED PER PLANS	
	ASTM C-174	MEASURING LENGTH OF DRILLED CONCRETE CORES			

¹PER LANE, TRENCH, ALLEY OR SIDEWALK

GENERAL DESIGN STANDARDS	
STANDARD DETAILS	
SCALE: N.T.S.	SHEET:
REVISION DATE: 11/11/2019	G - GN

DETAIL NO.	DETAIL NAME	EFFECTIVE DATE
GENERAL		
G-GN	GENERAL NOTES	07/24/2019
G-1	TABLE OF CONTENTS	05/20/2019
G-2	TYPICAL PAVEMENT CUT OVER TRENCH	05/20/2019
G-3	UTILITY BORE	05/20/2019
G-4	CONCRETE ENCASUREMENT	05/20/2019
G-5A/C	AERIAL CROSSING	05/20/2019
PAVING		
P-1	EXPANSION JOINTS	05/20/2019
P-2	CONSTRUCTION JOINTS	05/20/2019
P-3	SAWED CONTRACTION & ISOLATION JOINTS	05/20/2019
P-4	STREET JOINTING	05/20/2019
P-5	TYPICAL HEADERS	05/20/2019
P-6	THICKENED CONCRETE EDGE	05/20/2019
P-7	TYPICAL CURB & GUTTER	07/24/2019
P-8	PEDESTRIAN FACILITIES	05/20/2019
P-9	MONOLITHIC NOSE	05/20/2019
P-10	MEDIAN	05/20/2019
P-11	STAMPED CONCRETE MEDIAN PAVEMENT	05/20/2019
P-12A/12B	PERMANENT BARRICADE	05/20/2019
P-13A/13B	LEFT TURN LANE	05/20/2019
P-14	CONCRETE PAVING DETAIL - TYPICAL SECTION	05/20/2019
P-15	CONCRETE SIDEWALK WITH RETAINING WALL	05/20/2019
P-16	CURB RAMP - TYPE A	05/20/2019
P-17	CURB RAMP - TYPE B	05/20/2019
P-18	CURB RAMP - TYPE C	05/20/2019
P-19	CURB RAMP - TYPE D	05/20/2019
P-20	FIRE LANE PAVING	05/20/2019
P-21	FIRE LANE STRIPING	05/20/2019
P-22	ALLEY PAVING	05/20/2019
P-23	ALLEY/STREET INTERSECTION - OFFSET SIDEWALK	05/20/2019
P-24	ALLEY/STREET INTERSECTION - ADJACENT SIDEWALK	05/20/2019
P-25	ALLEY UTILITY LOCATION	05/20/2019
P-26	DRIVEWAY - GENERAL	07/24/2019
P-27	DRIVEWAY - FLARED	05/20/2019
P-28	DRIVEWAY - RADIAL	05/20/2019
P-29	DRIVEWAY - RESIDENTIAL ALLEY	05/20/2019
WATER		
W-GN	GENERAL NOTES - WATER	07/24/2019
W-1	TYPICAL WATER MAIN PIPE EMBEDMENT (NOT UNDER PAVEMENT)	05/20/2019
W-2	TYPICAL WATER MAIN PIPE EMBEDMENT (UNDER PAVING)	05/20/2019
W-3	WATER FLANGED FITTINGS	05/20/2019
W-4	WATER VALVE	05/20/2019
W-5	ABANDONMENT OF VALVE STACK	05/20/2019
W-6	AIR RELEASE VALVE	05/20/2019

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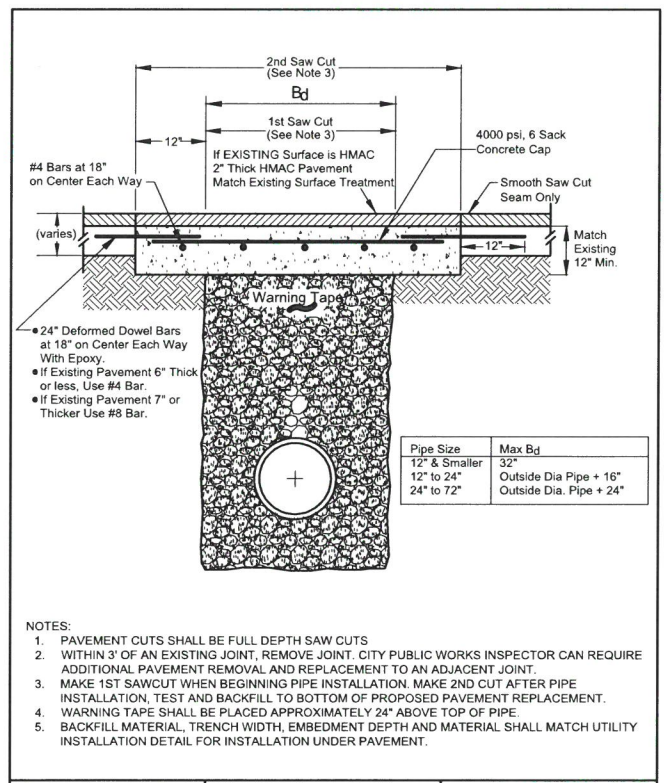
W-7	WATER SERVICE	05/20/2019
W-8	TYPICAL UTILITY LOCATIONS	05/20/2019
W-9	FIRE HYDRANT	05/20/2019
W-10	FIRE HYDRANT (STRAIGHT)	05/20/2019
W-11	FIRE HYDRANT (90 BEND)	05/20/2019
W-12	WATER FLANGED FITTINGS	05/20/2019
W-13	FIRE SPRINKLER YARD PIPING	05/20/2019
W-14	REMOTE FDC AND FIRE LINE	05/20/2019
W-15	3" THRU 10" DOMESTIC TURBINE WATER METER ASSEMBLY	05/20/2019
W-16	FIRE HYDRANT BOLLARD	05/20/2019
WASTEWATER		
WW-GN	GENERAL NOTES - WASTEWATER	05/20/2019
WW-1	WASTEWATER EMBEDMENT (NOT UNDER PAVING)	05/20/2019
WW-2	WASTEWATER EMBEDMENT (UNDER PAVING)	05/20/2019
WW-3	WASTEWATER LATERAL	05/20/2019
WW-4	WASTEWATER MAINLINE CLEANOUT	05/20/2019
WW-5	WASTEWATER MANHOLE RING AND COVER	05/20/2019
WW-6	WASTEWATER MANHOLE RING AND COVER (RETROFIT ONLY)	05/20/2019
WW-7	DOUBLE CLEANOUT	05/20/2019
WW-8	SINGLE CLEANOUT	05/20/2019
WW-9	PRECAST MANHOLE	05/20/2019
WW-10	CAST-IN-PLACE MANHOLE	05/20/2019
WW-11	PRECAST DROP MANHOLE	05/20/2019
WW-12	CAST-IN-PLACE DROP MANHOLE	05/20/2019
WW-13	ABANDONED MANHOLE	05/20/2019
WW-14	MANHOLE INVERT AND CONNECTION	05/20/2019
WW-15	MANHOLE BLOCKOUT	05/20/2019
WW-16	MANHOLE VENT	05/20/2019
WW-17	PRECAST FLAT MANHOLE LID	05/20/2019
WW-18	CAST-IN-PLACE FLUSH MANHOLE LID	05/20/2019
WW-19	CAST-IN-PLACE MANHOLE LID	05/20/2019
TRAFFIC		
T-1A/1D	PAVEMENT MARKING	05/20/2019
T-5	JIGGLY BARS & TRAFFIC ARROWS	05/20/2019
T-6	STREET LIGHTING CONDUIT	05/20/2019
T-7	CROSSWALK PAVEMENT MARKING	05/20/2019
T-8	STREET NAME SIGN LAYOUT	05/20/2019
SOLID WASTE		
SW-1A/1B	DUMPSTER ENCLOSURE	05/20/2019
DRAINAGE		
D-1A/1B	5' AND 10' SINGLE RECESSED CURB INLET	05/20/2019
D-2A/2B	15' AND 20' DOUBLE STANDARD CURB INLET	05/20/2019
D-3A/3B	5' AND 10' SINGLE STANDARD CURB INLET	05/20/2019
D-4	CURB INLET DETAILS AND NOTES	05/20/2019
D-5	CURB INLET REINFORCING	05/20/2019
D-6A/6B	STORM DRAIN MANHOLE 4', 5', OR 6' SQUARE	05/20/2019

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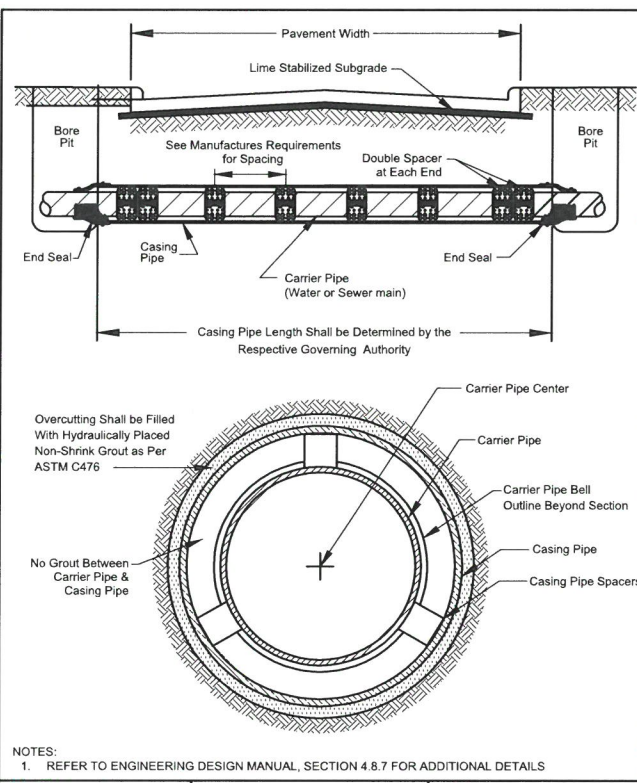
D-7A/7B	CONCRETE CHANNEL DETAILS	05/20/2019
FRANCHISE UTILITY		
F-1	FRANCHISE UTILITY PAVEMENT CUT REPLACEMENT	05/20/2019
F-2	TYPICAL FRANCHISE UTILITY LOCATION IN STREET ROW	05/20/2019
F-3	TYPICAL FRANCHISE UTILITY LOCATION IN ALLEY ROW	05/20/2019
F-4	RESERVED FOR FUTURE USE	
F-5A/4B	FRANCHISE UTILITY GENERAL NOTES	05/20/2019

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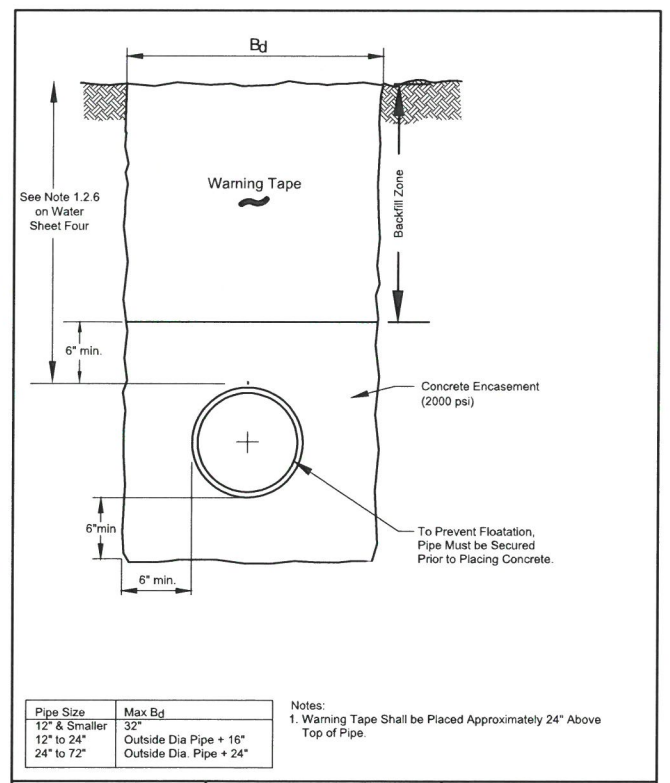
Public Works	TABLE OF CONTENTS	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/20/2019	SHEET: G-1D
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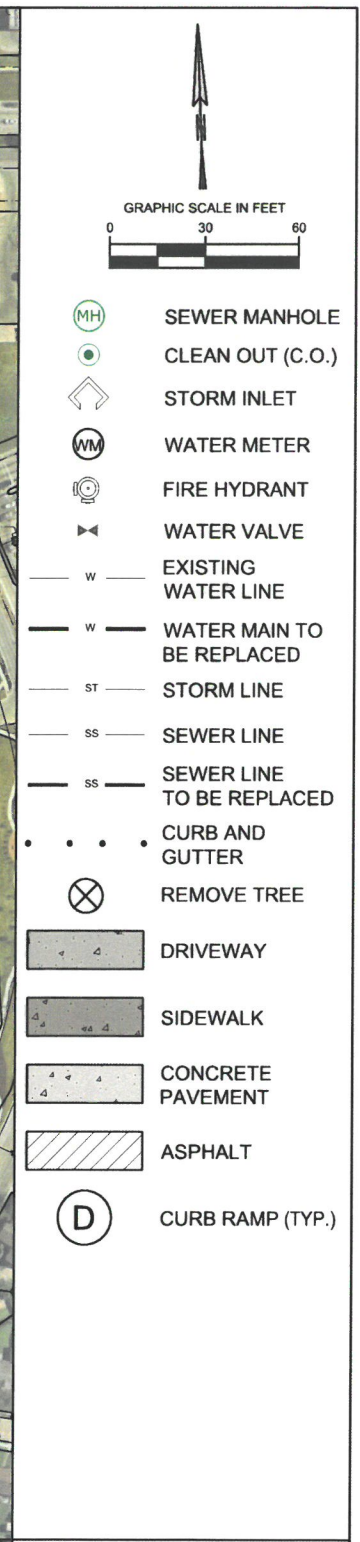
Public Works	TYPICAL PAVEMENT REPAIR OVER TRENCH	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/20/2019	SHEET: G-2
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Public Works	UTILITY BORE	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/20/2019	SHEET: G-3
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Public Works	CONCRETE ENCASUREMENT	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/20/2019	SHEET: G-4
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Public Works

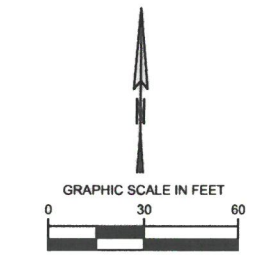
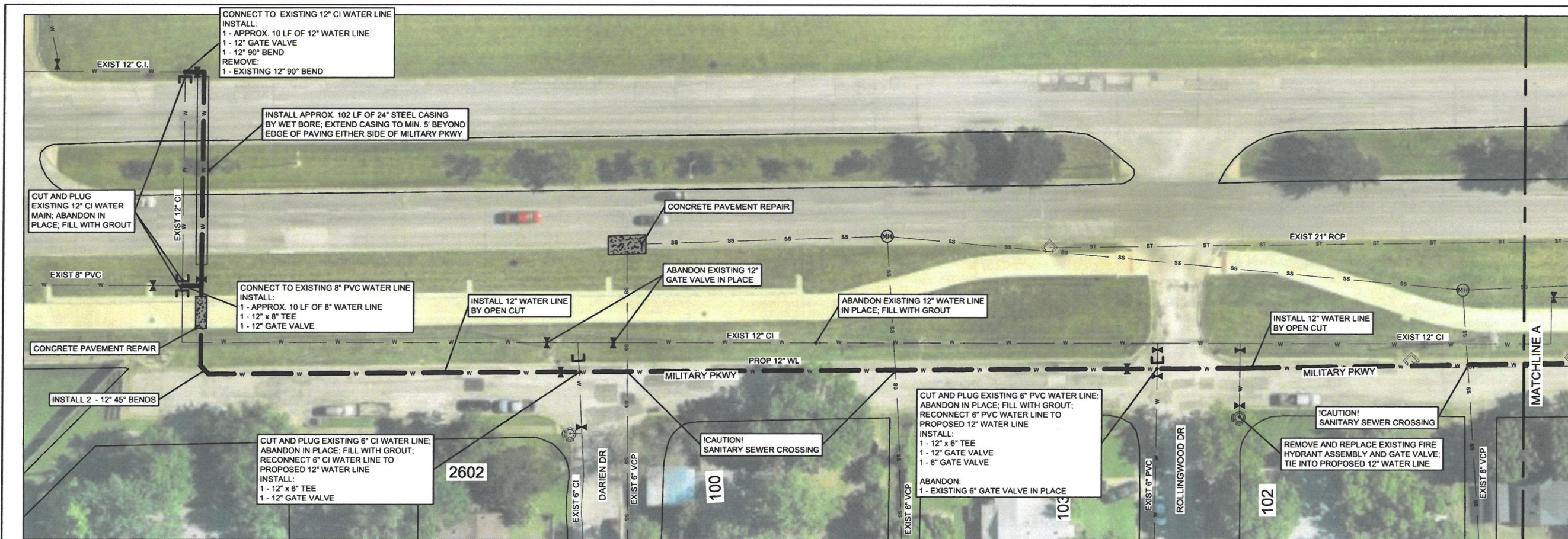
EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION, TO TAKE THE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**PAVING AND UTILITY IMPROVEMENTS
FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

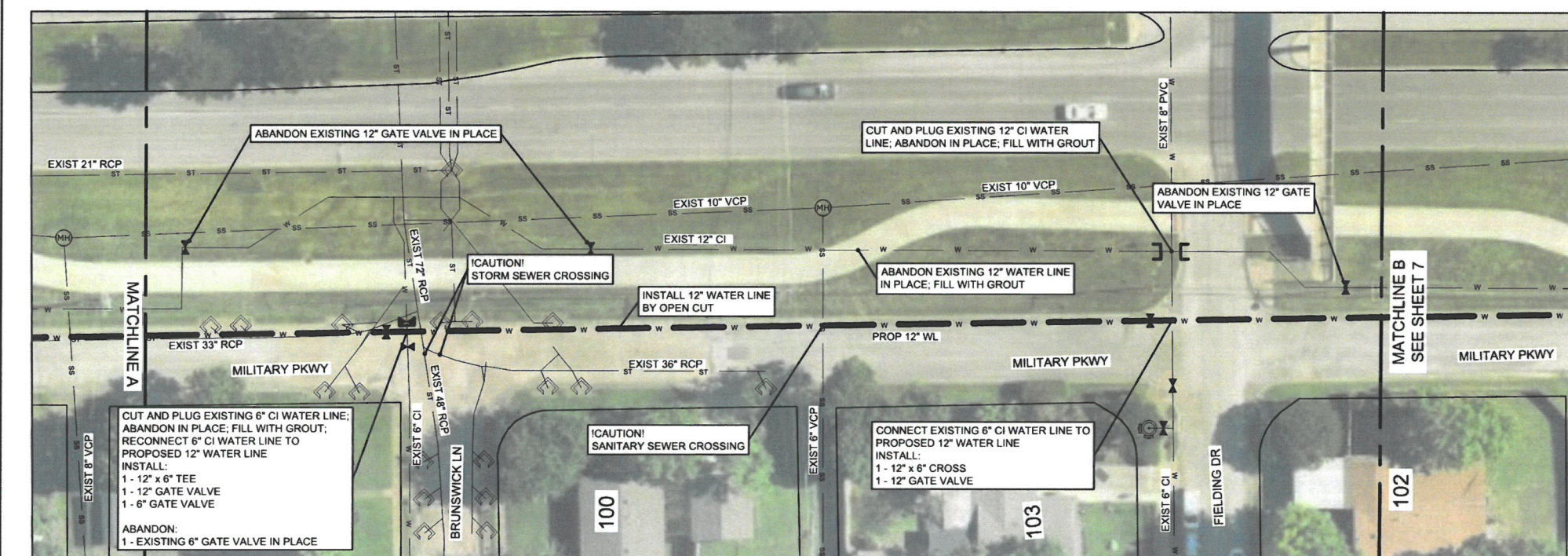
UTILITY LINE INDEX

REVISIONS	
SCALE: 1" = 250'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 5 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)



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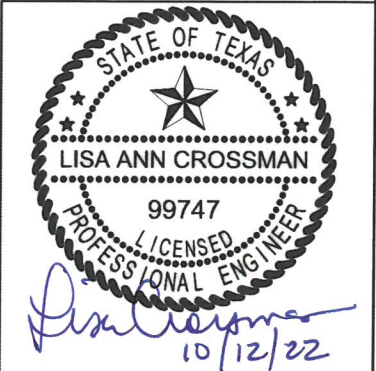
Public Works

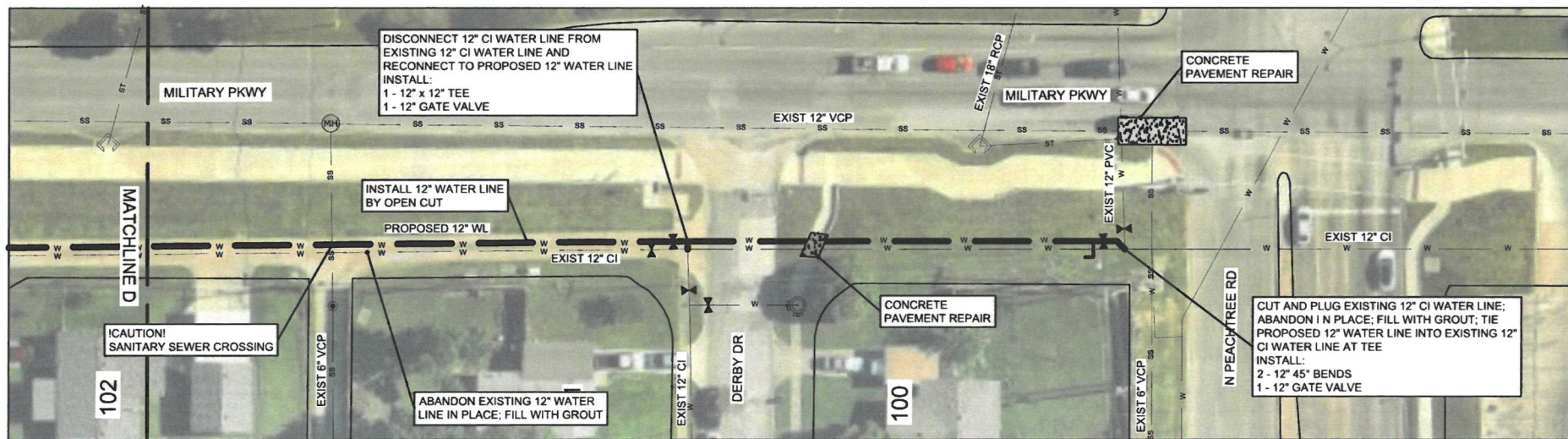
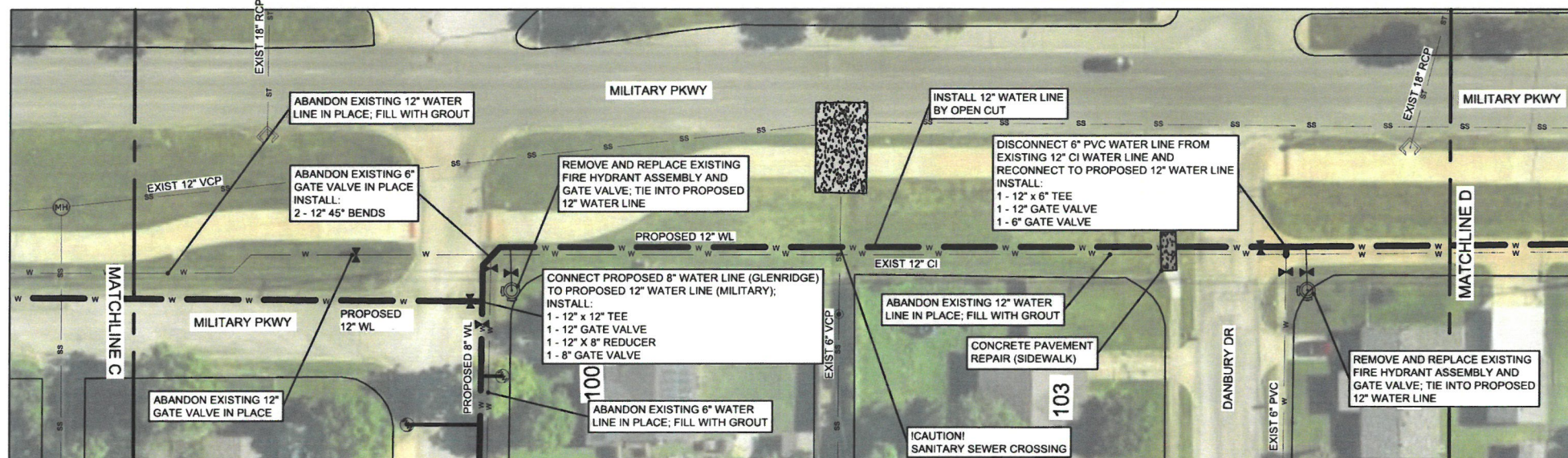
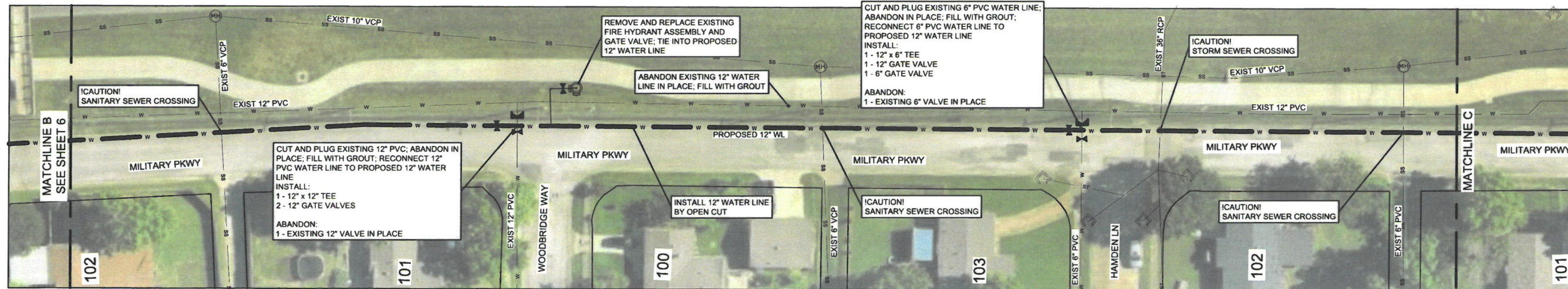
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**PAVING AND UTILITY IMPROVEMENTS
FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

**WATER IMPROVEMENTS FOR
MILITARY PKWY - 1**

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 6 OF 43





- GRAPHIC SCALE IN FEET
0 30 60
- (MH) SEWER MANHOLE
 - (C.O.) CLEAN OUT (C.O.)
 - (S) STORM INLET
 - (WM) WATER METER
 - (FH) FIRE HYDRANT
 - (V) WATER VALVE
 - W — EXISTING WATER LINE
 - W — WATER MAIN TO BE REPLACED
 - ST — STORM LINE
 - SS — SEWER LINE
 - SS — SEWER LINE TO BE REPLACED
 - CURB AND GUTTER
 - (X) REMOVE TREE
 - (D) DRIVEWAY
 - (S) SIDEWALK
 - (C) CONCRETE PAVEMENT
 - (A) ASPHALT
 - (D) CURB RAMP (TYP.)

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Public Works

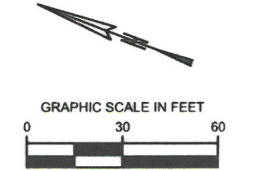
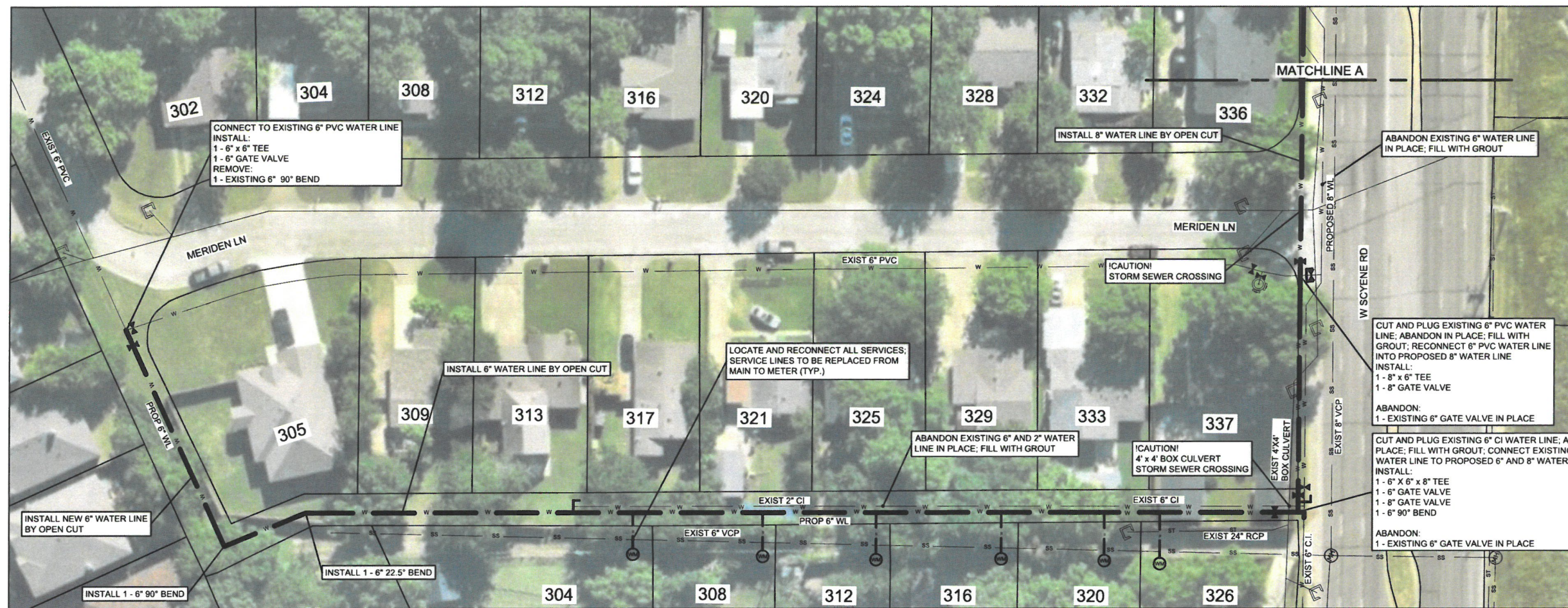
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

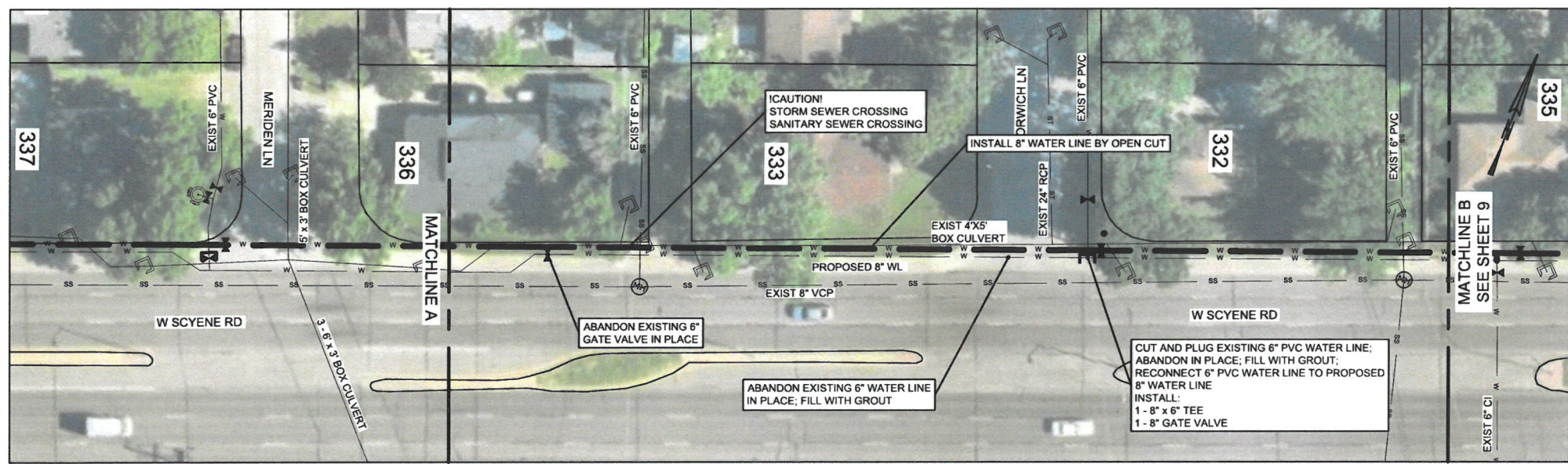
WATER IMPROVEMENTS FOR MILITARY PKWY - 2

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 7 OF 43





- (MH) SEWER MANHOLE
- (C.O.) CLEAN OUT (C.O.)
- (SI) STORM INLET
- (WM) WATER METER
- (FH) FIRE HYDRANT
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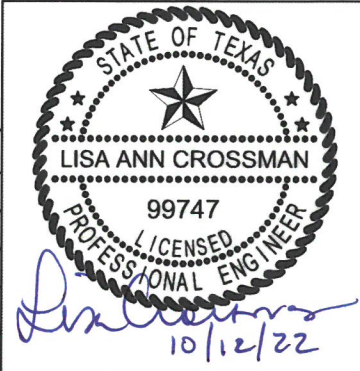
Public Works

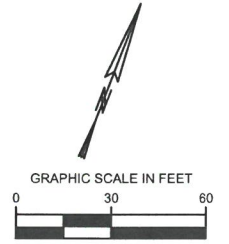
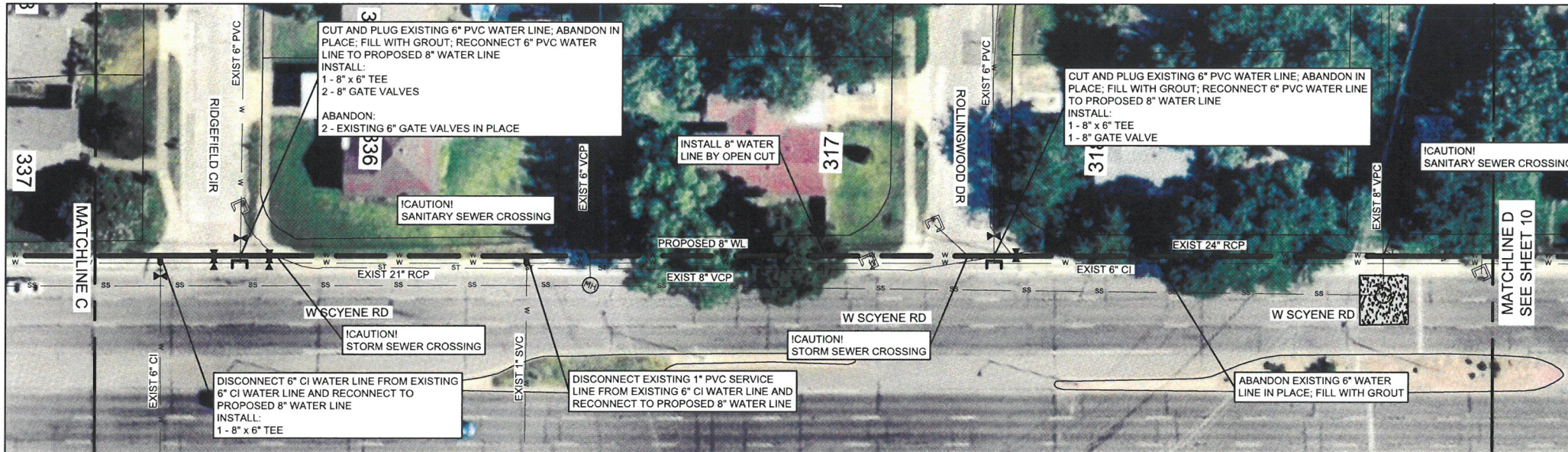
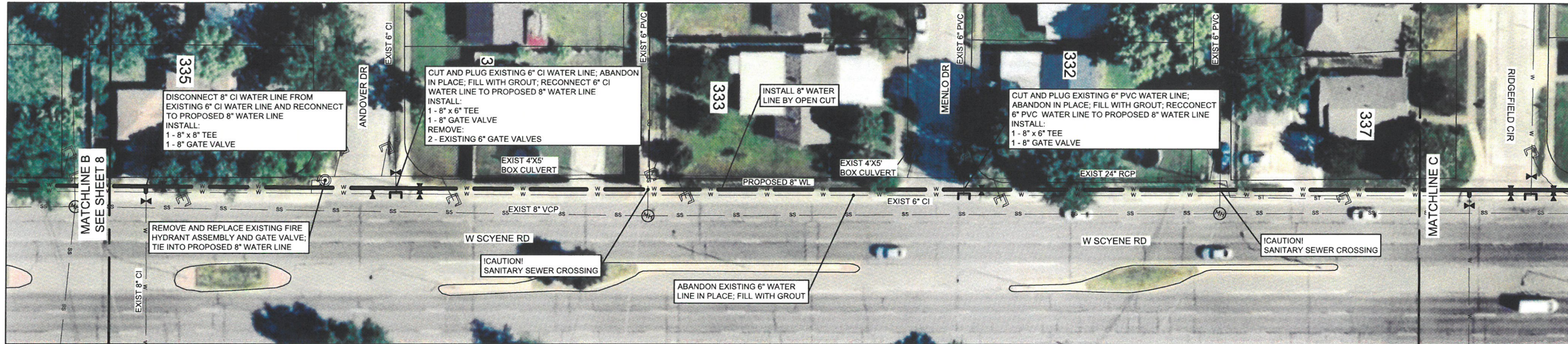
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION CITY CONTRACT # 2023-007

WATER IMPROVEMENTS FOR W SCYENE RD - 1

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 8 OF 43

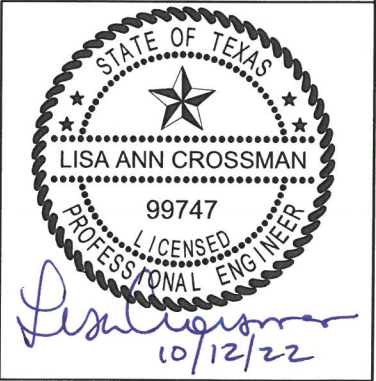




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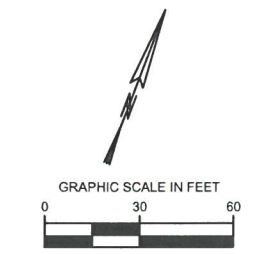
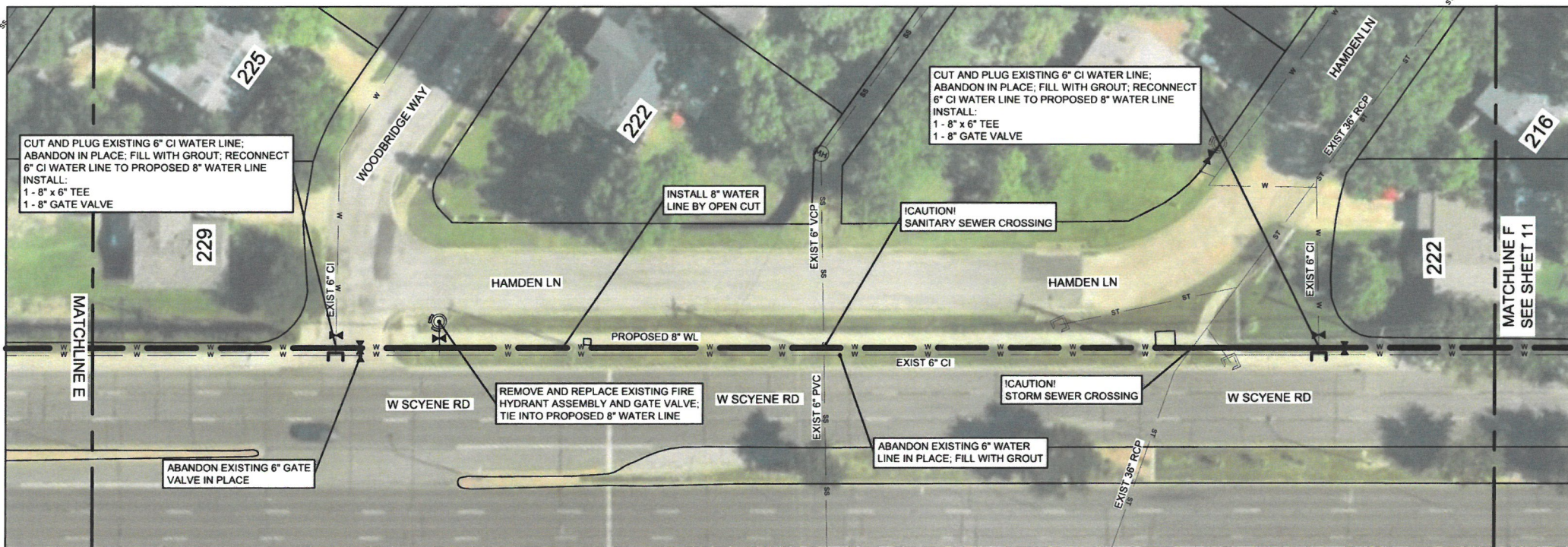
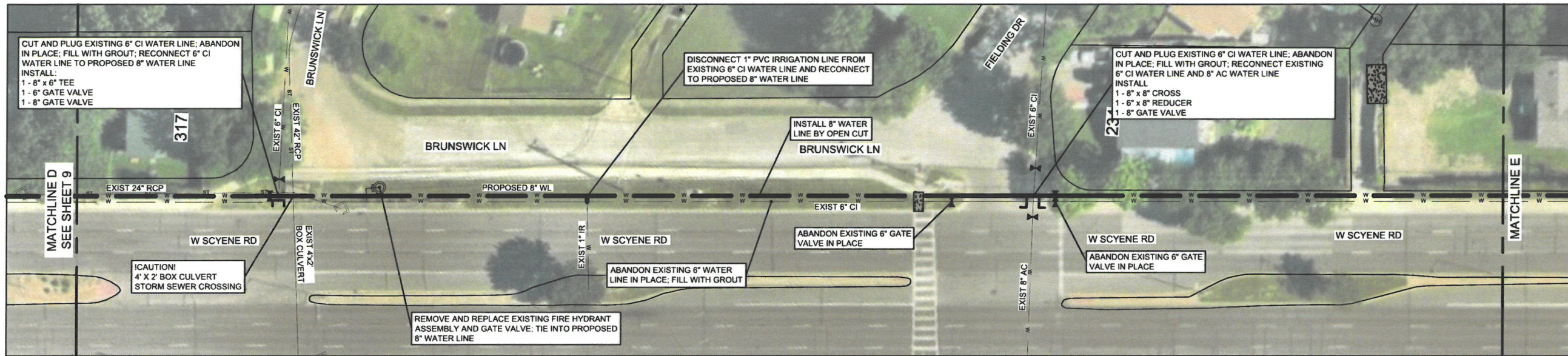
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

WATER IMPROVEMENTS FOR W SCYENE RD - 2

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 9 OF 43



- SEWER MANHOLE
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- STORM INLET
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Public Works

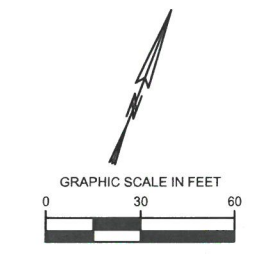
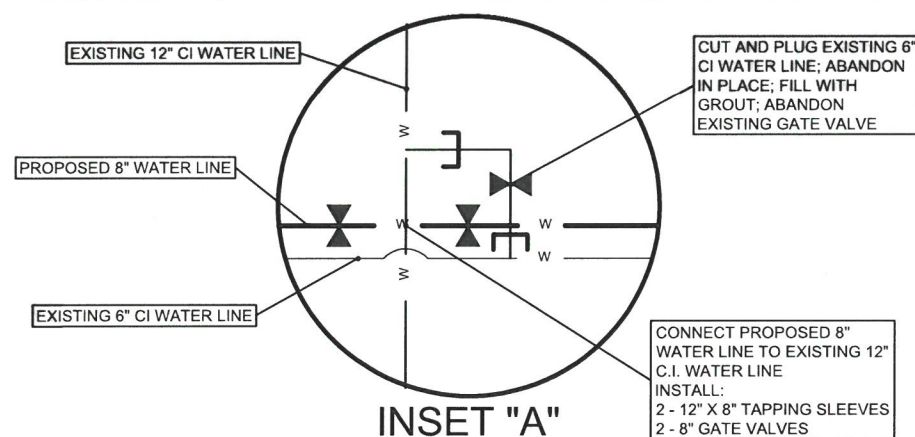
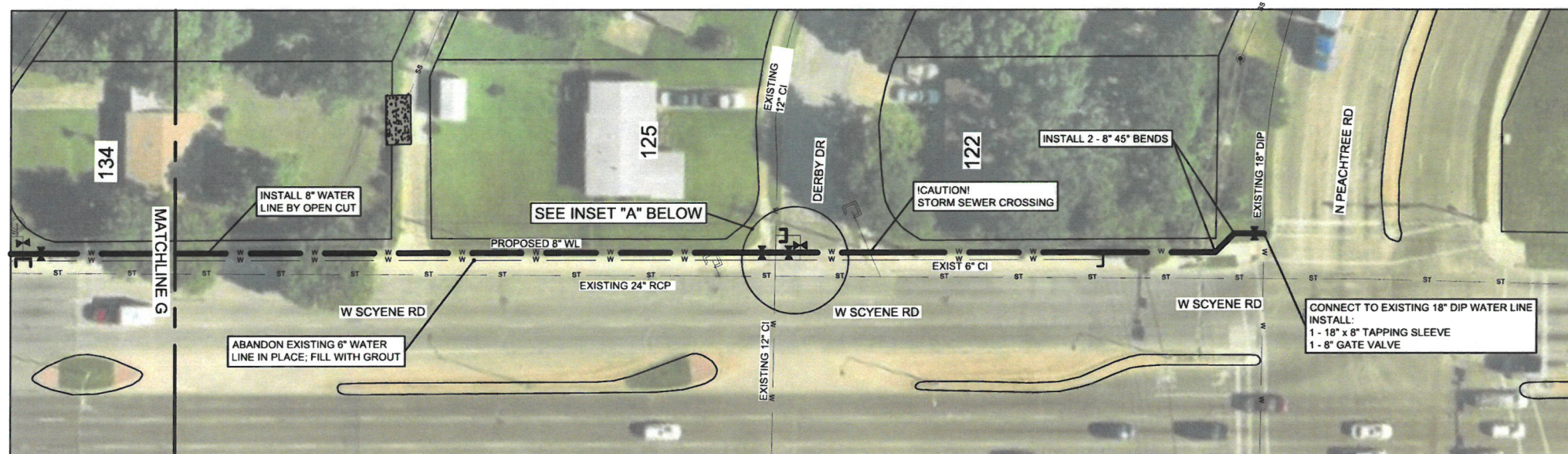
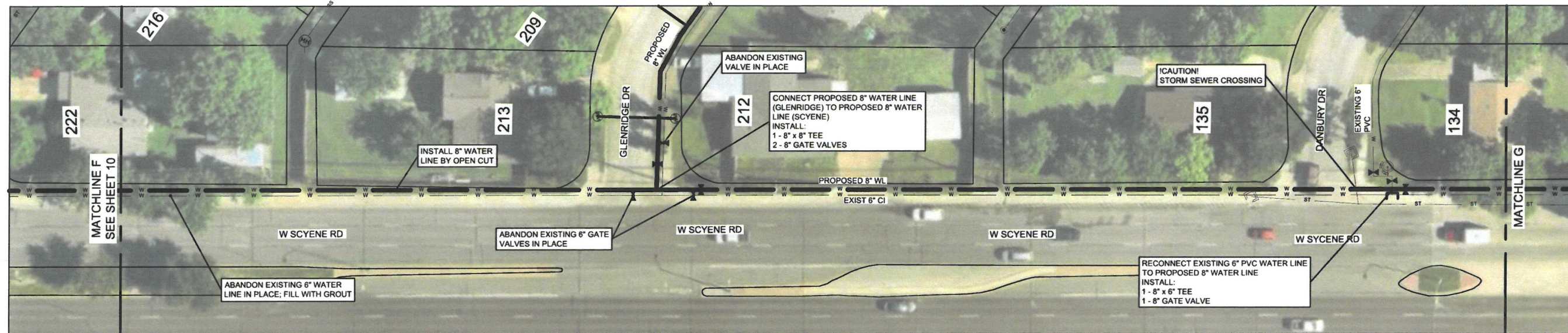
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION CITY CONTRACT # 2023-007

WATER IMPROVEMENTS FOR W SCYENE RD - 3

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 10 OF 43





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- (C.O.) CLEAN OUT (C.O.)
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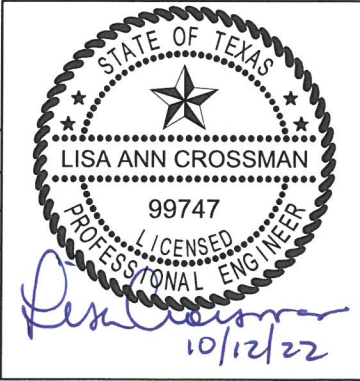
Public Works

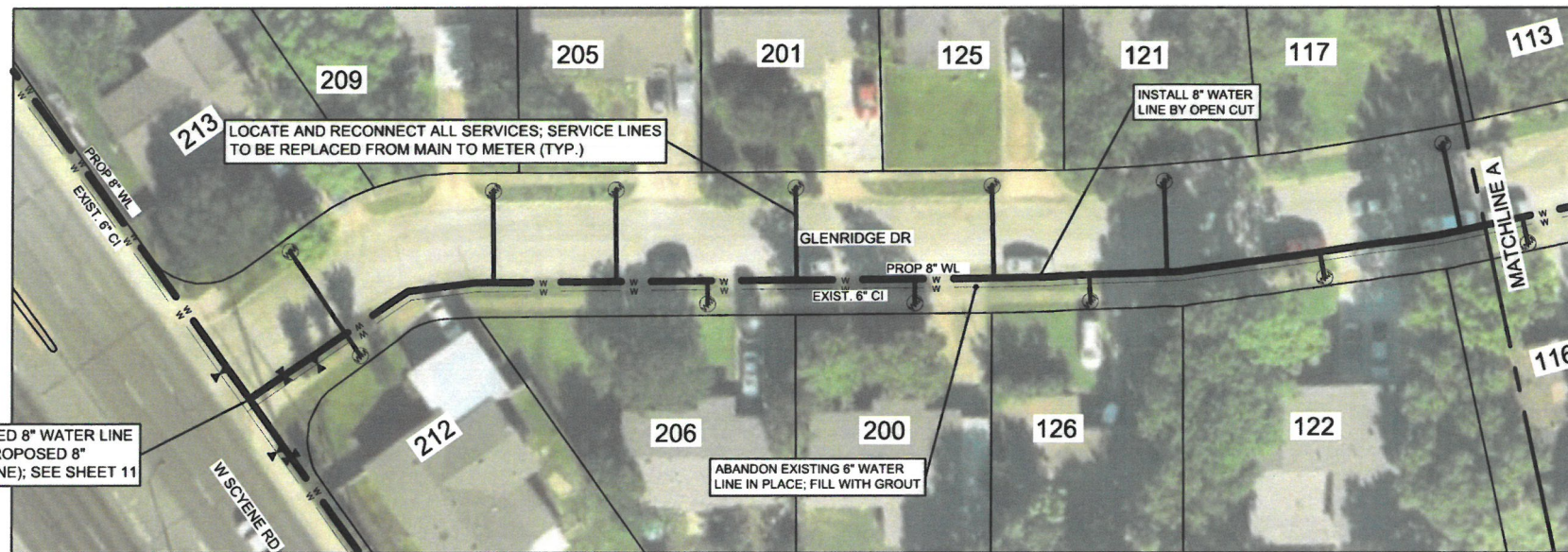
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

WATER IMPROVEMENTS FOR W SCYENE RD - 4

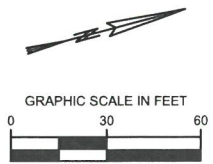
REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 11 OF 43



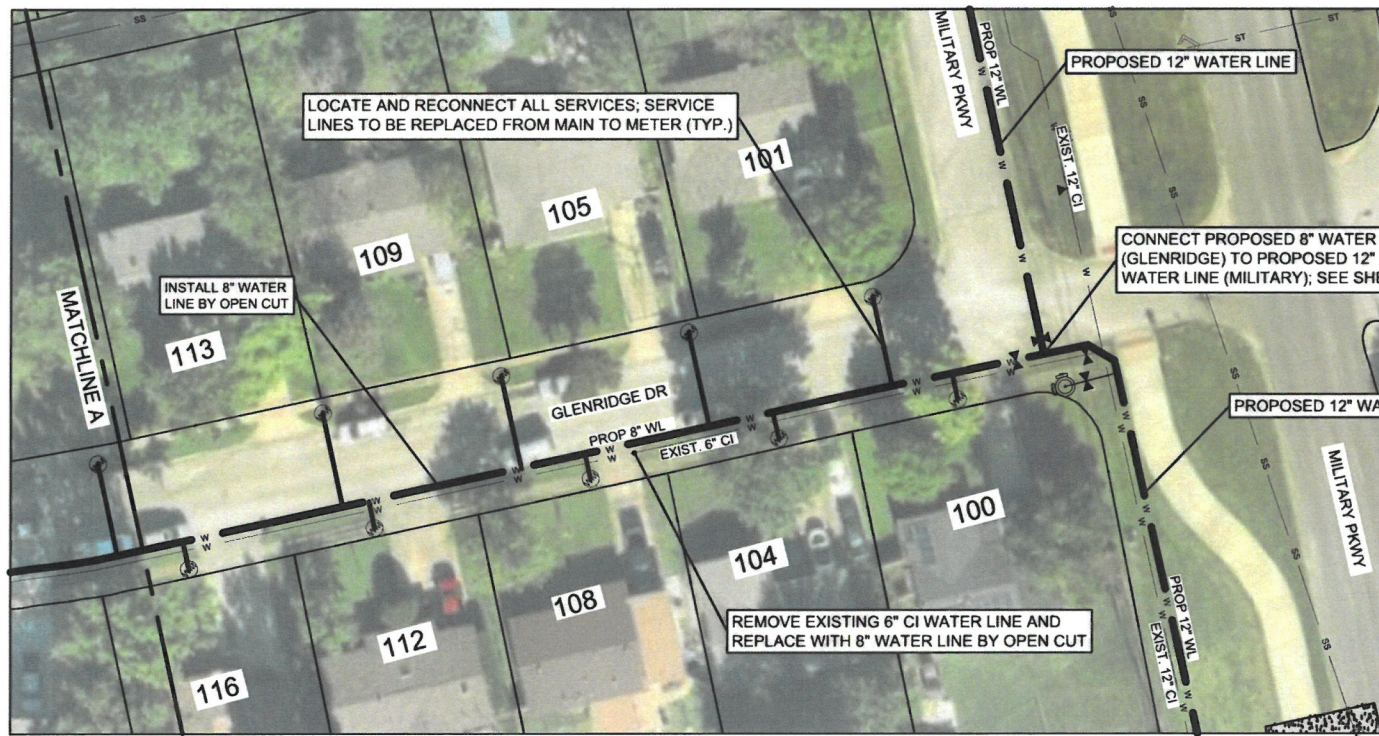


CONNECT PROPOSED 8" WATER LINE (GLENRIDGE) TO PROPOSED 8" WATER LINE (SCYENE); SEE SHEET 11

ABANDON EXISTING 6" WATER LINE IN PLACE; FILL WITH GROUT



- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE TO BE REPLACED
- SEWER LINE
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)



CONNECT PROPOSED 8" WATER LINE (GLENRIDGE) TO PROPOSED 12" WATER LINE (MILITARY); SEE SHEET 7

REMOVE EXISTING 6" CI WATER LINE AND REPLACE WITH 8" WATER LINE BY OPEN CUT

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4. NO OPEN TRENCHES SHALL BE LEFT WHILE WORKERS NOT PRESENT.
5. CONTRACTOR SHALL COORDINATE WATERLINE SHUTDOWN WITH PUBLIC WORKS CONSTRUCTION INSPECTOR. ALL EXISTING VALVES ARE TO BE OPERATED BY CITY OF MESQUITE PERSONNEL ONLY.
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7. ACCEPTABLE WATER LINE MATERIALS:
 - 7.1. WATERLINE INSTALLED BY PIPE BURSTING (DIPS):
 - FUSIBLE PVC OR CERTA-LOK, AWWA C900, CLASS 305, DR 14
 - HDPE, CLASS 333, DR 7, ASTM F714, PE 4710
 - 7.2. WATER LINE INSTALLED BY OPEN CUT (DIPS):
 - FUSIBLE PVC OR CERTA-LOK, AWWA C900, CLASS 305, DR 14
 - PVC, AWWA C900, CLASS 305, DR 14.
8. ACCEPTABLE SEWER LINE MATERIALS
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 - HDPE, ASTM F714, DR13.5
 - 8.2. SEWER LINE INSTALLED BY OPEN CUT (IPS)
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9. CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXISTING WATER MAINS UNLESS SHOWN OTHERWISE. PROPOSED WATER MAIN TO BE INSTALLED ADJACENT TO EXISTING WATER WITH MINIMUM 1 FOOT SEPARATION DISTANCE.

TEMPORARY PAVEMENT REPAIR ON ALL STREETS, ALLEYS AND DRIVEWAYS SHALL BE 1" ASPHALT IF REQUIRED BY CITY AT COMPLETION OF UTILITY WORK UNTIL PERMANENT PAVEMENT REPAIRS ARE MADE.



Public Works

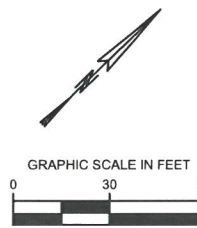
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

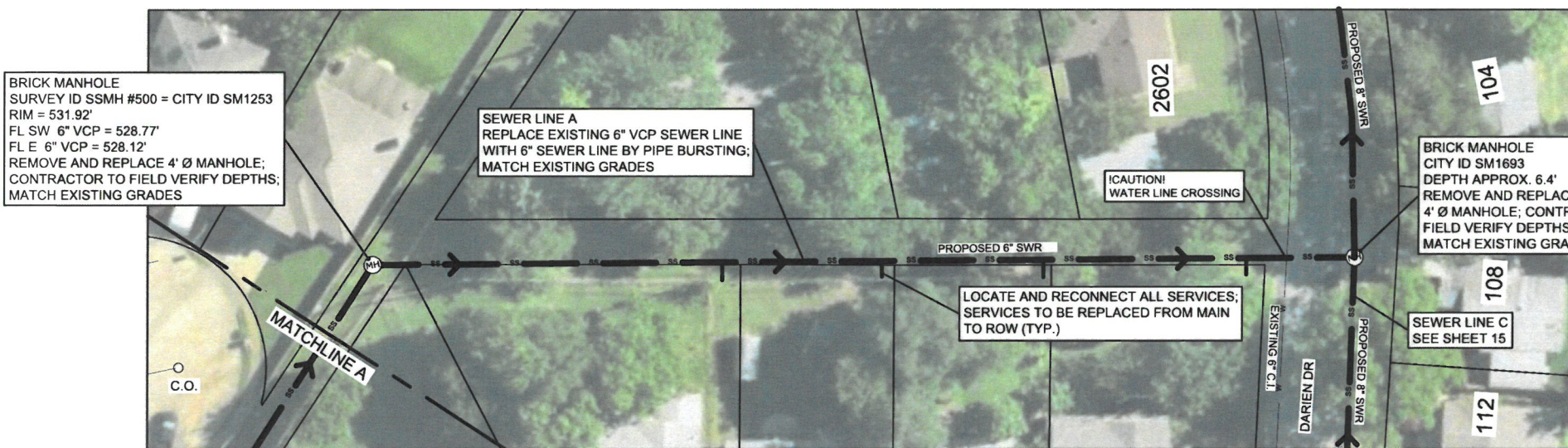
WATER IMPROVEMENTS FOR GLENRIDGE DR

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 12 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)



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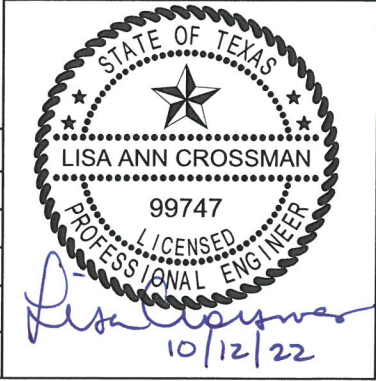
Public Works

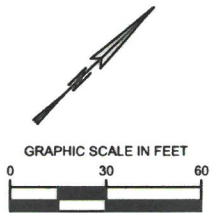
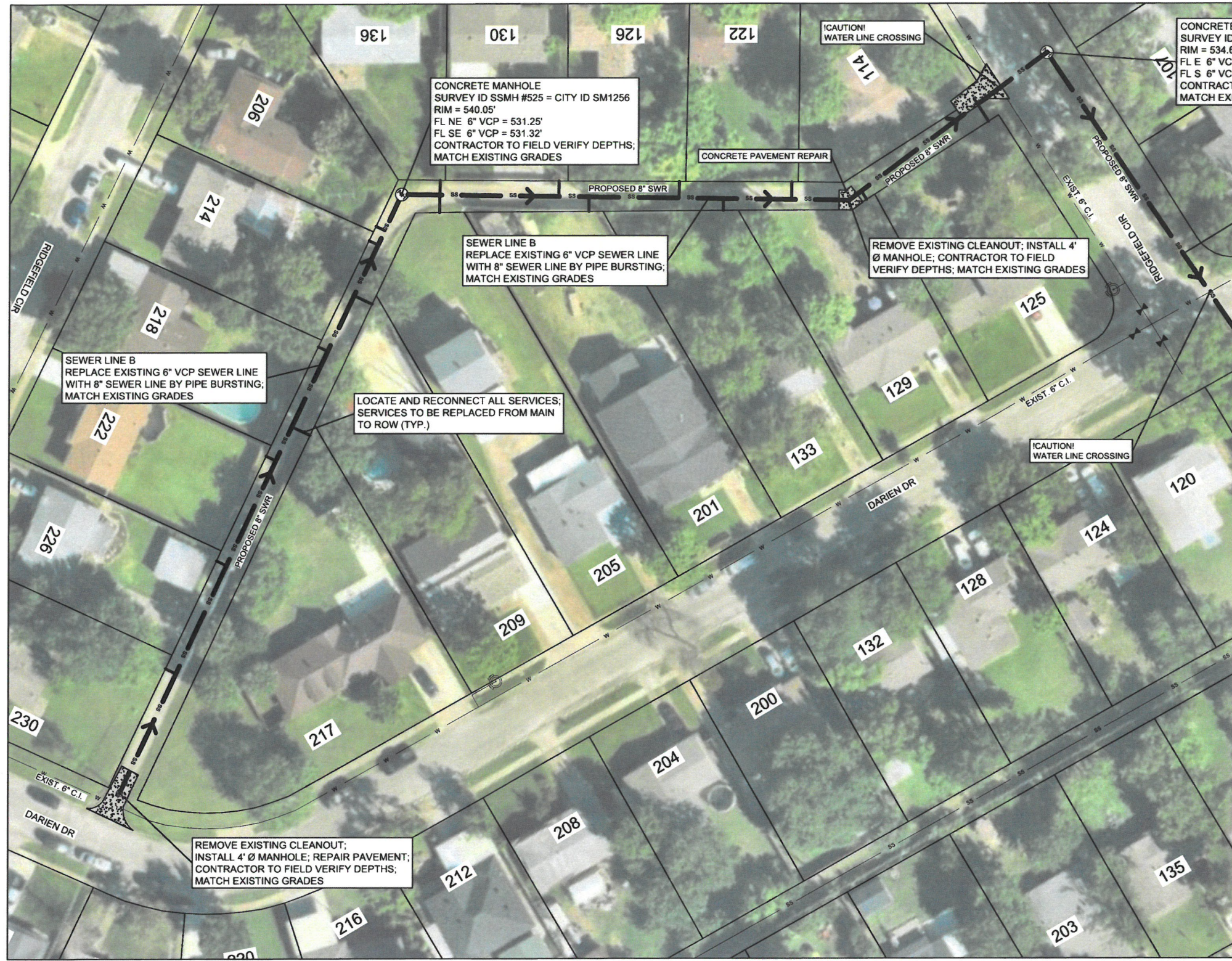
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

SEWER IMPROVEMENTS FOR SEWER LINE A

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 13 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
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- ASPHALT
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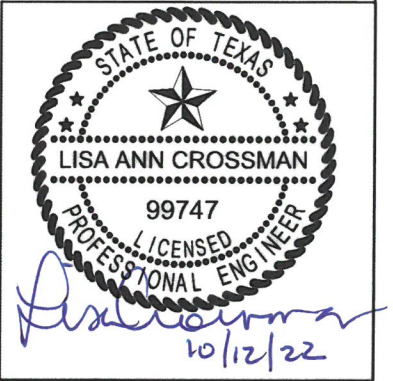
Public Works

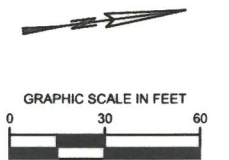
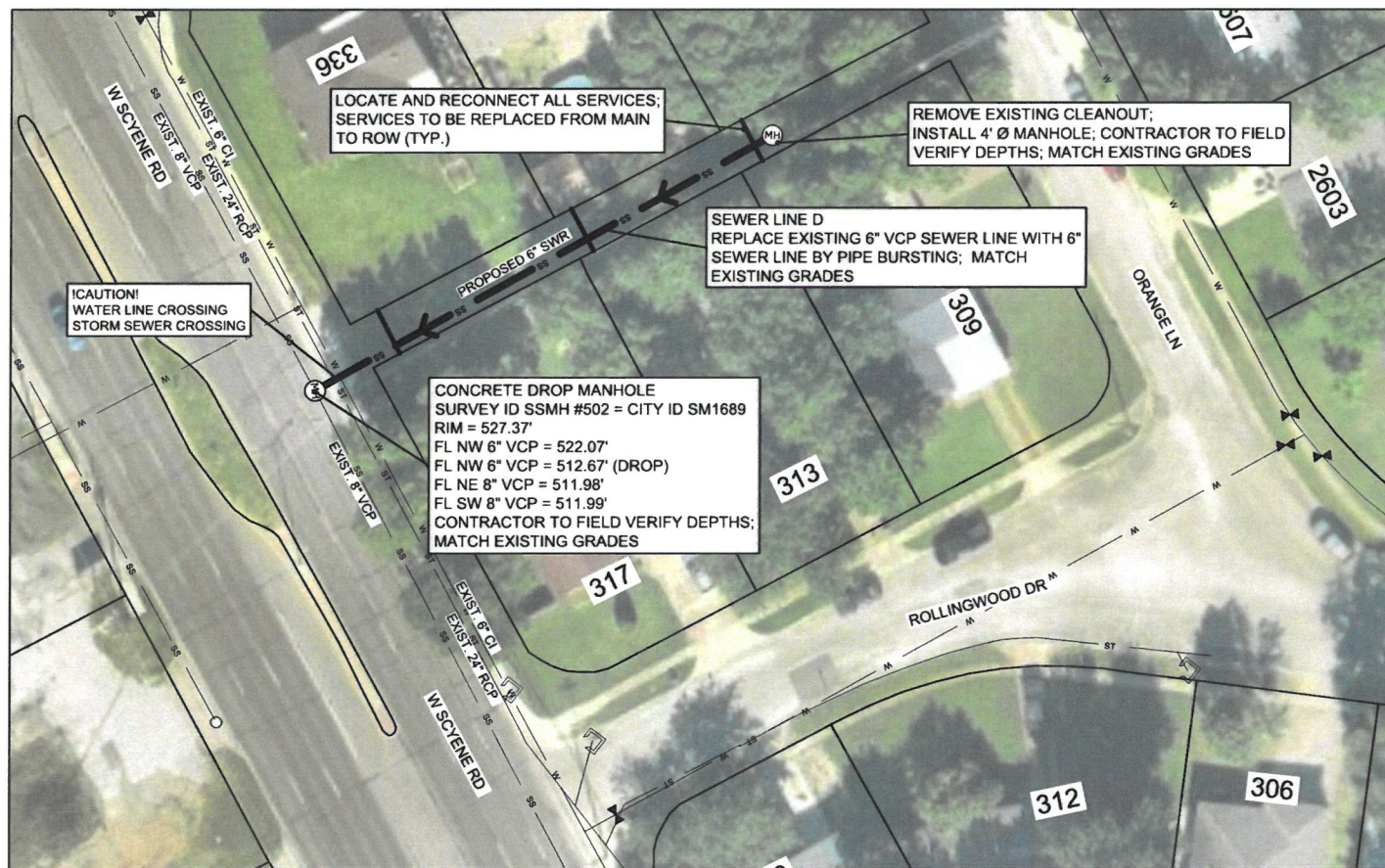
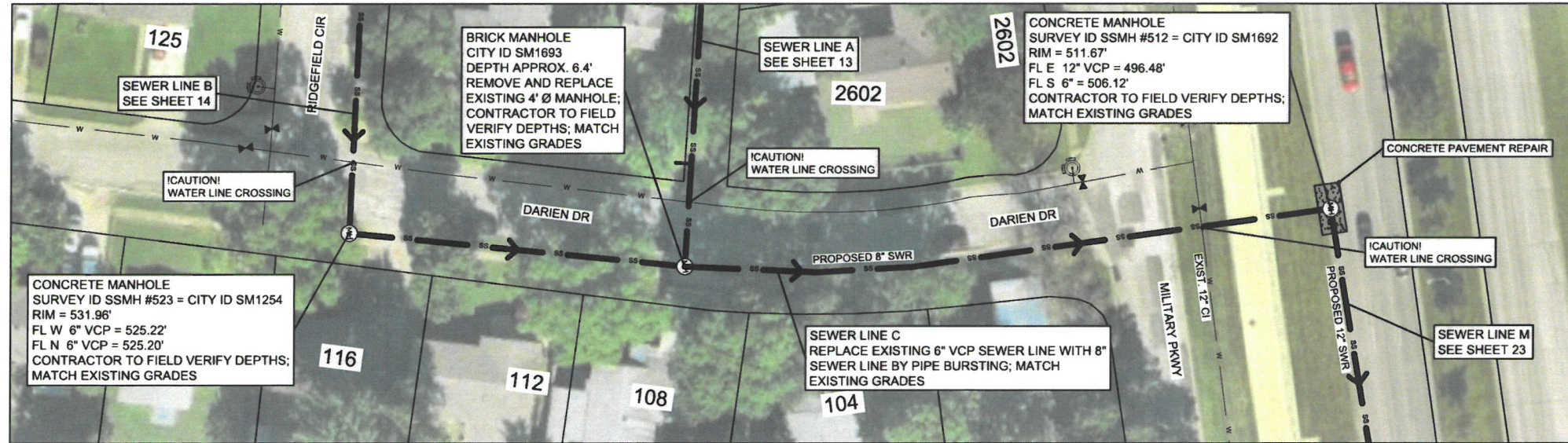
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

SEWER IMPROVEMENTS FOR SEWER LINE B

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 14 OF 43

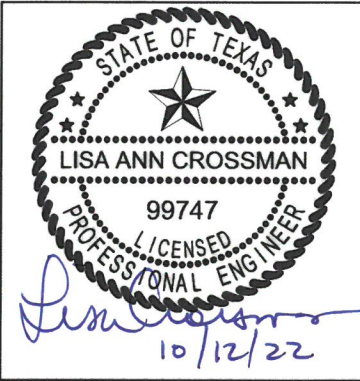




- (MH) SEWER MANHOLE
- (C.O.) CLEAN OUT (C.O.)
- (SI) STORM INLET
- (WM) WATER METER
- (FH) FIRE HYDRANT
- (WV) WATER VALVE
- W — EXISTING WATER LINE
- W — WATER MAIN TO BE REPLACED
- ST — STORM LINE
- SS — SEWER LINE
- SS — SEWER LINE TO BE REPLACED
- • • CURB AND GUTTER
- (X) REMOVE TREE
- (D) DRIVEWAY
- (S) SIDEWALK
- (C) CONCRETE PAVEMENT
- (A) ASPHALT
- (D) CURB RAMP (TYP.)

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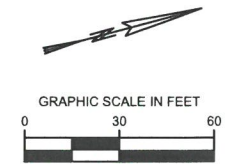
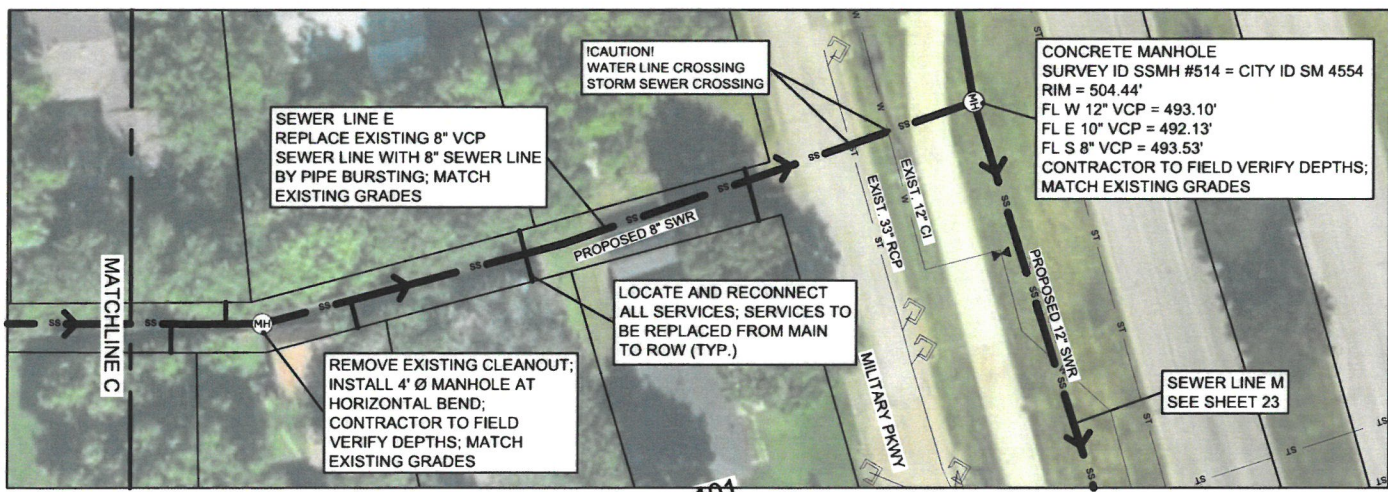
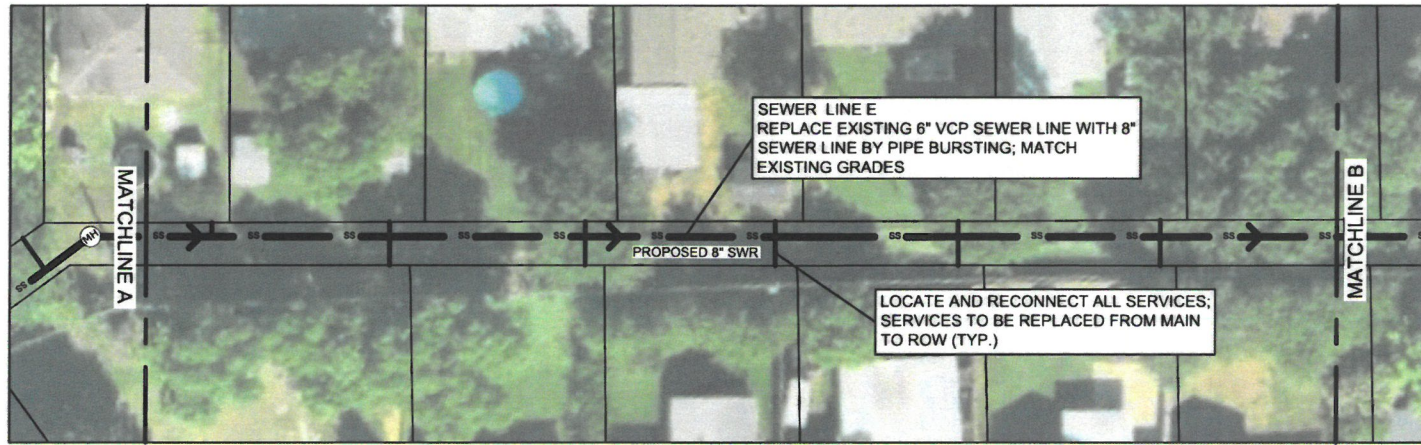
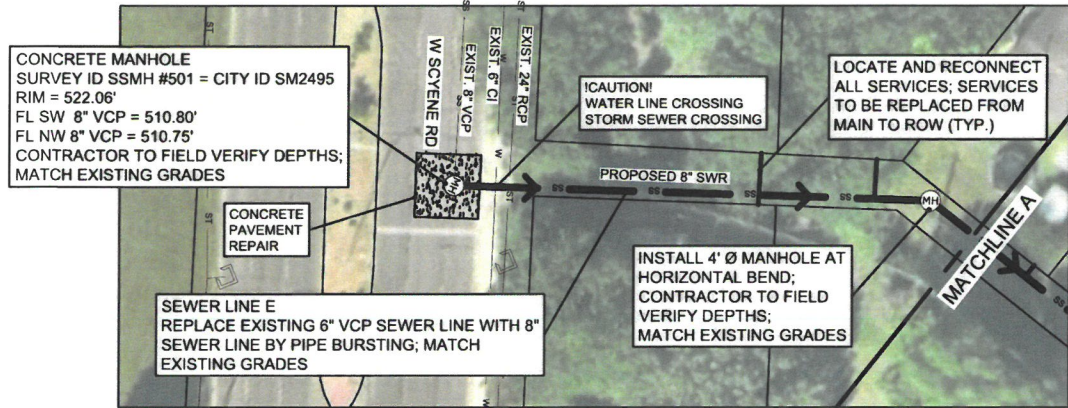
Public Works

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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

SEWER IMPROVEMENTS FOR SEWER LINE C AND D

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 15 OF 43



- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
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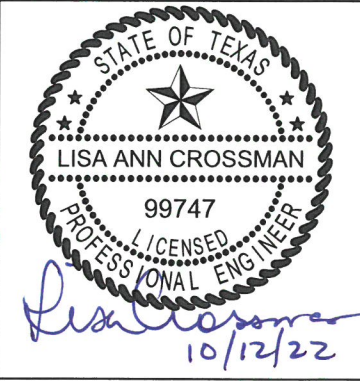
Public Works

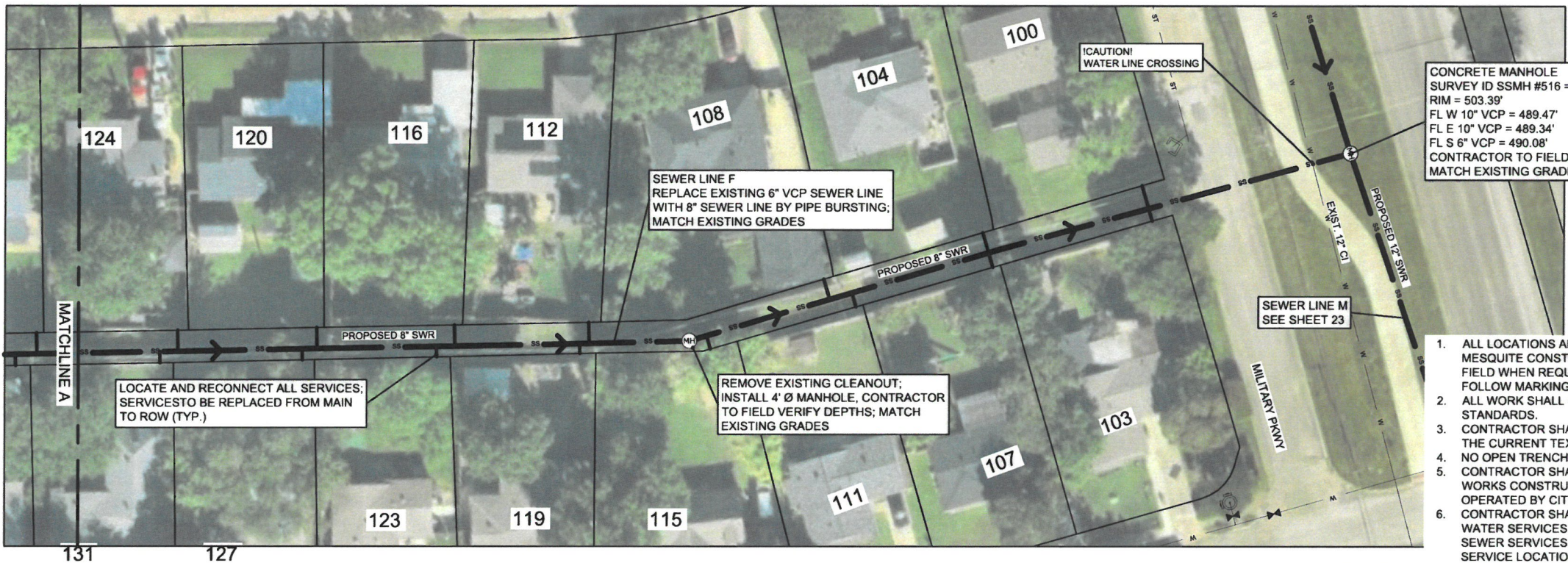
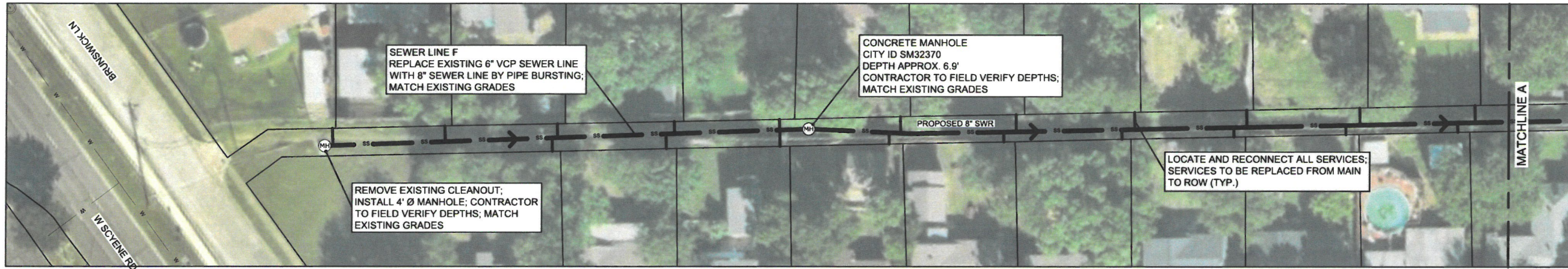
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION CITY CONTRACT # 2023-007

SEWER IMPROVEMENTS FOR SEWER LINE E

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 16 OF 43





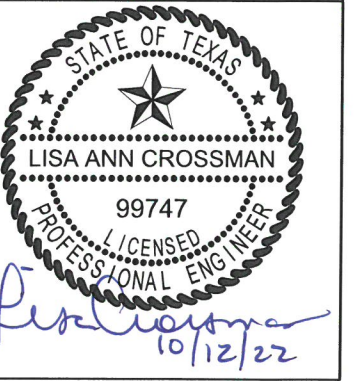
CONCRETE MANHOLE
SURVEY ID SSMH #516 = CITY ID 1257
RIM = 503.39'
FL W 10" VCP = 489.47'
FL E 10" VCP = 489.34'
FL S 6" VCP = 490.08'
CONTRACTOR TO FIELD VERIFY DEPTHS;
MATCH EXISTING GRADES

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 - HDPE, CLASS 333, DR 7, ASTM F714, PE 4710
 - 7.2. WATER LINE INSTALLED BY OPEN CUT (DIPS):
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 - FUSIBLE PVC OR CERTA-LOK, ASTM D3034, SDR26
9. CONTRACTOR SHALL FIELD VERIFY LOCATION, SIZE AND DEPTH OF EXISTING SEWER MAINS AND MANHOLES UNLESS SHOWN OTHERWISE. PROPOSED SEWER MAINS AND MANHOLES TO MATCH EXISTING GRADES AND DEPTHS.

GRAPHIC SCALE IN FEET
0 30 60

- (MH) SEWER MANHOLE
- (C.O.) CLEAN OUT (C.O.)
- (S) STORM INLET
- (WM) WATER METER
- (FH) FIRE HYDRANT
- (V) WATER VALVE
- w — EXISTING WATER LINE
- w — WATER MAIN TO BE REPLACED
- ST — STORM LINE
- SS — SEWER LINE
- SS — SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- (X) REMOVE TREE
- (D) CURB RAMP (TYP.)
- [Pattern] DRIVEWAY
- [Pattern] SIDEWALK
- [Pattern] CONCRETE PAVEMENT
- [Pattern] ASPHALT

TEMPORARY PAVEMENT REPAIR ON ALL STREETS, ALLEYS AND DRIVEWAYS SHALL BE 1" ASPHALT IF REQUIRED BY CITY AT COMPLETION OF UTILITY WORK UNTIL PERMANENT PAVEMENT REPAIRS ARE MADE.



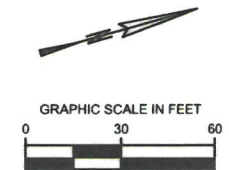
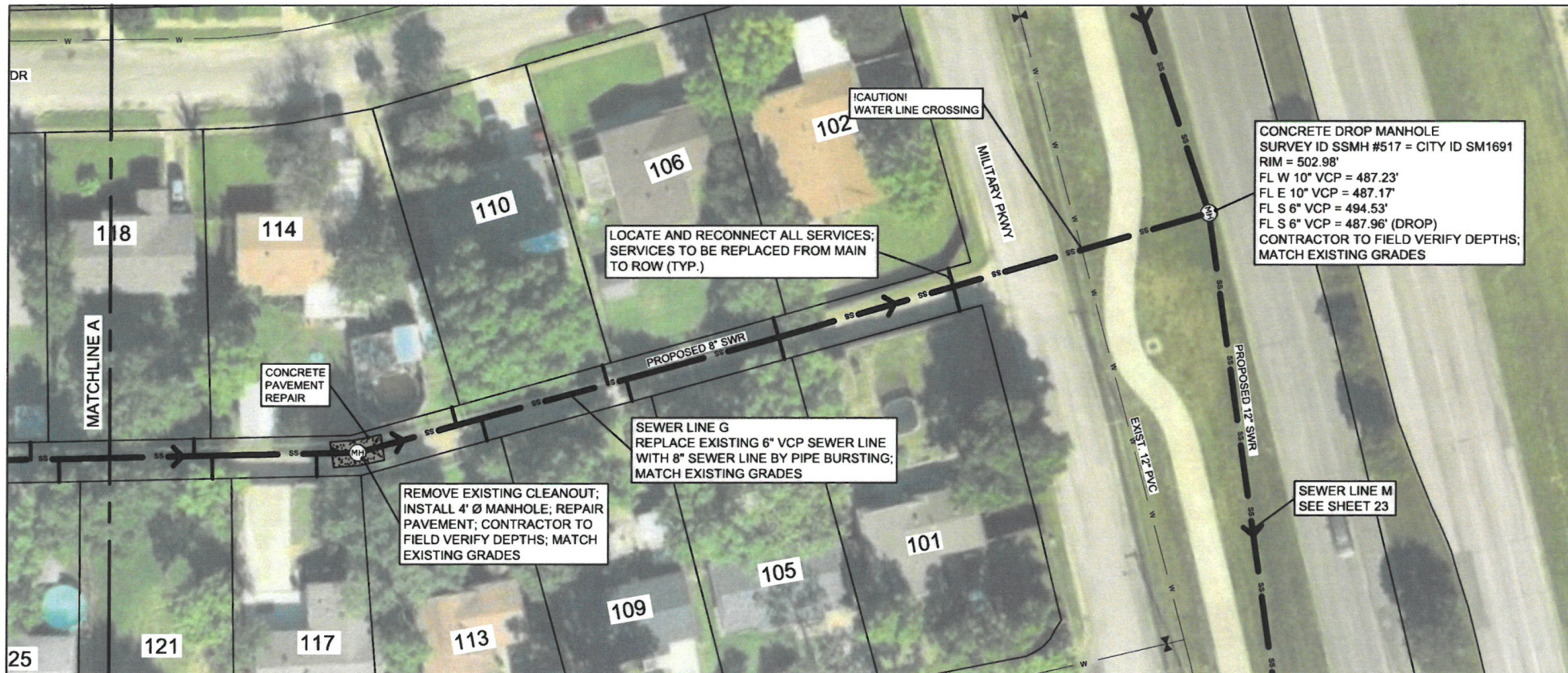
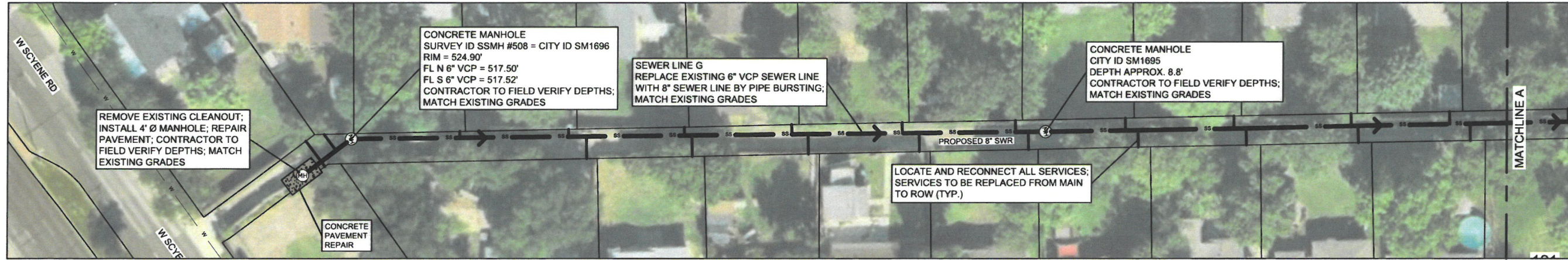
Public Works

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PAVING AND UTILITY IMPROVEMENTS
FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

SEWER IMPROVEMENTS FOR
SEWER LINE F

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 17 OF 43



- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
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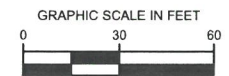
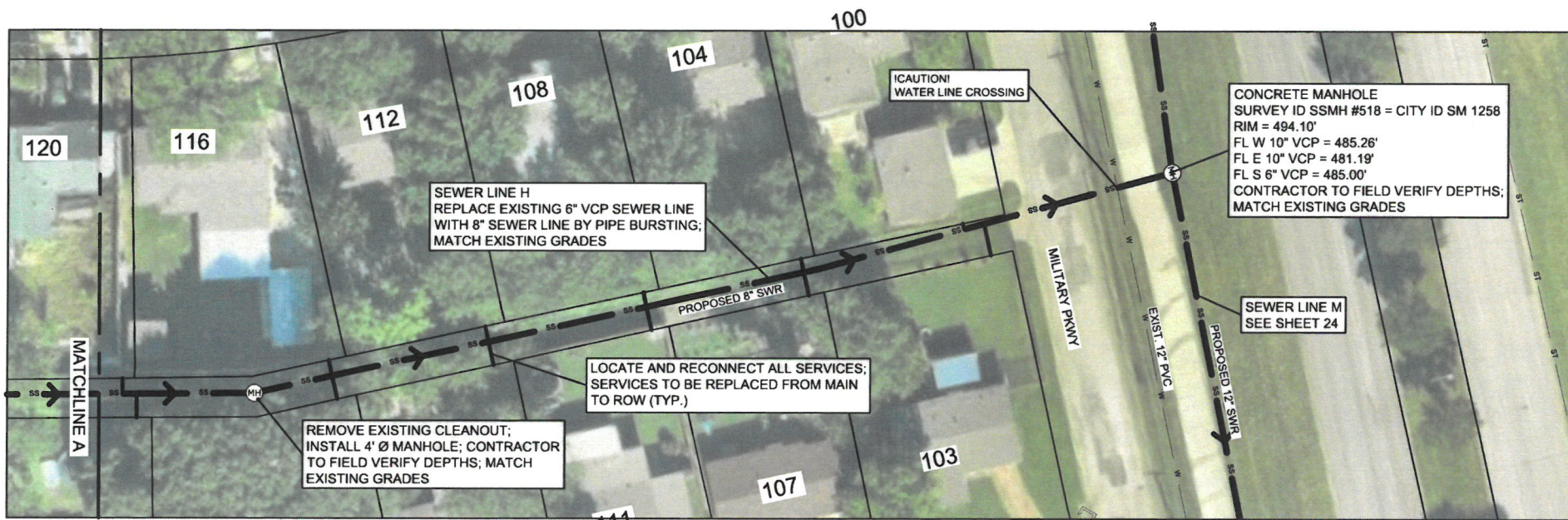
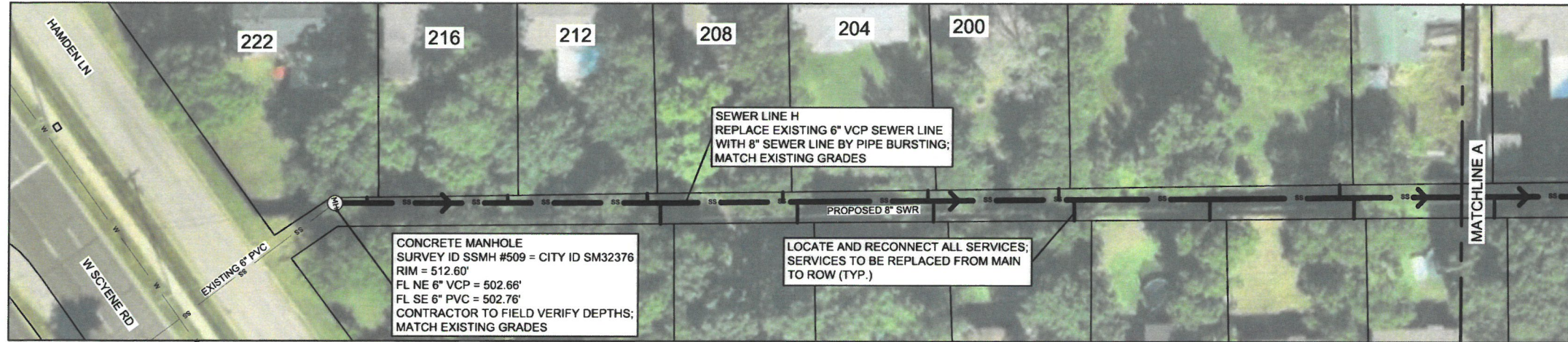
Public Works

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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

SEWER IMPROVEMENTS FOR SEWER LINE G

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 18 OF 43



- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
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Public Works

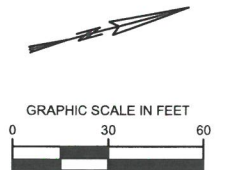
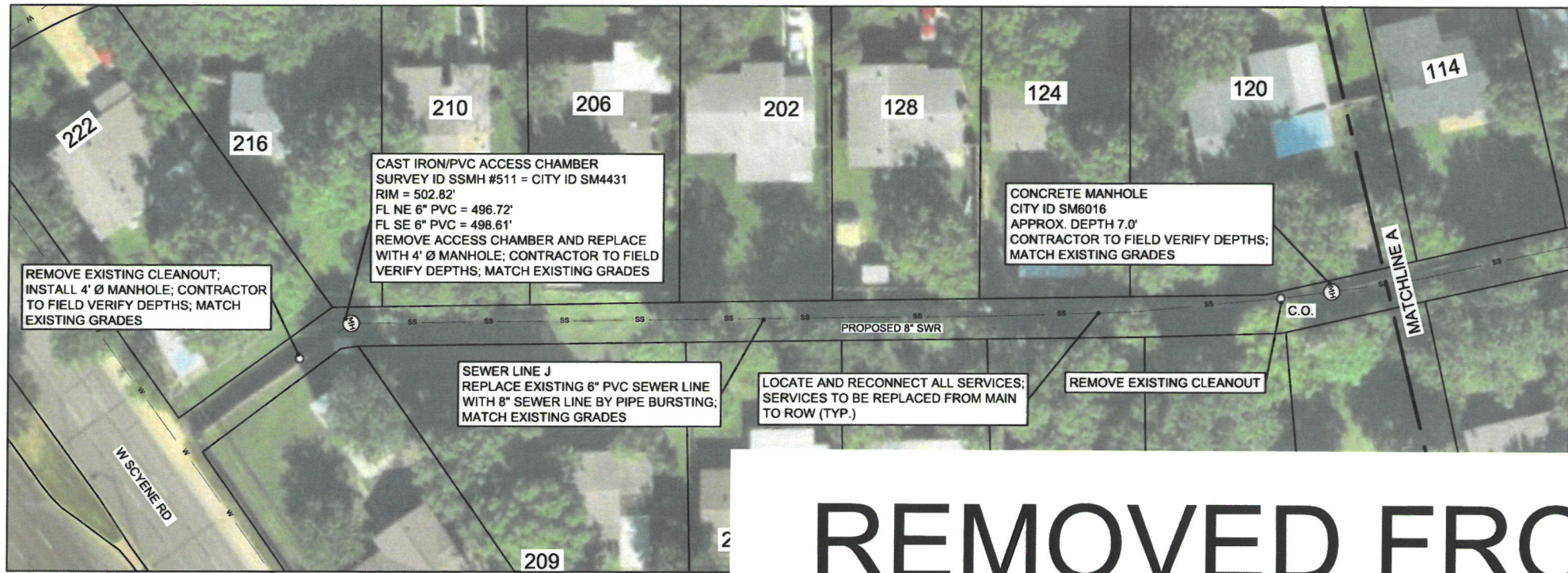
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

SEWER IMPROVEMENTS FOR SEWER LINE H

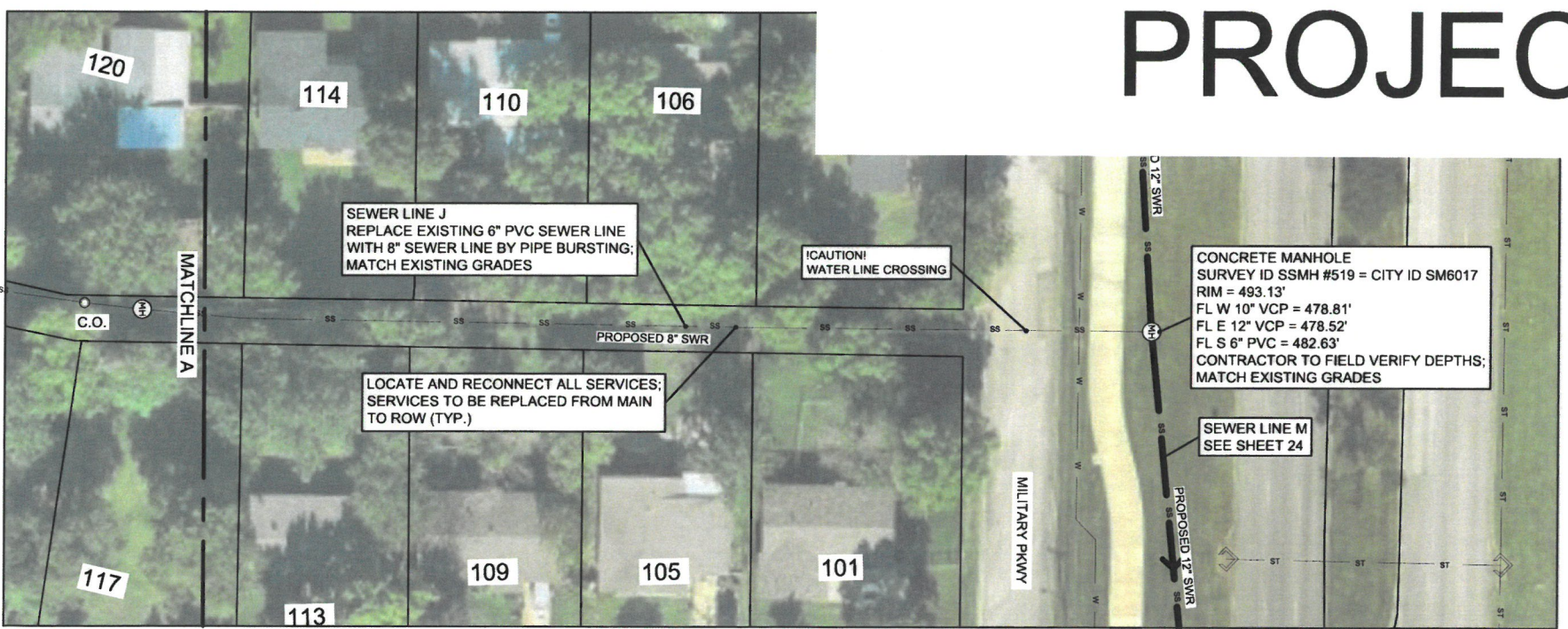
REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 19 OF 43





- (MH) SEWER MANHOLE
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- (S) STORM INLET
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- [Pattern] DRIVEWAY
- [Pattern] SIDEWALK
- [Pattern] CONCRETE PAVEMENT
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- (D) CURB RAMP (TYP.)

REMOVED FROM PROJECT



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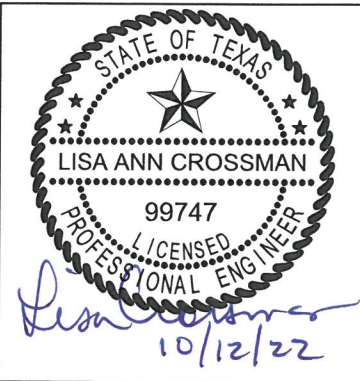
Public Works

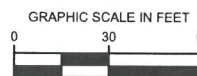
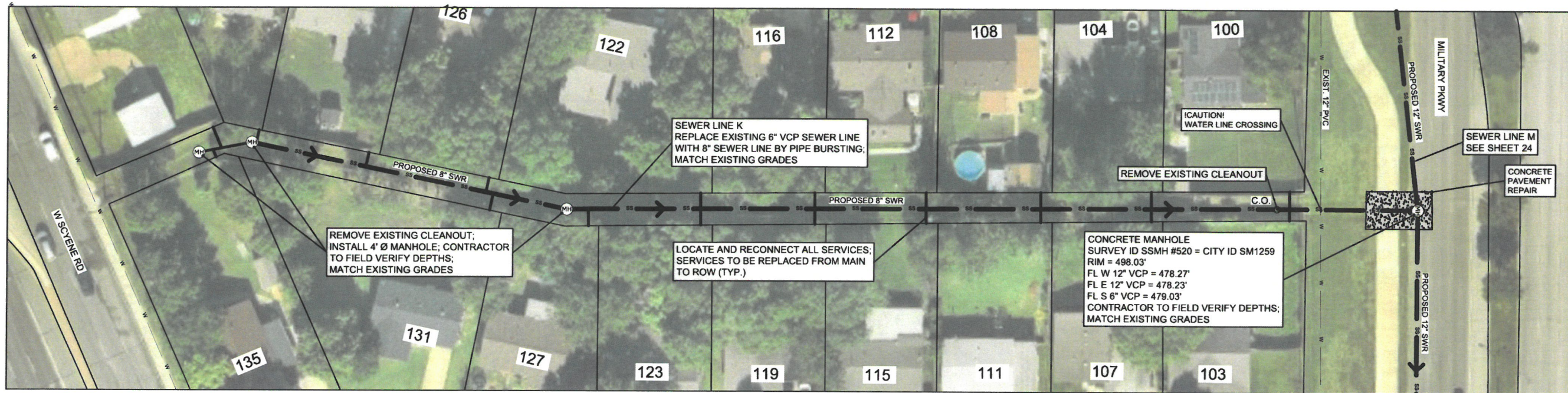
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION CITY CONTRACT # 2023-007

SEWER IMPROVEMENTS FOR SEWER LINE J

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 20 OF 43

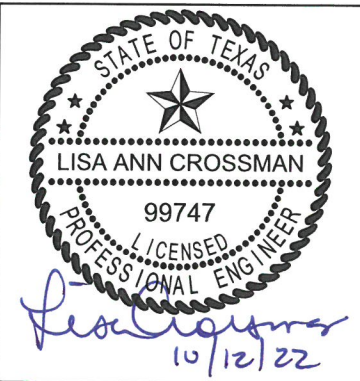




- SEWER MANHOLE
- CLEAN OUT (C.O.)
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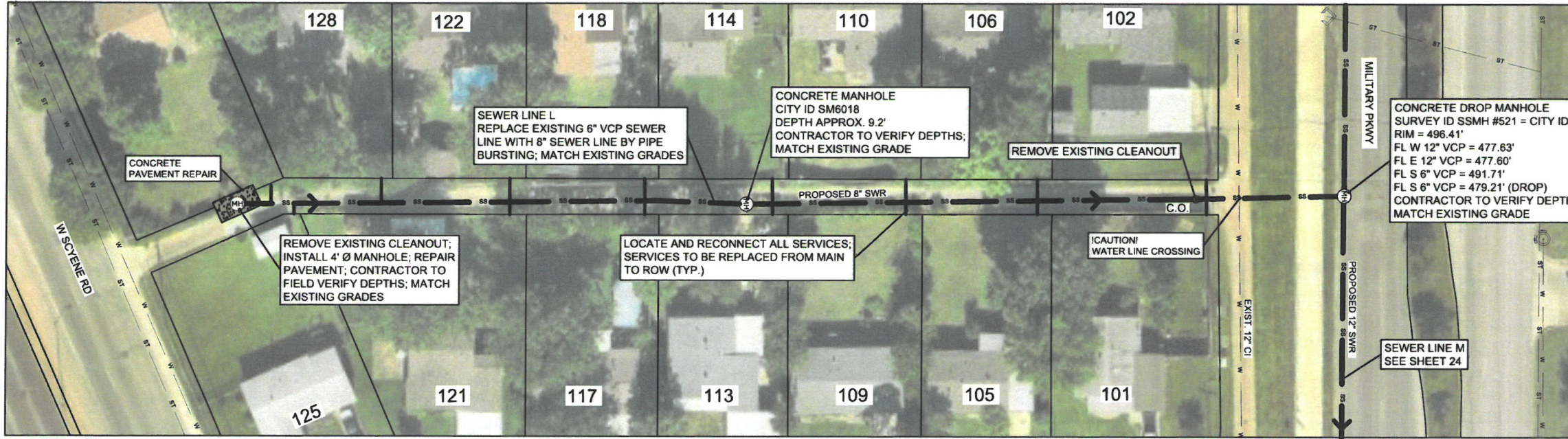
Public Works

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**PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

SEWER IMPROVEMENTS FOR SEWER LINE K

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 21 OF 43



- GRAPHIC SCALE IN FEET
0 30 60
- SEWER MANHOLE
 - CLEAN OUT (C.O.)
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Public Works

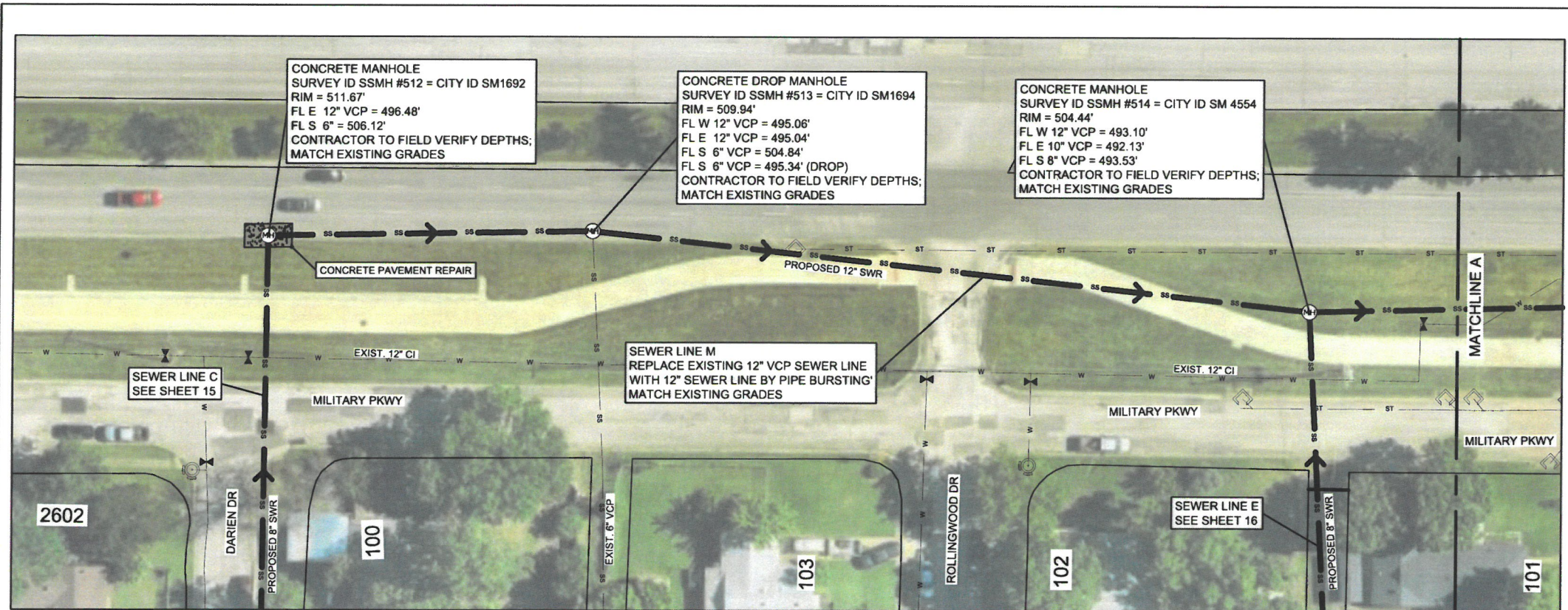
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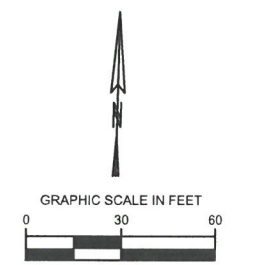
SEWER IMPROVEMENTS FOR SEWER LINE L

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
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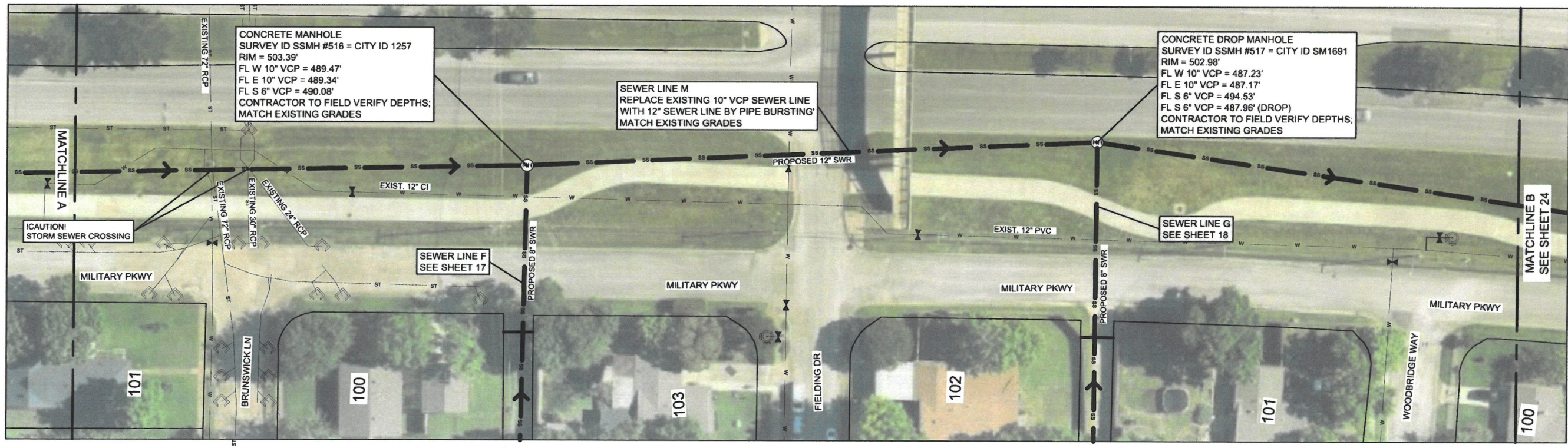




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 - 7.2. WATER LINE INSTALLED BY OPEN CUT (DIPS):
 - FUSIBLE PVC OR CERTA-LOK, AWWA C900, CLASS 305, DR 14
 - PVC, AWWA C900, CLASS 305, DR 14.
8. ACCEPTABLE SEWER LINE MATERIALS
 - 8.1. SEWER LINE INSTALLED BY PIPE BURSTING (IPS)
 - FUSIBLE PVC, ASTM D3034, SDR26
 - HDPE, ASTM F714, DR13.5
 - 8.2. SEWER LINE INSTALLED BY OPEN CUT (IPS)
 - FUSIBLE PVC OR CERTA-LOK, ASTM D3034, SDR26
9. CONTRACTOR SHALL FIELD VERIFY LOCATION, SIZE AND DEPTH OF EXISTING SEWER MAINS AND MANHOLES UNLESS SHOWN OTHERWISE. PROPOSED SEWER MAINS AND MANHOLES TO MATCH EXISTING GRADES AND DEPTHS.



- (MH) SEWER MANHOLE
- (C.O.) CLEAN OUT (C.O.)
- (S) STORM INLET
- (WM) WATER METER
- (FH) FIRE HYDRANT
- (V) WATER VALVE
- (W) EXISTING WATER LINE
- (W) WATER MAIN TO BE REPLACED
- (ST) STORM LINE
- (SS) SEWER LINE
- (SS) SEWER LINE TO BE REPLACED
- (C&G) CURB AND GUTTER
- (X) REMOVE TREE
- (D) DRIVEWAY
- (S) SIDEWALK
- (C) CONCRETE PAVEMENT
- (A) ASPHALT
- (D) CURB RAMP (TYP.)



TEMPORARY PAVEMENT REPAIR ON ALL STREETS, ALLEYS AND DRIVEWAYS SHALL BE 1" ASPHALT IF REQUIRED BY CITY AT COMPLETION OF UTILITY WORK UNTIL PERMANENT PAVEMENT REPAIRS ARE MADE.



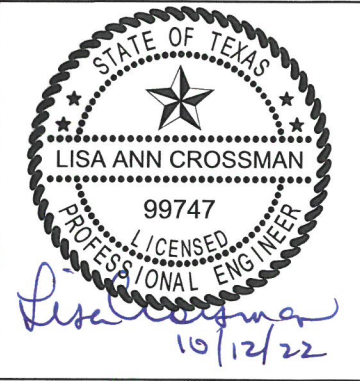
Public Works

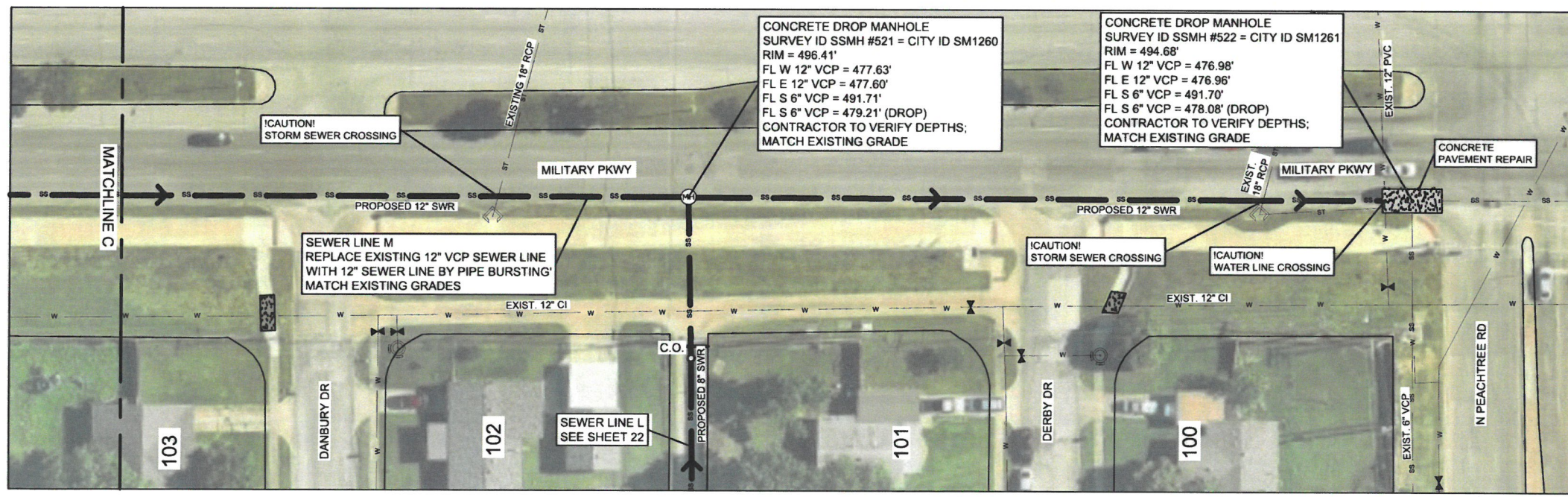
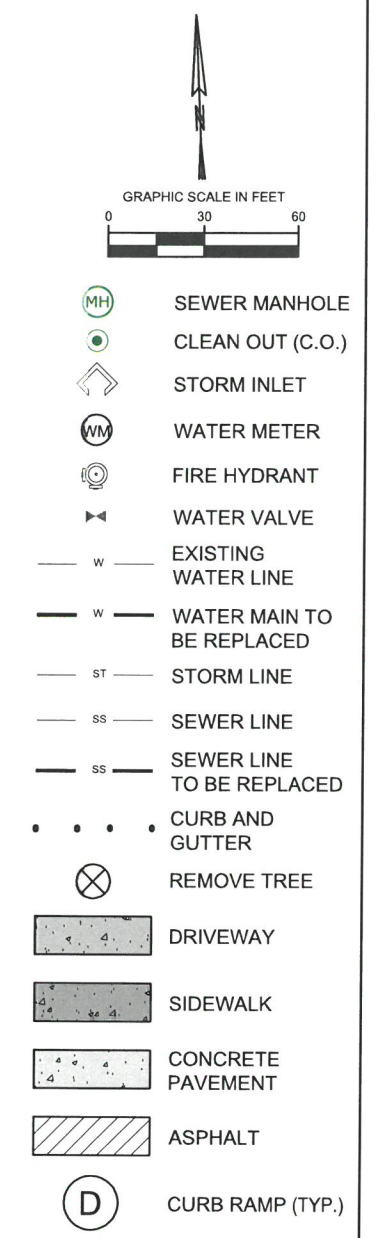
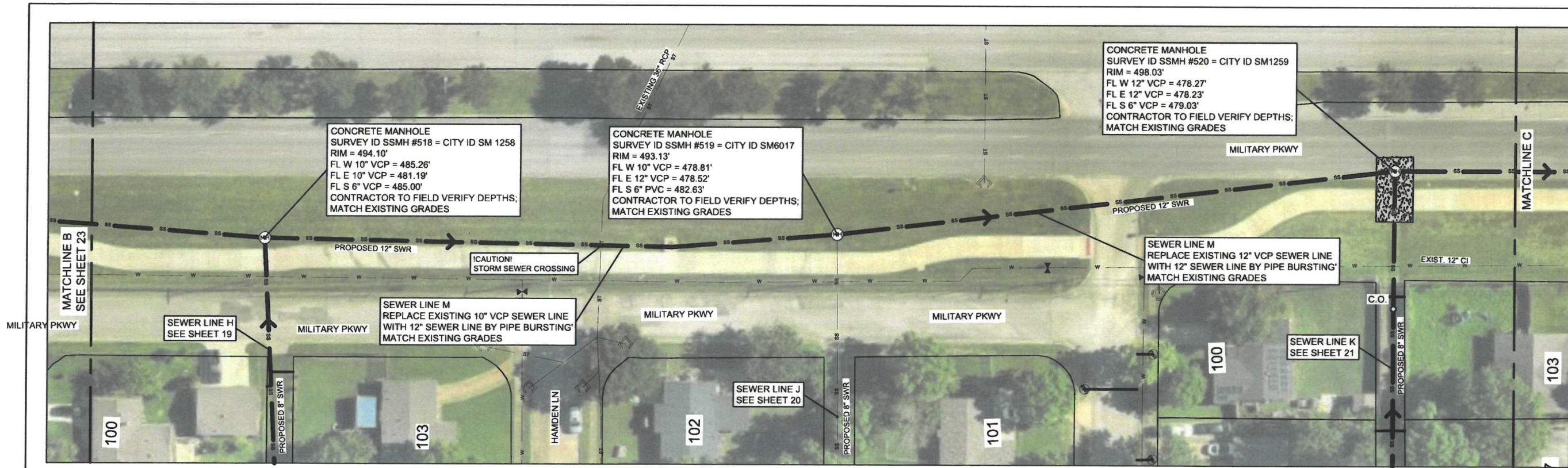
EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION, TO TAKE THE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

SEWER IMPROVEMENTS FOR SEWER LINE M-1

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 23 OF 43





- ALL LOCATIONS AND LIMITS SHOWN ARE APPROXIMATE. THE CITY OF MESQUITE CONSTRUCTION INSPECTOR WILL MARK REMOVAL LIMITS IN FIELD WHEN REQUESTED BY CONTRACTOR. CONTRACTOR SHALL FOLLOW MARKINGS IN FIELD ON EXACT LOCATIONS AND LIMITS.
- ALL WORK SHALL COMPLY WITH CITY OF MESQUITE GENERAL DESIGN STANDARDS.
- CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH THE CURRENT TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
- NO OPEN TRENCHES SHALL BE LEFT WHILE WORKERS NOT PRESENT.
- CONTRACTOR SHALL COORDINATE WATERLINE SHUTDOWN WITH PUBLIC WORKS CONSTRUCTION INSPECTOR. ALL EXISTING VALVES ARE TO BE OPERATED BY CITY OF MESQUITE PERSONNEL ONLY.
- CONTRACTOR SHALL LOCATE AND RECONNECT ALL SERVICES. ALL WATER SERVICES SHALL BE REPLACED FROM MAIN TO METER. ALL SEWER SERVICES SHALL BE REPLACED FROM MAIN TO RIGHT-OF-WAY. SERVICE LOCATIONS HAVE NOT BEEN LOCATED AND ARE SHOWN SCHEMATICALLY ON PLANS. CONTRACTOR SHALL VERIFY IN FIELD.
- ACCEPTABLE WATER LINE MATERIALS:
 - WATERLINE INSTALLED BY PIPE BURSTING (DIPS):
 - FUSIBLE PVC OR CERTA-LOK, AWWA C900, CLASS 305, DR 14
 - HDPE, CLASS 333, DR 7, ASTM F714, PE 4710
 - WATER LINE INSTALLED BY OPEN CUT (DIPS):
 - FUSIBLE PVC OR CERTA-LOK, AWWA C900, CLASS 305, DR 14
 - PVC, AWWA C900, CLASS 305, DR 14.
- ACCEPTABLE SEWER LINE MATERIALS
 - SEWER LINE INSTALLED BY PIPE BURSTING (IPS)
 - FUSIBLE PVC, ASTM D3034, SDR26
 - HDPE, ASTM F714, DR13.5
 - SEWER LINE INSTALLED BY OPEN CUT (IPS)
 - FUSIBLE PVC OR CERTA-LOK, ASTM D3034, SDR26
- CONTRACTOR SHALL FIELD VERIFY LOCATION, SIZE AND DEPTH OF EXISTING SEWER MAINS AND MANHOLES UNLESS SHOWN OTHERWISE. PROPOSED SEWER MAINS AND MANHOLES TO MATCH EXISTING GRADES AND DEPTHS.

TEMPORARY PAVEMENT REPAIR ON ALL STREETS, ALLEYS AND DRIVEWAYS SHALL BE 1" ASPHALT IF REQUIRED BY CITY AT COMPLETION OF UTILITY WORK UNTIL PERMANENT PAVEMENT REPAIRS ARE MADE.



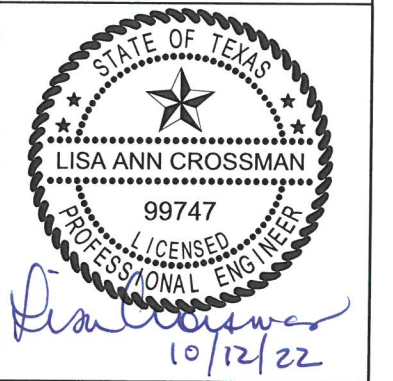
Public Works

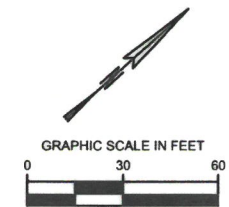
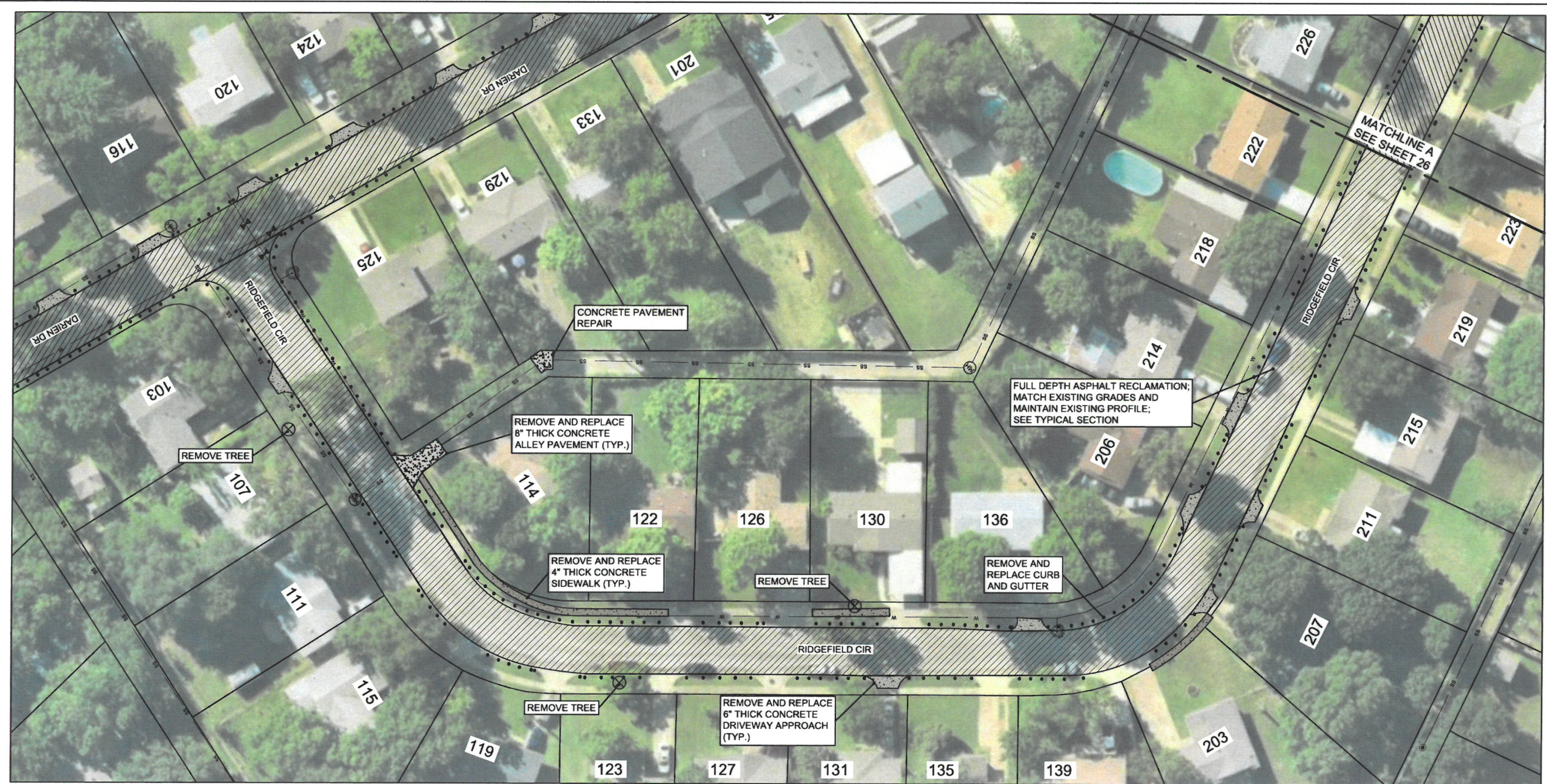
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

SEWER IMPROVEMENTS FOR SEWER LINE M-2

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 24 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)

1. ALL LOCATIONS AND LIMITS SHOWN ARE APPROXIMATE. THE CITY OF MESQUITE CONSTRUCTION INSPECTOR WILL MARK REMOVAL LIMITS IN FIELD WHEN REQUESTED BY CONTRACTOR. CONTRACTOR SHALL FOLLOW MARKINGS IN FIELD ON EXACT LOCATIONS AND LIMITS.
2. ALL WORK SHALL COMPLY WITH CITY OF MESQUITE GENERAL DESIGN STANDARDS.
3. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH THE CURRENT TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. ADJUSTMENT OF EXISTING WATER METERS, WATER VALVE STACKS AND MANHOLES SHALL BE COMPLETED AS NECESSARY TO ENSURE UTILITY APPURTENANCES ARE LEVEL WITH FINAL SURROUNDING GRADES.
- 4.



Public Works

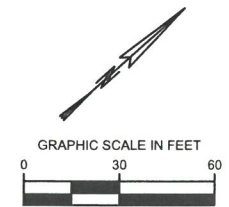
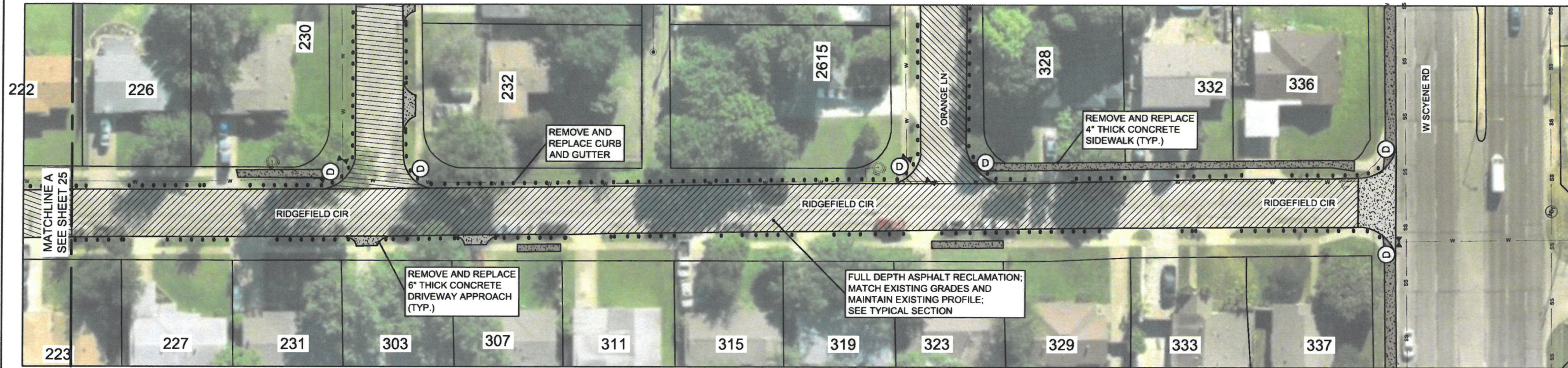
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**PAVING AND UTILITY IMPROVEMENTS
FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

**PAVING IMPROVEMENTS FOR
RIDGEFIELD CIR-1**

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 25 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)

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2. ALL WORK SHALL COMPLY WITH CITY OF MESQUITE GENERAL DESIGN STANDARDS.
3. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH THE CURRENT TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
4. ADJUSTMENT OF EXISTING WATER METERS, WATER VALVE STACKS AND MANHOLES SHALL BE COMPLETED AS NECESSARY TO ENSURE UTILITY APPURTENANCES ARE LEVEL WITH FINAL SURROUNDING GRADES.



Public Works

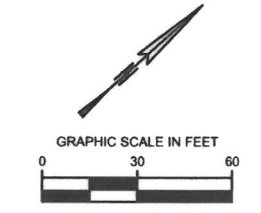
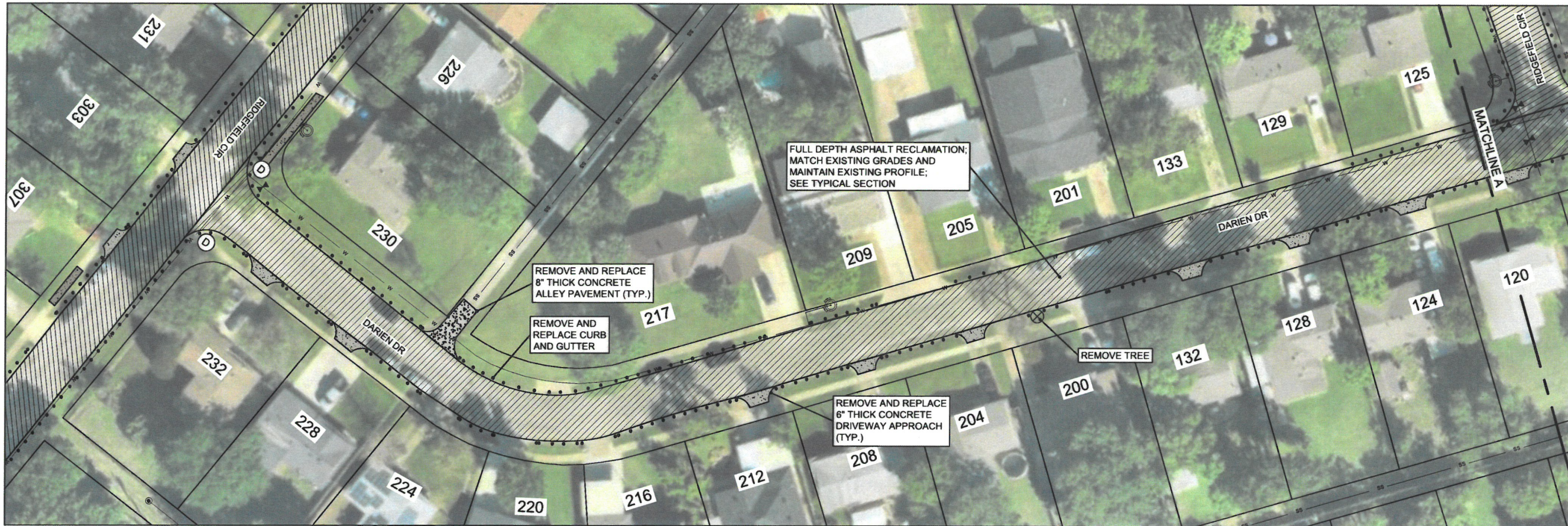
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**PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

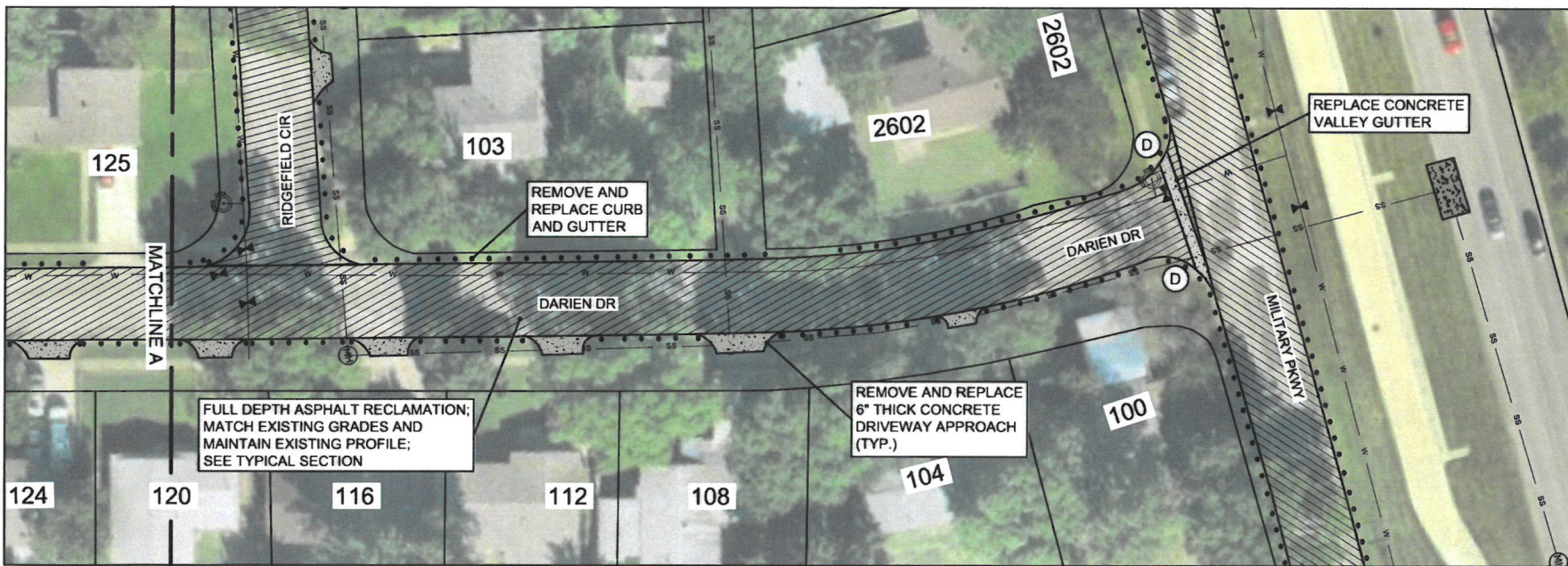
PAVING IMPROVEMENTS FOR RIDGEFIELD CIR-2

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 26 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)



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3. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH THE CURRENT TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
4. ADJUSTMENT OF EXISTING WATER METERS, WATER VALVE STACKS AND MANHOLES SHALL BE COMPLETED AS NECESSARY TO ENSURE UTILITY APPURTENANCES ARE LEVEL WITH FINAL SURROUNDING GRADES.



Public Works

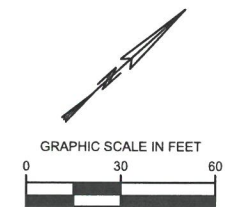
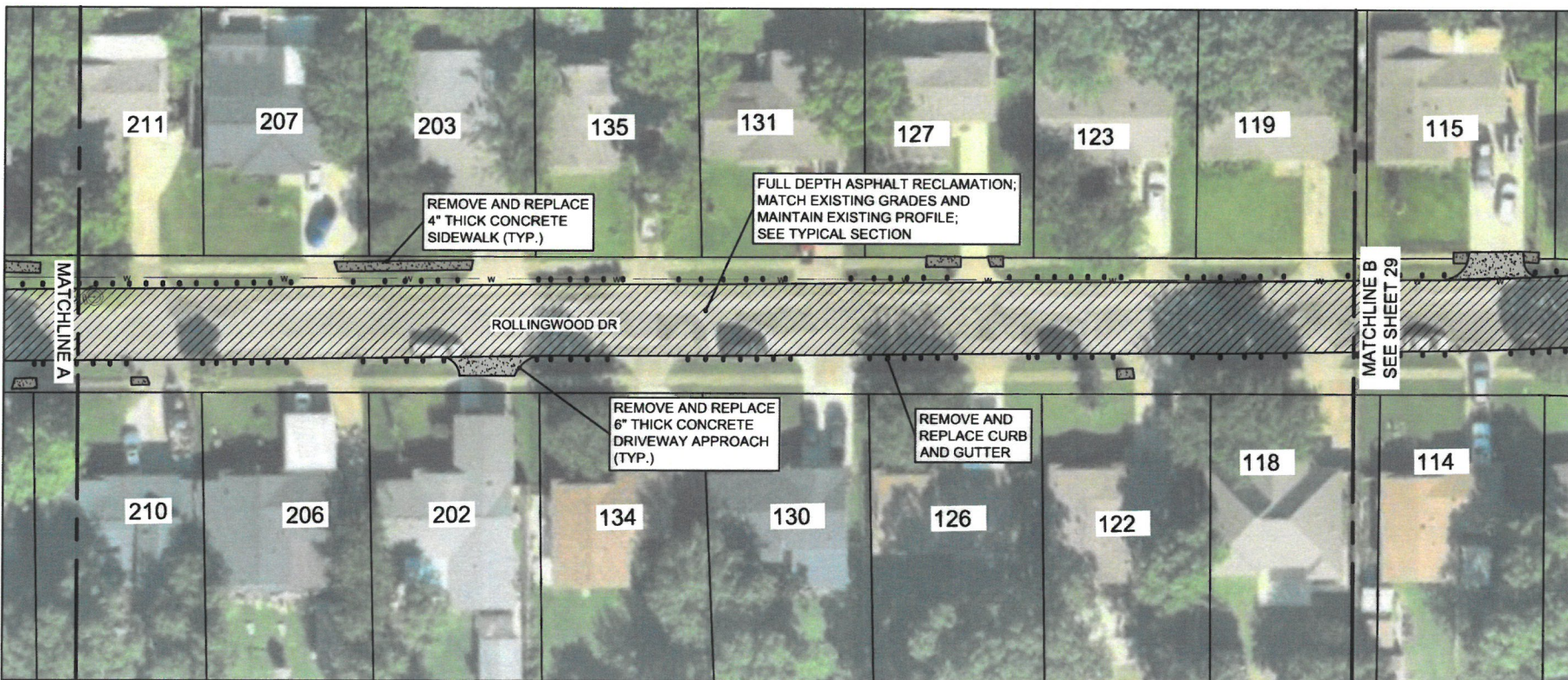
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

PAVING IMPROVEMENTS FOR DARIEN DR

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 27 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)

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Public Works

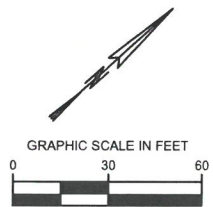
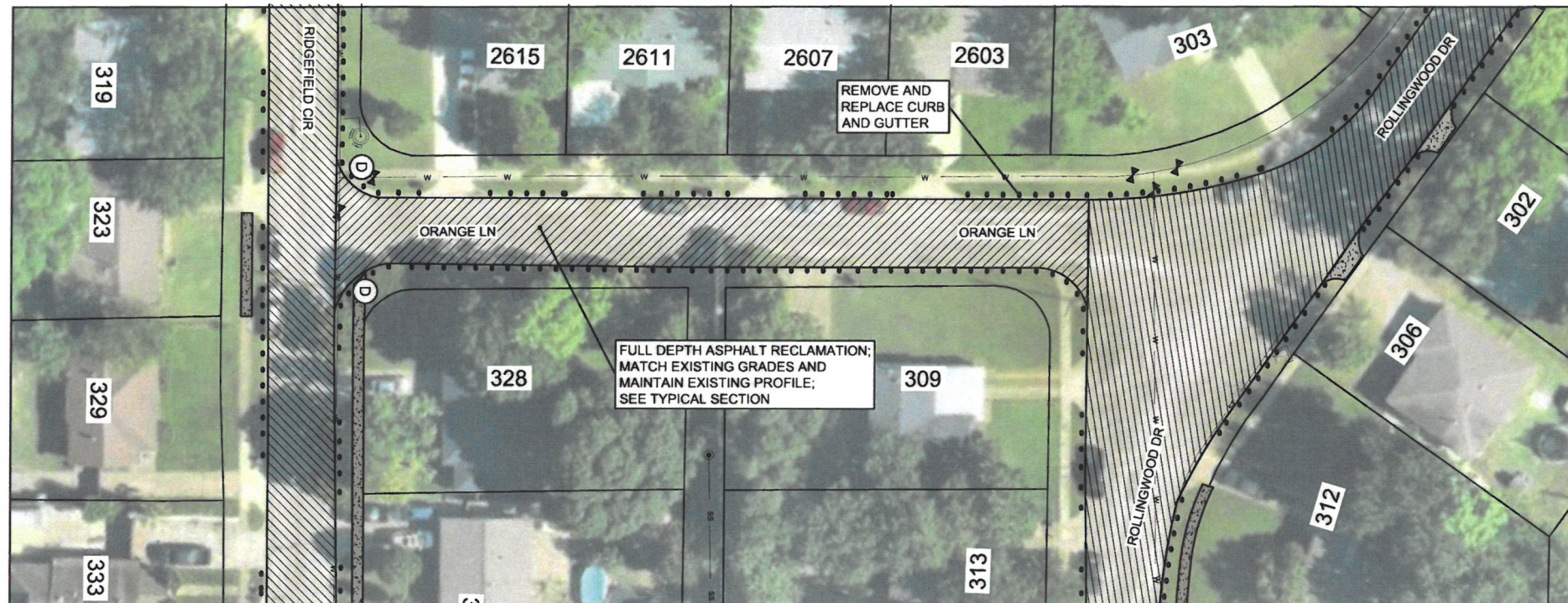
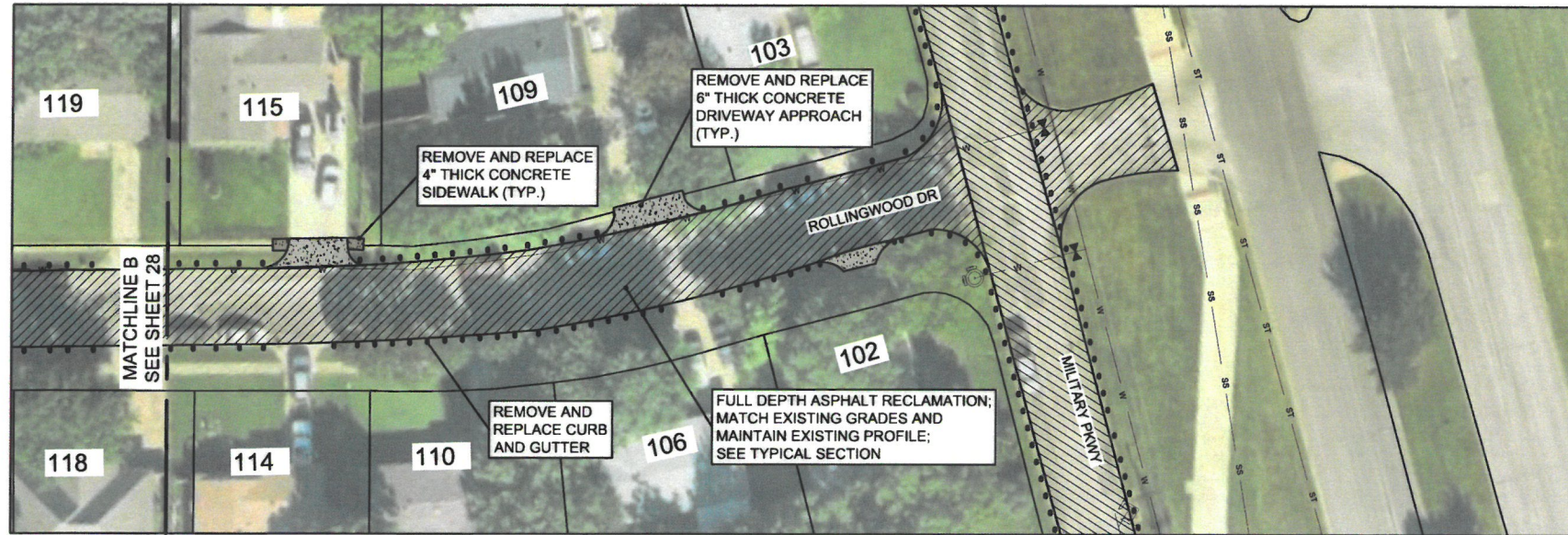
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**PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

PAVING IMPROVEMENTS FOR ROLLINGWOOD DR-1

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 28 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)

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Public Works

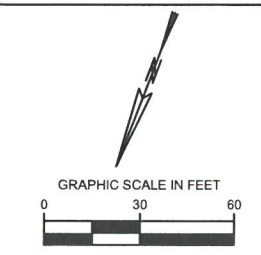
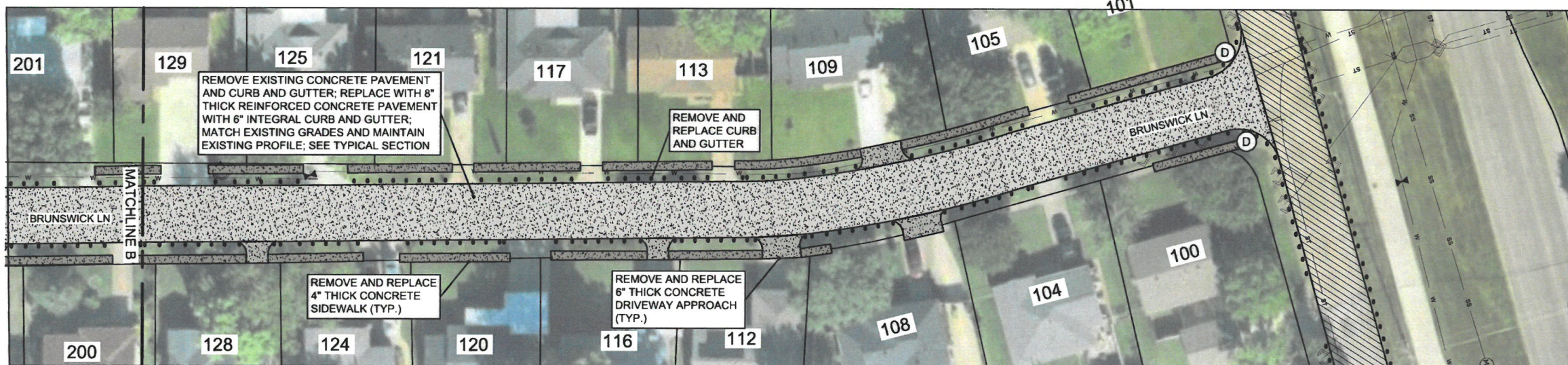
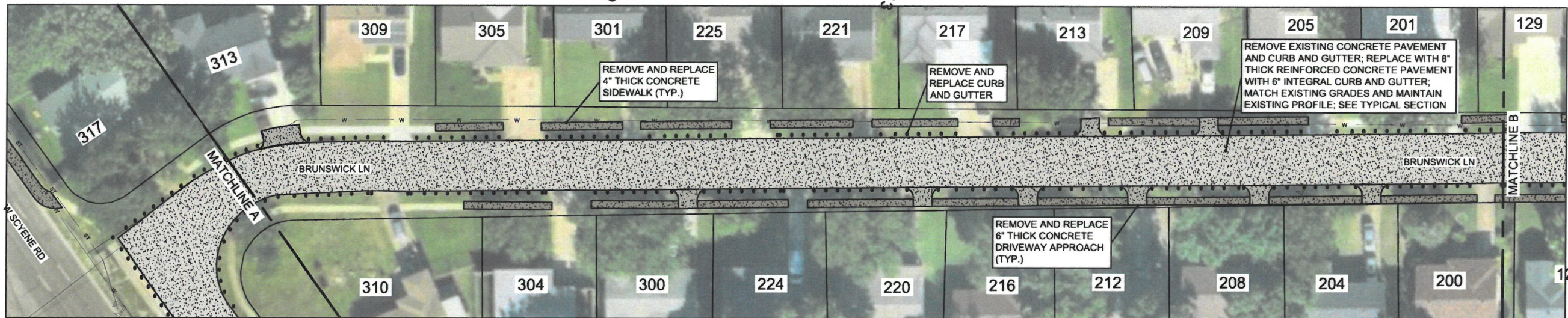
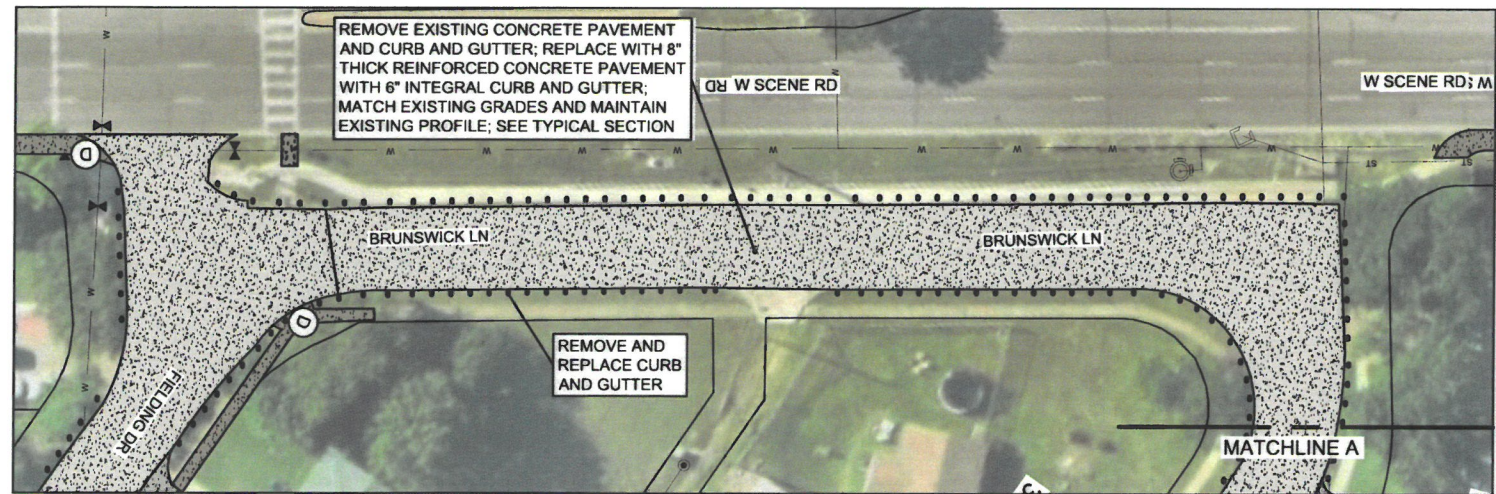
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**PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

PAVING IMPROVEMENTS FOR ROLLINGWOOD DR-2 AND ORANGE LN

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 29 OF 43





- (MH) SEWER MANHOLE
- (C.O.) CLEAN OUT (C.O.)
- (S) STORM INLET
- (WM) WATER METER
- (FH) FIRE HYDRANT
- (V) WATER VALVE
- w — EXISTING WATER LINE
- w — WATER MAIN TO BE REPLACED
- st — STORM LINE
- ss — SEWER LINE
- ss — SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- (X) REMOVE TREE
- (D) CURB RAMP (TYP.)
- [Pattern] DRIVEWAY
- [Pattern] SIDEWALK
- [Pattern] CONCRETE PAVEMENT
- [Pattern] ASPHALT

1. ALL LOCATIONS AND LIMITS SHOWN ARE APPROXIMATE. THE CITY OF MESQUITE CONSTRUCTION INSPECTOR WILL MARK REMOVAL LIMITS IN FIELD WHEN REQUESTED BY CONTRACTOR. CONTRACTOR SHALL FOLLOW MARKINGS IN FIELD ON EXACT LOCATIONS AND LIMITS.
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3. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH THE CURRENT TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
4. NO OPEN TRENCHES SHALL BE LEFT WHILE WORKERS NOT PRESENT.
5. CONTRACTOR SHALL COORDINATE WATERLINE SHUTDOWN WITH PUBLIC WORKS CONSTRUCTION INSPECTOR. ALL EXISTING VALVES ARE TO BE OPERATED BY CITY OF MESQUITE PERSONNEL ONLY.
6. ADJUSTMENT OF EXISTING WATER METERS, WATER VALVE STACKS AND MANHOLES SHALL BE COMPLETED AS NECESSARY TO ENSURE UTILITY APPURTENANCES ARE LEVEL WITH FINAL SURROUNDING GRADES.



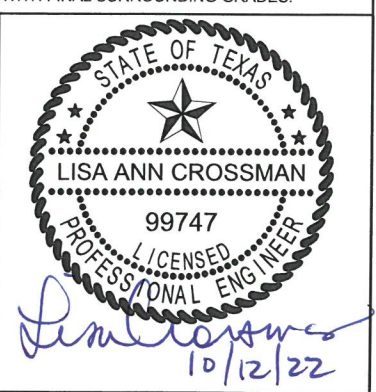
Public Works

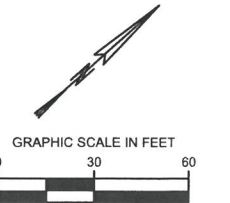
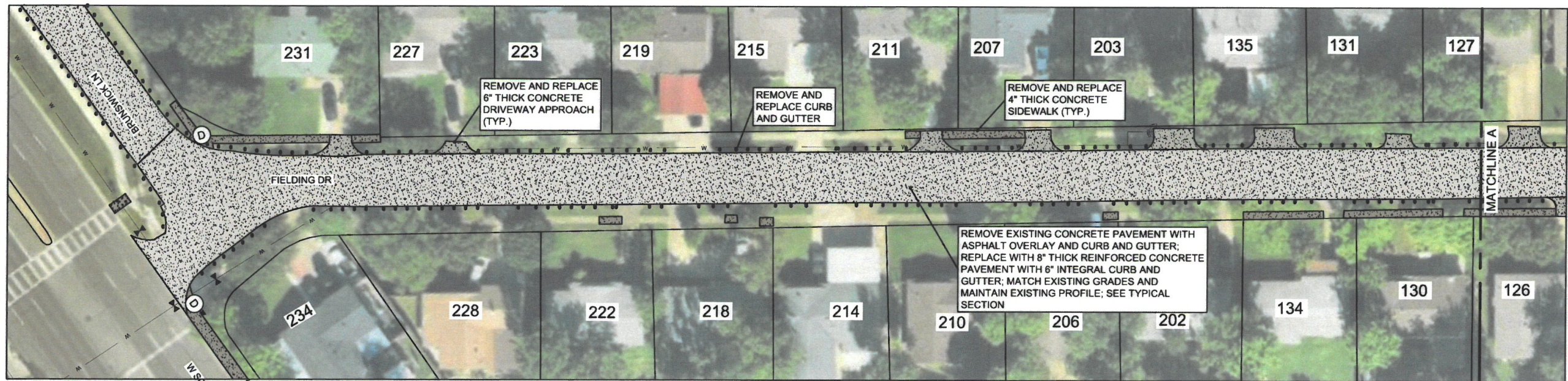
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

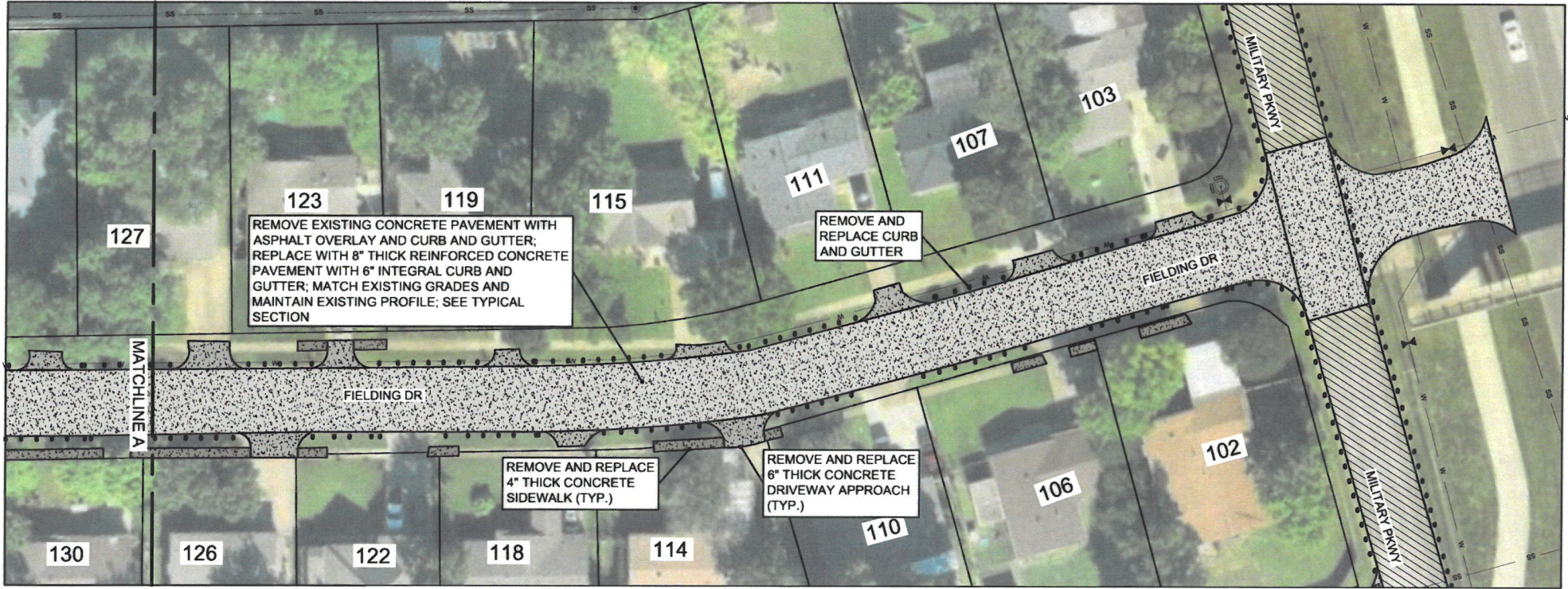
PAVING IMPROVEMENTS FOR BRUNSWICK LN

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 30 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)



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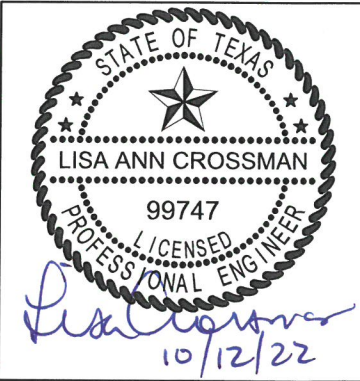
Public Works

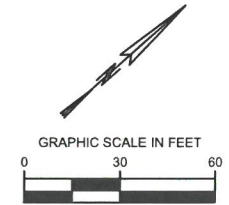
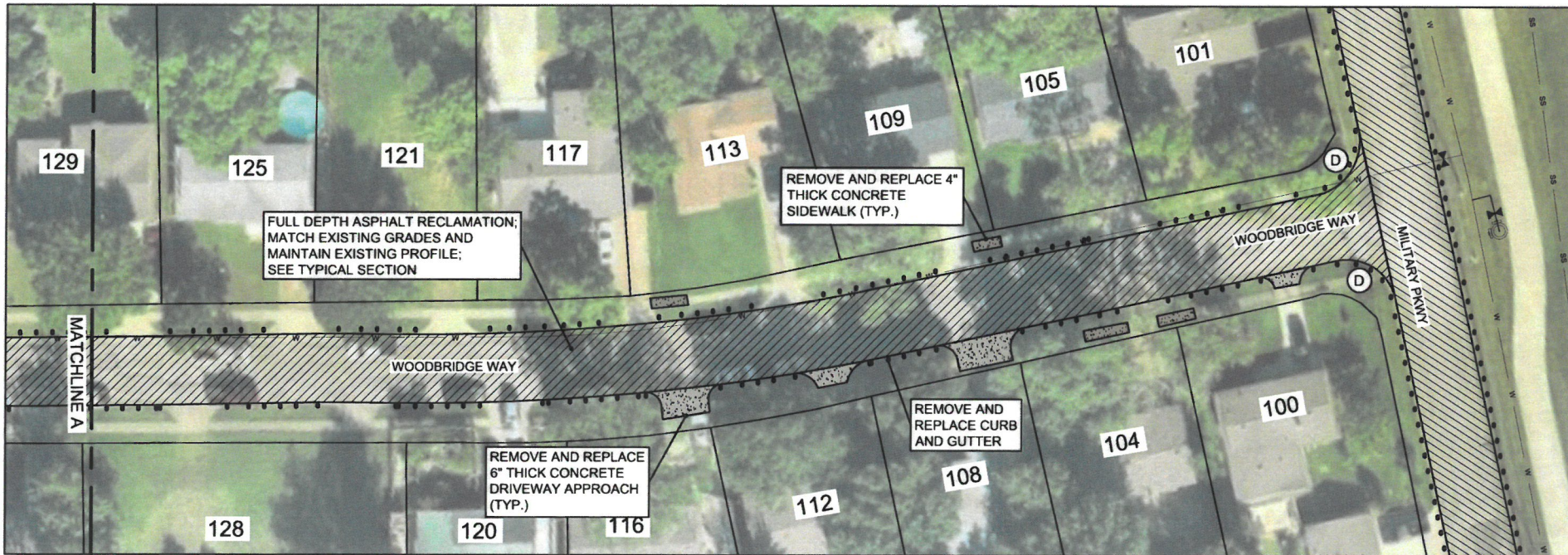
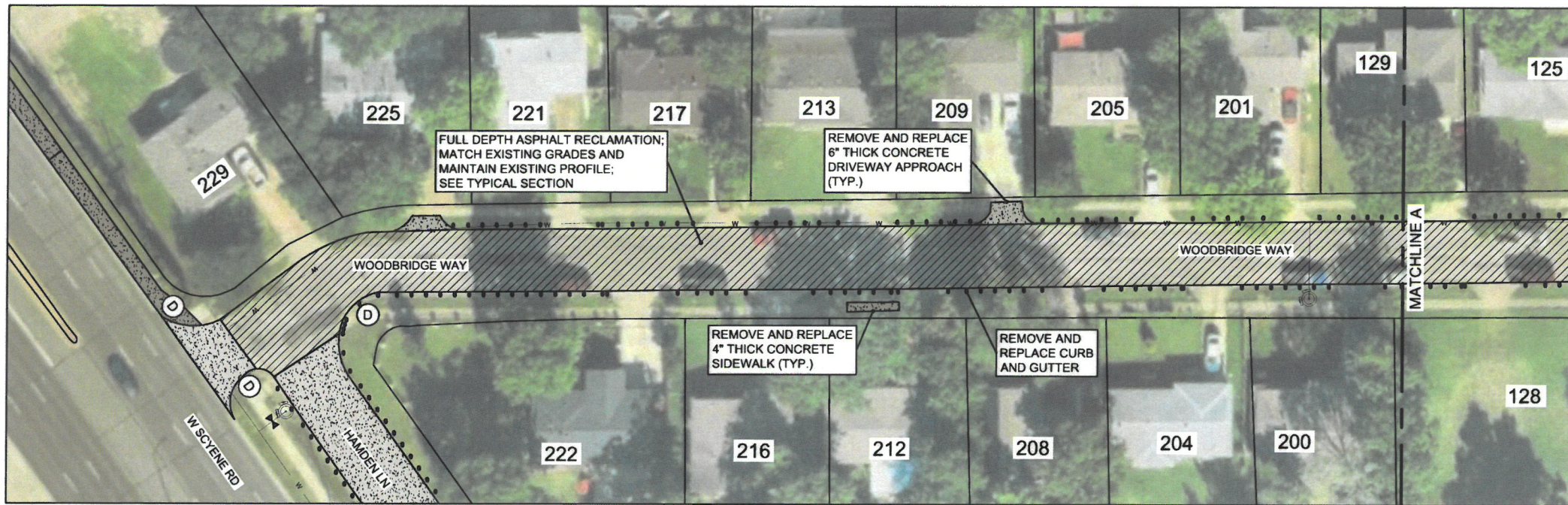
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






PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

PAVING IMPROVEMENTS FOR FIELDING DR

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 31 OF 43





-  SEWER MANHOLE
-  CLEAN OUT (C.O.)
-  STORM INLET
-  WATER METER
-  FIRE HYDRANT
-  WATER VALVE
-  EXISTING WATER LINE
-  WATER MAIN TO BE REPLACED
-  STORM LINE
-  SEWER LINE
-  SEWER LINE TO BE REPLACED
-  CURB AND GUTTER
-  REMOVE TREE
-  DRIVEWAY
-  SIDEWALK
-  CONCRETE PAVEMENT
-  ASPHALT
-  CURB RAMP (TYP.)

1. ALL LOCATIONS AND LIMITS SHOWN ARE APPROXIMATE. THE CITY OF MESQUITE CONSTRUCTION INSPECTOR WILL MARK REMOVAL LIMITS IN FIELD WHEN REQUESTED BY CONTRACTOR. CONTRACTOR SHALL FOLLOW MARKINGS IN FIELD ON EXACT LOCATIONS AND LIMITS.
2. ALL WORK SHALL COMPLY WITH CITY OF MESQUITE GENERAL DESIGN STANDARDS.
3. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH THE CURRENT TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
4. ADJUSTMENT OF EXISTING WATER METERS, WATER VALVE STACKS AND MANHOLES SHALL BE COMPLETED AS NECESSARY TO ENSURE UTILITY APPURTENANCES ARE LEVEL WITH FINAL SURROUNDING GRADES.



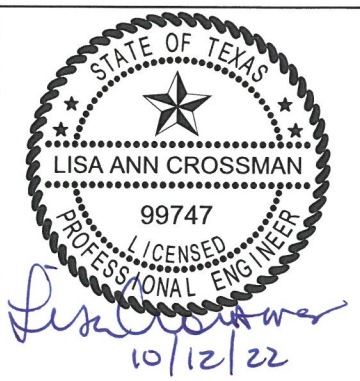
Public Works

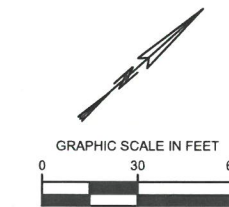
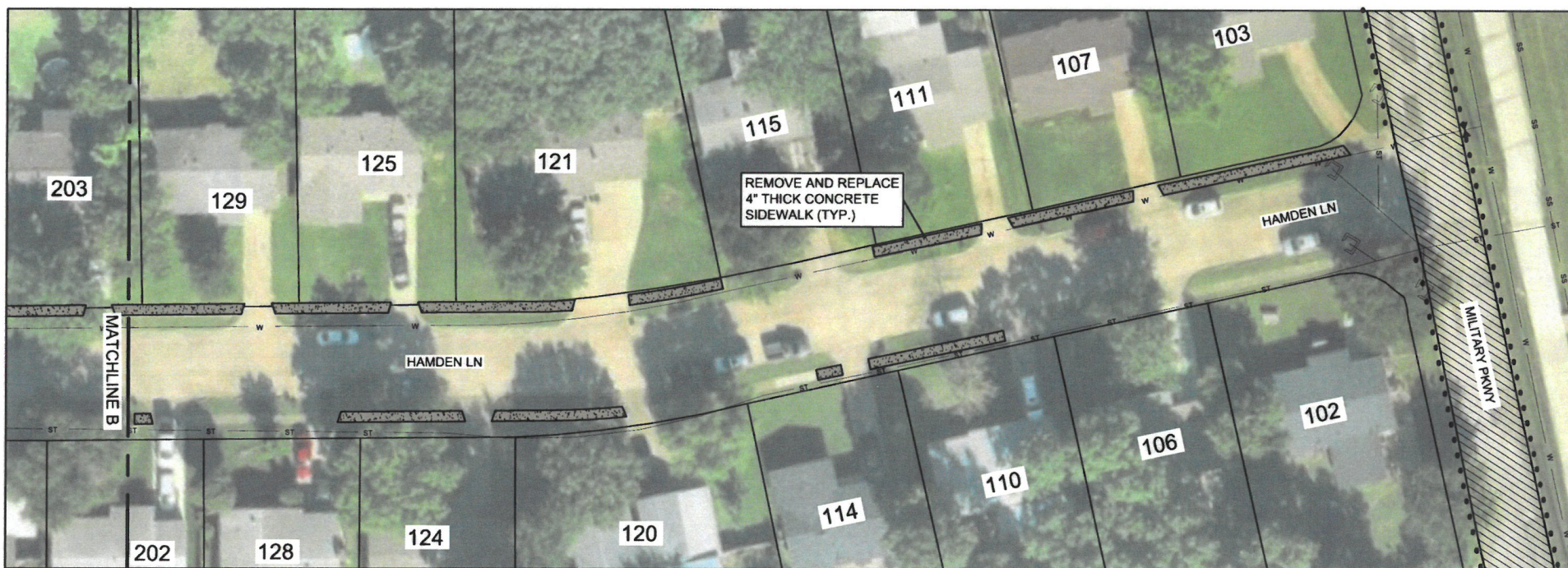
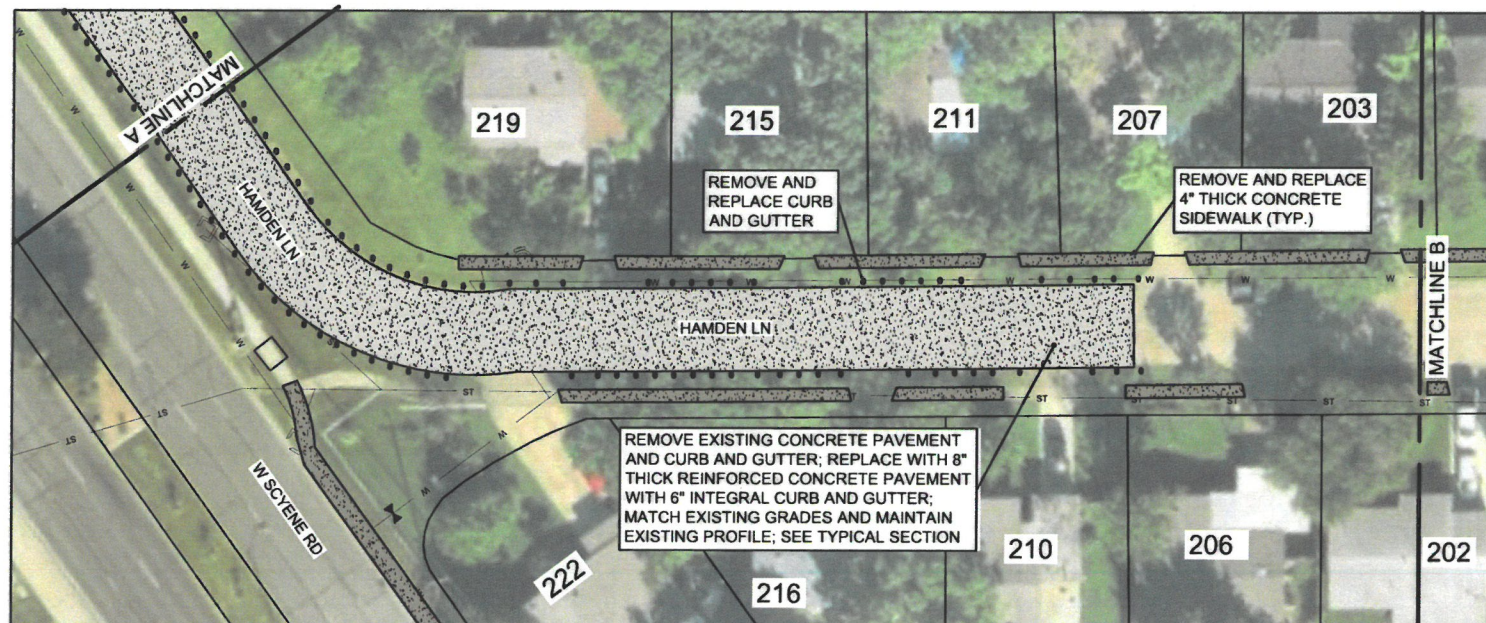
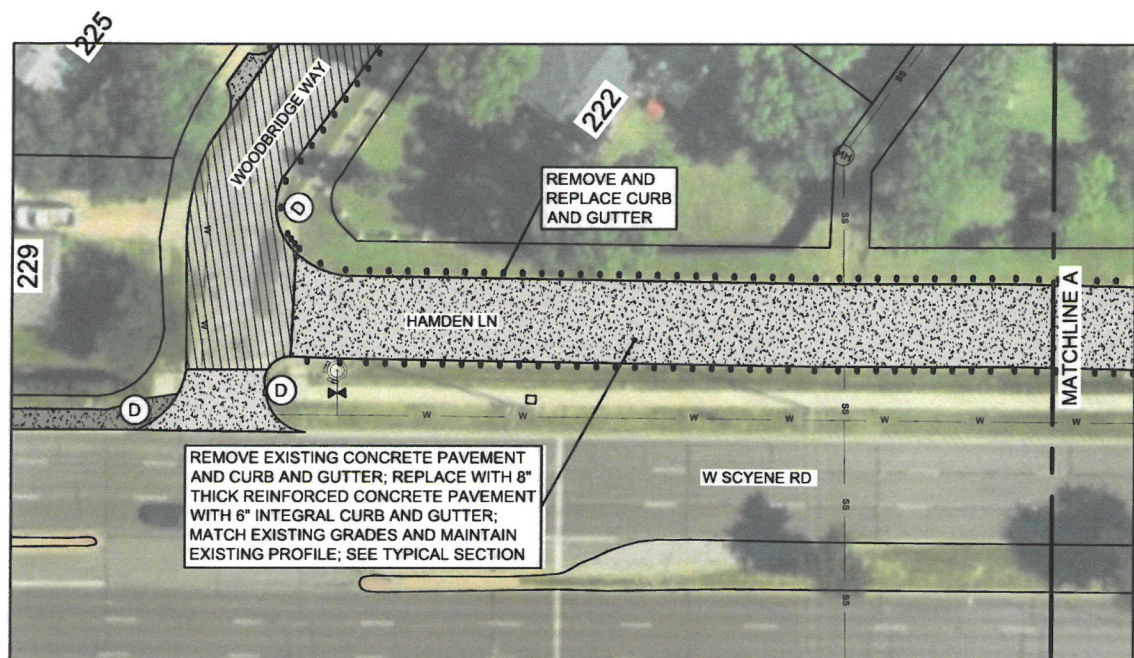
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

PAVING IMPROVEMENTS FOR WOODBRIDGE WAY

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 32 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)

1. ALL LOCATIONS AND LIMITS SHOWN ARE APPROXIMATE. THE CITY OF MESQUITE CONSTRUCTION INSPECTOR WILL MARK REMOVAL LIMITS IN FIELD WHEN REQUESTED BY CONTRACTOR. CONTRACTOR SHALL FOLLOW MARKINGS IN FIELD ON EXACT LOCATIONS AND LIMITS.
2. ALL WORK SHALL COMPLY WITH CITY OF MESQUITE GENERAL DESIGN STANDARDS.
3. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL IN ACCORDANCE WITH THE CURRENT TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
4. NO OPEN TRENCHES SHALL BE LEFT WHILE WORKERS NOT PRESENT.
5. CONTRACTOR SHALL COORDINATE WATERLINE SHUTDOWN WITH PUBLIC WORKS CONSTRUCTION INSPECTOR. ALL EXISTING VALVES ARE TO BE OPERATED BY CITY OF MESQUITE PERSONNEL ONLY.
6. ADJUSTMENT OF EXISTING WATER METERS, WATER VALVE STACKS AND MANHOLES SHALL BE COMPLETED AS NECESSARY TO ENSURE UTILITY APPURTENANCES ARE LEVEL WITH FINAL SURROUNDING GRADES.



Public Works

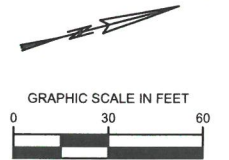
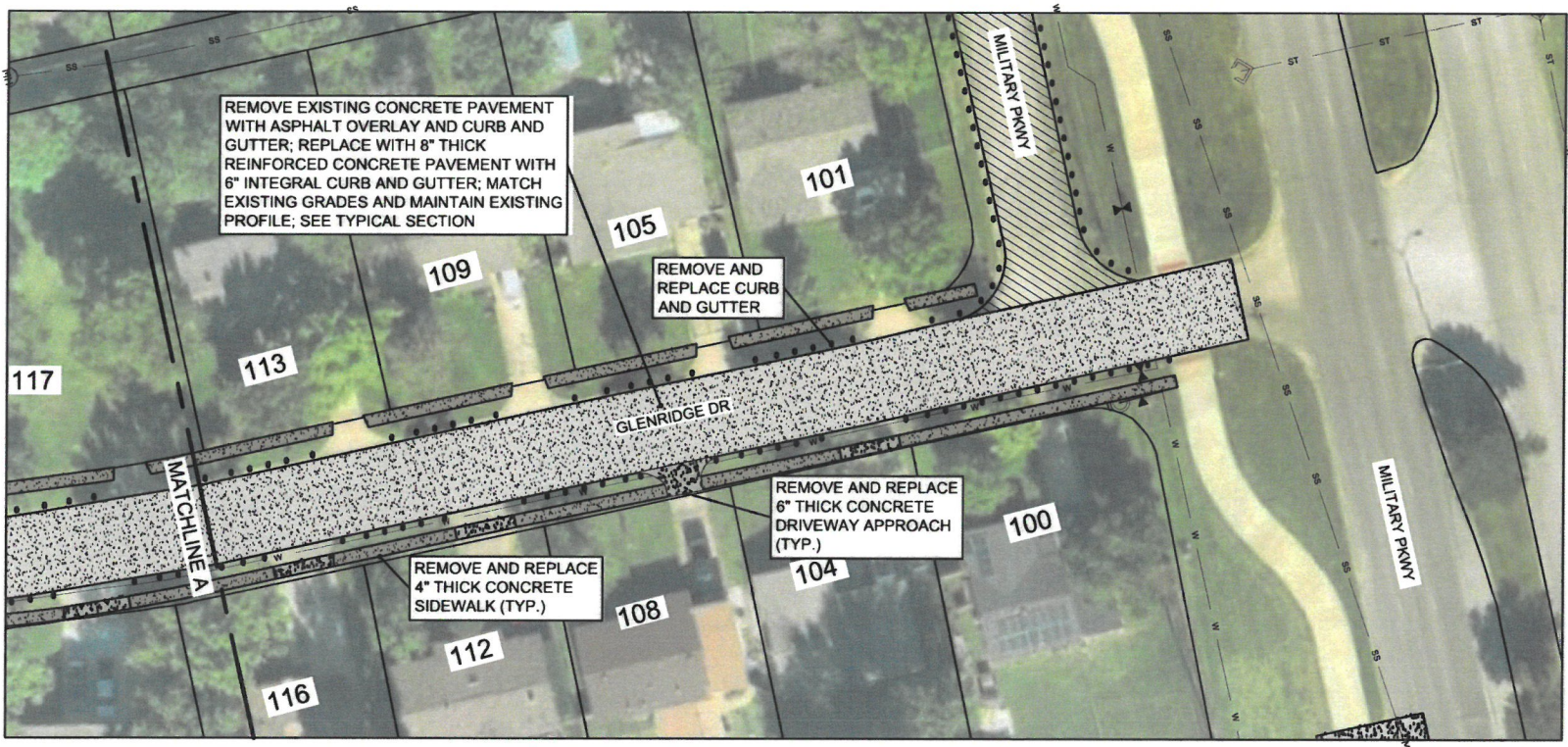
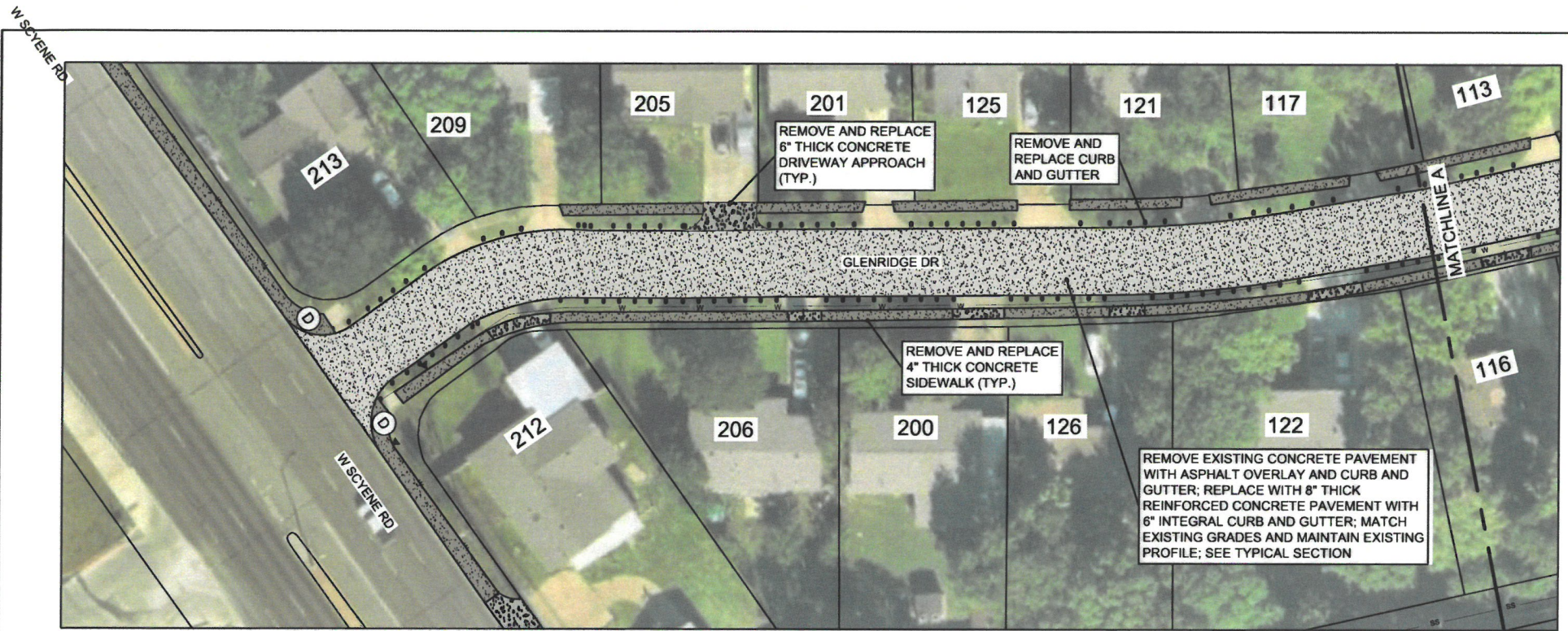
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PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

PAVING IMPROVEMENTS FOR
HAMDEN LN

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 33 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)

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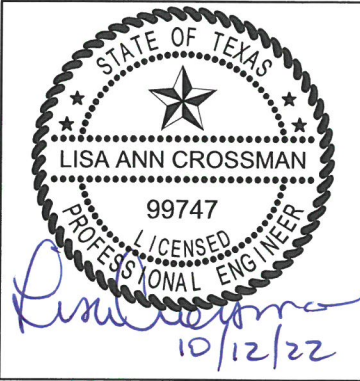
Public Works

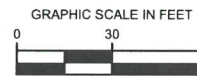
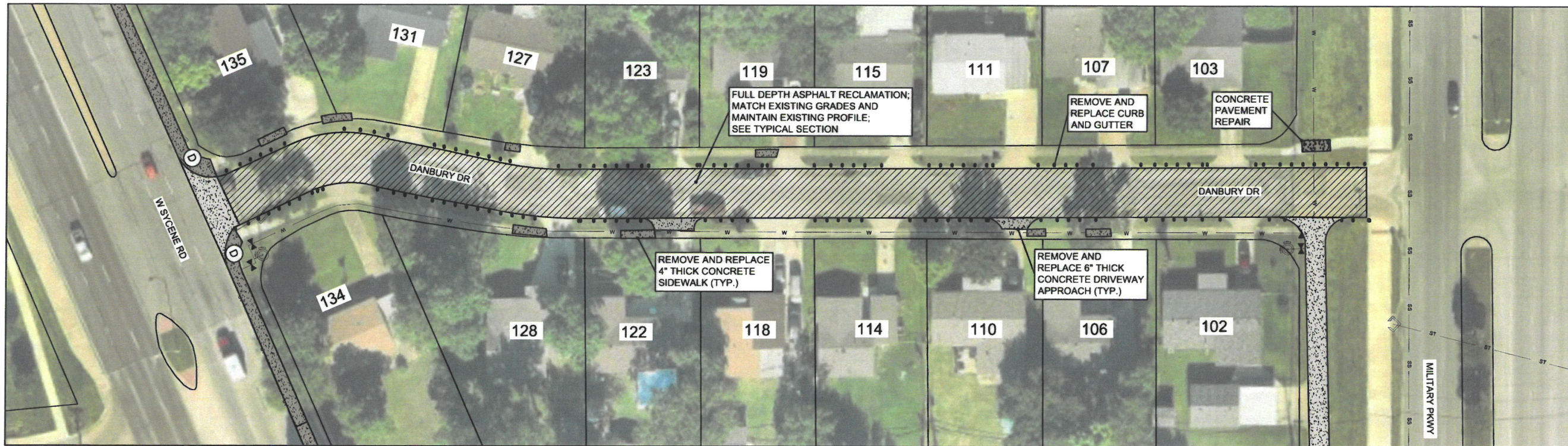
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**PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

PAVING IMPROVEMENTS FOR GLENRIDGE DR

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 34 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)

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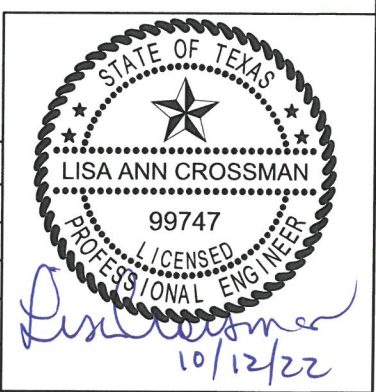
Public Works

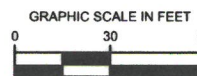
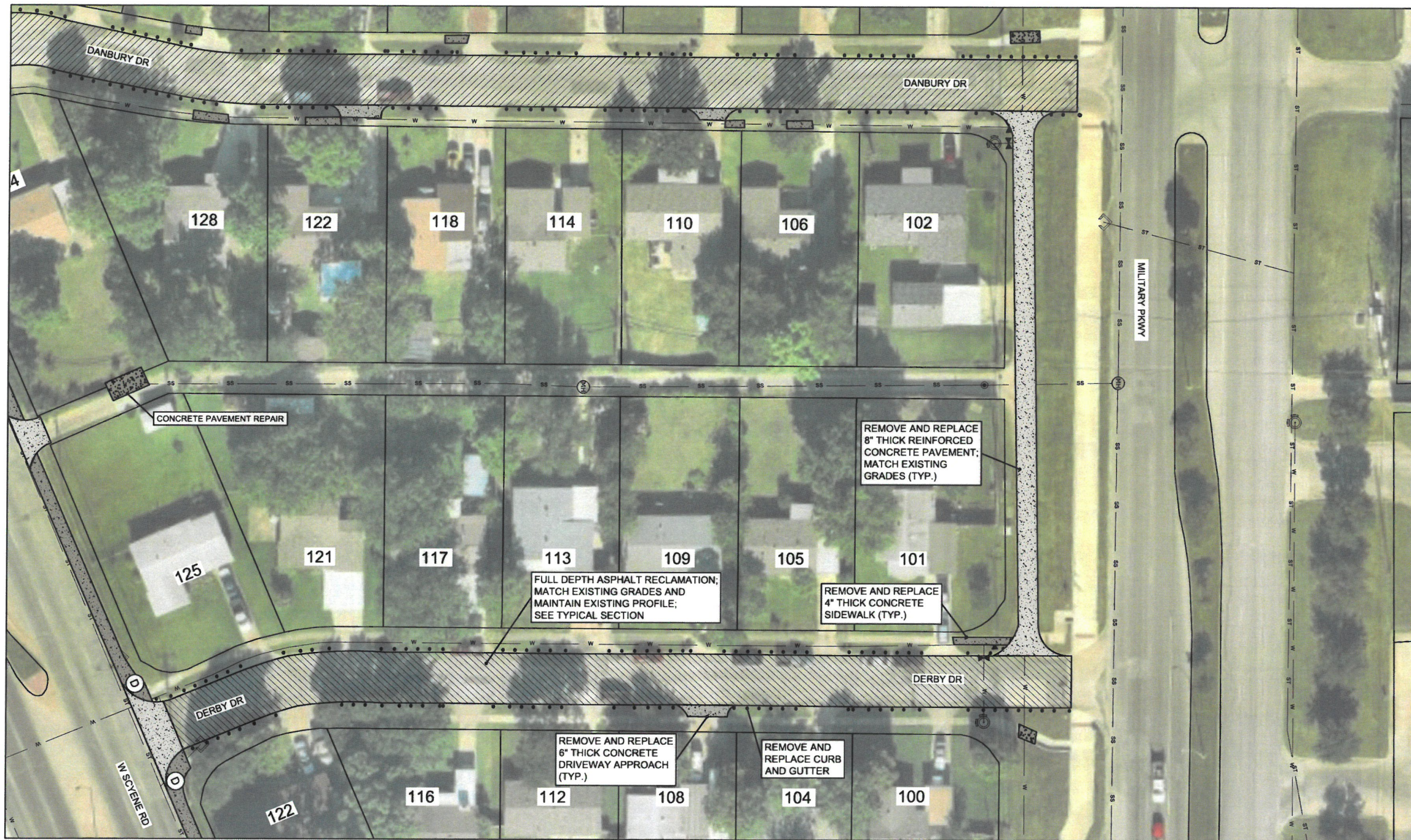
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**PAVING AND UTILITY IMPROVEMENTS
FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

**PAVING IMPROVEMENTS FOR
DANBURY DR**

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 35 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)

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Public Works

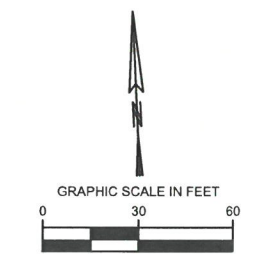
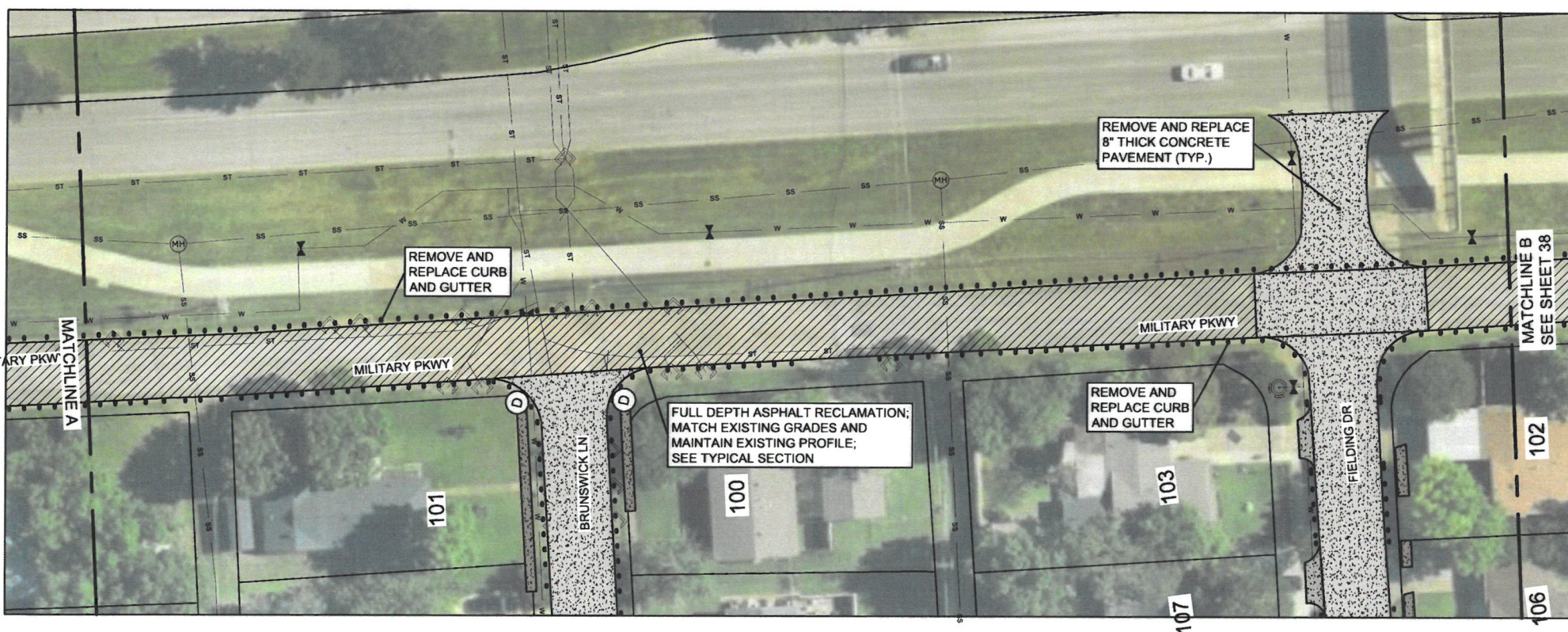
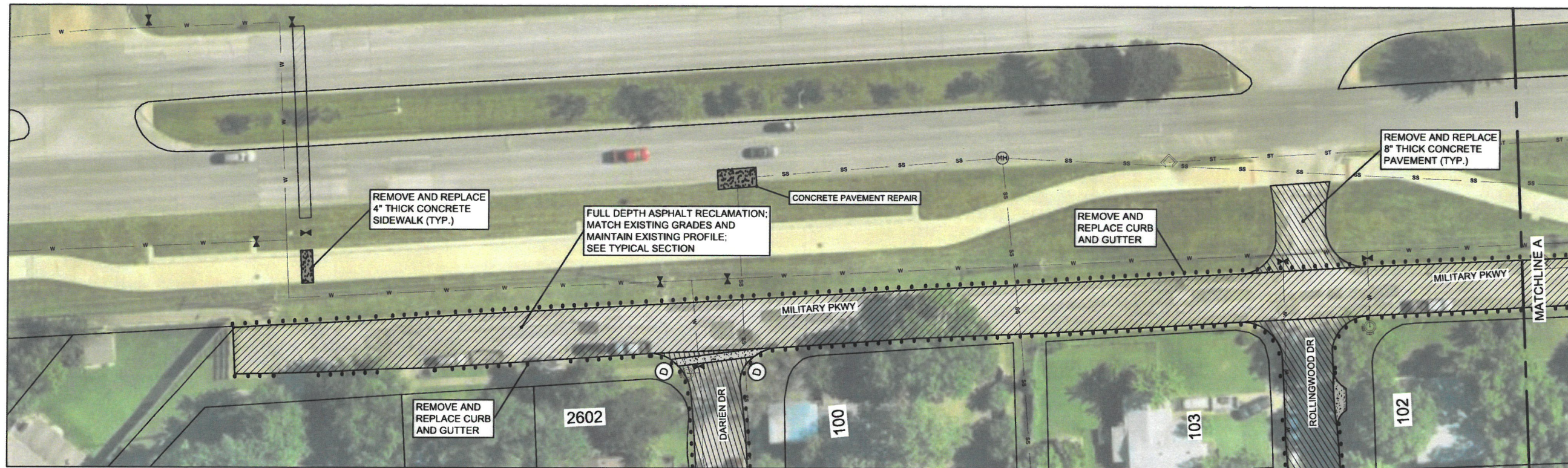
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PAVING AND UTILITY IMPROVEMENTS
FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

PAVING IMPROVEMENTS FOR
DERBY DR

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 36 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
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Public Works

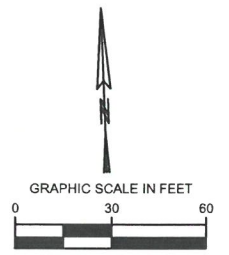
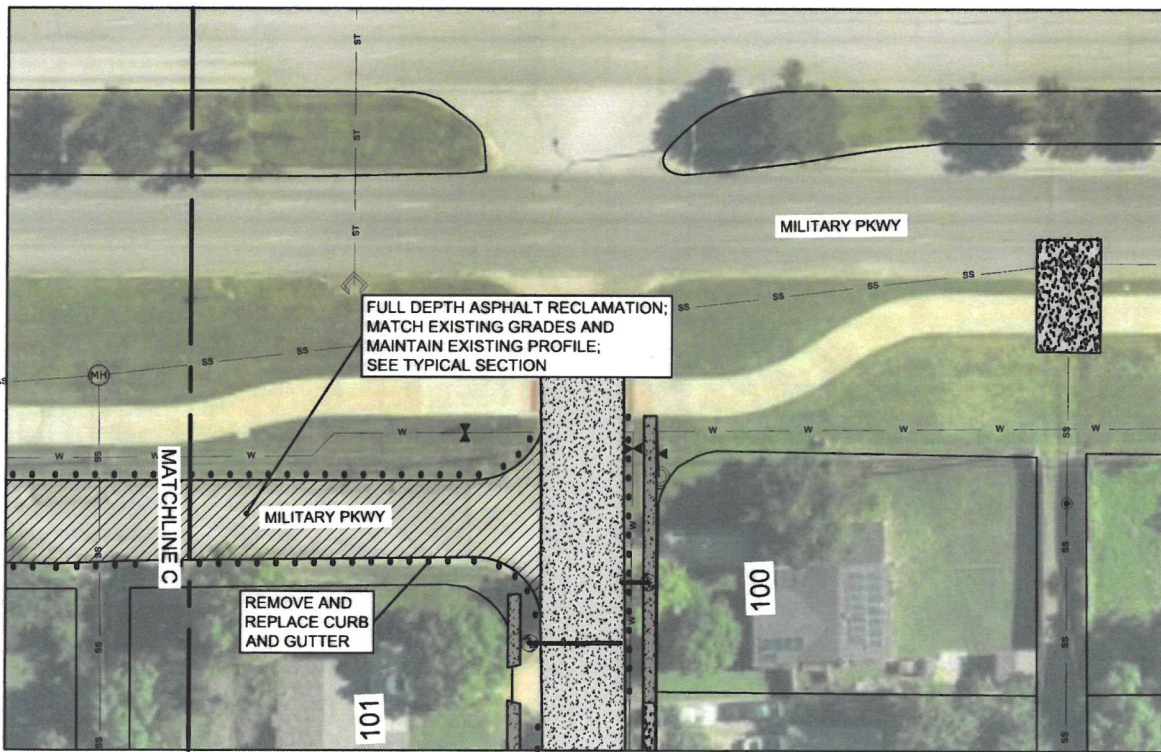
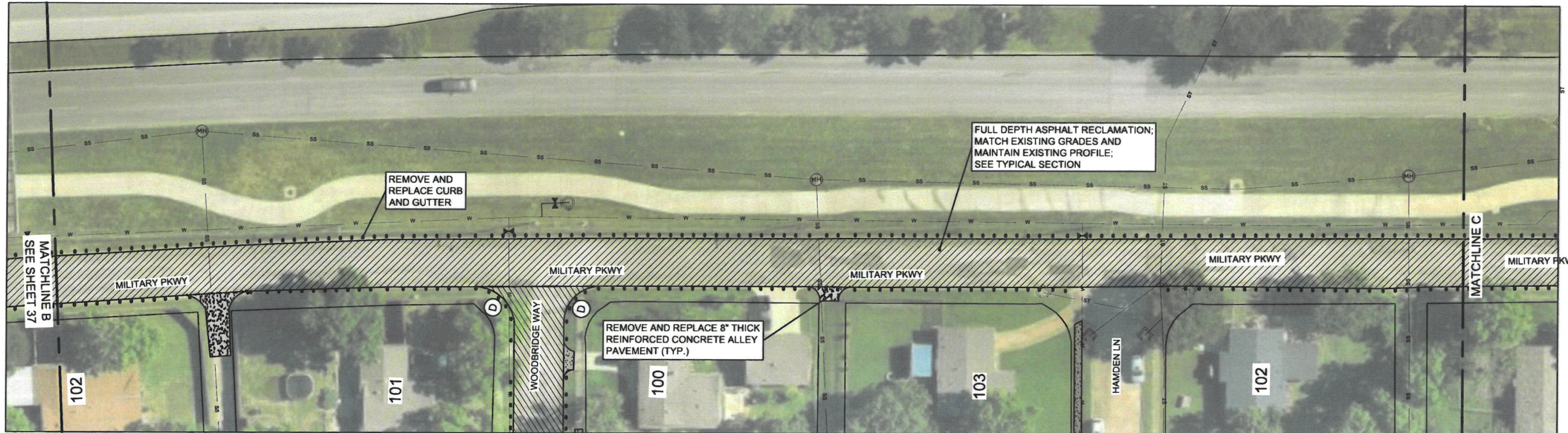
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**PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

PAVING IMPROVEMENTS FOR MILITARY PKWY-1

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 37 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
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- REMOVE TREE
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- SIDEWALK
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- ASPHALT
- CURB RAMP (TYP.)

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Public Works

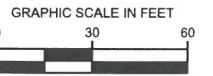
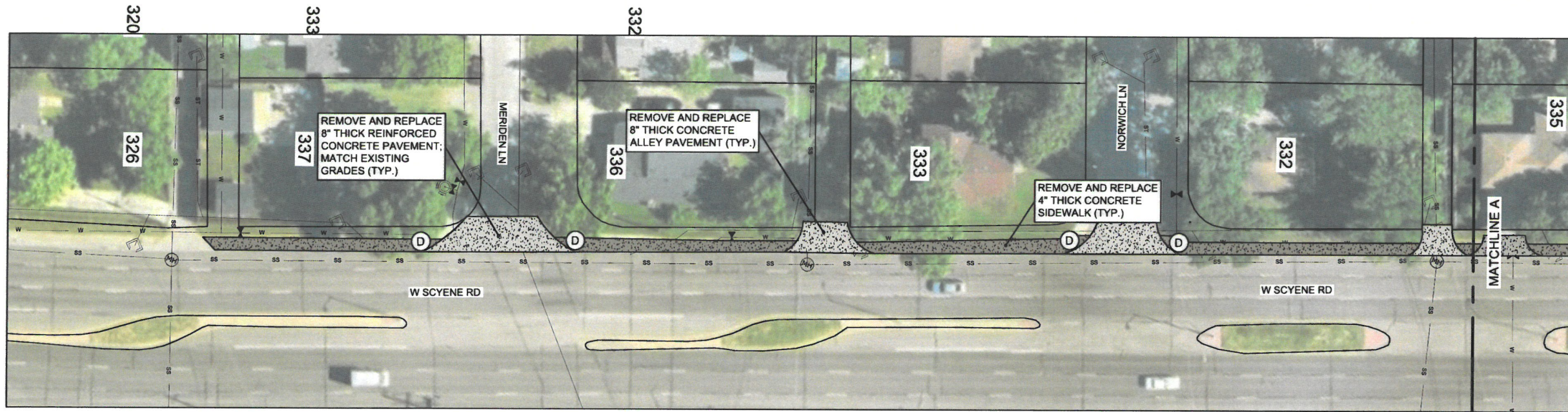
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PAVING AND UTILITY IMPROVEMENTS
FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

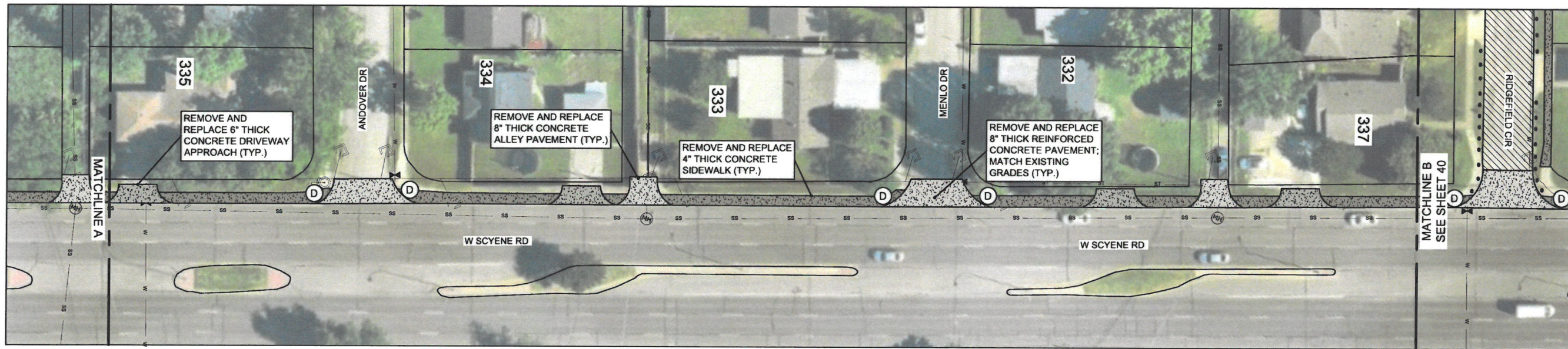
PAVING IMPROVEMENTS FOR
MILITARY PKWY-2

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 38 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
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- SEWER LINE TO BE REPLACED
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Public Works

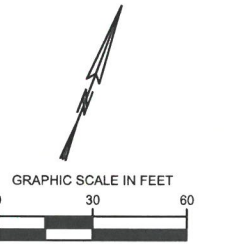
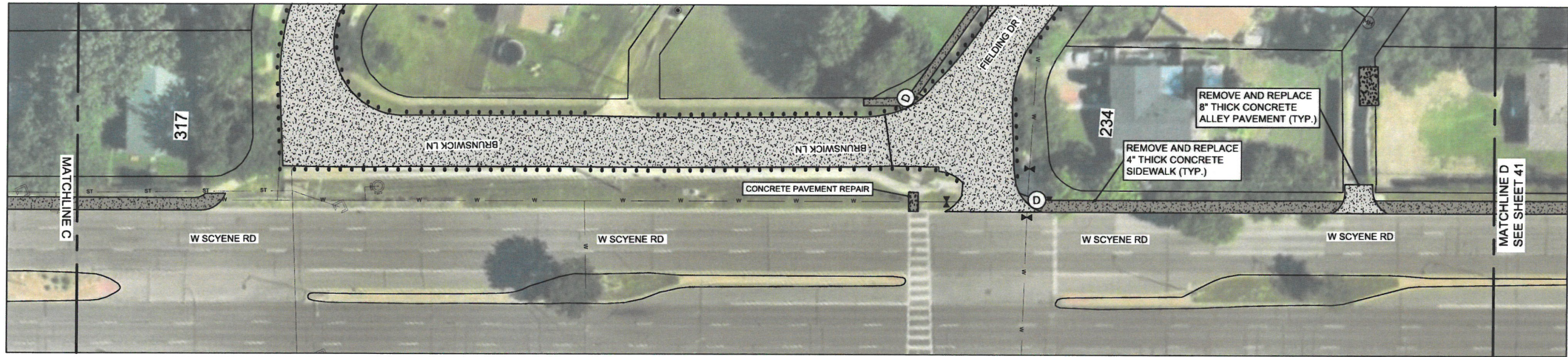
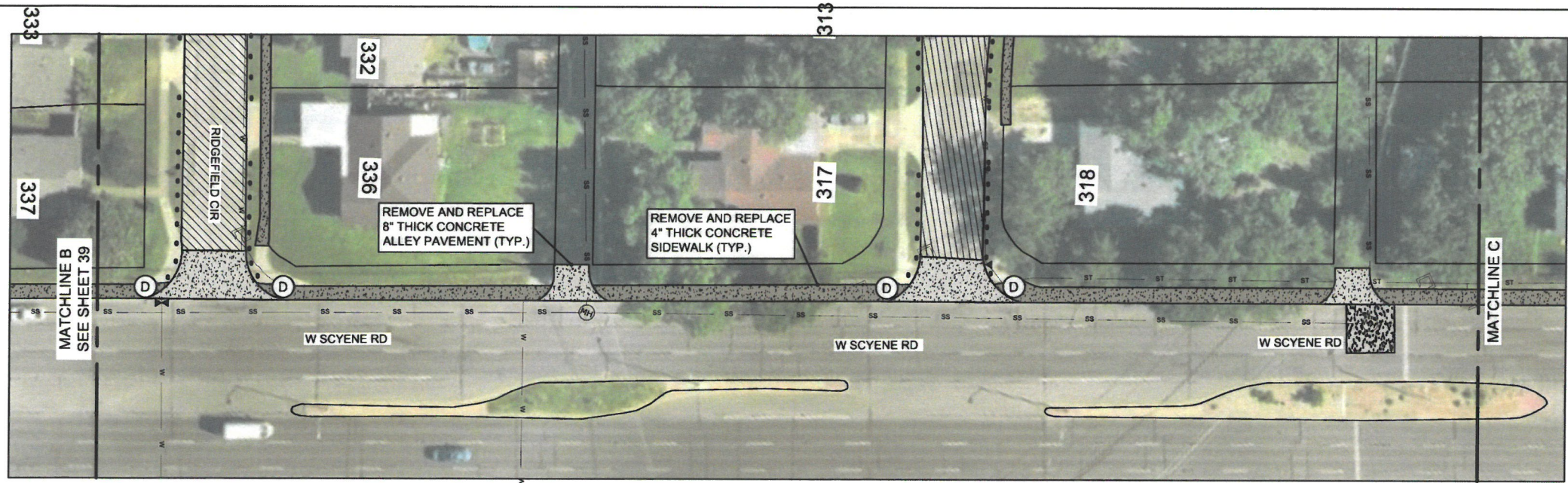
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**PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

PAVING IMPROVEMENTS FOR W SCYENE RD - 1

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 39 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
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- CURB RAMP (TYP.)

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Public Works

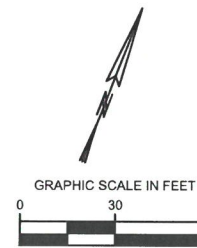
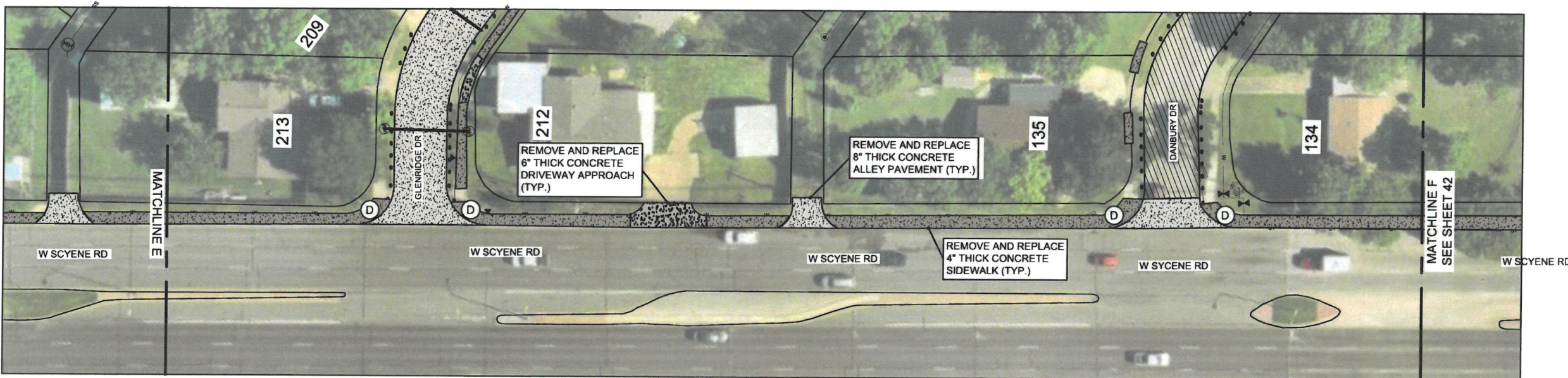
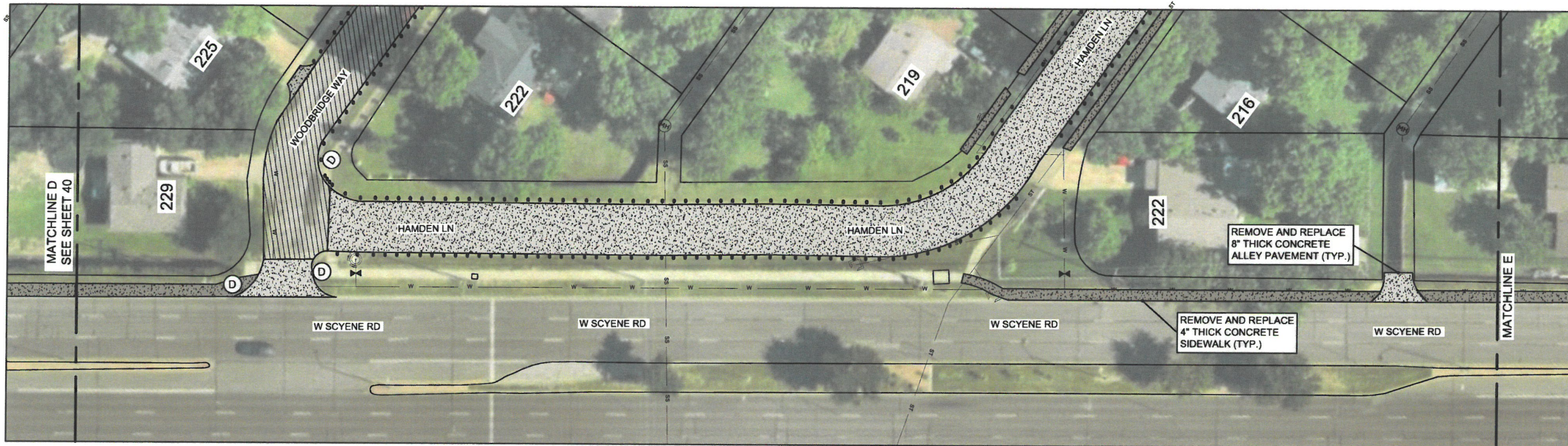
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**PAVING AND UTILITY IMPROVEMENTS FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

PAVING IMPROVEMENTS FOR
W SCYENE RD - 2

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 40 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
- CURB AND GUTTER
- REMOVE TREE
- DRIVEWAY
- SIDEWALK
- CONCRETE PAVEMENT
- ASPHALT
- CURB RAMP (TYP.)

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Public Works

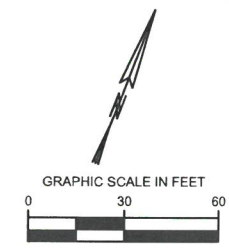
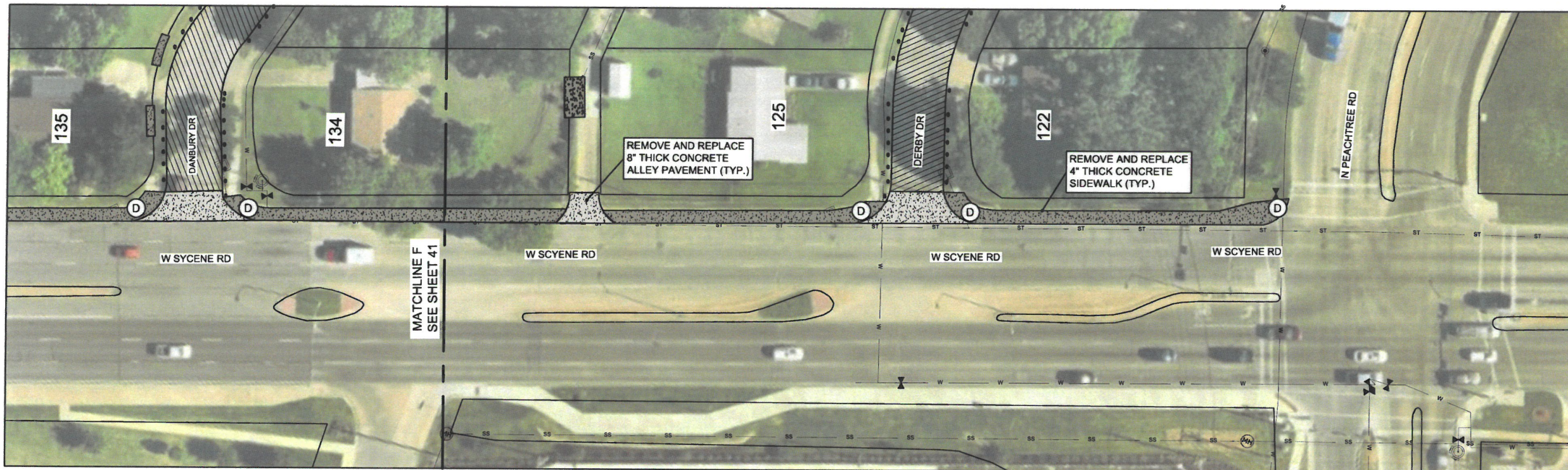
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**PAVING AND UTILITY IMPROVEMENTS
FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007**

PAVING IMPROVEMENTS FOR
W SCYENE RD - 3

REVISIONS	
SCALE: 1" = 60'	DRAWN BY: AK
DATE: OCT 2022	SHEET: 41 OF 43





- SEWER MANHOLE
- CLEAN OUT (C.O.)
- STORM INLET
- WATER METER
- FIRE HYDRANT
- WATER VALVE
- EXISTING WATER LINE
- WATER MAIN TO BE REPLACED
- STORM LINE
- SEWER LINE
- SEWER LINE TO BE REPLACED
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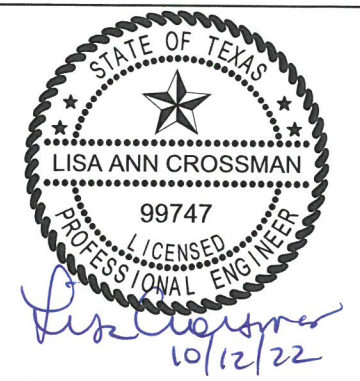
Public Works

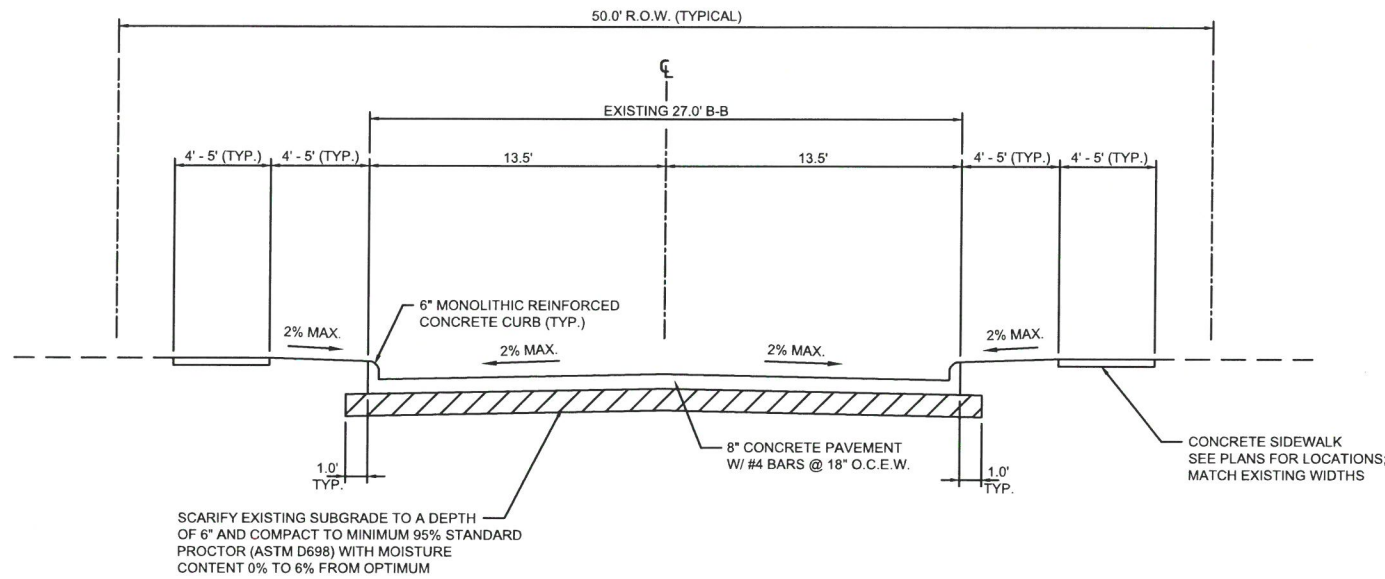
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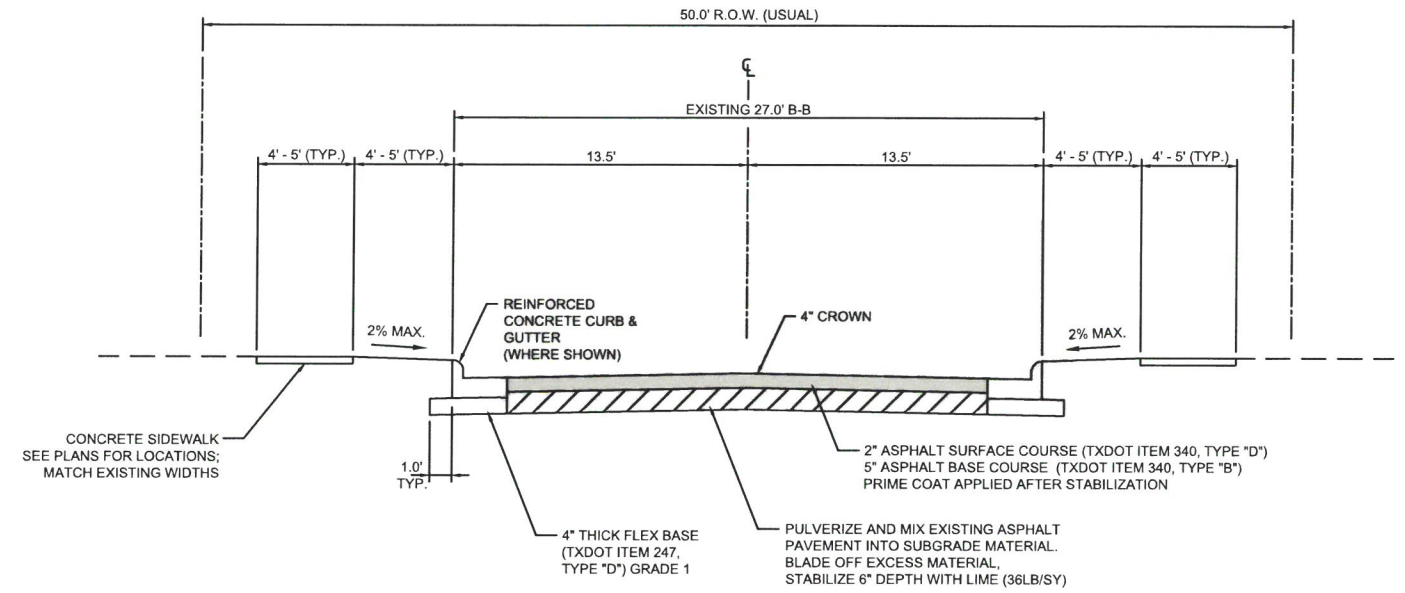
PAVING IMPROVEMENTS FOR
W SCYENE RD - 4

REVISIONS	
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TYPICAL SECTION
NEW CONCRETE SECTION



TYPICAL SECTION
RECLAIMED ASPHALT SECTION



Public Works

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PAVING AND UTILITY IMPROVEMENTS
FOR ROLLINGWOOD HILLS SUBDIVISION
CITY CONTRACT # 2023-007

REVISIONS

SCALE: 1" = 60'

DRAWN BY: AK

DATE: OCT 2022

SHEET: 43 OF 43



GENERAL NOTES FOR WATER MAINS AND RELATED APPURTENANCES:
1. GENERAL:

- 1.1. All water system improvements in the City of Mesquite, both privately and publicly maintained shall be designed and constructed in accordance with the City of Mesquite Engineering Design Standards.
- 1.2. All water system design and construction shall conform to the current Texas Commission on Environmental Quality (TCEQ) regulations. These regulations can be found in the Texas Administrative Code (TAC), Title 30, Chapter 290, Subchapter D - (Rules and Regulations for Public Water Systems).
- 1.3. All water system design, construction and materials shall conform to current American Water Works Association (AWWA) standards.
- 1.4. All materials that will come into contact with potable water must be approved for use under National Sanitation Foundation (NSF) Standard 61 (Drinking Water System Components - Health Effects)
- 1.5. Water systems shall be designed to comply with the latest City adopted version of the International Fire Code with adopted City amendments.
- 1.6. Water systems shall be designed to comply with the current Insurance Services Office (ISO) Fire Suppression Rating Schedule (edition 02-03) - Section 600 - Water Supply.

2. GENERAL INSTALLATION

- 2.1. All components of the water system (pipe, valves, fittings, restraints, blocking, services, and appurtenances) shall be designed for 200 psi working pressure and an AASHTO HS-20 live load except where loading conditions could exceed HS-20 live load limits in which case the City Engineer shall specify the appropriate design load.
- 2.2. Minimum Cover: Water mains with a nominal diameter less than 14-inches shall have a minimum cover of 42" and water mains with a nominal diameter 14" or greater shall have a minimum cover of 60-inches, unless otherwise approved by the City Engineer.
- 2.3. Utility Clearance: Water mains and sanitary sewer mains shall have a minimum clearance of nine (9) feet. If this clearance cannot be maintained, TCEQ alternate requirements shall be met.
- 2.4. Water mains are generally placed to be centered under the back of curb, unless otherwise approved by the City Engineer.
- 2.5. Storm Sewer Inlets shall be staked prior to water main placement so that the water main can be gradually deflected around and below the proposed inlets or other obstructions or conflicts in alignment. The Contractor shall stake the location of the back of curbs to ensure no valves fall within a curb.
- 2.6. Warning Tape: Warning tape shall be installed 24 inches above the top of pipe or as otherwise directed by the City Engineer. The tape shall be a plastic, high stretch, 4-inch wide tape approved by the City Engineer. The tape shall be blue in color and have the words "Caution - Water Main Buried Below" imprinted on the tape.
- 2.7. Grading Operations: The Contractor shall complete all fill and cut operations in accordance with released engineering plans prior to installing any utilities (i.e. water, sanitary sewer, drainage).
- 2.8. The Contractor shall not operate any valves in the existing water system nor operate any new valves that would allow connection to the City water system. The Contractor shall coordinate and notify the City Public Works Construction Inspector 48-hours in advance to schedule a shut-down of the existing water system by City personnel. The City may require a night or weekend shut-down in order to maintain customer service.
- 2.9. Temporary Fire Hydrant Meters: The City of Mesquite requires portable fire hydrant meters for temporary and/or construction water use at construction sites. They are routinely used to account for water usage prior to installation of a permanent water meter. These meters have a backflow prevention device attached. The City requires support for this device to prevent excessive torque when attached to a fire hydrant. The City requires payment for each meter. An invoice for water use is rendered each month. Arrangements for portable fire hydrant meters are administered by the City of Mesquite Water & Sewer Accounting Division at 757 N. Galloway Avenue. Please coordinate meter usage through the Utilities Division - Meter Services Section.

3. MATERIALS

- 3.1. Bolts and nuts for all fittings shall be stainless steel Grade 304 or 316 or ASTM A325 Type 3 Enhanced Corrosion Resistant steel. Stainless steel all-thread may be used in some applications with the approval of the City Engineer.
- 3.2. All fittings shall be mechanically restrained using restrained fittings as shown on the City of Mesquite Approved Water Materials List and meeting requirements of ASTM F1674 (PVC) or U.L. Standard 194 (Ductile Iron). Restraint gland and body and wedge components shall be ductile iron material. For pipe diameters 12" or greater, waterline plan shall show length of joints to be restrained on each side of fittings. For pipe diameters less than 12", all joints within 15-feet of fitting shall be restrained.
- 3.3. Concrete Blocking: All fittings, valves, hydrants, etc. shall be blocked with 2,000 p.s.i. concrete, 4-sack minimum cement content. All blocking shall be poured to avoid nuts and bolts to allow easy access for maintenance. Excessive blocking shall not be allowed and shall be removed at the contractor's expense. Sizing and construction of blocking shall be as shown in standard drawings 4010A to 4040 of the North Central Texas Council of Governments Public Works Construction Standards, Fourth Edition (October 2004).
- 3.4. Polyethylene Tube Wrap: All cast and ductile iron pipe, fittings and valves shall be wrapped with polyethylene tube wrap in accordance with AWWA C105. The polyethylene wrap must be blue in color. The wrap shall be installed in accordance with AWWA C105, Method A.

4. VALVES

- 4.1. Location: Valves shall be anchored to adjacent fittings at Tee and Cross fittings and on fire hydrant leads. Valves shall not be used at the dead end of mains as a plug. Contractors generally do not wish to pressure test against an old valve that may leak, therefore new mains shall start with a valve and end with a plug.
- 4.2. Location Marking: Valves located within a right-of-way shall be indicated on the face of the curb, or where curbs do not exist, on a conspicuous location adjacent to the valve location. Markings are to be the cutting of a four (4) inch high and 1/8" deep letter "V" with the point of the "V" pointing towards the valve location. The "V" shall be cut into the curb or paving using an approved motor driven concrete saw. The completed cut and valve riser lids shall receive a coating of blue paint if a main line valve or red if a fire hydrant valve. Contractor shall coat the interior, and exterior of the cut to a width of one (1) inch.
- 4.3. Joint Restraint: All valves shall be mechanically restrained per Section 3.2. Bolts and Nuts for all fittings shall be ASTM A325 Type 3 Enhanced Corrosion Resistant steel, or stainless steel A151 304 or 316.
- 4.4. Three-piece adjustable valve boxes: Adjustable valve boxes shall be furnished and set on each valve in accordance with the appropriate General Design Standards and the City of Mesquite Approved Water Materials List. After the final clean up and alignment has been completed, the Contractor shall cast in place a concrete block, 2-foot x 2-foot x 4-inch around all valve box tops at the finish grade.

5. TAPPING SLEEVES AND VALVES

- 5.1. Wet connections to existing water mains (6-inch through 12-inch in size), shall be made with a tapping sleeve and valve. EXCEPTION: In some cases where the size of the tap approaches the size of the main, as judged by the City Engineer, the use of a cut-in sleeve and tee will be required. Both the tapping sleeve and valve shall be rated for a minimum 200 psi service pressure.
- 5.2. Prior to tapping, all tapping sleeves and valves shall be air tested at 120 psi for three (3) minutes, with no pressure loss.
- 5.3. Tapping is to be accomplished with no interruption of service. Facilities shall be provided for proper dewatering and for disposal of water removed from the water mains and excavations without damage to adjacent property. Special care shall be taken to prevent contamination of the existing potable water line when dewatering, cutting, and making connections with existing pipe. No trench water, mud, or other contaminating substances shall be permitted to enter the existing lines. The interior of all tapping sleeves, tapping machine cutter assemblies, and tapping gate valves installed in such connections, and the surface of the existing pipe at these connections, shall be thoroughly cleaned and then swabbed with a solution having a chlorine content of 200 milligrams per liter.

6. FIRE HYDRANTS

- 6.1. Fire hydrants shall be located to minimize interference with driveways and shall be located with sufficient clearance from drive and street radii to prevent the fire hydrant from being struck if a vehicle jumps the curb and/or takes a wide turn. Hydrants shall not be placed in intersection radii or other locations with a high probability of being damaged by traffic. A 3-foot clear space shall be maintained around the circumference of fire hydrants except as otherwise required or approved.
- 6.2. Mid-block fire hydrants shall be located on property lines (extended) to minimize interference with drives and on-street parking. Hydrants shall be placed 2-feet to 10-feet from the back of curb and shall not interfere with sidewalks, driveways, etc. Hydrants shall be placed so the bury mark is at ground or paving level. Mounding of the ground or paving shall not be allowed to achieve this requirement. No more than one extension of 18 inches maximum will be allowed for grade adjustment. Hydrants shall have a barrel length of 4-feet to 6-feet unless approved by the City Engineer. All hydrants shall be surrounded by a 2 to 9 feet long x 3-feet wide x 4-inch thick concrete pad with 3,600 psi, 6 sack concrete and #4 reinforcing bars on 18" centers both ways placed to anchor the hydrant and to provide a splash pad between the hydrant and the curb for flushing operations.
- 6.4. Installation: Installation shall be of a type as detailed in these standards. All fire hydrant leads shall be from an MJ to Flanged tee and all valves and fittings from the tee to hydrant shall be flanged.

- 6.5. Out of Service: If a fire hydrant is out of service, for any reason, the contractor shall bag the fire hydrant with a black trash bag secured with duct tape and report hydrant to the Utility Dispatch office with the reason why it is out of service. This includes, but is not limited to, hydrants that are out of service for the following reasons:

- 6.5.1. Water main valved-off and being abandoned but connected hydrant is not yet removed.
- 6.5.2. New hydrant recently installed but not yet ready for service
- 6.5.3. Hydrant temporarily out of service due to main shut down
- 6.6. Fire Hydrant Markers: The contractor shall place a Stemsolite Model 88-SSA blue fire hydrant marker in the street adjacent to the hydrant. The marker shall be located perpendicular to the curb, at the center of the driving lane closest to the fire hydrant. The marker shall be installed with a two part epoxy adhesive per manufacturer's instructions.
- 6.7. Fire Hydrant Painting (color coding): All fire hydrants are to be painted with a base coat consisting of two (2) coats of aluminum paint as specified below. Refer to City of Mesquite Approved Water Materials List for approved paint. When a color code other than aluminum is required, the top bonnet (from operating nut to underneath the uppermost flange) shall be painted two coats of the appropriate color in accordance with the following color code. Nozzle caps are not to be color-coded.
- 6.7.1. Base undercoat: Two (2) coats of aluminum paint are required as a base coat on all hydrants.
- 6.7.2. Overcoats: Two (2) additional coats of paint are required over the base coat. The colors shall conform as follows:

MAIN SIZE	COLOR
6 INCHES	ALUMINUM - TOP & BOTTOM
8 INCHES	BLUE TOP - ALUMINUM BOTTOM
10 INCHES OR LARGER	YELLOW TOP - ALUMINUM BOTTOM

7. SERVICES AND METERS

- 7.1. Meter and Service Location: Meters and services must be located within R.O.W. or easements in accordance with City approved plans and details. In residential developments, residential water meters and services are generally placed at the center of the lot in the grassed parkway. Water meters shall not be located in proposed driveways, sidewalks, parking lots or other paved areas. For narrow lots or front entry lots, the designer must design the location of the meters to make sure they are placed in an unpaved area. Meters in conflict with this requirement will be relocated by the developer/builder at their expense. In non-residential developments, water meters shall be located in unpaved islands. Meters should be set so that the meter face is 6-inches to 10-inches below finished grade.
- 7.2. All PEX-A water service lines shall be in accordance with ASTM F876 and AWWA C904 and the following procedures:
 - 7.2.1. For installation under a non-residential street, service line shall be installed with detectable tracing wire. Detectable tracing wire shall be a minimum 12 gauge with HDPE coating.
 - 7.2.2. A Plastic insert stiffener shall be used at all fittings.
- 7.3. All water services shall be continuous from the corporation valve at the water main to the angle meter valve in the meter box (No Couplings). Service line shall be "goose necked", crimping or excessive bending of the service line shall not be allowed. Service lines shall be continuous and shall have no fittings under any paving, unless approved by the City Engineer. Long copper service lines that exceed the length of standard rolls of copper may be spliced in unpaved areas with a silver solder coupling. When installing a water main the Contractor shall furnish and install new meter boxes. Service lines shall be poly-wrapped for the first 5-feet of copper service from the main. Water services shall have a minimum depth under paving of 36-inches (measured from surface of paving).
- 7.4. All service connections to the main for services 2" or smaller shall be made with service saddles.
- 7.5. A water meter box with locking lid shall be furnished and installed by the Contractor after paving and fine grading is complete. When installing a water main, new meter boxes shall be furnished, installed and connected to the main. Meters larger than 2-inches in size shall be furnished and installed by the Contractor in concrete vaults in accordance with City details.
- 7.6. Each individual service location shall be marked on the face of the curb with a 4-inch high and 1/8" deep scribe mark "I" cut in the curb using an approved motor driven concrete saw. The scribe mark "I" shall receive a coating of blue paint, which shall coat the interior and exterior of the cut to a width of 1-inch.

8. WATER SYSTEM INSTALLATION

- 8.1. Excavation: Excavation in general, shall be made in open cut from the surface of the ground and shall be no greater in width and depth than is necessary to permit the proper construction of the work. When the trench depth exceeds five (5) feet, see Standard Procedures Section 12.2 regarding "Trench Safety" requirements. The amount of trench excavation to grade shall not exceed 100 (one hundred) feet from the end of the pipe laying operations and no excavation shall be 300 (three hundred) feet in advance of the completed pipe operations (includes backfilling). At the end of the workday, all trench excavation shall be backfilled. Any landscaping and irrigation system within the City medians and right-of-ways that are disturbed, removed, or damaged during construction shall be replaced to original condition or better by a licensed irrigator.
- 8.2. Minimum bury depth: Minimum bury depth shall be forty-two (42) inches from finished grade to the top of the pipe, unless otherwise directed by the City Engineer.
- 8.3. Sanitation: The inside of all pipe and fittings shall be kept clean during installation. The City Engineer may require swabbing or pigging of all new pipe if the pipe is installed in an unsanitary manner. See Section 11 TESTING PROCEDURES for more information.
- 8.4. Lifting Straps: All water pipe, valves, fire hydrants, and fittings shall be installed by the use of lifting straps. The use of chains is prohibited.
- 8.5. Backfill and Compaction: For trenches not under paving, final backfill material shall be from the trench excavation placed in a maximum of 12 inch loose lifts and compacted to 95% of Standard Proctor Density (ASTM D698) at a moisture range of 0% to plus 6% of optimum moisture. Under existing or proposed paving (public/private sidewalks, streets, alleys, driveways, etc.), backfill shall be crushed concrete flexible base (TxDOT, Item 247, Grade 1, Type D) compacted to 95% of Standard Proctor Density (ASTM D698) at a moisture range of 0% to plus 6% of optimum moisture unless alternate material is approved by the City Engineer. The contractor shall take new proctors at each change in soil type. Water jetting will not be allowed for any trench.

9. TESTING PROCEDURES

- 9.1. Notification of Testing: The Contractor shall hire an independent testing lab, subject to the approval of the City Engineer, for all material and acceptance testing at Contractors Expense. The Contractor shall notify the assigned City Public Works Construction Inspector of all density testing 24 hours prior to the scheduled test. Copies of all test reports shall be sent to the Public Works Inspector for review and acceptance and inclusion in the City project file. Projects will not receive City acceptance until all test results are complete and satisfactory.
- 9.2. Compaction of Trenches and Excavations: Density tests shall be performed at a frequency of one test per lift, per 300 linear feet of trench (including services) at locations specified by the City Public Works Construction Inspector. All nuclear gauge density tests shall be performed per ASTM D2922.
- 9.3. Pressure Testing and Disinfecting Water Mains: The purpose of this specification is to define the minimum requirements for the pressure testing and disinfection of water mains, including the preparation of water mains, hydrostatic tests, flushing, application of chlorine, and sampling for the presence of coliform bacteria. Water mains, services and fire sprinkler systems shall be flushed and disinfected per the following requirements and in accordance with AWWA C651 "Disinfecting Water Mains".
- 9.4. Connection to Existing Water System: Water required to fill the new main for hydrostatic pressure testing, disinfection, and flushing shall be supplied through a temporary connection between the distribution system and the new main. The temporary connection shall include an appropriate cross-connection control device and shall be disconnected during the hydrostatic pressure test. As an alternate, a connection to the existing distribution system is permitted provided a new valve is placed at the connection point. Do not test against an existing valve in the existing system.
- 9.5. General Procedures and Precautions Taken During Construction:
 - 9.5.1. Inspect materials prior to installation to ensure their cleanliness and integrity.
 - 9.5.2. Keep interior of pipe dry and clean during storage and installation. Prevent contaminants from entering the water main during storage and construction.
 - 9.5.3. If dirt enters the pipe during storage or installation, it shall be removed and the interior surface swabbed with a 1 to 5 percent hypochlorite disinfecting solution.
 - 9.5.4. During construction openings in the pipe shall be closed with a watertight plug when pipe laying is stopped at the close of each day's work or for other reasons such as rest breaks and meals to prevent contaminants and animals from entering pipe.
 - 9.5.5. Remove, by flushing or other means, those materials that may have entered the water main.
 - 9.5.6. Chlorinating any residual contamination that may remain, and flushing the chlorinated water from the main.
 - 9.5.7. Protecting the existing distribution system from backflow caused by hydrostatic test and disinfection procedure.
 - 9.5.8. Documenting that an adequate level of chlorine contacted each pipe to provide disinfection.

- 9.5.9. Once the contractor has been notified by the City Public Works Construction Inspector of a successfully (negative result) laboratory bacteriological testing result, the contractor can make connection of the approved new water main to the active distribution system.
- 9.6. Hydrostatic (Pressure) Test: All water mains, fittings and services shall be tested with a hydraulic test pressure of not less than 200 psi over a period of not less than 2 hours. The allowable leakage, in gallons of (one pipe or less), shall be calculated per the following equation:

$$\frac{\text{ALLOWABLE LEAKAGE} \times 2.31}{D} = 148,000$$

D = DIAMETER OF PIPE (IN)

- 9.6.1. For a two hour pressure test at a pressure of 200 psi. If the tests indicate a leakage in excess of the acceptable rate, the Contractor shall be required to find and repair the leak. Even if the test requirements are met, all apparent leaks shall be repaired and stopped.
- 9.6.2. The hydrostatic pump shall be connected to a system where the amount of leakage can be determined by measurement or gauge. The 200-psi pressure shall be maintained at the highest point of the main being tested over the entire 2-hour test period. The leakage shall be determined by comparing the quantity of water in the measuring system at the beginning of the test and quantity of water at the end of the test. The difference in these quantities shall be the leakage. An alternate method is to add water to the measuring system during the test. At the end of the 2-hour test, the quantity of water added shall be the leakage.

9.7. Flushing and Pigging the Main Prior to Disinfection / Chlorination

- 9.7.1. Flushing Method: Before the main is chlorinated, it shall be filled to eliminate air pockets and flushed to remove particulates. The flushing velocity in the main shall not be less than 3 ft/sec. Below is the required flow and openings needed to flush pipelines with a pressure of 40 psi

M	FLOW (GPM)	1" TAP	1.5" TAP	2" TAP	2.5" HYDRANT OUTLET
4"	120	1			1
6"	260		1		1
8"	470		2		1
10"	730		3	2	1
12"	1060			3	2
16"	1880			5	2

9.7.2. Pigging Method:

- 9.7.2.1. Pigging is accomplished by passing an appropriate sized pig through the pipe. A pig is a bullet-shaped, flexible sponge available in different sizes, densities, and degrees of roughness. All mains 12-inch and larger must be pigged prior to flushing and disinfection with chlorine.
- 9.7.2.2. The pig shall be inserted in the new conduit at the location where the new conduit is connected to the active distribution system.
- 9.7.2.3. Where expulsion of the pig is required through a dead-ended conduit, the Contractor shall make every effort to prevent back flow of the purged water into the conduit after passage of the pig. Backwater re-entry into the pipe can be prevented by the temporary installation of mechanical joint bends and pipe joints to provide a riser out of the trench.
- 9.7.2.4. After passage of the pig, flushing of all backwater from the pipe, and satisfactory test results, the Contractor shall secure the test location openings and then proceed with disinfection.

9.8. Disinfection (Chlorination):

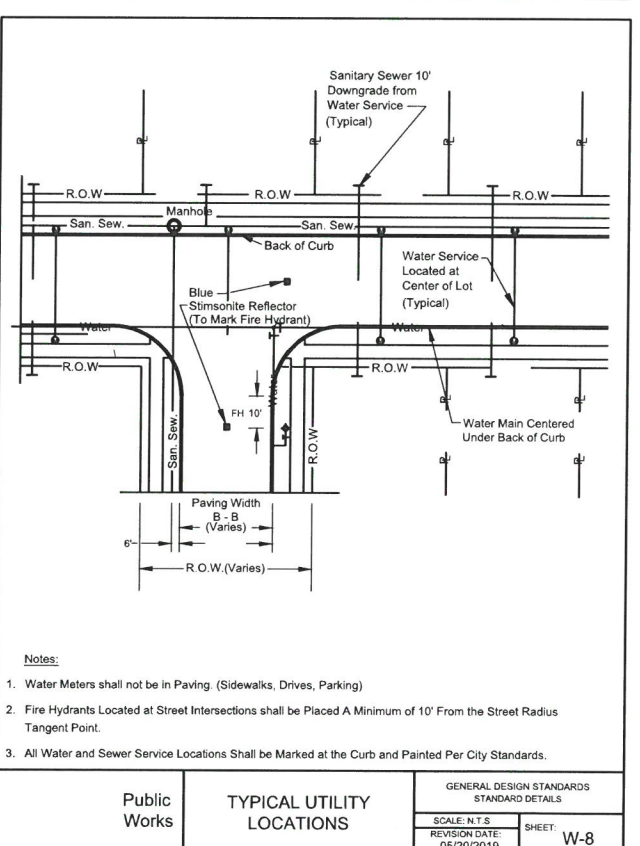
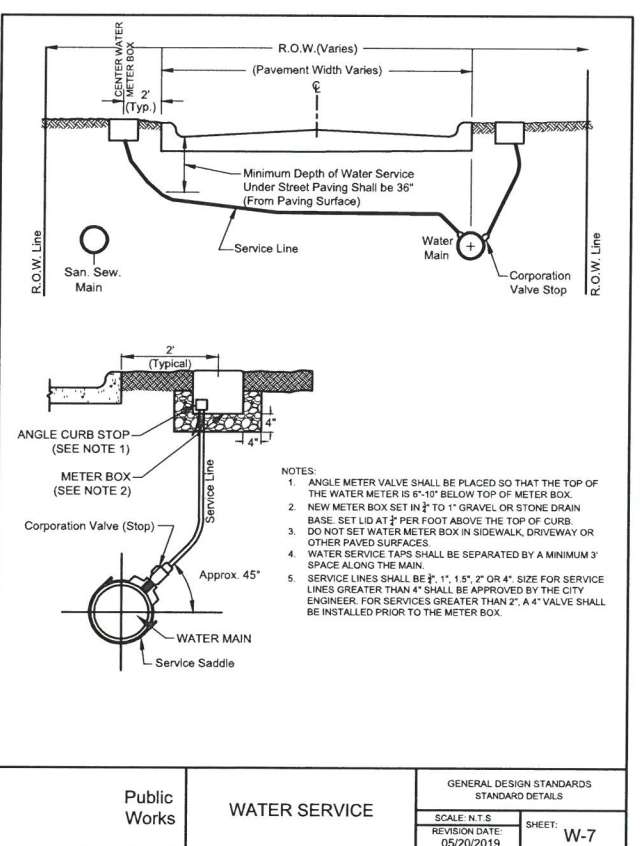
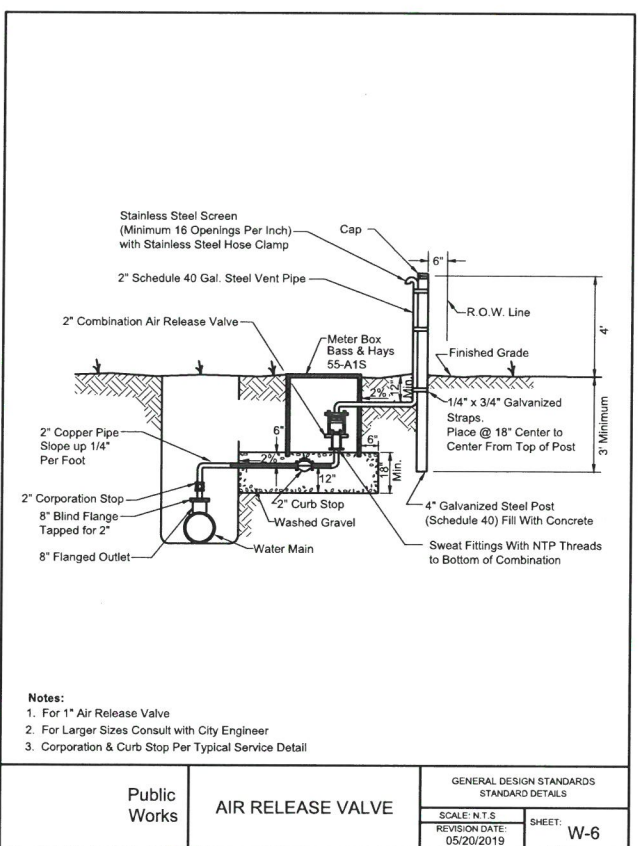
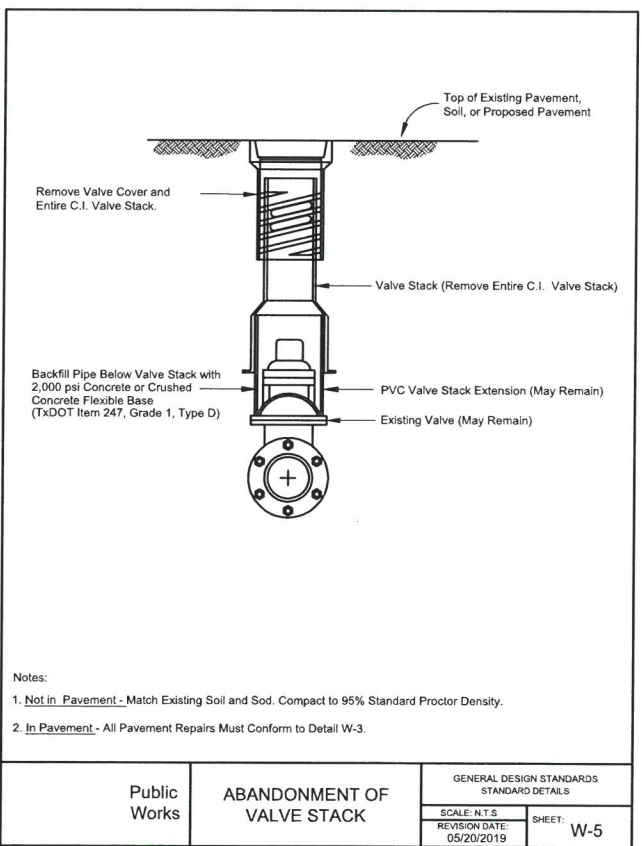
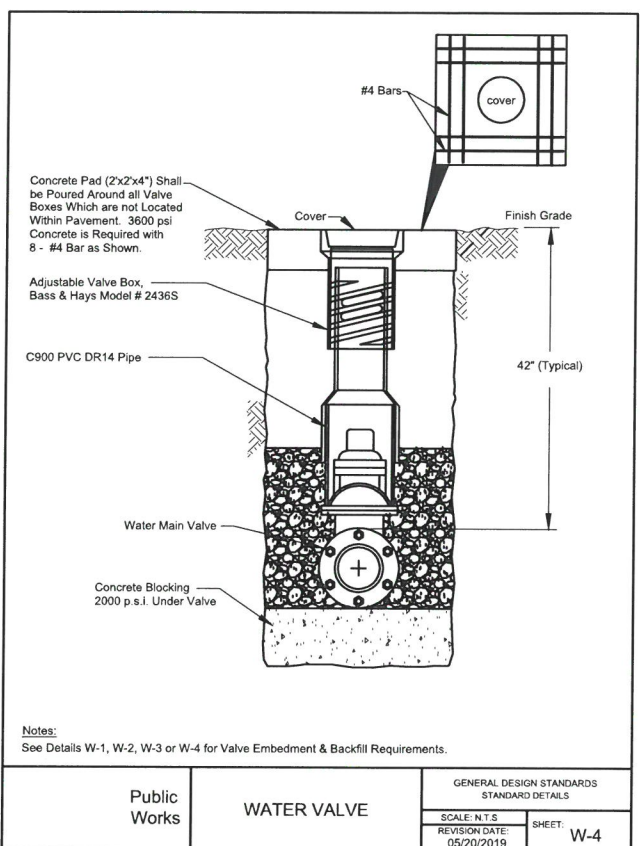
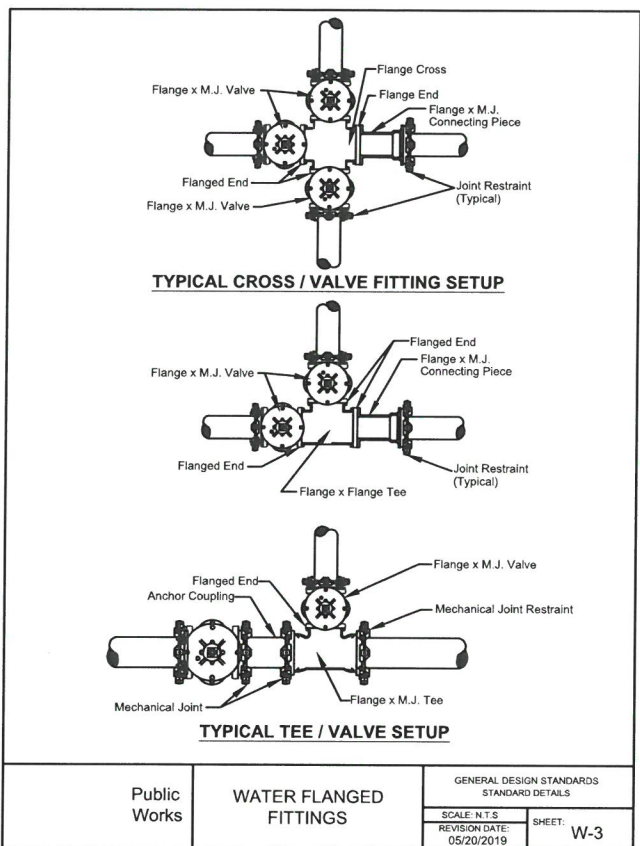
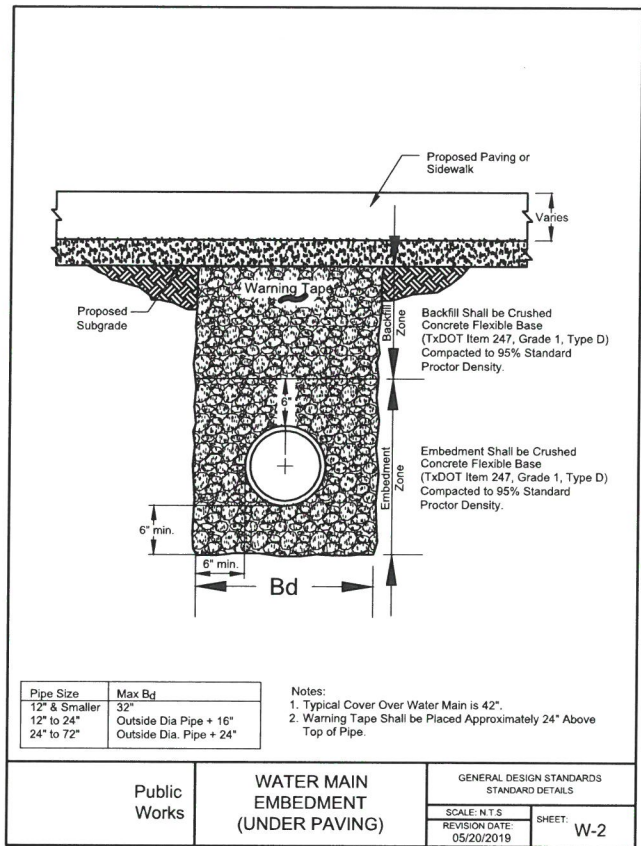
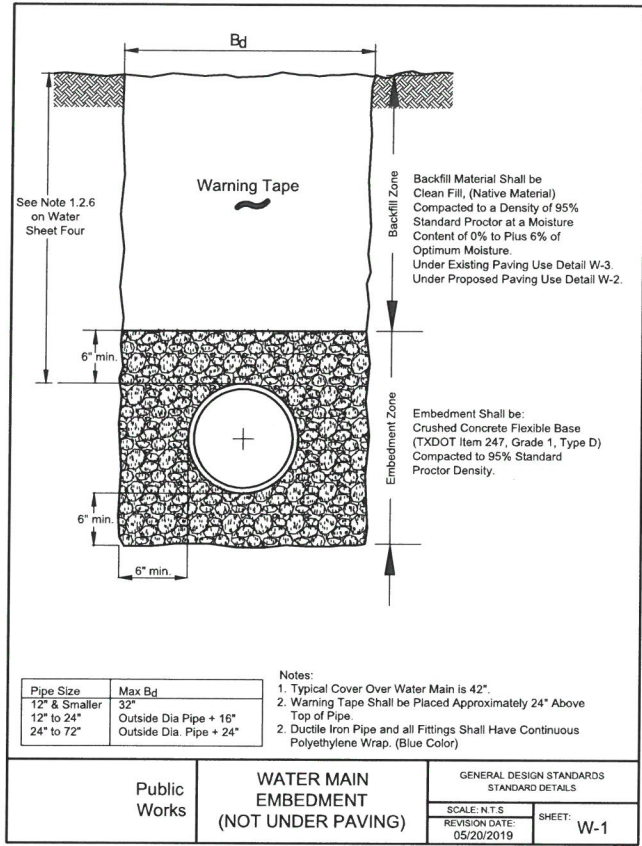
- 9.8.1. The Continuous-feed method must be used unless it is stated otherwise in the Contract Specifications.
- 9.8.2. The Contractor shall install and remove all pump-in, blow-off and sampling points.
- 9.8.3. Water from the existing system or other approved source shall be made to flow at a constant rate in the new main.
- 9.8.4. At a point no more than 10-ft downstream of the beginning of the new conduit, water entering the new conduit shall receive a dose of chlorine such that the water shall have not less than 100-mg/L (ppm) free chlorine. Chlorine application shall not cease until the entire conduit is filled with heavily chlorinated water. 125 lbs of Calcium Hypochlorite (65% available chlorine) is required in 100,000 gal of water to produce 100 mg/L (ppm) Chlorine concentration.
- 9.8.5. The chlorinated water shall be retained in the conduit for at least 24 hours, during which time all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. Every effort shall be made to prevent the flow of chlorinated water into conduits in active service. At the end of the 24-hour period, the treated water in all portions of the conduit shall have a residual of at least 10-mg/L (ppm) free chlorine.
- 9.8.6. Chlorine for Disinfection:
 - 9.8.6.1. Calcium Hypochlorite in granular form conforming to ANSI/AWWA B300 must be used and must contain approximately 65 percent available chlorine by weight. The material should be stored in a cool, dry, and dark environment to minimize deterioration.
 - 9.8.6.2. The heavily chlorinated water shall then be flushed from the conduit and disposed in a manner meeting the requirements set out below.
 - 9.8.6.3. The chlorine residual shall be tested prior to flushing operations.
- 9.9. Disposal of Hyper-Chlorinated Water: If the chlorine residual exceeds 4-mg/L (ppm) the water shall remain in the new water conduit until the chlorine residual is less than 4-mg/L (ppm). As an alternate, the Contractor may choose to evacuate the water into water trucks, or an approved storage facility (such as a detention pond) until the chlorine residual is 4-mg/L (ppm) or less, or treat the water with Sodium Bisulfite or another dechlorination chemical (Sulfur Dioxide, Sodium Sulfite, Sodium Thiosulfate, or Ascorbic Acid) or method appropriate for potable water and approved by the Owner until the chlorine residual is reduced to 4-mg/L (ppm) or less. The heavily chlorinated water shall not be disposed of into the storm sewer system. After the specified chlorine residual is obtained, less than 4-mg/L (ppm), the water may then be discharged into the storm sewer system or utilized by the Contractor.

- 9.9.1. The requirement for discharge of heavily chlorinated water is found in the TPDES General Permit to Authorize the Discharge of Storm Water and Certain Non-Storm Water Discharges from Regulated Construction Activities Within the State of Texas.
- 9.9.2. The Contractor shall prepare the conduit for disinfection activities and secure same after chlorination is complete.
- 9.9.3. This shall consist of furnishing all equipment, material and labor to satisfactorily prepare the conduit for disinfection. The Contractor shall also be required to provide adequate provisions for sampling.
- 9.9.4. The Contractor shall make all necessary taps into the pipe to accomplish chlorination of a new line.
- 9.9.5. After satisfactory completion of the disinfection operation, the Contractor shall remove surplus pipe at the chlorination and sampling points, plug the remaining pipe, backfill, and complete all appurtenant work necessary to secure the conduit.

9.10. Bacterial Sampling:

- 9.10.1. Unless otherwise specified, the Contractor shall inject chlorine disinfectant into the conduit and monitor the solution.
- 9.10.2. The City Public Works Construction Inspector shall supervise the taking of water samples from a suitable tap (not through a fire hydrant) for analysis by the North Texas Municipal Water District laboratory. The sample(s) shall be transported by City staff to the laboratory at 9:00 AM on Tuesdays and Thursdays. Samples may not be taken earlier than 3:00 PM on the day prior to delivery. The City Public Works Construction Inspector shall notify the Contractor of the results.
- 9.10.3. Microbiological sampling shall be done prior to connecting the new conduit into the existing distribution system in accordance with AWWA C651 Disinfecting Water Mains. Samples shall be tested in accordance with Standard Methods for the Examination of Water and Wastewater. Samples for bacteriological analysis shall be collected in sterile bottles treated with sodium thiosulfate. At least one sample shall be collected from every 1,000-linear-foot of new water conduit, plus one set from the end of the line and at least one set from each branch. If trench water has entered the new conduit during construction or, if in the opinion of the City inspector, excessive quantities of dirt or debris have entered the new conduit, samples shall be taken at intervals of approximately 200-linear-foot. Samples shall be taken of water that has been in the new conduit for at least 16-hours.
- 9.10.4. Unsatisfactory test results shall require a repeat of the disinfection process and resampling as required above until a satisfactory sample is obtained.
- 9.10.5. In the event there are two unsatisfactory test results from the same sampling point, the Contractor must "poly-pig" the new water main and samples taken again until a satisfactory sample is obtained.
- 9.11. Tapping Sleeve and Valve Air Test: Prior to tapping, all tapping sleeves and valves shall be air tested at 120 psi for three (3) minutes, with no pressure loss.

GENERAL DESIGN STANDARDS STANDARD DETAILS	
SCALE: N.T.S.	SHEET: W-GN
REVISION DATE: 07/24/2019	



Public Works	WATER MAIN EMBEDMENT (NOT UNDER PAVING)	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: W-1
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Public Works	WATER MAIN EMBEDMENT (UNDER PAVING)	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: W-2
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Public Works	WATER FLANGED FITTINGS	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: W-3
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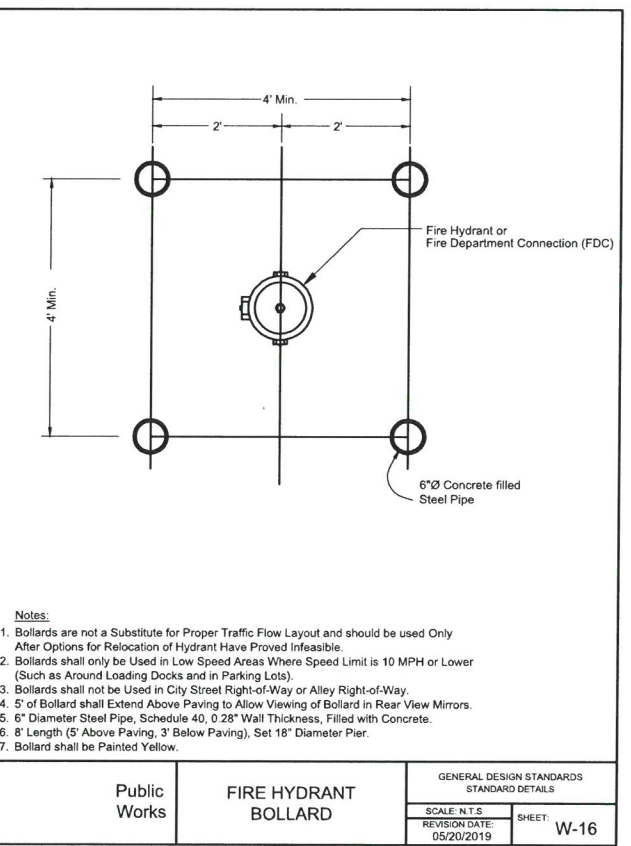
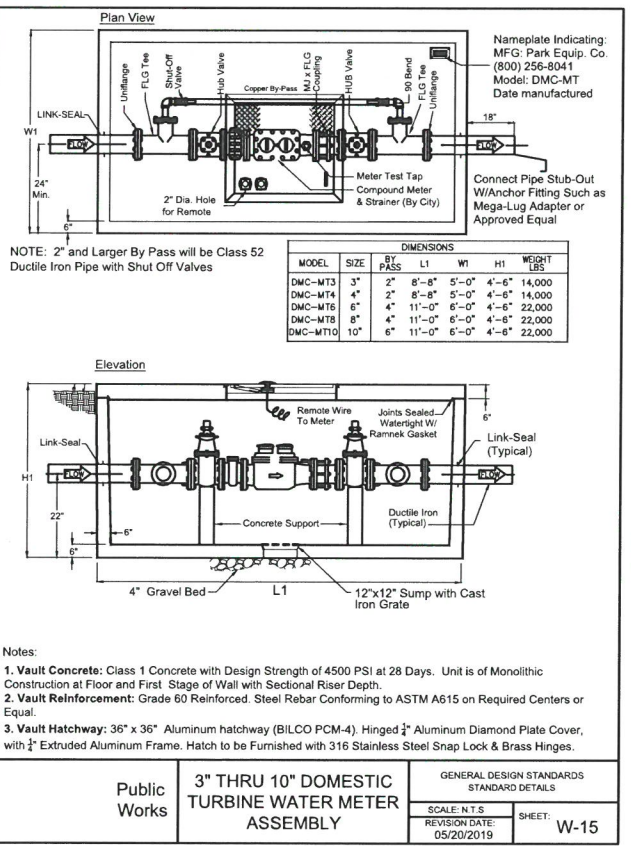
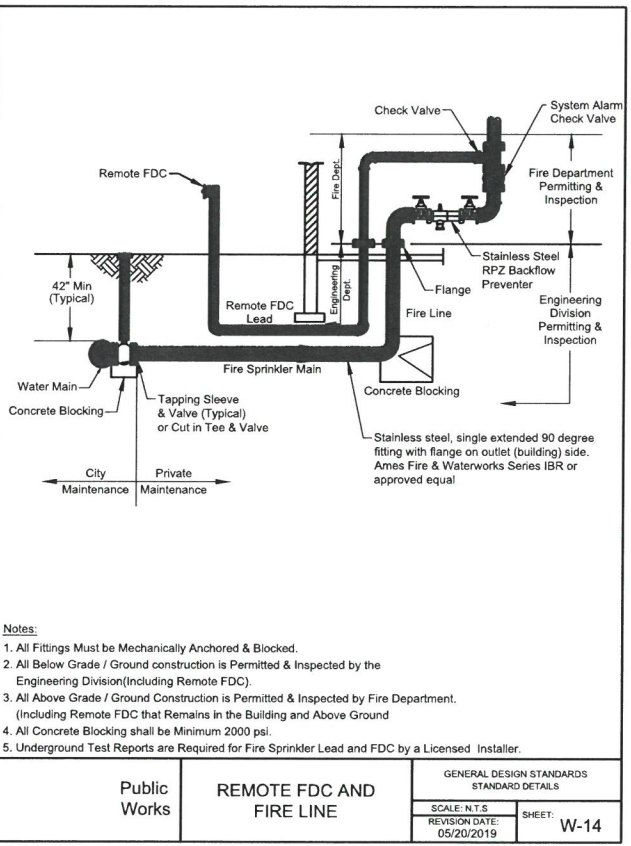
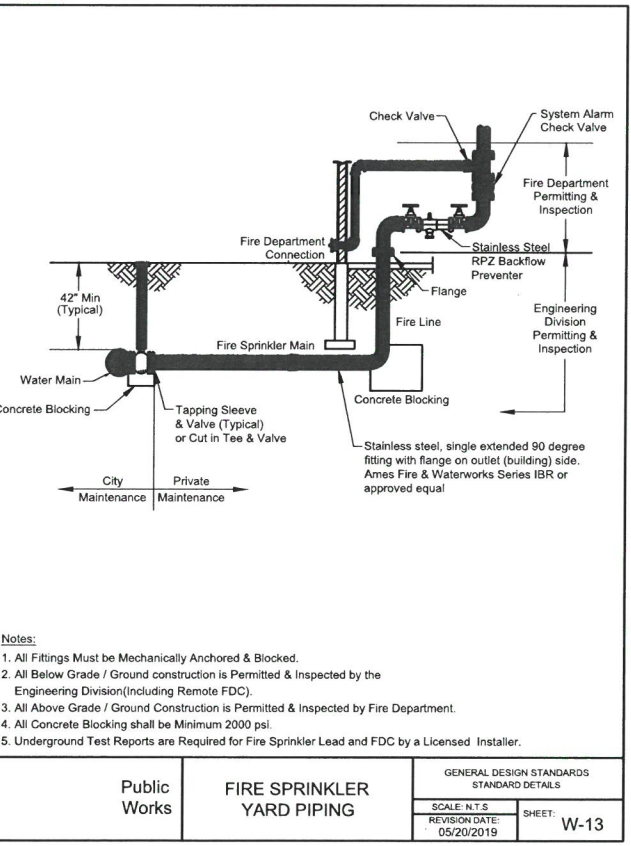
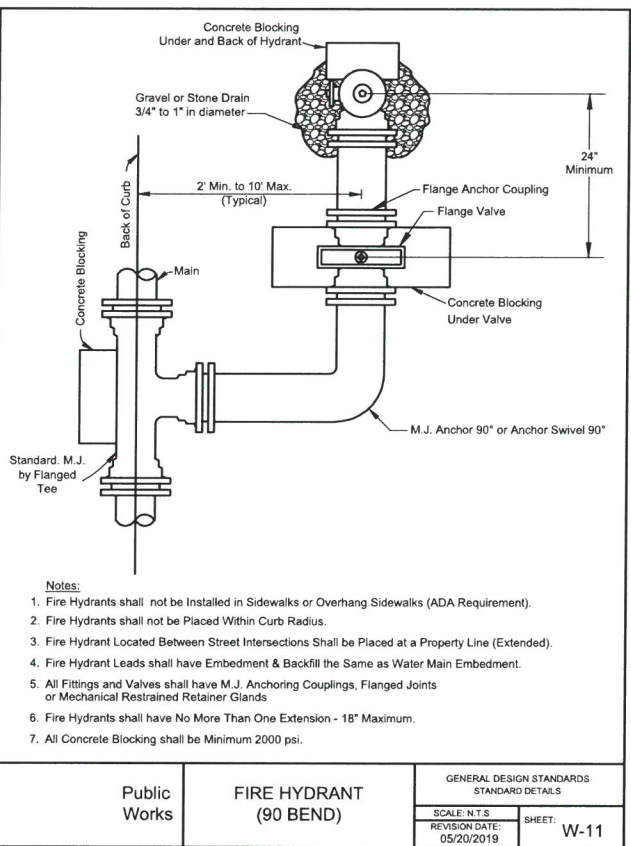
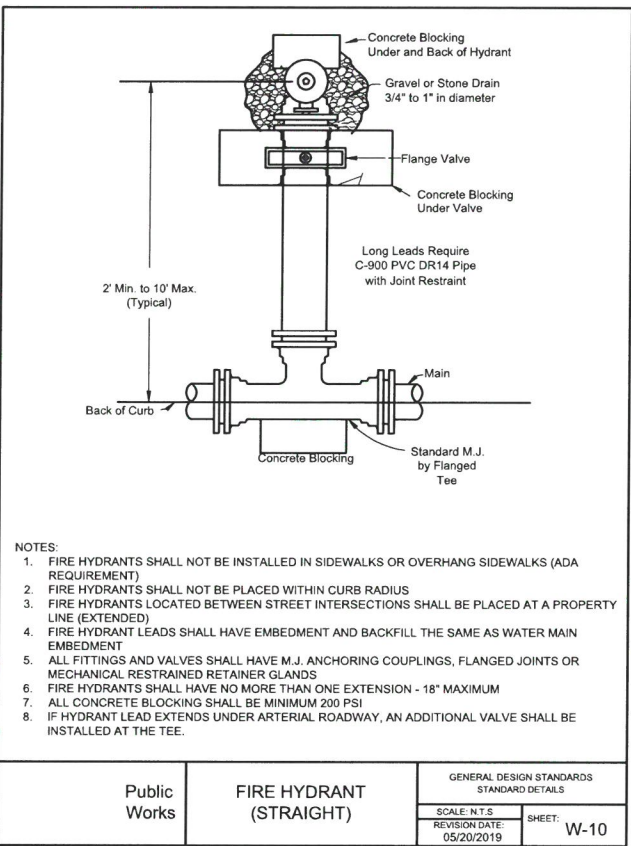
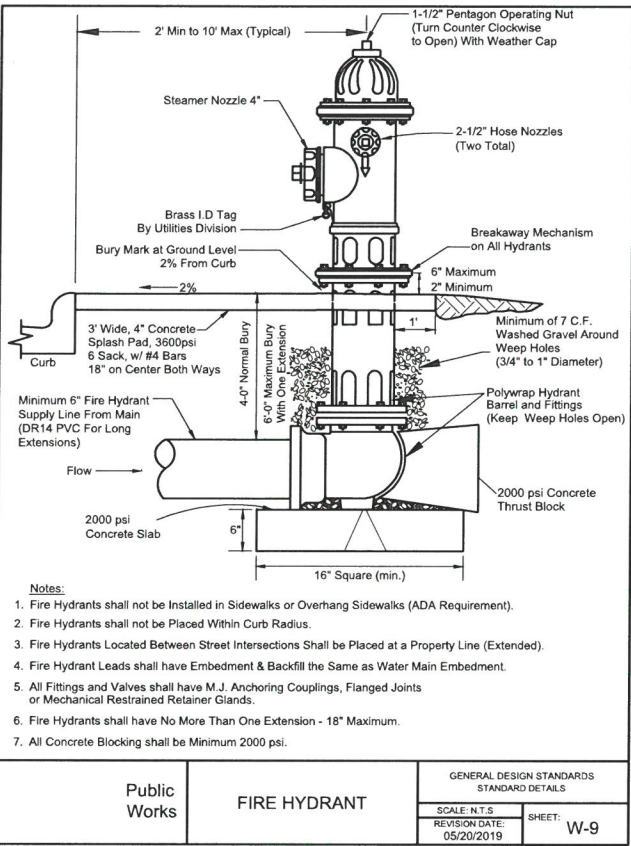
Public Works	WATER VALVE	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: W-4
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Public Works	ABANDONMENT OF VALVE STACK	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: W-5
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Public Works	AIR RELEASE VALVE	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: W-6
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Public Works	WATER SERVICE	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: W-7
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Public Works	TYPICAL UTILITY LOCATIONS	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: W-8
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GENERAL NOTES FOR WASTEWATER MAINS AND RELATED APPURTENANCES:

- 1. GENERAL:**
- 1.1. ALL SANITARY SEWER SYSTEM IMPROVEMENTS IN THE CITY OF MESQUITE, BOTH PRIVATELY AND PUBLICLY MAINTAINED SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF MESQUITE ENGINEERING DESIGN STANDARDS.
 - 1.2. ALL SANITARY SEWER SYSTEM DESIGN AND CONSTRUCTION SHALL CONFORM TO THE MOST CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) REGULATIONS. THESE REGULATIONS CAN BE FOUND IN THE TEXAS ADMINISTRATIVE CODE (TAC), TITLE 30, CHAPTER 217, SUBCHAPTER C (DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEMS).
 - 1.3. ALL SANITARY SEWER SYSTEM DESIGN AND CONSTRUCTION SHALL CONFORM TO THE CURRENT ADOPTED VERSION OF THE NORTH CENTRAL TEXAS (NCTCOG) - PUBLIC WORKS CONSTRUCTION STANDARDS SPECIFICATIONS AND STANDARD DRAWINGS.
 - 1.4. PRIVATE SANITARY SEWER SERVICE MAINS AND LATERALS SHALL BE DESIGNED, PERMITTED AND INSPECTED PER THE INTERNATIONAL PLUMBING CODE. GENERALLY, PRIVATE SYSTEMS ARE PERMITTED AND INSPECTED BY THE CITY BUILDING INSPECTION DIVISION.
 - 1.5. THE INSTALLATION AND TESTING OF ALL SANITARY SEWER SYSTEM IMPROVEMENTS AND COMPONENTS SHALL BE COORDINATED WITH, AND OBSERVED BY, A CITY PUBLIC WORKS CONSTRUCTION INSPECTOR.
 - 1.6. MATERIALS MUST CONFORM TO THE CITY OF MESQUITE APPROVED MATERIALS LIST.

- 2. SANITARY SEWER MAINS:**
- 2.1. SANITARY SEWER MAINS ARE GENERALLY PLACED IN THE PARKWAY, 6 FEET BACK OF CURB, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
 - 2.2. TRENCH BOXES SHALL BE REQUIRED FOR CONSTRUCTION OF MAINS WHERE ADEQUATE CLEARANCE FROM STREETS OR PRIMARY STRUCTURES CANNOT BE ACHIEVED. ADEQUATE CLEARANCE IS DEFINED AS A DISTANCE FROM THE PAVEMENT / STRUCTURE EQUAL TO THE DEPTH OF THE TRENCH.
 - 2.3. THE SPACING AND SEPARATION OF WATER MAINS FROM SANITARY SEWER MAINS SHALL FOLLOW THE NINE (9) FOOT RULE AS SET FORTH IN THE TCEQ REGULATION (30 TAC 217.53). WATER AND SANITARY SEWER MAINS (INCLUDING MANHOLES) SHALL BE SEPARATED BY NINE FEET IN ALL DIRECTIONS AND INSTALLED IN SEPARATE TRENCHES.
 - 2.4. WARNING TAPE SHALL BE INSTALLED 24 INCHES ABOVE THE TOP OF THE PIPE OR AS OTHERWISE DIRECTED BY THE PUBLIC WORKS CONSTRUCTION INSPECTOR. THE TAPE SHALL BE A PLASTIC, HIGH STRENGTH, 4 INCH WIDTH TAPE APPROVED BY THE CITY ENGINEER. THE TAPE SHALL BE GREEN IN COLOR AND HAVE THE WORDS "CAUTION SANITARY SEWER MAIN BURIED BELOW" IMPRINTED ON THE TAPE.
 - 2.5. SEWER MAINS SHALL BE FROM THE CITY OF MESQUITE APPROVED SEWER MATERIALS LIST AND SHALL BE EITHER:
 - 2.5.1. PVC ASTM D 3034, SDR 26 PIPE: 4" - 15" DIAMETER.
 - 2.5.2. PVC ASTM F 679, PS 115 PIPE: 18" - 27" DIAMETER.
 - 2.5.3. FIBERGLASS PIPE, AWWA M45 AND ASTM D3262: 30" OR LARGER DIAMETER.
 - 2.5.4. DUCTILE IRON PIPE, AWWA C151: AERIAL CROSSING OR WHERE LOADING MAY BE A CONCERN.

- 3. SERVICE LATERALS:**
- 3.1. SERVICE LATERALS SHALL BE LOCATED TEN (10) FEET DOWNSTREAM OF THE WATER SERVICE FOR THE LOT (WATER SERVICE GENERALLY TO BE LOCATED AT THE CENTERLINE OF THE LOT), AND PLUGGED SUITABLE FOR TESTING.
 - 3.2. ALL SANITARY SEWER SERVICES ARE TO HAVE A MINIMUM COVER OF THREE (3) FEET AND A MAXIMUM COVER OF FIVE (5) FEET AS MEASURED AT THE PROPERTY LINE OR EASEMENT LINE FROM THE PROPOSED GRADE TO TOP OF PIPE. IN GENERAL, THE MINIMUM DEPTH FOR SEWER TO SERVE GIVEN PROPERTY WITH A 4-INCH LATERAL SHALL BE 3 FEET PLUS 2% TIMES THE LENGTH OF THE LATERAL TO THE MIDDLE OF THE STRUCTURE. SERVICES THAT ARE LONGER THAN 100 FEET FROM THE MAIN AND LARGER BUILDINGS MAY REQUIRE A DEEPER SERVICE LINE AND MAY REQUEST AN EXEMPTION BY THE CITY ENGINEER FROM THE MAXIMUM COVER REQUIREMENTS. **NO SERVICES SHALL BE CONNECTED TO MAINS OVER 15 FEET DEEP AS MEASURED FROM THE PROPOSED GROUND ELEVATION TO THE MAIN FLOWLINE.**
 - 3.3. WHERE REQUIRED BY THE CITY, CONTRACTOR SHALL INSTALL A PROPERTY LINE CLEANOUT PER THE CITY OF MESQUITE GENERAL DESIGN DETAILS. CONTRACTOR SHALL NOT INSTALL DOUBLE SERVICE CLEANOUTS IN CONCRETE PAVING.
 - 3.4. SERVICE FITTINGS SHALL BE A TEE OR WYE FITTING TO BE INSTALLED ON THE MAIN. SADDLE SERVICES ARE NOT ALLOWED FOR NEW CONSTRUCTION.
 - 3.5. EACH INDIVIDUAL SERVICE LOCATION SHALL BE MARKED ON THE FACE OF THE CURB WITH A FOUR (4) INCH HIGH AND 1/8" DEEP DOUBLE SCRIBE MARK "I" CUT IN THE CURB USING AN APPROVED MOTOR DRIVEN CONCRETE SAW. THE DOUBLE SCRIBE MARK "I" SHALL RECEIVE A COATING OF GREEN PAINT, WHICH SHALL COAT THE INTERIOR AND EXTERIOR OF THE CUT TO A WIDTH OF ONE (1) INCH.

- 4. MANHOLES:**
- 4.1. MANHOLE WALL THICKNESS SHALL CONFORM TO THE FOLLOWING TABLE:

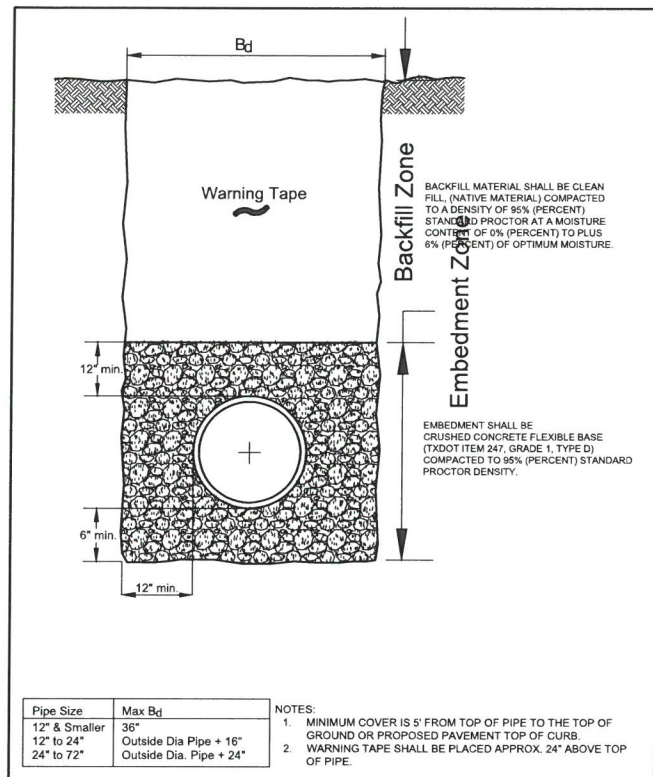
MANHOLE DIAMETER	MINIMUM WALL THICKNESS (PRE-CAST)	MINIMUM WALL THICKNESS (CAST-IN PLACE)
4 FEET	5"	6"
5 FEET	6"	8"
6 FEET	8"	8"
> 6 FEET AND/OR SPECIAL CONDITIONS AND SITUATIONS	AS REQUIRED BY CITY ENGINEER	

- 4.2. DROP MANHOLES SHALL BE INSTALLED IF THERE IS AN INCOMING MAIN WITH A VERTICAL DROP OF MORE THAN TWO (2) FEET MEASURED FROM FLOWLINE TO FLOWLINE. ALL DROP MANHOLES SHALL BE INTERNAL AND CONFORM TO CITY OF MESQUITE STANDARD DETAILS. DROP MANHOLES SHALL HAVE A MINIMUM DIAMETER OF FIVE (5) FEET. EXISTING MANHOLES THAT HAVE DROPS INSTALLED MAY TERMINATE THE DROP PIPE AT THE INVERT LEDGE.
- 4.3. THE TOP OF A MANHOLE LOCATED WITHIN THE 100-YEAR FLOODPLAIN SHALL BE THE LESSER OF A MINIMUM OF 1 FOOT ABOVE THE ULTIMATE 100-YEAR WATER SURFACE ELEVATION OR 3 FEET ABOVE ADJACENT GRADE. MANHOLES SHALL HAVE A CONCRETE APRON CONSTRUCTED AT GRADE AROUND ALL MANHOLES IN FLOODPLAINS. THE TOPS OF ALL OTHER MANHOLES SHALL BE SET TO THE GRADE OF ADJACENT LAND OR PAVING.
- 4.4. MANHOLE MATERIALS
 - 4.4.1. PRE-CAST CONCRETE SHALL CONFORM TO CURRENT ASTM DESIGNATION C 478 (C 478M). LIFTING EYES ARE NOT ALLOWED IN PRE-CAST MANHOLES. SHOP DRAWINGS SHALL BE SUBMITTED TO THE CITY ENGINEER FOR ALL PRE-CAST MANHOLES.
 - 4.4.2. CAST-IN-PLACE CONCRETE MANHOLES SHALL CONFORM TO CITY OF MESQUITE ENGINEERING DESIGN STANDARDS.
 - 4.4.3. BRICK OR FIBERGLASS MANHOLES OR ANY OTHER TYPE OF MANHOLE MATERIAL OTHER THAN CONCRETE WILL NOT BE ALLOWED.
 - 4.4.4. MANHOLES MUST HAVE A CONCENTRIC TOP CONE SECTION. ECCENTRIC CONE MANHOLES MAY BE USED IN SITUATIONS WHERE CONFLICTS WITH OTHER FACILITIES WARRANT IT.
- 4.5. ALL RINGS SHALL BE BOLTED TO THE MANHOLE CONE SECTION WITH A LAYER OF MASTIC APPLIED BETWEEN THE RING AND CONE SECTION.
- 4.6. MANHOLE RINGS AND COVERS SHALL BE ADJUSTED BY THE USE OF APPROVED GRADE RINGS WITH BUTYL SEALANT BETWEEN GRADE RINGS, COVER RING AND MANHOLE. MAXIMUM ADJUSTMENT IS EIGHT (8) INCHES. GRADE RINGS MAY BE HDPE OR RUBBER AS SHOWN ON THE CITY OF MESQUITE APPROVED SEWER MATERIALS LIST AND IN ACCORDANCE WITH NCTCOG PUBLIC WORKS CONSTRUCTION STANDARD 502.1.2.2 OR 502.1.2.4. CONCRETE GRADE RINGS, BRICKS, STEEL, IRON OR AND BROKEN CONCRETE ARE NOT ACCEPTABLE FOR ADJUSTMENT.
- 4.7. ALL MANHOLES SHALL HAVE FULL DEPTH INVERTS TO THE DEPTH OF THE LARGEST ENTERING MAIN.
- 4.8. ALL MANHOLES RINGS SHALL BE SEALED AND CONTAIN AN INTERNAL MANHOLE CHIMNEY SEAL OR APPROVED EXTERNAL SEAL OR WRAP AS SHOWN ON THE CITY OF MESQUITE APPROVED SEWER MATERIALS LIST.
- 4.9. ALL MANHOLES SHALL HAVE A 3/4 INCH THICK PLYWOOD FALSE BOTTOM INSTALLED PRIOR TO INITIATION OF GRADING AND/OR LIMING OPERATIONS.
- 4.10. ALL MANHOLES, INCLUDING RINGS AND COVERS, WITH A CONNECTING PIPE OF FIFTEEN (15) INCHES IN DIAMETER OR LARGER SHALL BE COATED WITH A CITY APPROVED STRUCTURAL/HIGH SULFIDE RESISTANT COATING (SEE CITY OF MESQUITE APPROVED SEWER MATERIALS LIST). COATING APPLICATION PROCEDURES SHALL CONFORM TO THE RECOMMENDATIONS OF THE COATING MANUFACTURER, INCLUDING MATERIAL HANDLING, MIXING, AND ENVIRONMENTAL CONTROLS DURING APPLICATION, SAFETY, AND EQUIPMENT.

- 4.11. MANHOLE TESTING SHALL BE IN ACCORDANCE WITH TECHNICAL SPECIFICATION 10030, 1.3.3.D.
- 4.12. EACH MANHOLE SHALL BE MARKED ON THE FACE OF THE CURB WITH A FOUR (4) INCH HIGH AND 1/8" DEEP SCRIBE MARK "MH" CUT IN THE CURB USING AN APPROVED MOTOR DRIVEN CONCRETE SAW. THE SCRIBE MARK "MH" SHALL RECEIVE A COATING OF GREEN PAINT, WHICH SHALL COAT THE INTERIOR AND EXTERIOR OF THE CUT TO A WIDTH OF ONE (1) INCH.
- 4.13. STUB OUTS FROM MANHOLES SHALL BE A MINIMUM FIVE (5) FOOT LONG AND CAPPED.

- 5. INSTALLATION AND CONSTRUCTION:**
- 5.1. INSTALLATION OF ALL SANITARY SEWER SHALL CONFORM TO NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS (NCTCOG) STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ITEMS 505.1 AND 507 EXCEPT AS AMENDED IN THESE STANDARDS.
 - 5.2. EXCAVATION IN GENERAL SHALL BE MADE IN OPEN CUT FROM THE SURFACE OF THE GROUND AND SHALL BE NO GREATER IN WIDTH AND DEPTH THAN IS NECESSARY TO PERMIT THE PROPER CONSTRUCTION OF THE WORK. WHEN THE TRENCH DEPTH EXCEEDS FIVE (5) FEET, SEE TECHNICAL SPECIFICATION 10030, 3.1.A REGARDING TRENCH SAFETY REQUIREMENTS. THE AMOUNT OF TRENCH EXCAVATION TO GRADE SHALL NOT EXCEED ONE HUNDRED (100) FEET FROM THE END OF THE PIPE LAYING OPERATIONS AND NO EXCAVATION SHALL BE THREE HUNDRED (300) FEET IN ADVANCE OF THE COMPLETED PIPE OPERATIONS (INCLUDES BACKFILLING). AT THE END OF THE WORKDAY, ALL TRENCH EXCAVATION SHALL BE BACKFILLED OR TRENCH SHALL BE COVERED WITH STEEL PLATES AND SECURED IN PLACE WITH ASPHALT. ANY LANDSCAPING AND IRRIGATION SYSTEM WITHIN THE CITY MEDIANS AND RIGHT-OF-WAYS THAT IS DISTURBED, REMOVED, OR DAMAGED DURING CONSTRUCTION SHALL BE REPLACED TO ORIGINAL CONDITION OR BETTER BY A LICENSED IRRIGATOR.
 - 5.3. BACKFILL:
 - 5.3.1. FOR TRENCHES IN CITY ROW OR UNDER CITY MAINTAINED PAVEMENT (EXISTING AND PROPOSED) OR WHERE INDICATED ON PLANS, TRENCH SHALL BE BACKFILLED WITH RECYCLED CRUSHED CONCRETE FLEXIBLE BASE PER TxDOT ITEM NO. 247, GRADE 1, TYPE D TO BOTTOM OF PROPOSED PAVEMENT.
 - 5.3.2. FOR TRENCHES NOT IN CITY ROW UNDER EXISTING OR PROPOSED CITY MAINTAINED PAVEMENT, TRENCH MAY BE BACKFILLED WITH NATIVE SOIL.
 - 5.3.3. EXCAVATION WITHIN 6 FEET OF A MANHOLE SHALL BE BACKFILLED WITH RECYCLED CRUSHED CONCRETE FLEXIBLE BASE PER TxDOT ITEM NO. 247, GRADE 1, TYPE D.
 - 5.4. COMPACT EACH 12" LOOSE LAYER OF BACKFILL TO WITHIN 95% TO 100% OF STANDARD PROCTOR DENSITY AT A MOISTURE RANGE OF 0% TO 6% OF OPTIMUM. THE CONTRACTOR SHALL TAKE NEW PROCTORS AT EACH CHANGE IN SOIL TYPE. WATER JETTING WILL NOT BE ALLOWED FOR ANY TRENCH.

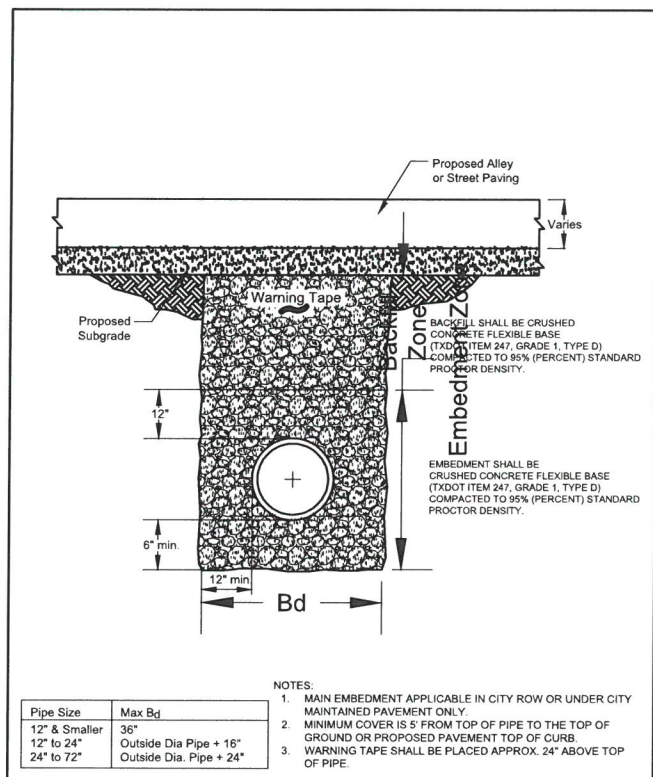
- 6. TESTING:**
- 6.1. THE CONTRACTOR SHALL EMPLOY AND PAY FOR AN INDEPENDENT TESTING LABORATORY, APPROVED BY THE CITY ENGINEER, TO PERFORM TESTING OF CONSTRUCTION MATERIALS. CONTRACTOR SHALL SUBMIT THE NAME OF THE TESTING LABORATORY PRIOR TO BEGINNING OF WORK. THE CONTRACTOR SHALL NOTIFY THE ASSIGNED CITY PUBLIC WORKS CONSTRUCTION INSPECTOR OF ALL TESTING 24 HOURS PRIOR TO THE SCHEDULED TEST. COPIES OF ALL TEST REPORTS SHALL BE SENT TO THE CITY PUBLIC WORKS CONSTRUCTION INSPECTOR FOR REVIEW AND ACCEPTANCE AND INCLUSION IN THE CITY PROJECT FILE. PROJECTS WILL NOT RECEIVE CITY ACCEPTANCE UNTIL ALL TEST RESULTS ARE COMPLETE AND SATISFACTORY.
 - 6.2. DENSITY TESTS SHALL BE PERFORMED AT A FREQUENCY OF ONE TEST PER LIFT, PER 300 LINEAR FEET OF TRENCH (INCLUDING SERVICES) AT LOCATIONS SPECIFIED BY THE CITY PUBLIC WORKS INSPECTOR. IN ADDITION TO THE TRENCH DENSITY TESTS, TWO NUCLEAR GAUGE DENSITY TESTS SHALL BE TAKEN OF THE MANHOLE BACKFILL WITHIN 4 FOOT OF THE MANHOLE. ALL NUCLEAR GAUGE DENSITY TESTS SHALL BE PERFORMED PER ASTM D6938. DENSITY TESTS MUST MEET A MINIMUM COMPACTION OF 95% OF STANDARD PROCTOR DENSITY (ASTM D698) AT A MOISTURE RANGE OF 0% TO 6% OF OPTIMUM MOISTURE.
 - 6.3. ALL MANHOLES SHALL BE VACUUM TESTED INCLUDING GRADE RINGS AND CASTING PER NCTCOG PUBLIC WORKS CONSTRUCTION STANDARD 502.1.5.2 AND MEET TCEQ REGULATIONS 30 TAC 217 AND ASTM C1244, "STANDARD TEST METHOD FOR CONCRETE SEWER MANHOLES BY THE NEGATIVE AIR PRESSURE (VACUUM) TEST PRIOR TO BACKFILL". THE TIME FOR THE VACUUM TO DROP FROM 10 INCHES OF MERCURY TO 9 INCHES SHALL NOT BE LESS THAN TWO (2) MINUTES.
 - 6.4. MAINS LESS THAN THIRTY SIX (36) INCHES IN DIAMETER SHALL PASS DEFLECTION MANDREL TEST PER NCTCOG STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, ITEM 507.5.1.4 FLEXIBLE PIPE (DEFLECTION) TESTING AND TCEQ REGULATIONS CHAPTER 217.57(B) DEFLECTION TESTING. ALTERNATE METHODS FOR MEASURING DEFLECTION FOR PIPES LARGER THAN THIRTY SIX (36) INCHES IN DIAMETER SUBJECT TO CITY APPROVAL. TESTING OF MAINS THIRTY SIX (36) INCHES AND LARGER SHALL OCCUR AT LEAST 30 DAYS AFTER INSTALLATION AND BACKFILL. PIPE WITH DEFLECTION EXCEEDING THE PERCENTAGE ALLOWED DEFLECTION PER NCTCOG TABLE 507.5.1.4.2(A) AT THE TIME OF TESTING SHALL BE UNCOVERED AND REINSTALLED. IF DEFLECTION EXCEEDS 7% AT THE TIME OF TESTING, PIPE SHALL BE REMOVED AND REPLACED WITH NEW MATERIALS. ALL FAILED JOINTS, PIPES, SECTIONS OR STRUCTURES SHALL BE RETESTED UPON COMPLETION OF REMEDIAL ACTIONS. FAILED SECTIONS SHALL BE RETESTED AFTER THE REMEDIAL CONSTRUCTION HAS BEEN IN PLACE FOR 30 DAYS.
 - 6.5. MAINS LESS THAN THIRTY SIX (36) INCHES IN DIAMETER AND LATERALS SHALL PASS A LOW PRESSURE AIR TEST PER NCTCOG STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, ITEM 507.5.1.3 LOW PRESSURE AIR TESTING AND TCEQ REGULATIONS 30 TAC CHAPTER 217.57(A)(1) LOW PRESSURE AIR TEST. PIPES 36-INCHES AND LARGER MAY BE TESTED PER NCTCOG ITEM 507.5.1.3.3 (INDIVIDUAL JOINT AIR TEST METHOD). TESTING OF MAINS THIRTY SIX (36) INCHES AND LARGER SHALL OCCUR AT LEAST 30 DAYS AFTER INSTALLATION AND BACKFILL. ALL FAILED JOINTS, PIPES, SECTIONS OR STRUCTURES SHALL BE RETESTED UPON COMPLETION OF REMEDIAL ACTIONS. FAILED SECTIONS SHALL BE RETESTED AFTER THE REMEDIAL CONSTRUCTION HAS BEEN IN PLACE FOR 30 DAYS.
 - 6.6. AFTER THE DEFLECTION MANDREL AND AIR PRESSURE TEST, THE CONTRACTOR SHALL CONDUCT A COLOR TELEVISION CAMERA INSPECTION OF THE INTERIOR OF THE INSTALLED SANITARY SEWER SYSTEM. THE MAIN MUST BE LACED WITH ENOUGH WATER TO FILL ANY LOW POINTS. A COPY OF THE RECORDING IN DIGITAL FORMAT AND STORAGE DEVICE (DVD DISK, FLASH DRIVE, ETC.) AS SPECIFIED BY THE CITY, WITH WRITTEN LOG OF THE INSPECTION, SHALL BE PROVIDED TO THE PUBLIC WORKS CONSTRUCTION INSPECTOR PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.



Pipe Size	Max B _d
12" & Smaller	36"
12" to 24"	Outside Dia. Pipe + 16"
24" to 72"	Outside Dia. Pipe + 24"

NOTES:
 1. MINIMUM COVER IS 5' FROM TOP OF PIPE TO THE TOP OF GROUND OR PROPOSED PAVEMENT TOP OF CURB.
 2. WARNING TAPE SHALL BE PLACED APPROX. 24" ABOVE TOP OF PIPE.

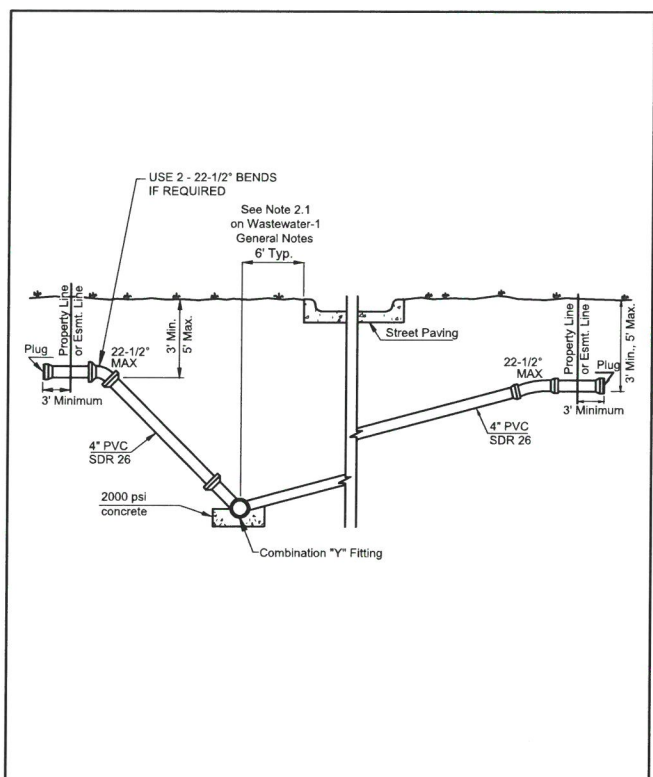
Public Works	WASTEWATER EMBEDMENT (NOT UNDER PAVING)	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/17/2022	SHEET: WW-1
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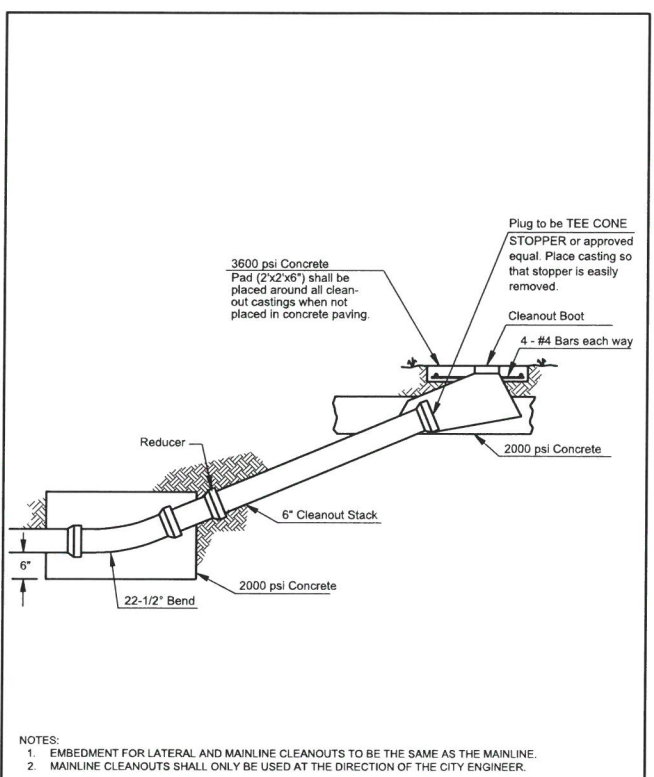
Pipe Size	Max B _d
12" & Smaller	36"
12" to 24"	Outside Dia. Pipe + 16"
24" to 72"	Outside Dia. Pipe + 24"

NOTES:
 1. MAIN EMBEDMENT APPLICABLE IN CITY ROW OR UNDER CITY MAINTAINED PAVEMENT ONLY.
 2. MINIMUM COVER IS 5' FROM TOP OF PIPE TO THE TOP OF GROUND OR PROPOSED PAVEMENT TOP OF CURB.
 3. WARNING TAPE SHALL BE PLACED APPROX. 24" ABOVE TOP OF PIPE.

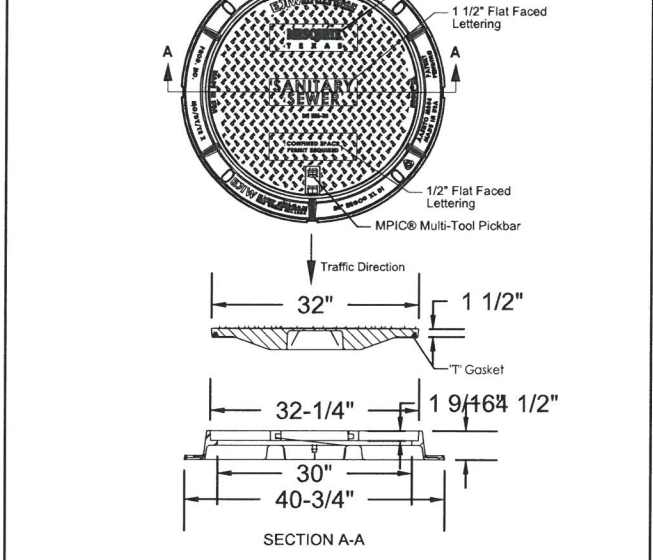
Public Works	WASTEWATER EMBEDMENT (UNDER CITY PAVING)	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/17/2022	SHEET: WW-2
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Public Works	WASTEWATER LATERAL	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/17/2022	SHEET: WW-3
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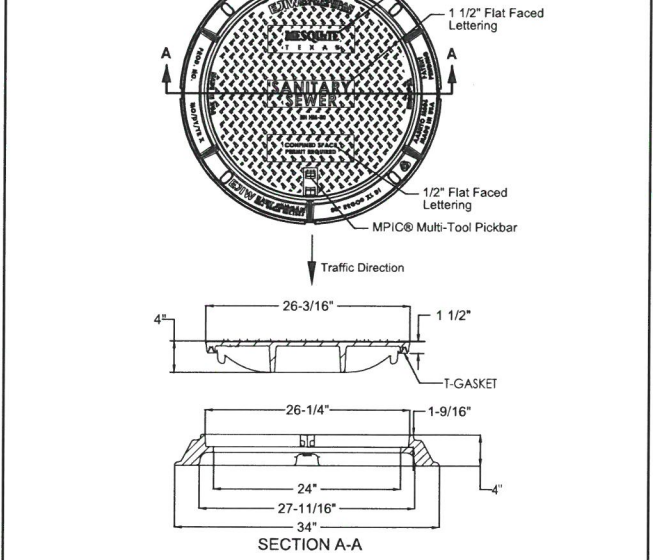


Public Works	WASTEWATER MAINLINE CLEANOUT	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/17/2022	SHEET: WW-4
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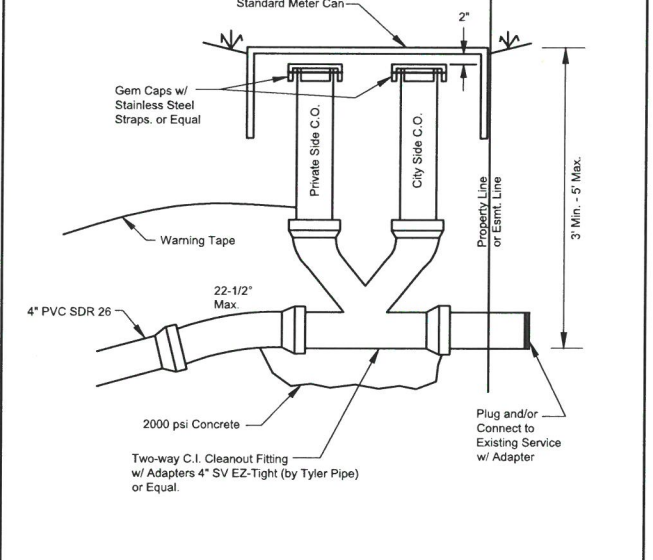
NOTES:
 1. MATERIALS SHALL BE DUCTILE IRON ASTM A-536 FOR FRAME AND COVER.
 2. DESIGN LOAD SHALL BE HEAVY DUTY (HS-20).
 3. LID SHALL BE ORIENTED SUCH THAT A PICKBAR IS ORIENTED WITH TRAFFIC FLOW.
 4. LID SHALL BE BOLTED WHEN IN FLOODPLAIN.

Public Works	WASTEWATER MANHOLE RING AND COVER	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/17/2022	SHEET: WW-5
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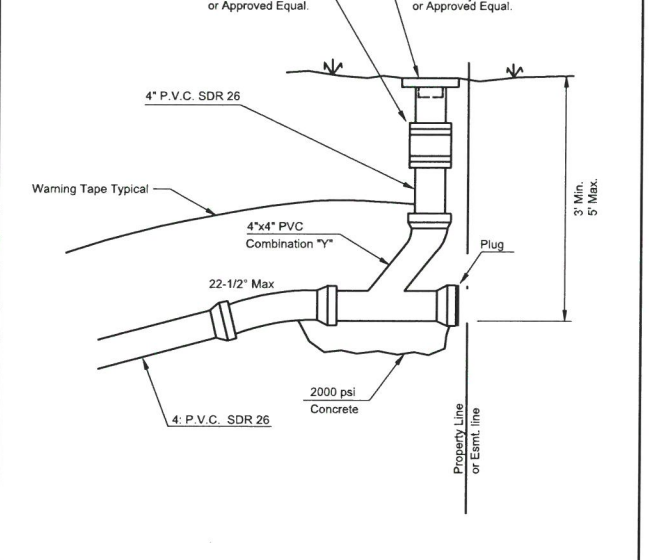
NOTES:
 1. MATERIALS SHALL BE DUCTILE IRON ASTM A-536 FOR FRAME AND COVER.
 2. DESIGN LOAD SHALL BE HEAVY DUTY (HS-20).
 3. LID SHALL BE ORIENTED SUCH THAT A PICKBAR IS ORIENTED WITH TRAFFIC FLOW.
 4. LID SHALL BE BOLTED WHEN IN FLOODPLAIN.

Public Works	WASTEWATER MANHOLE RING AND COVER (RETROFIT ONLY)	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/17/2022	SHEET: WW-6
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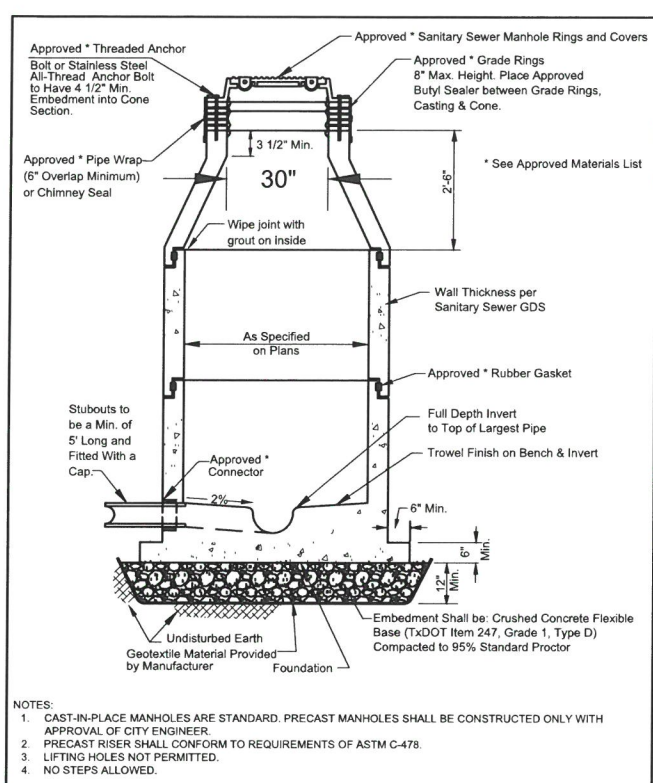
*INSTALL ONLY AT THE DIRECTION OF THE CITY ENGINEER

Public Works	DOUBLE CLEANOUT	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/20/2019	SHEET: WW-7
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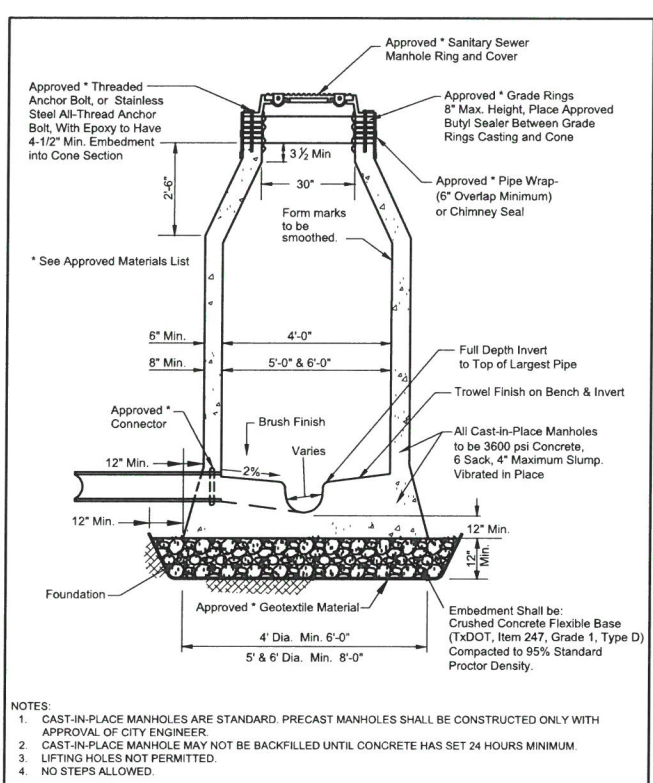


*INSTALL ONLY AT THE DIRECTION OF THE CITY ENGINEER

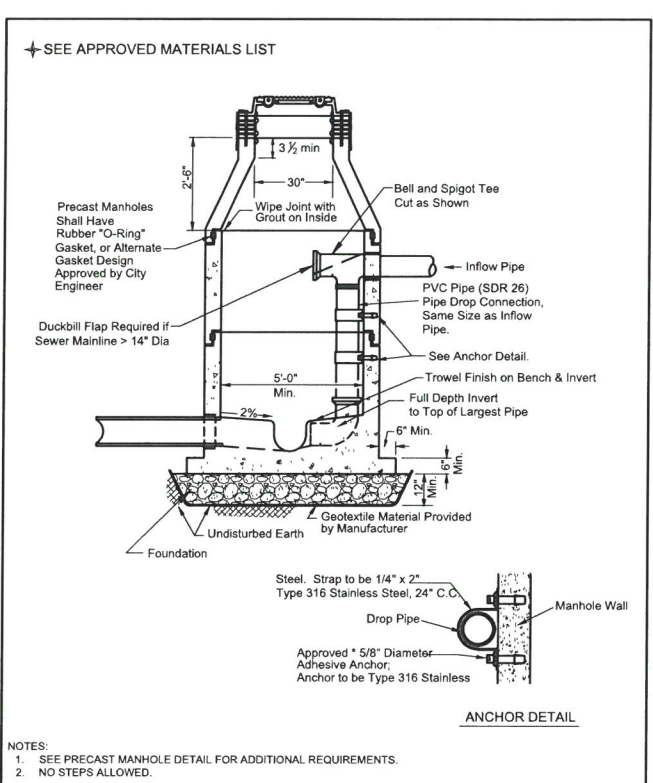
Public Works	SINGLE CLEANOUT	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	REVISION DATE: 05/17/2022	SHEET: WW-8
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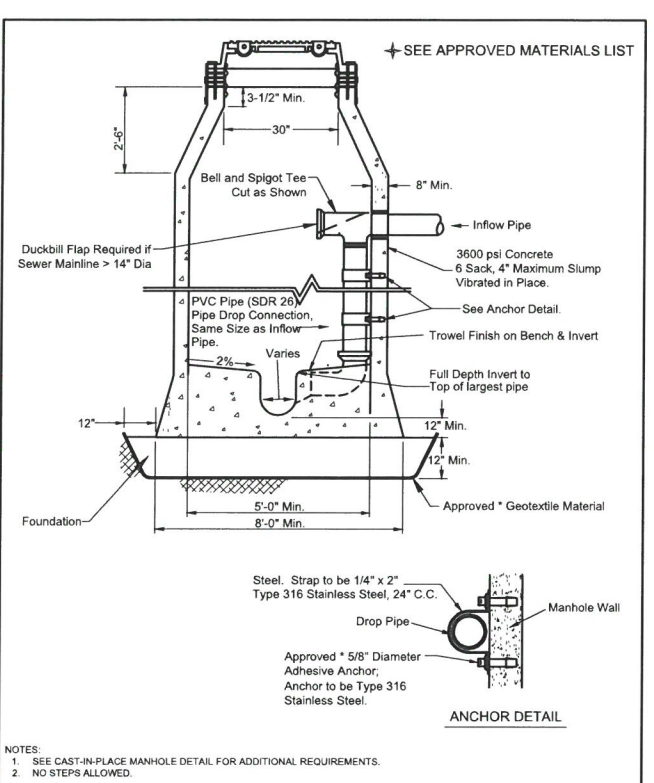
Public Works	PRECAST MANHOLE	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: WW-9
		REVISION DATE:	05/17/2022



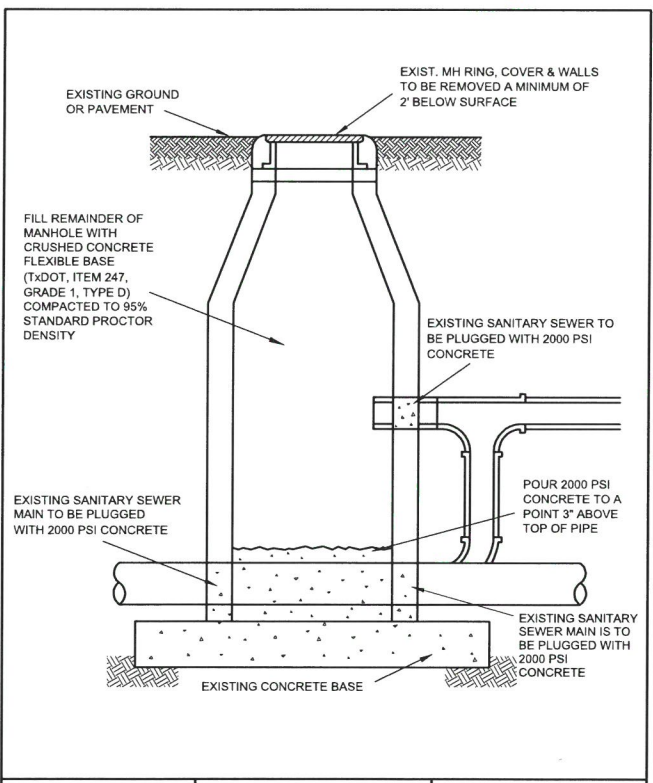
Public Works	CAST-IN-PLACE MANHOLE	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: WW-10
		REVISION DATE:	05/17/2022



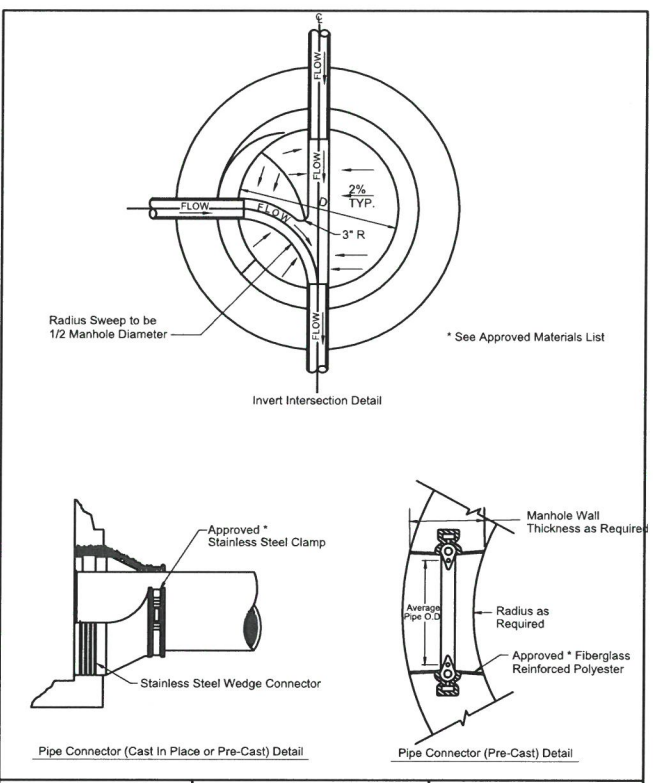
Public Works	PRECAST DROP MANHOLE	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: WW-11
		REVISION DATE:	05/17/2022



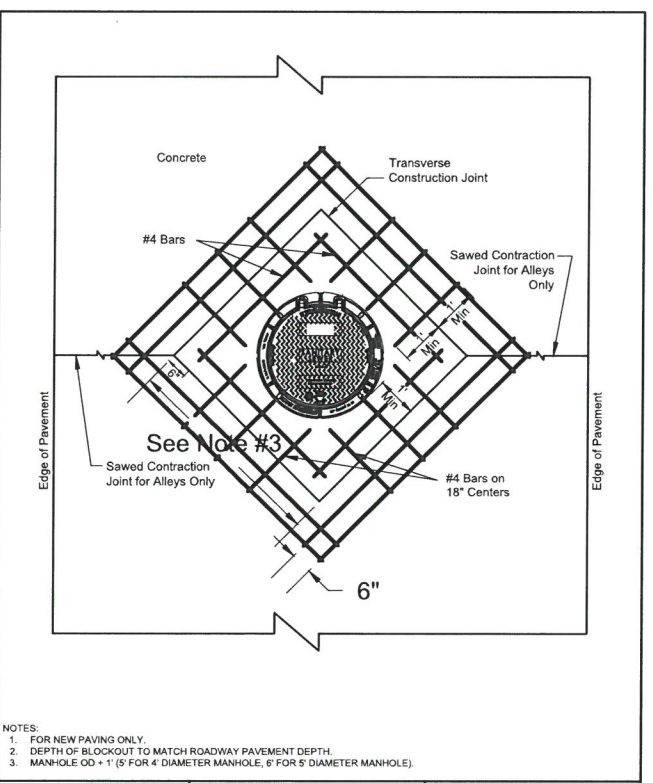
Public Works	CAST-IN-PLACE DROP MANHOLE	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: WW-12
		REVISION DATE:	05/17/2022



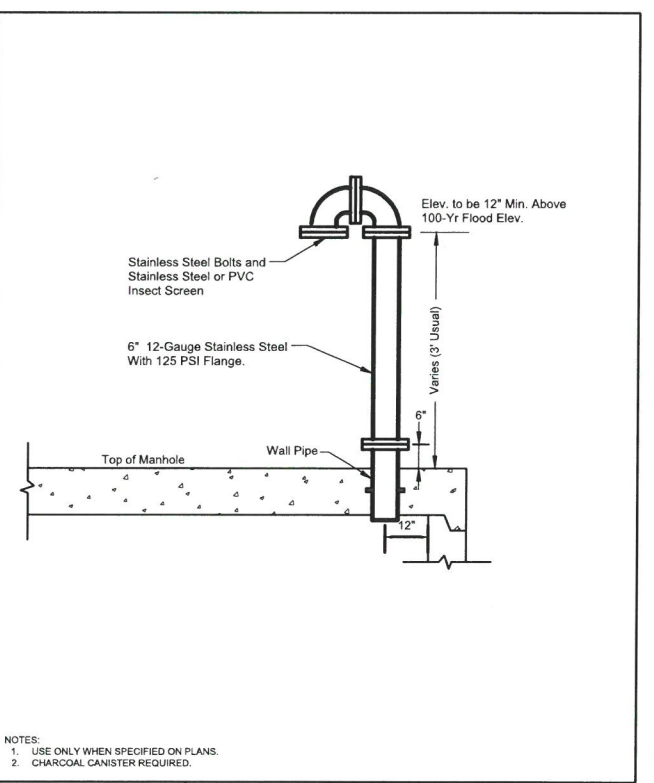
Public Works	ABANDONED MANHOLE	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: WW-13
		REVISION DATE:	05/17/2022



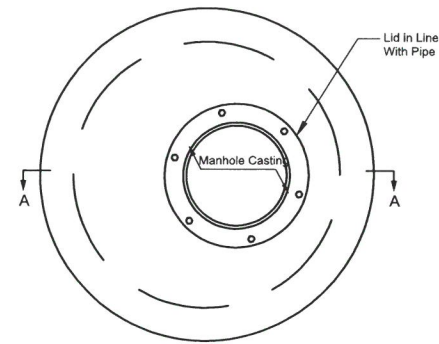
Public Works	MANHOLE INVERT AND CONNECTION	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: WW-14
		REVISION DATE:	05/17/2022



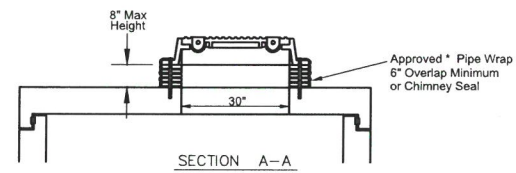
Public Works	MANHOLE BLOCKOUT	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: WW-15
		REVISION DATE:	05/17/2022



Public Works	MANHOLE VENT	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: WW-16
		REVISION DATE:	05/20/2019



* See Approved Materials List



- NOTES:
1. MANHOLE FLAT LIDS MUST BE LOAD RATED FOR HS-20 LOADINGS.
 2. SEE PRECAST MANHOLE DETAIL FOR ADDITIONAL REQUIREMENTS.
 3. ALTERNATE: RING AND COVER MAY BE CAST IN TO THE LID PER DETAIL WW-19.

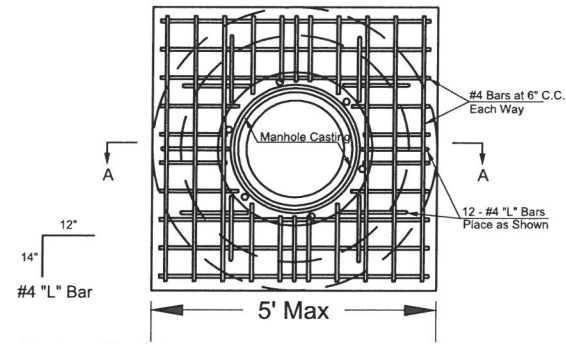
Public
Works

PRECAST FLAT
MANHOLE LID

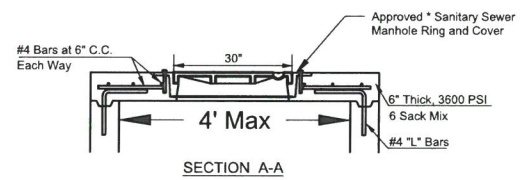
GENERAL DESIGN STANDARDS
STANDARD DETAILS

SCALE: N.T.S. SHEET: WW-17

REVISION DATE: 05/17/2022



* See Approved Materials List



- NOTES:
1. FOR STREET APPLICATION ONLY.
 2. MANHOLE FLUSH LIDS MUST BE LOAD RATED FOR HS-20 LOADINGS.
 3. SEE CAST-IN-PLACE MANHOLE DETAIL FOR ADDITIONAL REQUIREMENTS.

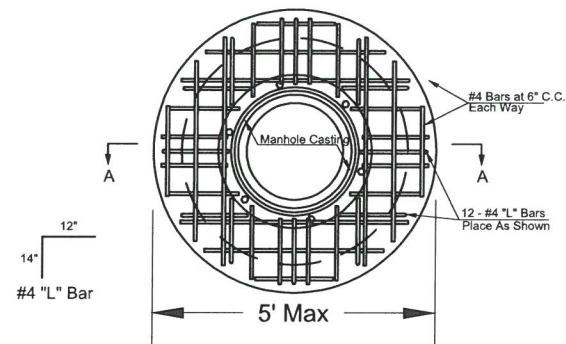
Public
Works

CAST-IN-PLACE
FLUSH
MANHOLE LID

GENERAL DESIGN STANDARDS
STANDARD DETAILS

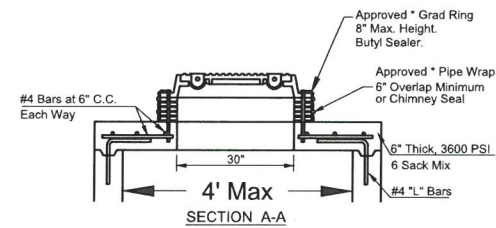
SCALE: N.T.S. SHEET: WW-18

REVISION DATE: 05/20/2019



* See Approved Materials List

* See Approved Materials List



- NOTES:
1. FOR STREET APPLICATION ONLY.
 2. MANHOLE FLAT LIDS MUST BE LOAD RATED FOR HS-20 LOADINGS.
 3. SEE CAST-IN-PLACE MANHOLE DETAIL FOR ADDITIONAL REQUIREMENTS.

Public
Works

CAST-IN-PLACE
MANHOLE LID

GENERAL DESIGN STANDARDS
STANDARD DETAILS

SCALE: N.T.S. SHEET: WW-19

REVISION DATE: 05/17/2022

EXPANSION JOINT

Smooth Dowel Bars				
Commercial Driveway, Street, Alley & Firelane Paving Thickness (in.)	Diameter (in.)	Length (in.)	Spacing (in.)	Expansion Joint Thickness
6	#8 (1 in.)	30	18	3/4"
> 6 and ≤ 12	#11 (1.4 in.)	30	12	3/4"
> 12	Determined by City Engineer			
Sidewalk, Residential Driveway and Trail Thickness (in.)				
4-6	#4 (1/2 in.)	24	12	1/2"

NOTES:

- Expansion Cap for Dowels Shall have an Inside Diameter of 1/16" Greater than that of Dowel and be Designed to Provide Free Movement of the Dowel Bar.
- Expansion Cap to Fit Dowel Min. 2" Embedment and Min. 1-1/4" Clearance from the Closed End of the Sleeve to the Dowel.
- Expansion Joints Shall be Installed at a Maximum Distance of Six Hundred (600) Feet, and at Street Intersections Radial, PC's and PT's or as Otherwise Directed. No Expansion Joint Shall Fall in a Driveway Approach or Inlet.
- Expansion Material Per Approved Material List
- Dowel Bars to be Placed Parallel to Pavement at Spacing and Lengths per Table, Centered on Expansion Material. One Side of Dowel Bar Shall be Coated in Thin Film of Grease or Other Approved De-Bonding Material. Where Drilling of Dowel Bars is Required, It Shall be Done by an Approved Mechanical Rig.
- Expansion Joints Shall Not Be Placed At Pavement Grade Breaks.

Public Works | EXPANSION JOINTS | GENERAL DESIGN STANDARDS STANDARD DETAILS | SCALE: N.T.S. | SHEET: P-1

LONGITUDINAL CONSTRUCTION JOINT

TRANSVERSE CONSTRUCTION JOINT

Deformed Reinforcing Bars			
Commercial Driveway, Street, Alley & Firelane Paving Thickness (in.)	Diameter (in.)	Length (L)	Spacing (in.)
< 8	#8 (1 in.)	30	18
≥ 8	#11 (1.4 in.)	30	12
Sidewalk, Residential Driveway and Trail Thickness (in.)			
4-6	#4 (5 in.)	24	12

NOTES:

- Dowel Bars to be Placed Parallel to Pavement at Spacing and Lengths per Table. Where Drilling of Dowel Bars is Required, It Shall be Done by an Approved Mechanical Rig.
- Transverse Construction Joint can be used as Longitudinal Construction Joint in applications where new pavement is to be constructed or reconstructed next to old pavement.

Public Works | CONSTRUCTION JOINTS | GENERAL DESIGN STANDARDS STANDARD DETAILS | SCALE: N.T.S. | SHEET: P-2

SAWED CONTRACTION JOINT

ISOLATION JOINT

* Refer Approved Materials List for recommended material.

Public Works | SAWED CONTRACTION & ISOLATION JOINT | GENERAL DESIGN STANDARDS STANDARD DETAILS | SCALE: N.T.S. | SHEET: P-3

TYPICAL STREET JOINTING

EXISTING CONCRETE STREET TO NEW CONCRETE STREET TEE INTERSECTION

NOTE:

- All Concrete Placement Shall End in a Construction Joint, an Expansion Joint or a Concrete Header.
- Sawed Contraction Joints are Required at Center Line and Lane Line on any Street Pavement Width Greater than 22.5 Feet (Back to Back of Curb).
- Expansion Joints Shall be Installed at a Maximum Distance of Six Hundred (600) Feet and Street Intersections, PC's and PT's or as Otherwise Directed. No Expansion Joint Shall Fall in a Driveway Approach or Inlet.

Public Works | STREET JOINTING | GENERAL DESIGN STANDARDS STANDARD DETAILS | SCALE: N.T.S. | SHEET: P-4

CONCRETE HEADER

CONCRETE TO ASPHALT HEADER

NOTES:

- Concrete Headers Shall be Continuous Along Existing or Phased Pavement when Adjacent to the New Pavement. Additional Locations can be Shown on the Plans or at the Discretion of the City Engineer.

Public Works | TYPICAL HEADERS | GENERAL DESIGN STANDARDS STANDARD DETAILS | SCALE: N.T.S. | SHEET: P-5

THICKENED CONCRETE EDGE

Public Works | THICKENED CONCRETE EDGE | GENERAL DESIGN STANDARDS STANDARD DETAILS | SCALE: N.T.S. | SHEET: P-6

CURB AND GUTTER (HMAC PAVEMENT)

CURB AND GUTTER (CONCRETE PAVEMENT - FOR RECONSTRUCTION)

INTEGRAL CURB

LAYDOWN CURB

NOTES:

- Integral Curb shall be used on all new streets.
- Any honeycomb present on backside of curb shall be filled in.

Public Works | TYPICAL CURB & GUTTER | GENERAL DESIGN STANDARDS STANDARD DETAILS | SCALE: N.T.S. | SHEET: P-7

TYPICAL SECTION (OFFSET FROM CURB) PREFERRED OPTION

TYPICAL SECTION (ADJACENT TO CURB) - ONLY WITH PERMISSION OF CITY ENGINEER

PLAN VIEW

Type	Width	Thickness	Contraction Joint (A)	Expansion Joint (B)
Sidewalk	Min. 5' < 8'	4"	10' Spacing Tooled Joint	120' Max.
Trail - Hike & Bike	≥ 8'	6"	15' Spacing Sawcut	600' Max.

NOTES:

- Expansion Joints Shall be Placed at Maximum Intervals per Table and Shall also be Placed at each Lot Line
- Expansion Joint is required between sidewalk and abutting concrete pavement. No expansion joint is required between sidewalk and adjacent street curb. For expansion joints on driveways, refer to P-26 through P-29.
- All Sidewalks shall drain positive.

Public Works | PEDESTRIAN FACILITIES | GENERAL DESIGN STANDARDS STANDARD DETAILS | SCALE: N.T.S. | SHEET: P-8

Classification	Minimum Pavement Thickness (A)	Minimum Subgrade Thickness (B)	Minimum Bar: Maximum Spacing Reinforcing Steel
Local	6"	6" Lime Stabilized at 8% (Or 6" Crushed Concrete)	#4 @ 18" C.C.
Collector	8"	8" Lime Stabilized at 8% (Or 8" Crushed Concrete)	#4 @ 18" C.C.
Fire Lane	Per Fire Lane Detail		
Alleys	Per Typical Alley Detail		
Arterials	Per Engineering Design Manual Section 2.11		#4 @ 18" C.C.

NOTE:
CRUSHED CONCRETE SHALL MEET TxDOT SPECIFICATIONS, ITEM 247, TYPE D, GRADE 1 OR 2 WITH TRIAX TX 140 GEOGRID (OR APPROVED EQUAL.

Public Works	CONCRETE PAVEMENT DETAIL TYPICAL SECTION	GENERAL DESIGN STANDARDS STANDARD DETAILS
SCALE: N.T.S.	SHEET: P-14	REVISION DATE: 05/20/2019

Put Expansion Joint Material Here, If Abutting Concrete and Reference Paving Sheet P-1 Expansion Joint Detail.

SECTIONAL ELEVATION

NOTES:

- EXPOSED FACE OR WALL SHALL HAVE FORM LINER SWA GREENSTREAK #39, SIERRA DRYSTACK OR SYMONS #F3170575, #3170503 STANDARD DRY STACK OR AS DIRECTED BY THE CITY ENGINEER. FORM LINER IS REQUIRED FOR WALL 6" (SIX INCHES) IN HEIGHT AND OVER.
- MINIMUM COMPRESSIVE DESIGN STRENGTH OF THE CONCRETE SHALL BE 4,000 PSI AT 28 DAYS, 6 SACK MINIMUM CEMENT CONTENT.
- MINIMUM GRADE OF REINFORCING STEEL IS TO BE ASTM A-615, GRADE 60.
- ALL DISTANCES TO REINFORCING STEEL REFER TO CLEAR CONCRETE COVER OVER REINFORCING STEEL UNLESS NOTED OTHERWISE.
- MAXIMUM REINFORCING STEEL LAP IS TO BE THIRTY (30) BAR DIAMETERS.
- MAXIMUM SPACING OF EXPANSION JOINTS SHALL BE 120 FEET. AN EXPANSION JOINT SHALL BE PLACED AT EACH PROPERTY LINE. EXPANSION JOINTS SHALL BE CONTINUOUS THROUGH WALL AND ASSOCIATED SIDEWALK.
- ALL EXPOSED EDGES SHALL HAVE A 1/4" INCH CHAMFER.
- SIDEWALK WIDTH SHOWN IS MINIMUM WIDTH. CONSULT PAVING PLANS FOR THE CLEAR SIDEWALK WIDTH.

Public Works	CONCRETE SIDEWALK WITH RETAINING WALL	GENERAL DESIGN STANDARDS STANDARD DETAILS
SCALE: N.T.S.	SHEET: P-15	REVISION DATE: 05/20/2019

For City Contracts, Limits of Pay

Pay Limits for Curb Ramp

Provide Min. 5'x5' Landing, Measured to Face of Curb (Actual Size will Vary based on Curb Radius and Sidewalk Setback from Curb)

2' Wide Detectable Warning Device

NOTE:

- ALL PEDESTRIAN ELEMENTS, INCLUDING CURB RAMPS, SHALL COMPLY WITH THE PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY (PROWAG), PUBLISHED BY THE ARCHITECTURAL AND TRANSPORTATION COMPLIANCE BOARD ON JULY 16, 2011, 36 CFR PART 1190 OR ITS FINAL ADOPTED GUIDELINES.
- ALL PEDESTRIAN PATHS SHALL HAVE TYPICAL 1.5% (PERCENT), MAXIMUM 2% (PERCENT) CROSS SLOPE.
- DETAILS ARE REPRESENTATION OF INFORMATION FROM PROWAG AND ARE INTENDED TO PROVIDE GUIDANCE. IT IS THE RESPONSIBILITY OF THE DESIGN PROFESSIONAL AND THE CONTRACTOR TO ENSURE THAT ALL RAMPS CONSTRUCTED MEET THE REQUIREMENTS OF PROWAG.

Public Works	CURB RAMP TYPE A	GENERAL DESIGN STANDARDS STANDARD DETAILS
SCALE: N.T.S.	SHEET: P-16	REVISION DATE: 09/08/2020

Provide Min. 4'x4' Landing, Measured to Face of Curb (Actual Size will Vary based on Curb Radius and Sidewalk Setback from Curb). Landing shall be entirely within striped crosswalk area, Typ.

NOTE:

- ALL PEDESTRIAN ELEMENTS, INCLUDING CURB RAMPS, SHALL COMPLY WITH THE PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY (PROWAG), PUBLISHED BY THE ARCHITECTURAL AND TRANSPORTATION COMPLIANCE BOARD ON JULY 16, 2011, 36 CFR PART 1190 OR ITS FINAL ADOPTED GUIDELINES.
- ALL PEDESTRIAN PATHS SHALL HAVE TYPICAL 1.5% (PERCENT), MAXIMUM 2% (PERCENT) CROSS SLOPE.
- DETAILS ARE REPRESENTATION OF INFORMATION FROM PROWAG AND ARE INTENDED TO PROVIDE GUIDANCE. IT IS THE RESPONSIBILITY OF THE DESIGN PROFESSIONAL AND THE CONTRACTOR TO ENSURE THAT ALL RAMPS CONSTRUCTED MEET THE REQUIREMENTS OF PROWAG.

Public Works	CURB RAMP TYPE B	GENERAL DESIGN STANDARDS STANDARD DETAILS
SCALE: N.T.S.	SHEET: P-17	REVISION DATE: 09/08/2020

NOTE:

- ALL PEDESTRIAN ELEMENTS, INCLUDING CURB RAMPS, SHALL COMPLY WITH THE PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY (PROWAG), PUBLISHED BY THE ARCHITECTURAL AND TRANSPORTATION COMPLIANCE BOARD ON JULY 16, 2011, 36 CFR PART 1190 OR ITS FINAL ADOPTED GUIDELINES.
- ALL PEDESTRIAN PATHS SHALL HAVE TYPICAL 1.5% (PERCENT), MAXIMUM 2% (PERCENT) CROSS SLOPE.
- DETAILS ARE REPRESENTATION OF INFORMATION FROM PROWAG AND ARE INTENDED TO PROVIDE GUIDANCE. IT IS THE RESPONSIBILITY OF THE DESIGN PROFESSIONAL AND THE CONTRACTOR TO ENSURE THAT ALL RAMPS CONSTRUCTED MEET THE REQUIREMENTS OF PROWAG.

Public Works	CURB RAMP TYPE C	GENERAL DESIGN STANDARDS STANDARD DETAILS
SCALE: N.T.S.	SHEET: P-18	REVISION DATE: 09/08/2020

NOTE:

- ALL PEDESTRIAN ELEMENTS, INCLUDING CURB RAMPS, SHALL COMPLY WITH THE PROPOSED ACCESSIBILITY GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT-OF-WAY (PROWAG), PUBLISHED BY THE ARCHITECTURAL AND TRANSPORTATION COMPLIANCE BOARD ON JULY 16, 2011, 36 CFR PART 1190 OR ITS FINAL ADOPTED GUIDELINES.
- ALL PEDESTRIAN PATHS SHALL HAVE TYPICAL 1.5% (PERCENT), MAXIMUM 2% (PERCENT) CROSS SLOPE.
- DETAILS ARE REPRESENTATION OF INFORMATION FROM PROWAG AND ARE INTENDED TO PROVIDE GUIDANCE. IT IS THE RESPONSIBILITY OF THE DESIGN PROFESSIONAL AND THE CONTRACTOR TO ENSURE THAT ALL RAMPS CONSTRUCTED MEET THE REQUIREMENTS OF PROWAG.

Public Works	CURB RAMP TYPE D	GENERAL DESIGN STANDARDS STANDARD DETAILS
SCALE: N.T.S.	SHEET: P-19	REVISION DATE: 09/08/2020

Fire Lane Pavement Width (Min. 24')

Concrete Curb & Gutter

#4 @ 18" OCEW

6" Lime Stabilized Subgrade Type "A" Hydrated Lime at 33 lbs./S.Y. Application Rate.

Subgrade Shall be Compacted to 95% Std. Proctor Density (Min. 6" Depth)

NOTE:

- REFER TO DETAIL FOR EXPANSION JOINT AND CONTRACTION JOINT, FOR SPACING, ETC. OF JOINTS.
- WHERE A CURB IS USED, THE REQUIRED CLEARANCE SHALL BE MEASURED FROM THE CURB FACE TO ANY PERMANENT TRAFFIC OBSTACLE.
- CONCRETE SHALL BE 4,000 PSI AT 28 DAYS, 6 (SIX) SACK MIX MINIMUM. REFER TO PAVING GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.
- 6" (SIX INCH) LIME STABILIZED SUBGRADE MAY BE SUBSTITUTED BY EITHER ADDITIONAL 2" (TWO INCHES) OF CONCRETE PAVING OR 6" (SIX INCHES) RECYCLED CONCRETE FLEXIBLE BASE (PER TxDOT ITEM NO. 247, TYPE 1, GRADE B).
- ALL DIMENSIONS ARE FACE TO FACE OF CURB, WHERE A FIRE LANE DEAD ENDS AND EXCEEDS 150' (FEET) LENGTH, A HAMMERHEAD OR CUL-DE-SAC PER DETAIL P14-B MUST BE PROVIDED FOR THE FIRE TRUCK TO TURN AROUND.
- FOR FIRE LANE PAVEMENT WIDTH, REFER TO 2015 INTERNATIONAL FIRE CODE APPENDIX D 103 AND CITY ORDINANCES 4469 AND 4499 FOR AMENDMENTS.

Public Works	FIRE LANE PAVING	GENERAL DESIGN STANDARDS STANDARD DETAILS
SCALE: N.T.S.	SHEET: P-20	REVISION DATE: 05/20/2019

Fire Lane Pavement Width

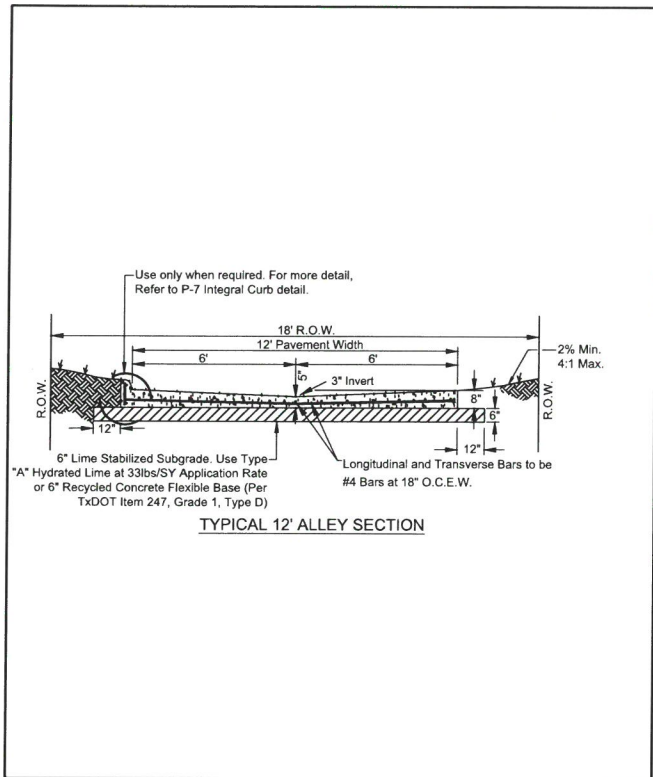
6" Wide Stripe

Dimensions Typ. Both Sides

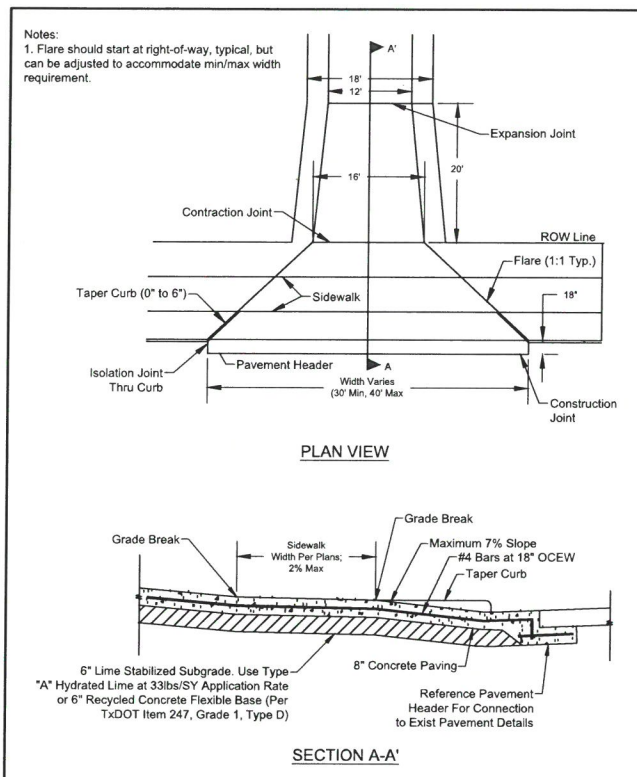
NOTE:

- LETTERING SHALL BE "FIRE LANE - NO PARKING" OR "NO PARKING - FIRE LANE" WITH 4" (FOUR INCH) WHITE LETTERS.
- WHERE CURB IS AVAILABLE, THE STRIPING SHALL BE ON THE VERTICAL FACE OF CURB.

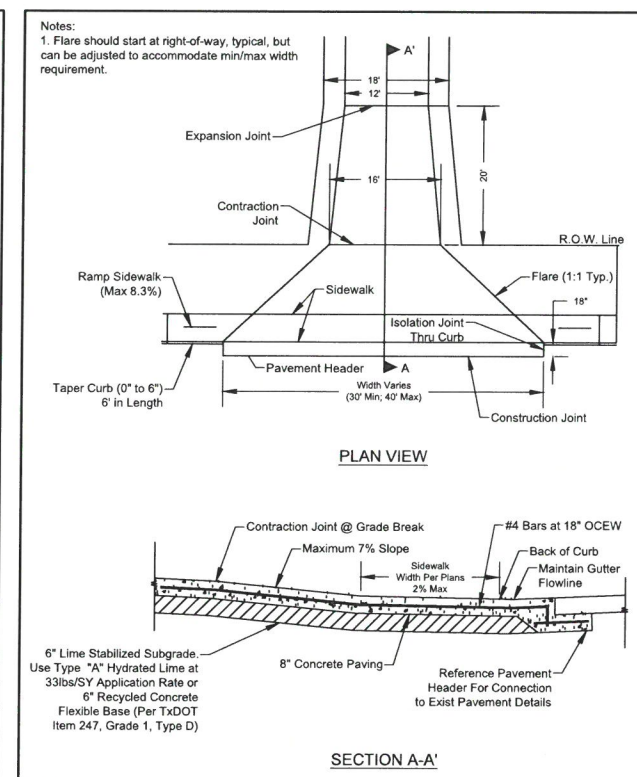
Public Works	FIRE LANE STRIPING	GENERAL DESIGN STANDARDS STANDARD DETAILS
SCALE: N.T.S.	SHEET: P-21	REVISION DATE: 05/20/2019



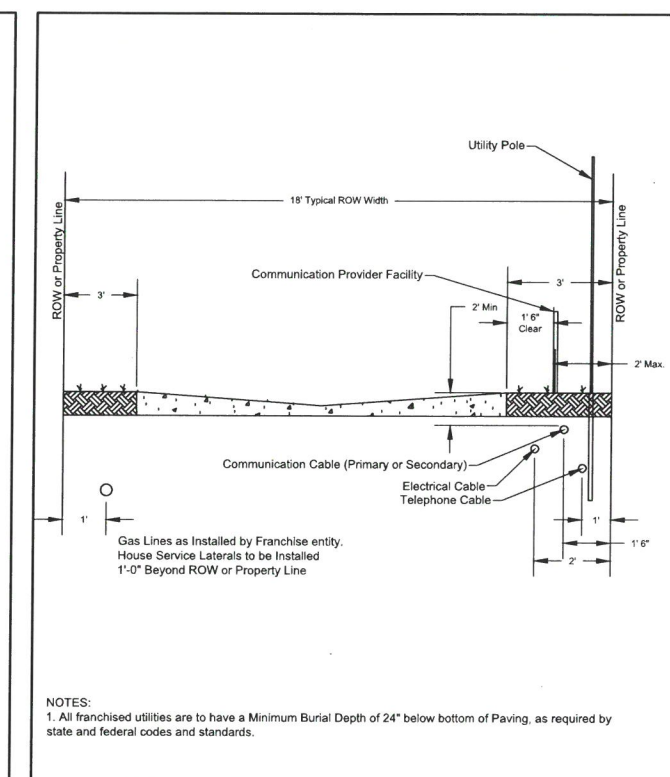
Public Works	ALLEY PAVING	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: P-22
		REVISION DATE: 05/20/2019	



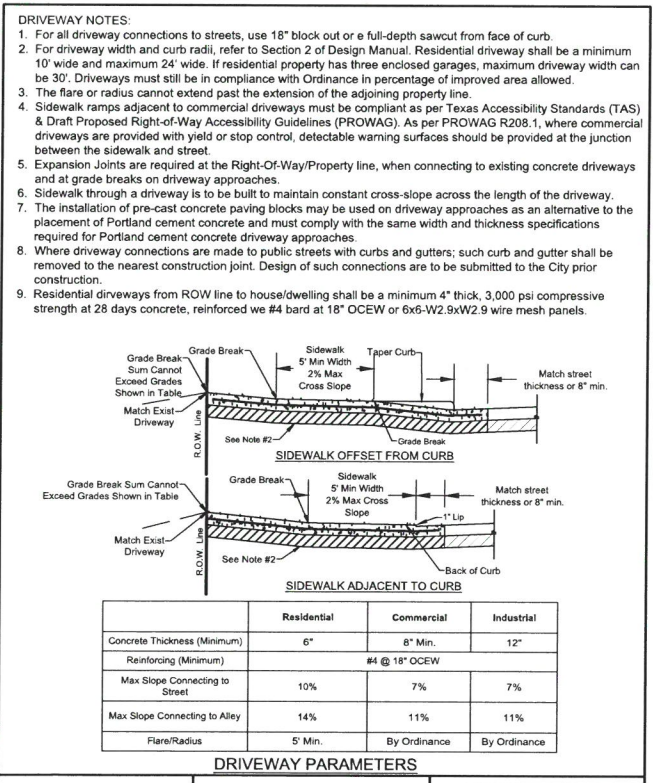
Public Works	ALLEY/STREET INTERSECTION OFFSET SIDEWALK	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: P-23
		REVISION DATE: 05/20/2019	



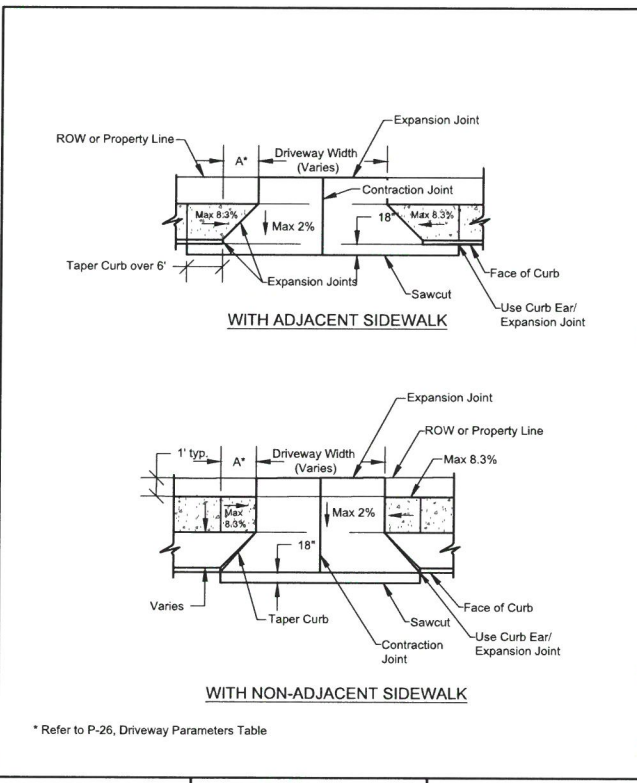
Public Works	ALLEY/STREET INTERSECTION ADJACENT SIDEWALK	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: P-24
		REVISION DATE: 05/20/2019	



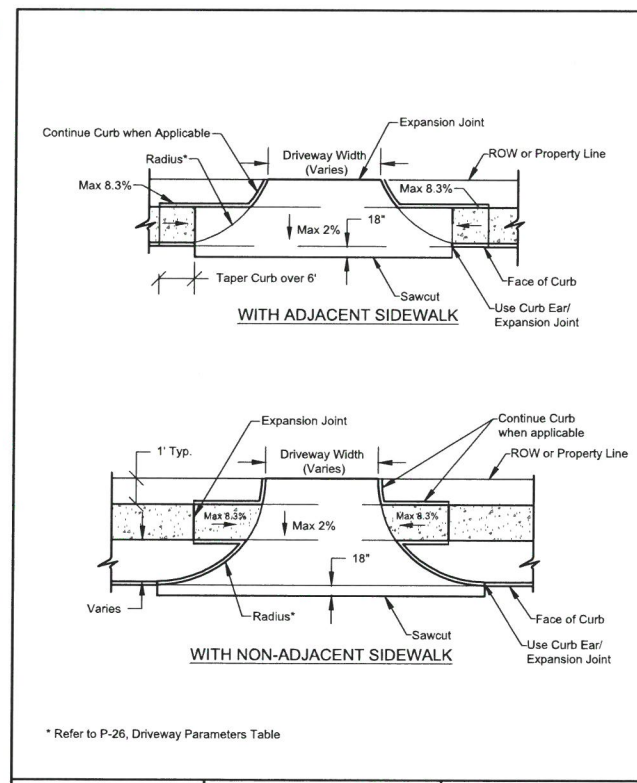
Public Works	ALLEY UTILITY LOCATION	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: P-25
		REVISION DATE: 05/20/2019	



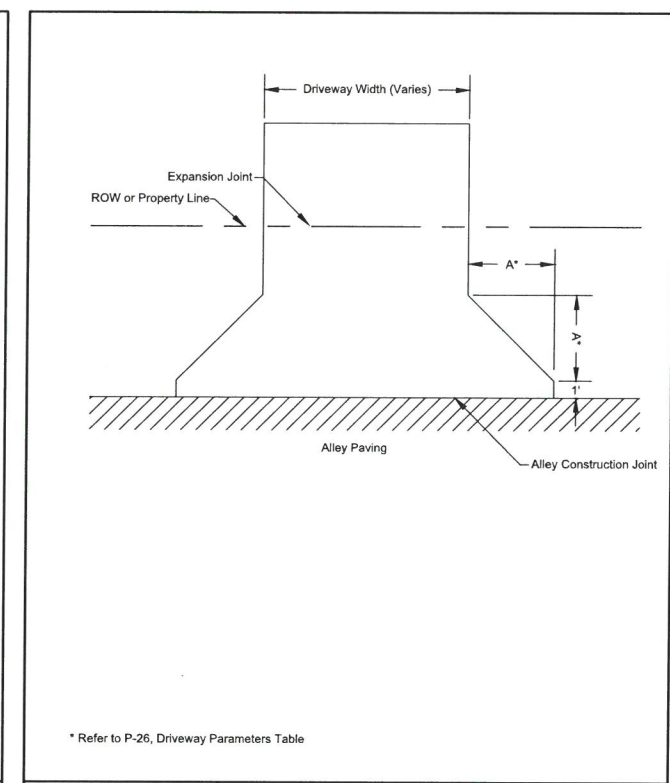
Public Works	DRIVEWAY	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: P-26
		REVISION DATE: 09/30/2020	



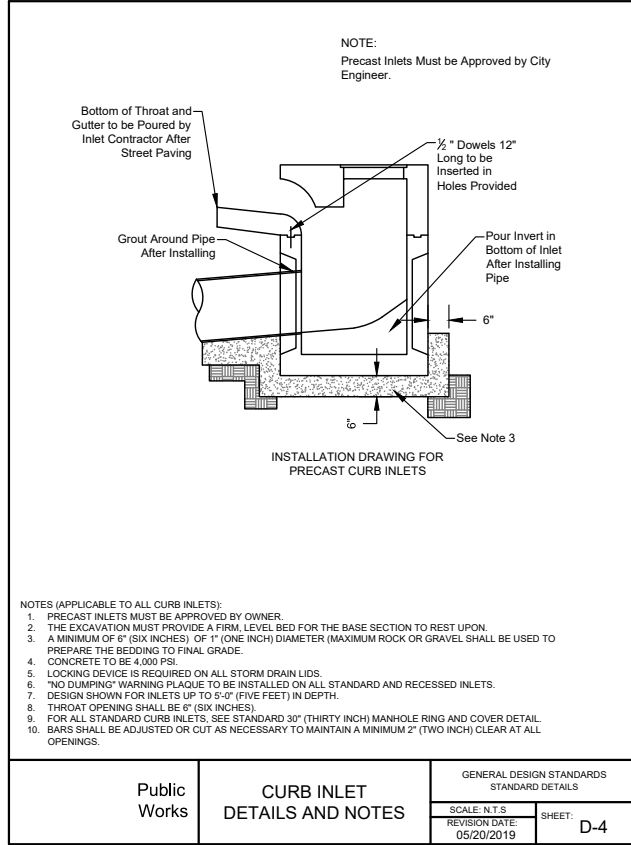
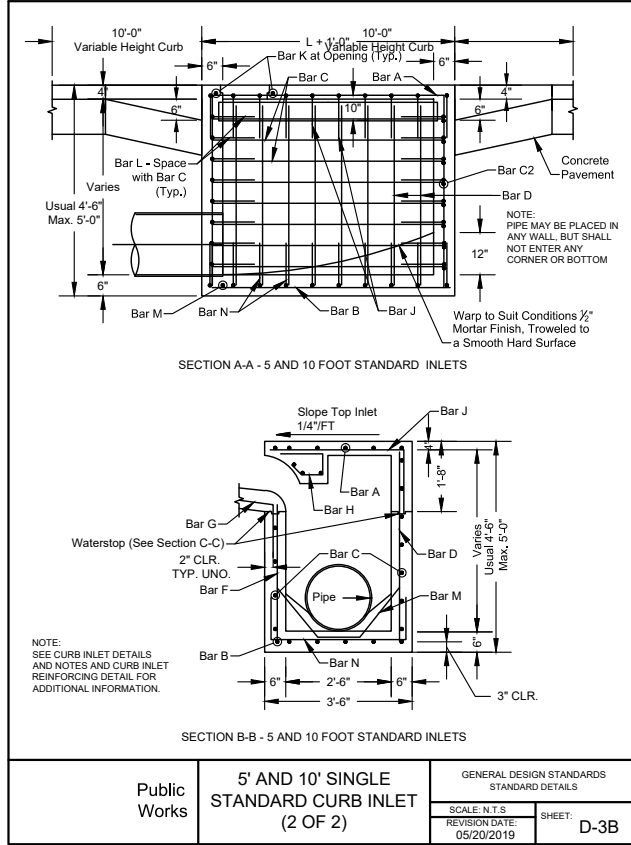
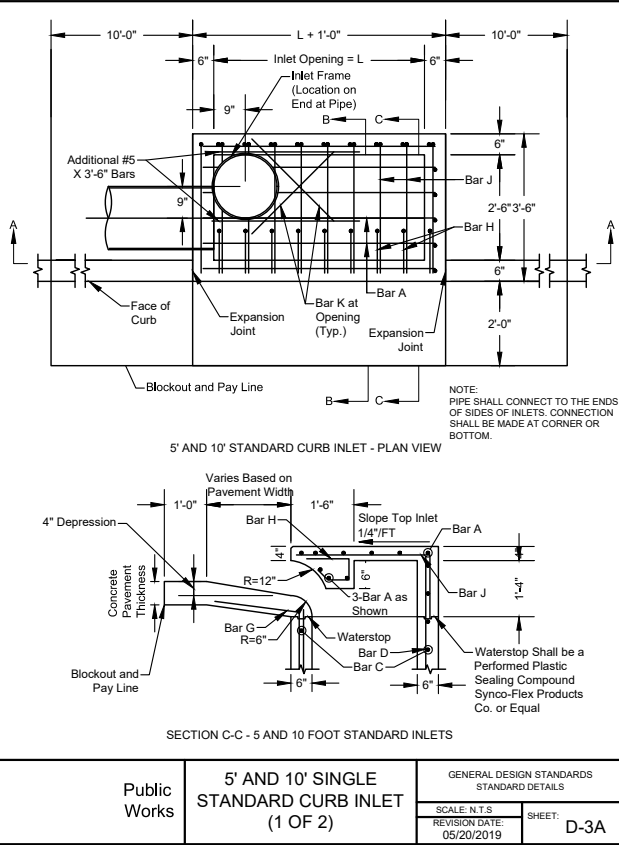
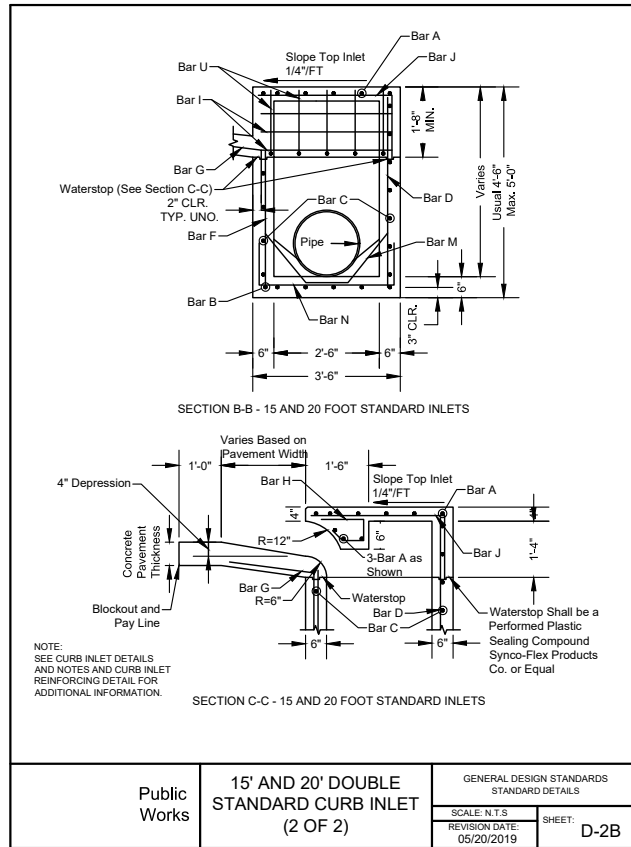
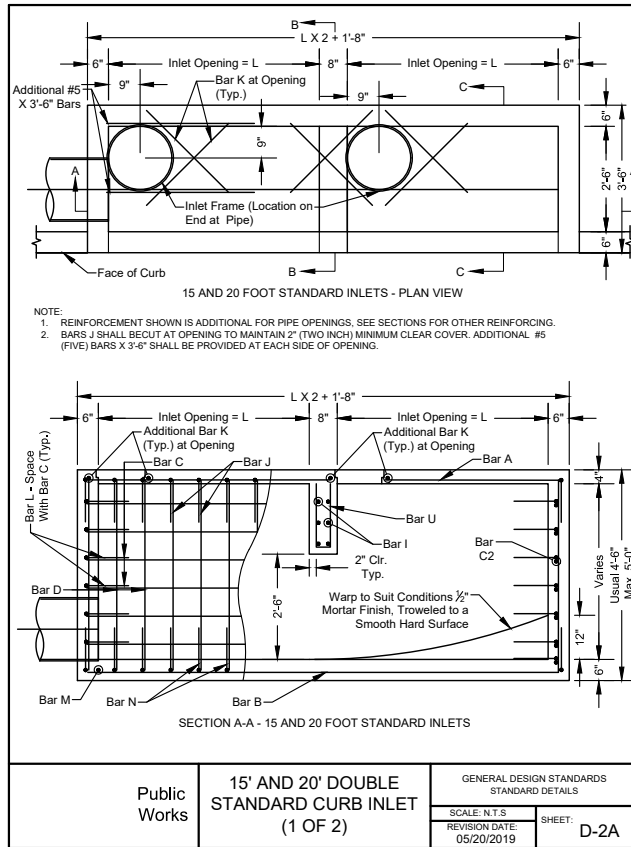
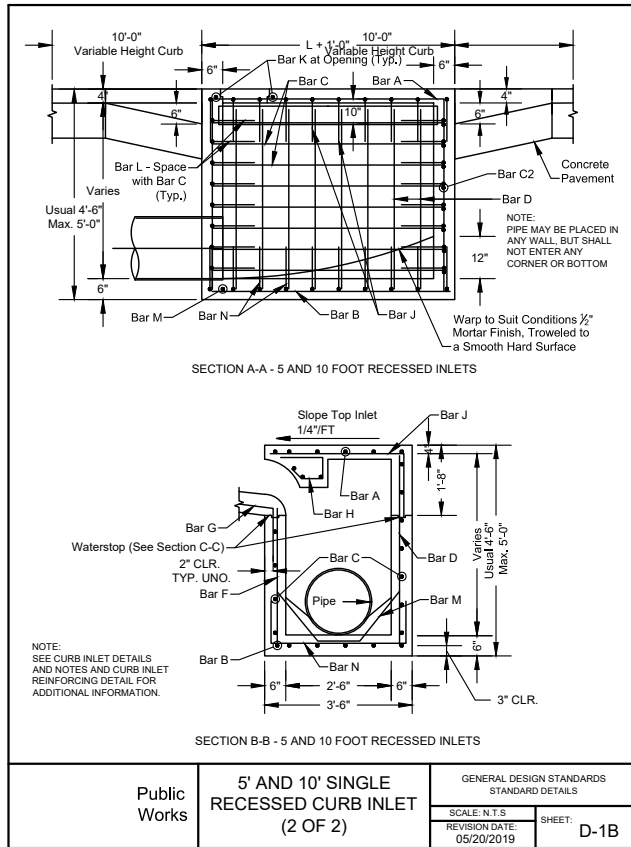
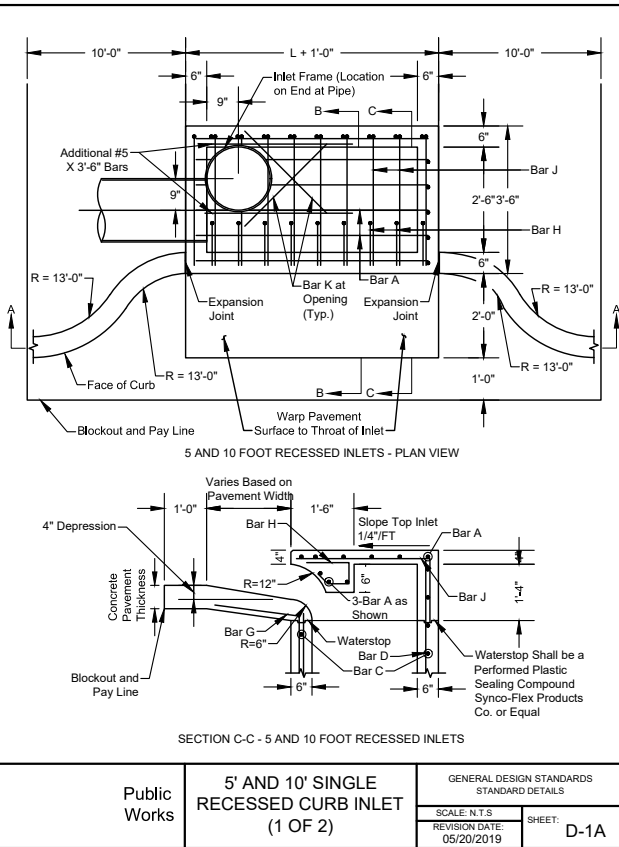
Public Works	DRIVEWAY FLARED	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: P-27
		REVISION DATE: 05/20/2019	



Public Works	DRIVEWAY RADIAL	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: P-28
		REVISION DATE: 05/20/2019	

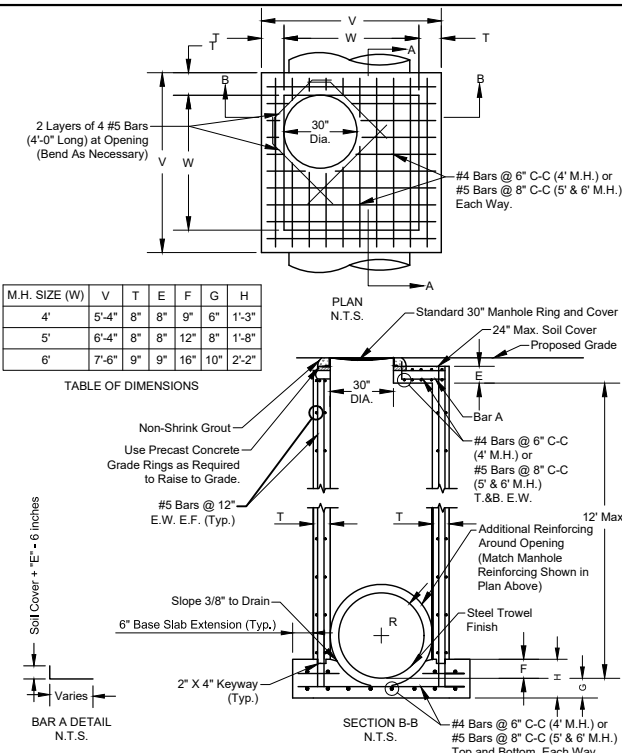


Public Works	DRIVEWAY RESIDENTIAL IN ALLEY	GENERAL DESIGN STANDARDS STANDARD DETAILS	
		SCALE: N.T.S.	SHEET: P-29
		REVISION DATE: 05/20/2019	



Inlet Opening "L"	Bar	Bar Size	Bar Length	Bar Spacing	Inlet Opening "L"	Bar	Bar Size	Bar Length	Bar Spacing		
										Double Inlets	
7'-6"	A	#4	16'-4"	8" O.C. MAX.	10'-0"	A	#4	21'-4"	8" O.C. MAX.		
	B	#4	16'-4"	8" O.C. MAX.		B	#4	21'-4"	8" O.C. MAX.		
	C	#4	16'-4"	8" O.C. MAX.		C	#4	21'-4"	8" O.C. MAX.		
	C2	#4	3'-2"	8" O.C. MAX.		C2	#4	3'-2"	8" O.C. MAX.		
	D	#5	4'-6"	12" O.C. MAX.		D	#5	4'-6"	12" O.C. MAX.		
	F	#5	3'-3"	12" O.C. MAX.		F	#5	3'-3"	12" O.C. MAX.		
	G	#4	3'-6"	12" O.C. MAX.		G	#4	3'-6"	12" O.C. MAX.		
	H	#4	2'-6"	12" O.C. MAX.		H	#4	2'-6"	12" O.C. MAX.		
	I	#4	2'-0"	8" O.C. MAX.		I	#4	2'-0"	8" O.C. MAX.		
	J	#5	4'-8"	12" O.C. MAX.		J	#5	4'-8"	12" O.C. MAX.		
5'-0"	K**	#4	3'-0"	8" O.C. MAX.	5'-0"	K**	#4	3'-0"	8" O.C. MAX.		
	L	#4	3'-0"	8" O.C. MAX.		L	#4	3'-0"	8" O.C. MAX.		
	M**	#4	4'-0"	8" O.C. MAX.		M**	#4	4'-0"	8" O.C. MAX.		
	N	#5	6'-2"	8" O.C. MAX.		N	#5	6'-2"	8" O.C. MAX.		
	U	#4	3'-4"	8" O.C. MAX.		U	#4	3'-4"	8" O.C. MAX.		
	5'-0"	A	#4	5'-0"		8" O.C. MAX.	5'-0"	A	#4	9'-0"	8" O.C. MAX.
		B	#4	5'-0"		8" O.C. MAX.		B	#4	9'-0"	8" O.C. MAX.
		C	#4	5'-0"		8" O.C. MAX.		C	#4	9'-0"	8" O.C. MAX.
		C2	#4	3'-2"		8" O.C. MAX.		C2	#4	3'-2"	8" O.C. MAX.
		D	#5	4'-6"		12" O.C. MAX.		D	#5	4'-6"	12" O.C. MAX.
F		#5	3'-3"	12" O.C. MAX.	F	#5		3'-3"	12" O.C. MAX.		
G		#4	3'-6"	12" O.C. MAX.	G	#4		3'-6"	12" O.C. MAX.		
H		#4	2'-6"	12" O.C. MAX.	H	#4		2'-6"	12" O.C. MAX.		
J		#5	4'-8"	12" O.C. MAX.	J	#5		4'-8"	12" O.C. MAX.		
K**		#4	3'-0"	8" O.C. MAX.	K**	#4		3'-0"	8" O.C. MAX.		
2'-0"	L	#4	3'-0"	8" O.C. MAX.	2'-0"	L	#4	3'-0"	8" O.C. MAX.		
	M**	#4	4'-0"	8" O.C. MAX.		M**	#4	4'-0"	8" O.C. MAX.		
	N	#5	6'-2"	8" O.C. MAX.		N	#5	6'-2"	8" O.C. MAX.		
	* BAR LENGTHS SHOWN ARE FOR MAX. HEIGHT INLETS. VALUES SHALL BE ADJUSTED FOR USUAL HEIGHT INLETS. ** DIMENSIONS SHOWN FOR TOP SLAB OPENINGS AS SHOWN IN THE DETAILS. ADDITIONAL BARS SHALL BE PROVIDED AT ALL PIPE OPENINGS AS SHOWN IN THE DETAILS. NUMBER AND DIMENSIONS TO BE MODIFIED AS NEEDED.										

Public Works
CURB INLET REINFORCING
GENERAL DESIGN STANDARDS STANDARD DETAILS
SCALE: N.T.S.
REVISION DATE: 05/20/2019
SHEET: D-5



M.H. SIZE (W)	V	T	E	F	G	H
4'	5'-4"	8"	8"	9"	6"	1'-3"
5'	6'-4"	8"	8"	12"	8"	1'-8"
6'	7'-6"	9"	9"	16"	10"	2'-2"

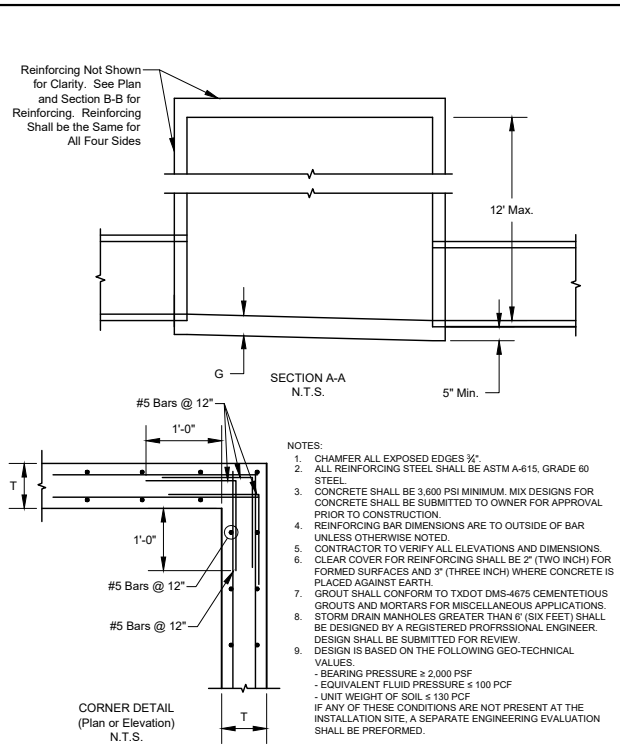
TABLE OF DIMENSIONS

Public Works

STORM DRAIN MANHOLE
4', 5' OR 6' SQUARE
(1 OF 2)

GENERAL DESIGN STANDARDS
STANDARD DETAILS

SCALE: N.T.S.
REVISION DATE: 05/20/2019
SHEET: D-6

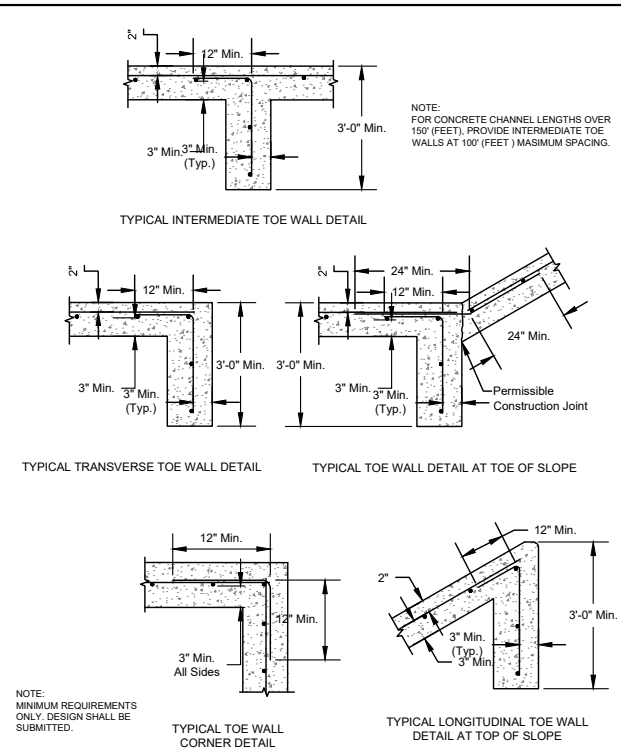


Public Works

STORM DRAIN MANHOLE
4', 5' OR 6' SQUARE
(2 OF 2)

GENERAL DESIGN STANDARDS
STANDARD DETAILS

SCALE: N.T.S.
REVISION DATE: 05/20/2019
SHEET: D-6B

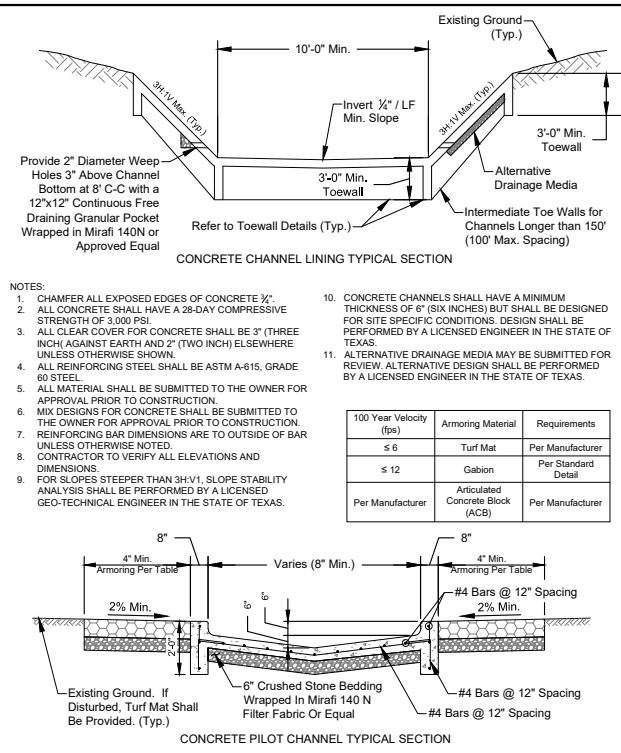


Public Works

CONCRETE CHANNEL
DETAILS
(1 OF 2)

GENERAL DESIGN STANDARDS
STANDARD DETAILS

SCALE: N.T.S.
REVISION DATE: 05/20/2019
SHEET: D-7A

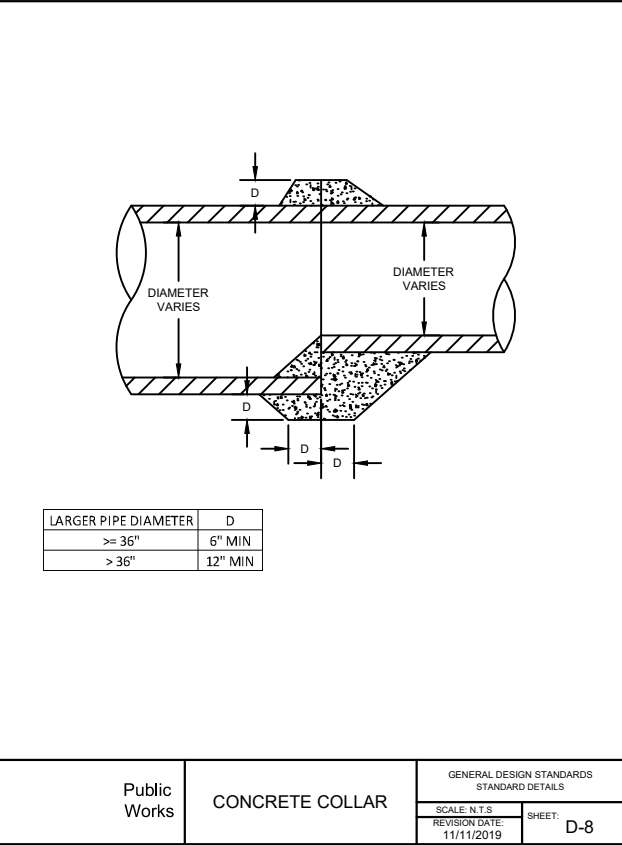


Public Works

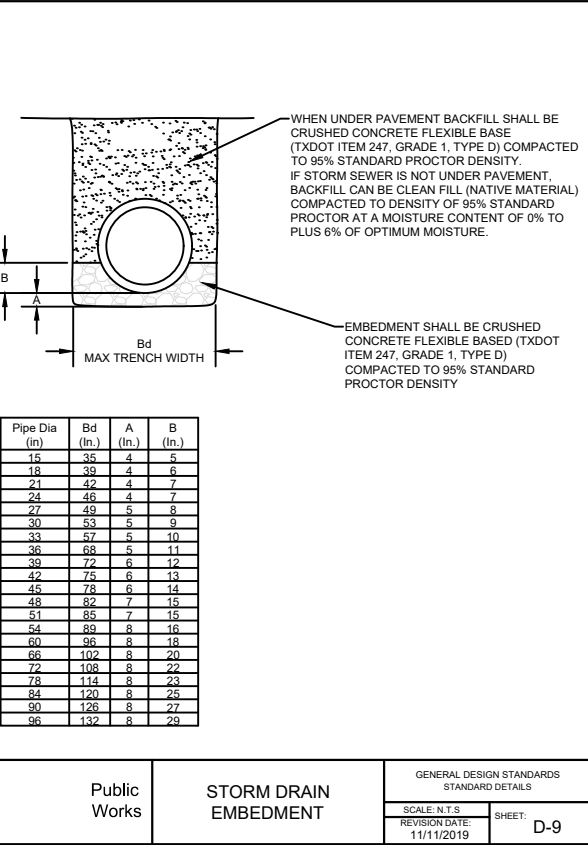
CONCRETE CHANNEL
DETAILS
(2 OF 2)

GENERAL DESIGN STANDARDS
STANDARD DETAILS

SCALE: N.T.S.
REVISION DATE: 05/20/2019
SHEET: D-7B



LARGER PIPE DIAMETER	D
≥ 36"	6" MIN
> 36"	12" MIN



Pipe Dia (in)	Bd (in)	A (in)	B (in)
15	35	4	5
18	39	4	6
21	42	4	7
24	46	4	7
27	49	5	8
30	53	5	9
33	57	5	10
36	68	5	11
39	72	6	12
42	75	6	13
45	78	6	14
48	82	7	15
51	85	7	15
54	89	8	16
60	95	8	18
66	102	8	20
72	108	8	22
78	114	8	23
84	120	8	25
90	126	8	27
96	132	8	29

Public Works

STORM DRAIN EMBEDMENT

GENERAL DESIGN STANDARDS
STANDARD DETAILS

SCALE: N.T.S.
REVISION DATE: 11/11/2019
SHEET: D-9

Public Works

CONCRETE COLLAR

GENERAL DESIGN STANDARDS
STANDARD DETAILS

SCALE: N.T.S.
REVISION DATE: 11/11/2019
SHEET: D-8