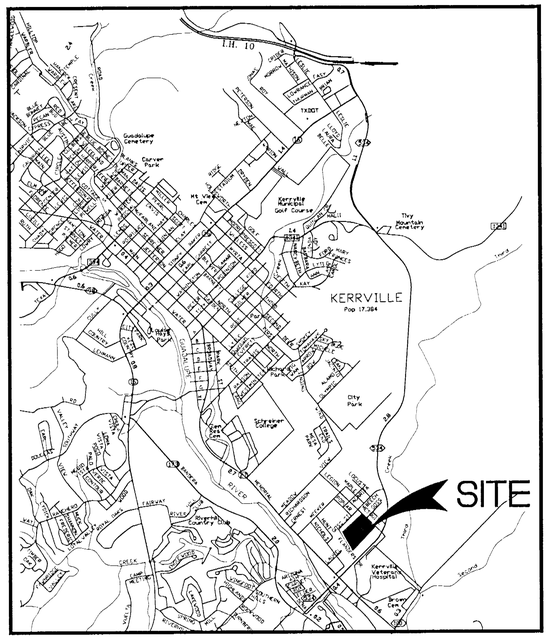
CONSTRUCTION DRAWINGS

STREET, DRAINAGE, AND UTILITY IMPROVEMENTS

FOR

LEGION HILLS, PHASE IV

KERRVILLE, TEXAS



LOCATION MAP

NOT TO SCALE

LIST OF DRAWINGS:

1. TITLE SHEET
2. OVERALL SITE & UTILITY PLAN
3. WATER DISTRIBUTION PLAN
4. MASTER DRAINAGE PLAN
5. STREET PLAN & PROFILE–BUSH BOULEVARD STA 1+00 TO END
6. STREET PLAN & PROFILE–PATRIOT DRIVE STA 1+00 TO END
7. SANITARY SEWER PLAN & PROFILE – LINE "A" STA 1+00 TO END
8. SANITARY SEWER PLAN & PROFILE – LINE "B" STA 1+00 TO END
9. STORM DRAIN "A" PLAN & PROFILE
10. STREET AND DRAINAGE DETAIL SHEET
11. UTILITY DETAIL SHEET
12. EROSION AND SEDIMENTATION CONTROL PLAN

RESIDENTIAL SUBDIVISION SEQUENCE OF CONSTRUCTION:

A. EROSION CONTROL DEVICES INSTALLED PER STORM WATER POLLUTION PREVENTION PLAN. EROSION CONTROL DEVICES MUST BE MAINTAINED DURING THE ENTIRE COURSE OF CONSTRUCTION.

B. DRAINAGE AND GRADING INCLUDING ALL CUT AND FILL FOR PROPOSED STREETS MUST BE INSTALLED FIRST (DRAINAGE PIPE, CULVERTS, INLET BOXES, CHANNELS, RIP–RAP, ETC.).

C. UTILITIES INSTALLED AFTER DRAINAGE AND ESPECIALLY AFTER CUT AND FILL HAS BEEN COMPLETE. UTILITIES INCLUDE BUT ARE NOT LIMITED TO WATER, SEWER, ELECTRIC, CABLE, TELEPHONE, AND GAS. REVEGETATION BEGINS IMMEDIATELY IN AREAS OF UTILITIES INSTALLED OUT OF THE RIGHT OF WAY.

D. UTILITIES (INCLUDING STORM DRAINAGE PIPE) TESTED PER SECTION 800 OF KERRVILLE STANDARD SPECIFICATIONS OF SUBDIVISION CONSTRUCTION AND SUBSEQUENT REPAIRS MADE.

E. PAVEMENT INSTALLED AND REVEGETATION OF RIGHT OF WAY. PAVEMENT MAY NOT BEGIN UNTIL ALL UTILITIES WITHIN THE RIGHT OF WAY ARE INSTALLED AND COMPLETE (WATER, SEWER, ELECTRIC, CABLE, TELEPHONE, AND GAS).

F. UTILITIES TESTED PER SECTION 800 OF KERRVILLE STANDARD SPECIFICATIONS OF SUBDIVISION CONSTRUCTION AND SUBSEQUENT REPAIRS MADE.

G. RECORD DRAWINGS (AS–BUILT) SUBMITTED TO CITY ENGINEER.

H. REVEGETATION COMPLETE, EROSION CONTROL DEVICES REMOVED.

I. FINAL WALK THROUGH, PUNCH LIST, FINAL ACCEPTANCE.

ENGINEER:

STATE OF TEXAS
KENNETH B. KOLACNY
86300
LICENSED
PROFESSIONAL ENGINEER

KEN KOLACNY, P.E.

1-10-05

DEC. 2004

MATKIN-HOOVER
ENGINEERING, INC.

CIVIL ENGINEERS
LAND PLANNERS
CONSULTANTS

P.O. Box 54
1499 S. MAIN
BOERNE, TEXAS 78006
PH: 830–249–0600

Sheet 1 of 12

Job No. 2144.00

UTILITY GENERAL NOTES:

1. ALL WATER PIPE SHALL BE AWWA C-900-81, DR-14, CLASS 200 PSI.

2. ALL MAINS SHALL BE FLUSHED, HYDROSTATICALLY TESTED, AND DISINFECTED BY THE CONTRACTOR, AS PROVIDED FOR THE CITY OF KERRVILLE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

3. FOR PURPOSES OF RECORD DRAWINGS FOR THE CITY OF KERRVILLE, THE CONTRACTOR SHALL FURNISH THE ENGINEER WITH ALL THE FINAL MEASUREMENTS, TAPS AND LENGTH OF SERVICE CONNECTIONS.

4. CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT.

5. ALL GARBAGE OR SPOIL MATERIAL FROM THIS WORK SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR, AT HIS EXPENSE.

6. WHEN SEWER MAINS ARE INSTALLED IN THE VICINITY OF WATER MAINS, SUCH INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY "RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS" (1998 OR ANY REVISIONS THERETO.)

7. ALL TRENCH BACKFILL FOR THIS PROJECT SHALL BE ACCOMPLISHED ACCORDING TO THE WATER SYSTEM DETAIL SHEET. NO WATER JETTING WILL BE ALLOWED. OBSERVATION OF TRENCH BACKFILL WILL BE SUPPLEMENTED BY MOISTURE-DENSITY TESTING CONDUCTED AT PERIODIC INTERVALS DURING THE COMPACTION PROCESS. THE CONTRACTOR WILL BE REQUIRED TO MAKE SUITABLE EXCAVATION TO ALLOW ACCESS FOR SUCH TESTING, AND WILL BE REQUIRED TO REMOVE AND REPLACE BACKFILL AS MANY TIMES AS NECESSARY TO ACHIEVE 95% COMPACTION. TRENCH TESTING INTERVAL SHALL BE 1 TEST PER LIFT PER 500 LF OF TRENCH. LIFT HEIGHT SHALL BE 8" OF LOOSE MATERIAL.

8. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS PROJECT SHALL CONFORM TO ALL APPLICABLE CITY OF KERRVILLE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION(LATEST EDITION), CITY OF KERRVILLE BUILDING CODE AND REGULATIONS, AS WELL AS OTHER SAFETY CODES AND INSPECTION PROVISIONS APPLICABLE TO THE PROJECT AND REQUIREMENTS OF THE CITY OF KERRVILLE FIRE DEPARTMENT.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ALL PERMITS, TESTS, APPROVALS AND ACCEPTANCES REQUIRED TO COMPLETE CONSTRUCTION OF THIS PROJECT.

10. ALL ITEMS NOT SPECIFICALLY CALLED FOR ON THE PLANS, OR IN THE SPECIFICATIONS, BUT NECESSARY TO REASONABLY CONSTRUCT THE FACILITY OR IMPROVEMENT, SHALL BE CONSIDERED INCIDENTAL TO THE OVERALL PROJECT AND NO SEPARATE PAYMENTS WILL BE MADE FOR THESE ITEMS.

11. THE CONTRACTOR SHALL EXCAVATE AROUND EXISTING UTILITIES WHICH INTERSECT THE PROPOSED ALIGNMENT OF THE SERVICES AND NOTIFY THE ENGINEER OF POTENTIAL CONFLICTS, PRIOR TO ANY CONSTRUCTION IN THE AREA.

12. THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE ONLY. ACTUAL LOCATIONS AND DEPTHS OF UTILITIES MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.

13. THE CONTRACTOR SHALL NOTIFY THE GOVERNMENTAL AND/OR UTILITY COMPANIES REGARDING THE LOCATION OF EXISTING FACILITIES PRIOR TO CONSTRUCTION.

14. DEPTH OF BURY FOR ALL PIPING SHALL BE A MINIMUM OF 4' UNLESS OTHERWISE NOTED.

15. ALL PROPOSED SANITARY SEWER PIPE AND FITTINGS SHALL BE SDR 26 PVC PIPE.

16. ALL ROUGH GRADING TO BE COMPLETED TO WITHIN 0.1' (ONE-TENTH) OF GRADE PRIOR TO INSTALLATION OF UTILITIES TO ENSURE PROPER COVER ON PROPOSED UTILITIES.

17. ALL TIES TO EXISTING UTILITIES MUST BE COORDINATED WITH THE CITY OF KERRVILLE UTILITY CONSTRUCTION DEPARTMENT.

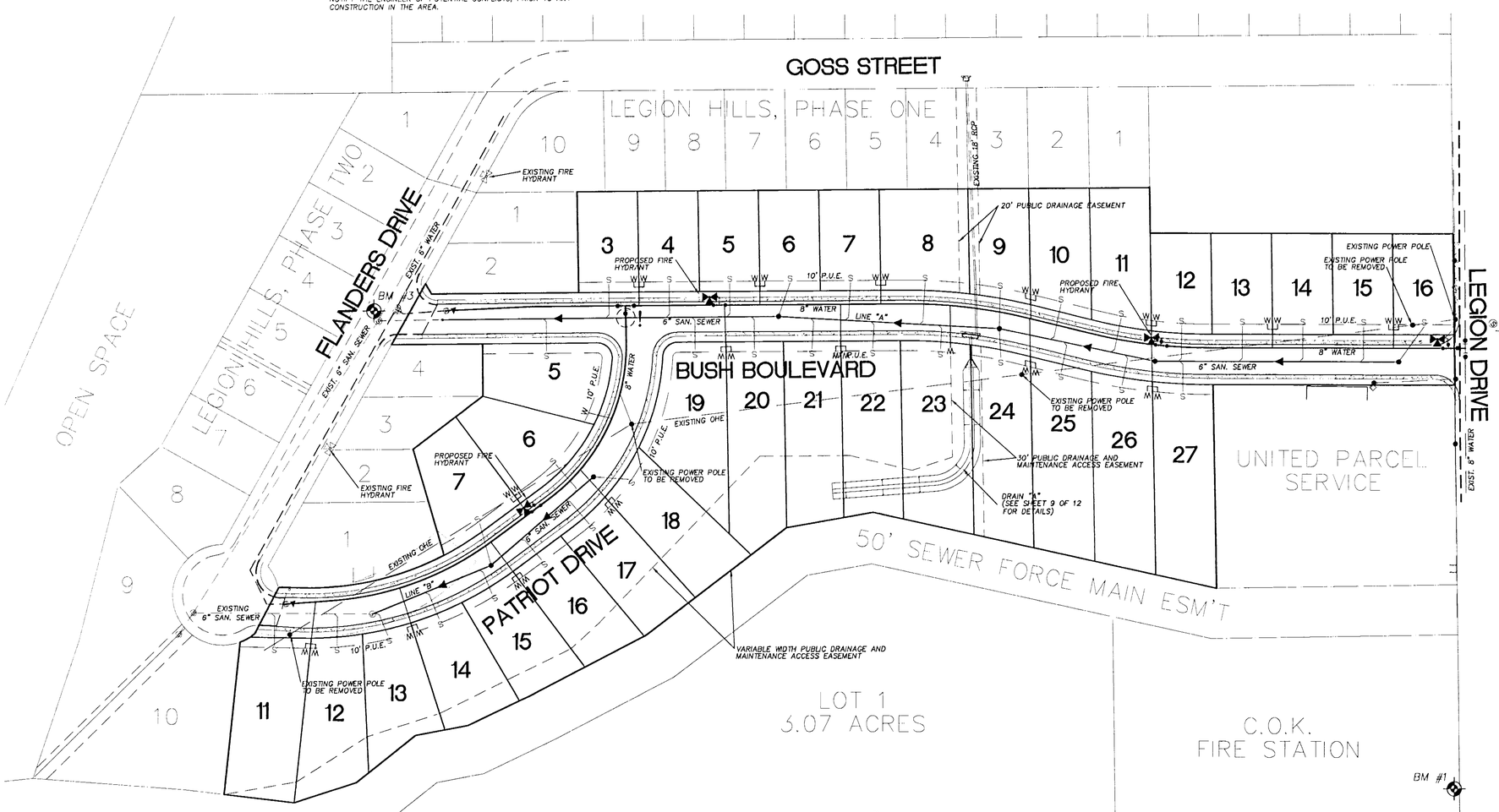
BENCHMARK LEGEND:

BM #1 – 1665.74 CONCRETE MONUMENT AT EAST PROPERTY LINE OF CITY OF KERRVILLE FIRE DEPARTMENT ALONG LEGION DRIVE

BM #2 – 1662.42 RIM OF SEWER MANHOLE IN LEGION DRIVE AT PROPOSED BUSH BLVD.

BM #3 – 1648.79 RIM OF SEWER MANHOLE IN FLANDERS DRIVE AT PROPOSED BUSH BLVD.

NOTE: (!) DENOTES WATER/SEWER CROSSING–SEE DETAIL THIS SHEET



Scale: 1" = 60'

LEGEND:

EXISTING OVERHEAD ELECTRIC — OHE — P.P.

EXISTING SANITARY SEWER — SS — MANHOLE

PROPOSED SANITARY SEWER — SS — MANHOLE

EXISTING WATER — W — FIRE HYDRANT

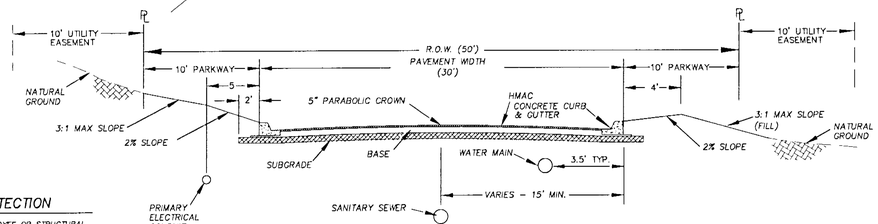
PROPOSED WATER — W — FIRE HYDRANT

PROPOSED PRIMARY ELECTRIC, TELEPHONE AND CABLE T.V. LINES — TRANSFORMER — JUNCTION BOX

PROPOSED ELECTRIC, TELEPHONE AND CABLE T.V. SERVICE LINES — HANDHOLE

STREET LIGHT

PUBLIC UTILITY EASEMENT P.U.E.



NOTES: 1. SEE TYPICAL TRENCH SECTIONS FOR DETAILS ON WATER, SEWER AND ELECTRICAL TRENCHES.

2. SEE STREET AND DRAINAGE DETAILS SHEET FOR PAVING CROSS SECTION.

TYPICAL STREET SECTION

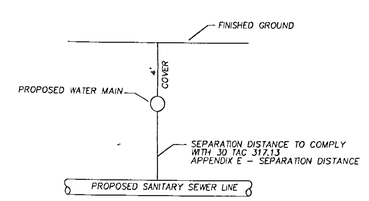
SCALE : NONE

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS COVERING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATIONS.

SANITARY SEWER NOTES:

1. NO VERTICAL STACKS ALLOWED FOR ANY LOTS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
2. PIPE TYPE DESIGNATIONS ARE SDR 26.
3. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 150 P.S.I. DR18 C900 AND MEET THE REQUIREMENTS OF AWWA C900-18 WITH ONE JOINT CENTERED AT WATER MAIN.
4. ALL RESIDENTIAL SEWER SERVICE LATERALS ARE 4" DIA. AND SHALL BE EXTENDED TO THE PROPERTY LINE AND CAPPED AND SEALED. CONTRACTOR SHALL INSTALL A 2-WAY CLEANOUT AT THE END OF ALL SERVICE LATERALS.



TYPICAL SANITARY SEWER/WATER MAIN CROSSING DETAIL

SCALE : NONE

NOTE:
SIDEWALKS ARE NOT INCLUDED IN THIS CONTRACT. SIDEWALKS WILL BE INSTALLED BY INDIVIDUAL PROPERTY OWNERS AS REQUIRED BY CITY ORDINANCES.

NOTE:
ELECTRIC, TELEPHONE & CABLE T.V. LINES SHOWN FOR BACKGROUND PURPOSES ONLY. REF. ELECTRIC, TELEPHONE & CABLE T.V. PLANS FOR DETAILS AND FINAL PRIMARY & SECONDARY SERVICE ROUTING.

STATE OF TEXAS
KENNETH B. KOLACNY
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PROFESSIONAL ENGINEER
1-10-05

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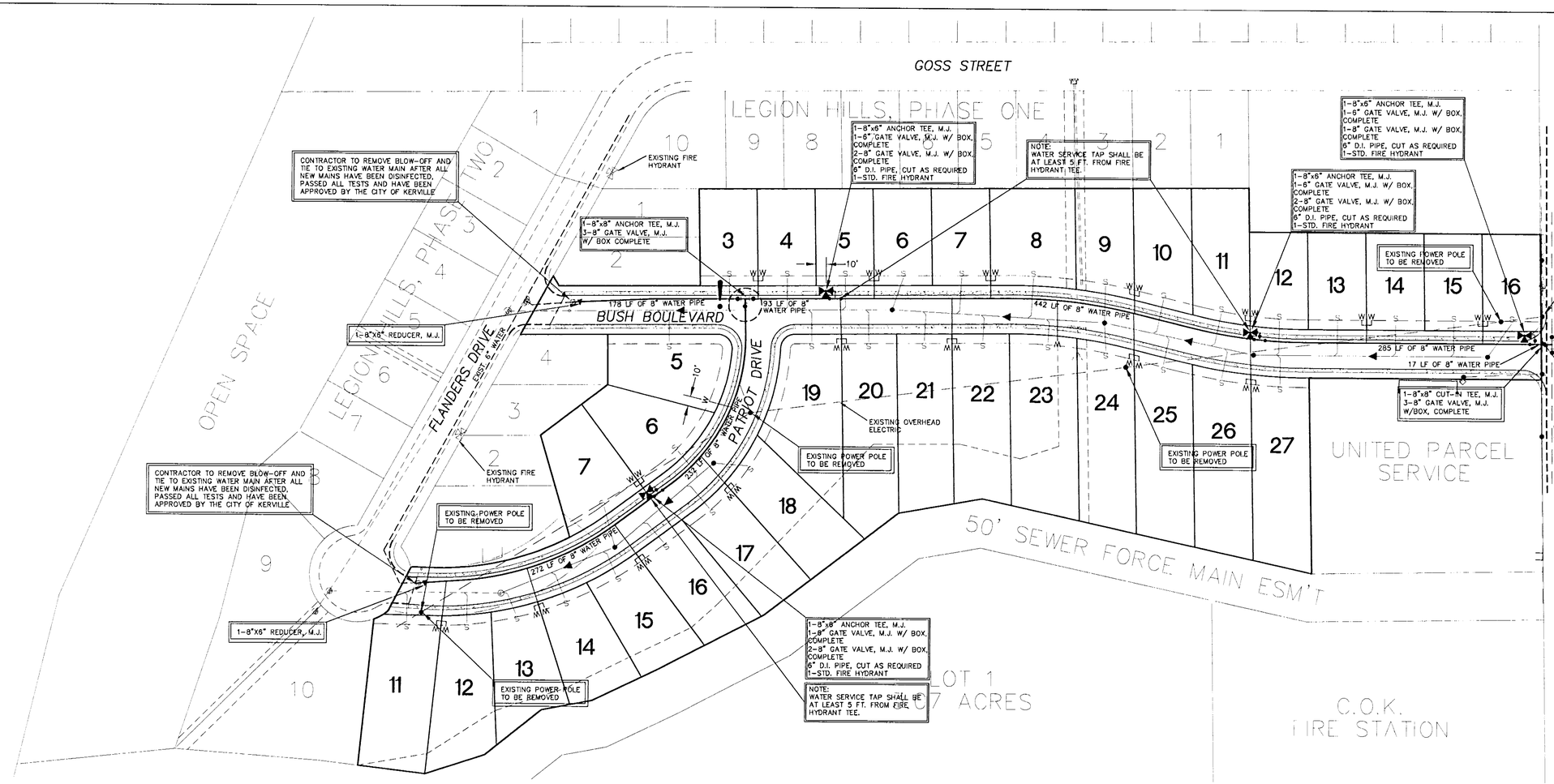
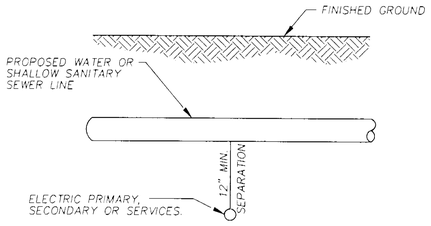
LEGION HILLS, PHASE IV
OVERALL SITE & UTILITY PLAN
FOR
CITY OF KERRVILLE
KERR COUNTY, TEXAS

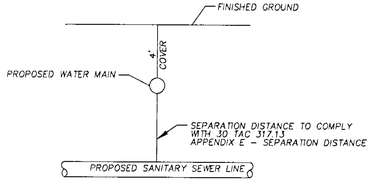
JOB NO. 2144.00
DATE NOV. 2004
DESIGNED MBM
CHECKED KBK
SHEET 2 OF 12





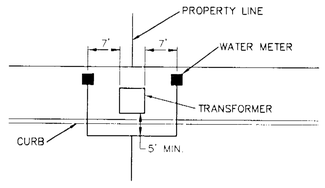
ELECTRIC / SANITARY SEWER OR WATER MAIN CROSSING DETAIL

N.T.S.



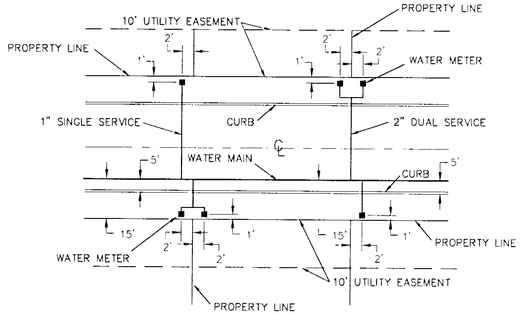
TYPICAL SANITARY SEWER / WATER MAIN CROSSING DETAIL

N.T.S.



WATER METER / ELECTRIC TRANSFORMER LOCATION DETAIL

SCALE : NONE



NOTE: SEE TYPICAL SERVICE DETAILS, SHEET 11 OF 12

WATER METER LOCATION DETAIL

SCALE : NONE

DENOTES WATER/SEWER CROSSING–SEE DETAIL HIS SHEET

GENERAL WATER NOTES:

1. All materials and construction procedures within the scope of this project shall be approved by the City of Kerrville and comply with the following as applicable:

   A. Current City of Kerrville "Standard Specifications for Subdivision Construction, August 2002"
   B. Current TxDOT " Standard Specification for Construction of Highways, Streets and Drainage"

2. The Contractor shall not proceed with any pipe installation work until they notify City of Kerrville Public Works Department at (830) 792–8312 with at least 3 working days (72hours) notice.

3. The locations and depths of existing utilities, including service laterals, and drainage structures shown on the plans are approximate only. The Contractor shall verify the exact location and depths of underground utilities at least 48 hours prior to construction whether shown on plans or not, and to protect the same during construction.

City of Kerrville – Public Works	830–792–8312
"Texas State Wide One Call Locator"	800–545–6005
Electric	"
Telephone	"
Cable television	"
Gas	"

4. No meter boxes to be set in driveways. Any meter boxes set in driveways will be relocated at contractor's expense.

5. The Contractor shall be responsible for restoring to its original or better condition from damage done to existing fences, curbs, streets, driveways, landscaping and structures.

6. The Contractor shall avoid cutting roots larger than one inch in diameter when excavating near existing trees. Excavation in vicinity of trees shall proceed with caution.

7. No extra–payment shall be allowed for work called for on the plans but not included on the bid schedule. This incidental work will be required and shall be included under the pay item to which it relates.

8. Flushing, Hydrostatic Testing & Disenfection of all water pipe shall be included in the unit price of water pipe.

9. The Developer dedicates the water mains upon completion by the Developer and acceptance by the City of Kerrville. The City of Kerrville will own and maintain said water mains which are located within this particular subdivision.

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS COVERING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATIONS.

STATE OF TEXAS
KENNETH B. HOOVER
65300
LICENSED PROFESSIONAL ENGINEER
1-10-05

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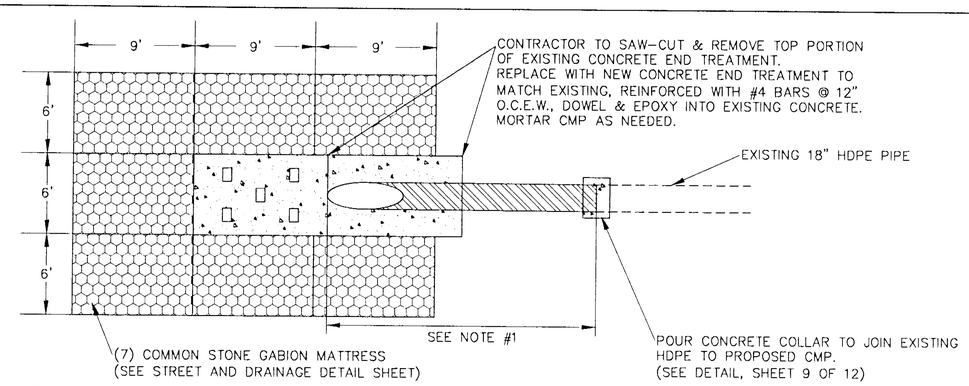
LEGION HILLS, PHASE IV
WATER DISTRIBUTION PLAN
FOR
CITY OF KERRVILLE
KERRVILLE, TEXAS

JOB NO. 2144.00
DATE NOV. 2004
DESIGNED MBM
CHECKED KBK
SHEET 3 OF 12

RUNOFF COMPUTATIONS

(INLET CALCULATIONS ARE SHOWN ON THE STORM DRAIN PLAN AND PROFILE SHEET)

PT	AREA (acres) INCREMENT	AREA (acres) TOTAL	TC OVERLND	TC SHLLW CNC	TC CHANNEL	Tc	C	I	Q C.F.S.	FREQ. YR
1 (EXIST CURB INLET)	1.663	1.663	17	5	0	22	0.75	5.97	7.45	25
								7.55	9.42	100
2 (PROP. CURB INLET)	4.635	4.635	20	1	0	21	0.75	6.13	21.30	25
								7.75	26.94	100
1+2 (PIPE OUTLET)		6.298	17	5	1	23	0.75	5.82	27.51	25
								7.37	34.81	100
3 (LOT RUN-OFF)	2.779	2.779	20	1	0	21	0.75	6.13	12.77	25
								7.75	16.15	100
1+2+3 (CHANNEL)		9.077	17	5	1	23	0.75	5.82	39.64	25
								7.37	50.16	100



NOTE:
1. CONTRACTOR TO REMOVE 20 L.F. OF DAMAGED 18" HDPE STORM DRAIN PIPE AND REPLACE WITH 20 L.F. OF 18" C.M.P. BACKFILL & COMPACT TO 95% STANDARD PROCTOR.

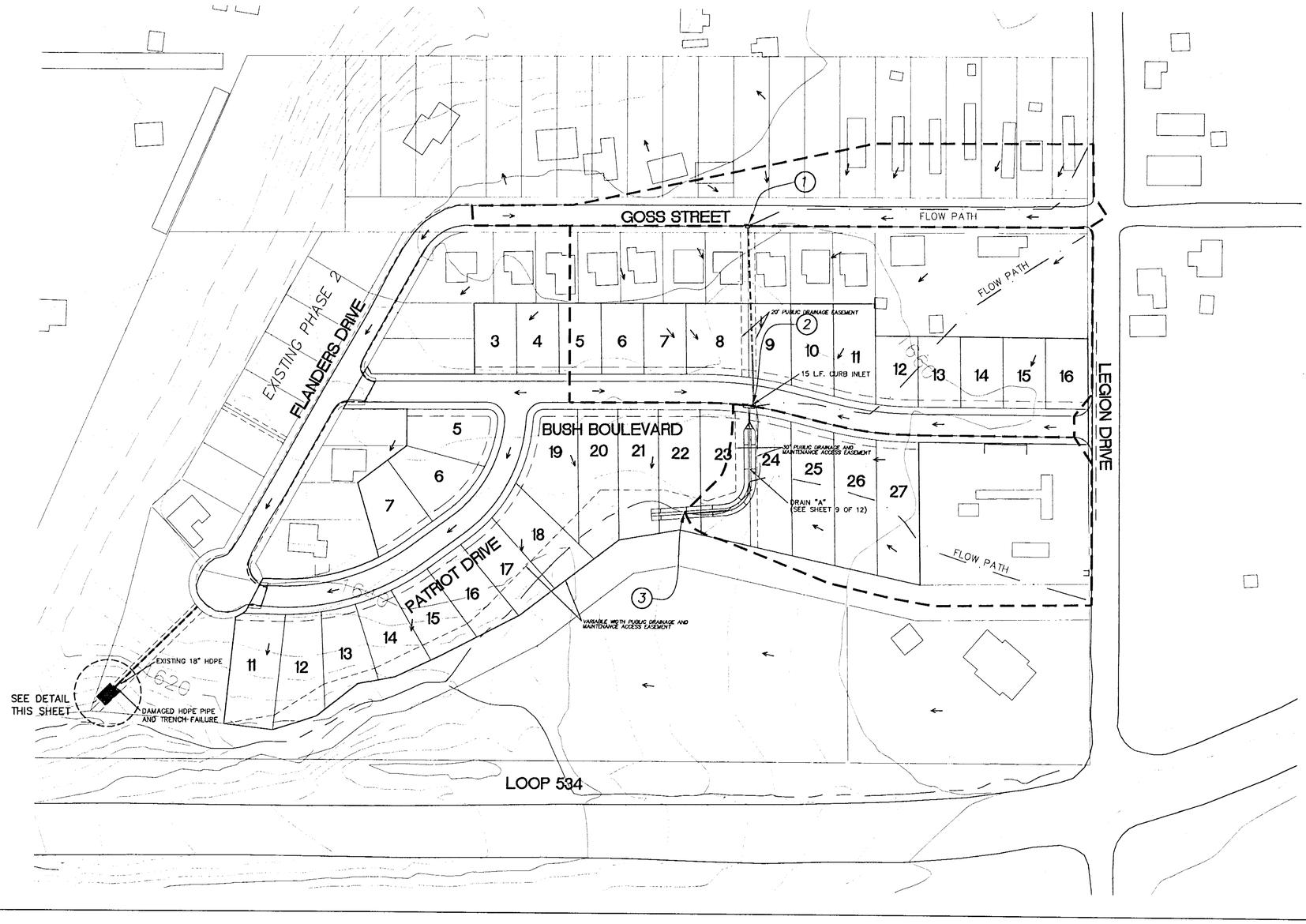
HDPE STORM DRAIN REPAIR DETAIL

SCALE: NONE

Scale: 1" = 80'

LEGEND

- EXIST. 4' CONTOUR
- PROP. DRAINAGE AREA DIVIDE
- ← PROPOSED FLOW ARROW
- (1) PROPOSED RUNOFF COMPUTATION POINT



STATE OF TEXAS
KENNETH B. KOLODNY
86300
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1-10-05

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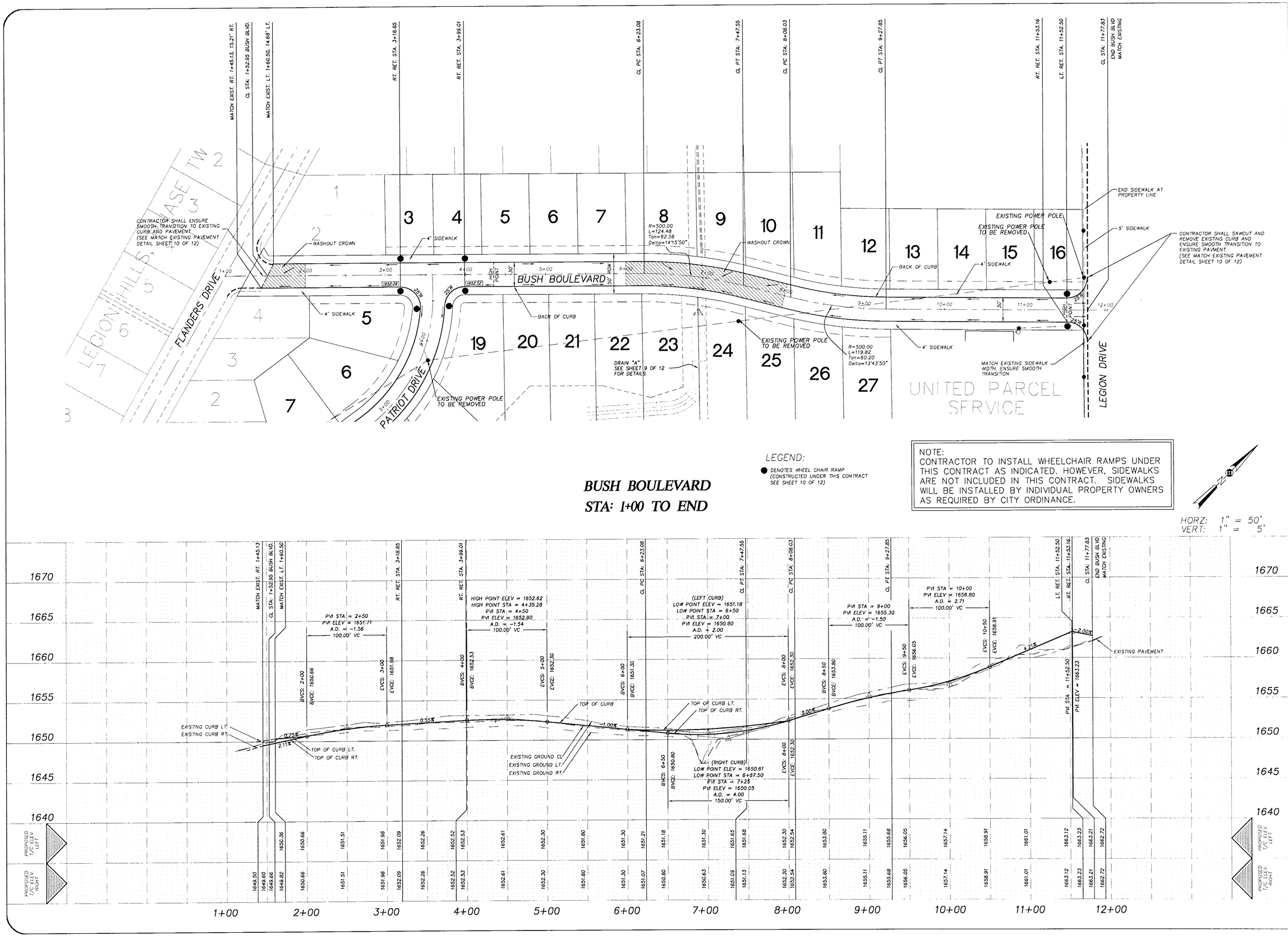
LEGION HILLS, PHASE IV
MASTER DRAINAGE PLAN
FOR
CITY OF KERRVILLE
KERRVILLE, TEXAS

JOB NO. 2144.00
DATE NOV. 2004
DESIGNED MBM
CHECKED KBK
SHEET 4 OF 12



LEGEND:

● DENOTES WHEEL CHAIR RAMP (CONSTRUCTED UNDER THIS CONTRACT SEE SHEET 10 OF 12)

NOTE:
CONTRACTOR TO INSTALL WHEELCHAIR RAMPS UNDER THIS CONTRACT AS INDICATED. HOWEVER, SIDEWALKS ARE NOT INCLUDED IN THIS CONTRACT. SIDEWALKS WILL BE INSTALLED BY INDIVIDUAL PROPERTY OWNERS AS REQUIRED BY CITY ORDINANCE.

BUSH BOULEVARD
STA: 1+00 TO END

HORZ: 1" = 50'
VERT: 1" = 5'

Rev.

STATE OF TEXAS
KENNETH B. KOLTON
86300
LICENSED
PROFESSIONAL ENGINEER
1-10-05

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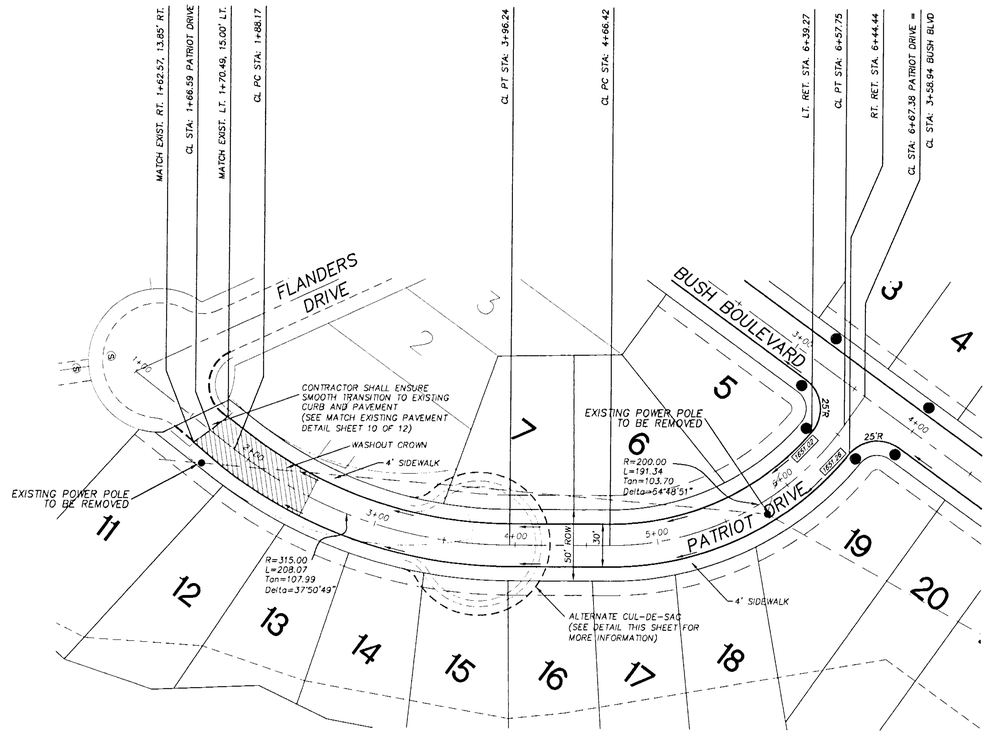
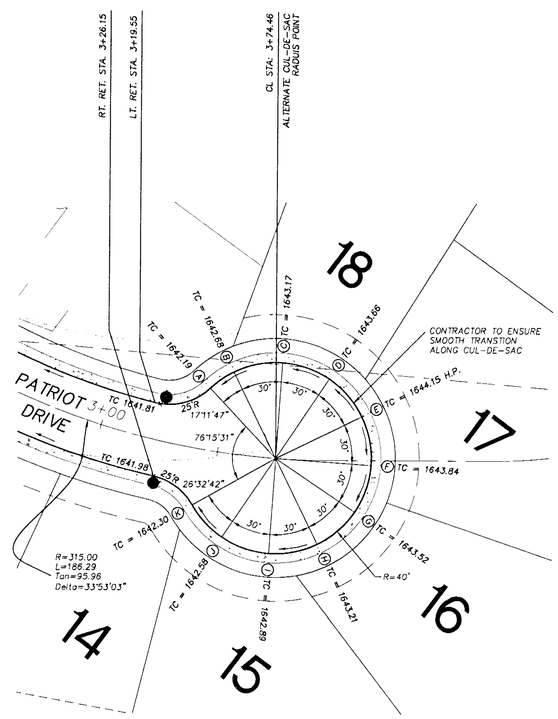
CONSULTANTS

LEGION HILLS, PHASE IV
BUSH BOULEVARD - PLAN AND PROFILE - STA. 1+00 TO END
FOR
CITY OF KERRVILLE
KERRVILLE, TEXAS

JOB NO. 2144.00
DATE NOV 2004
DESIGNED MBM
CHECKED KBK
SHEET 5 OF 12





ALTERNATE CUL-DE-SAC DETAIL

SCALE: 1" = 30'

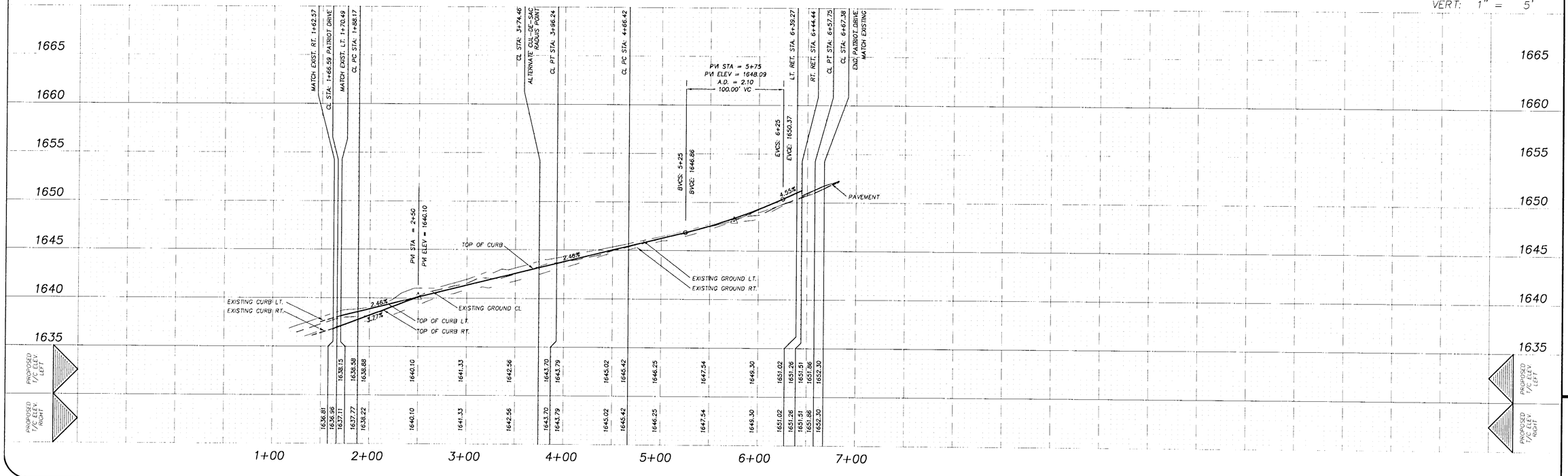
NOTE:
CONTRACTOR TO INSTALL WHEELCHAIR RAMPS UNDER THIS CONTRACT AS INDICATED. HOWEVER, SIDEWALKS ARE NOT INCLUDED IN THIS CONTRACT. SIDEWALKS WILL BE INSTALLED BY INDIVIDUAL PROPERTY OWNERS AS REQUIRED BY CITY ORDINANCE.

LEGEND:

● DENOTES WHEEL CHAIR RAMP (CONSTRUCTED UNDER THIS CONTRACT SEE SHEET 10 OF 12)

PATRIOT DRIVE
STA: 1+00 TO END

HORZ: 1" = 50'
VERT: 1" = 5'



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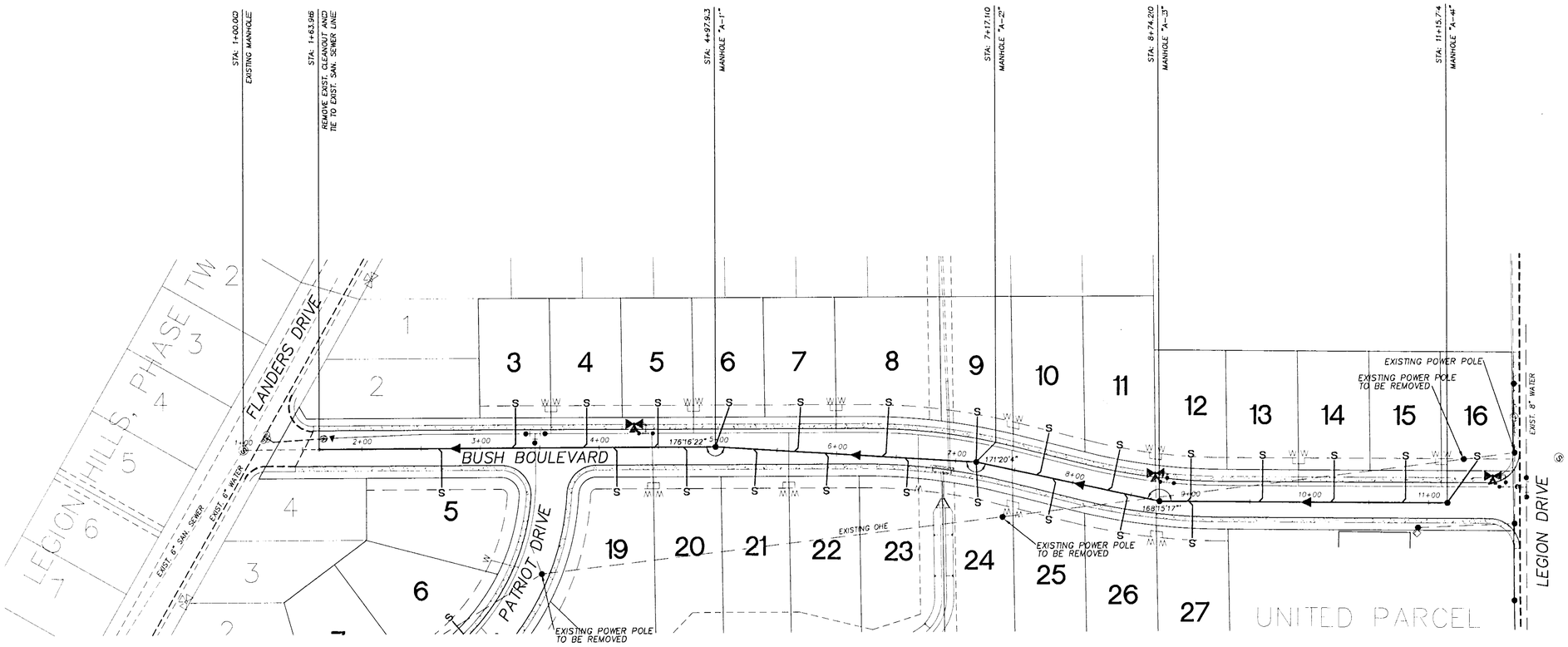
LAND PLANNERS
CONSULTANTS

STATE OF TEXAS
KENNETH B. KOVACICH
86300
LICENSED PROFESSIONAL ENGINEER
1-10-05

Rev.

LEGION HILLS, PHASE IV
PATRIOT DRIVE - PLAN AND PROFILE - STA. 1+00 TO END
FOR
CITY OF KERRVILLE
KERRVILLE, TEXAS

JOB NO. 2144.00
DATE NOV 2004
DESIGNED MBM
CHECKED KBK
SHEET 6 OF 12

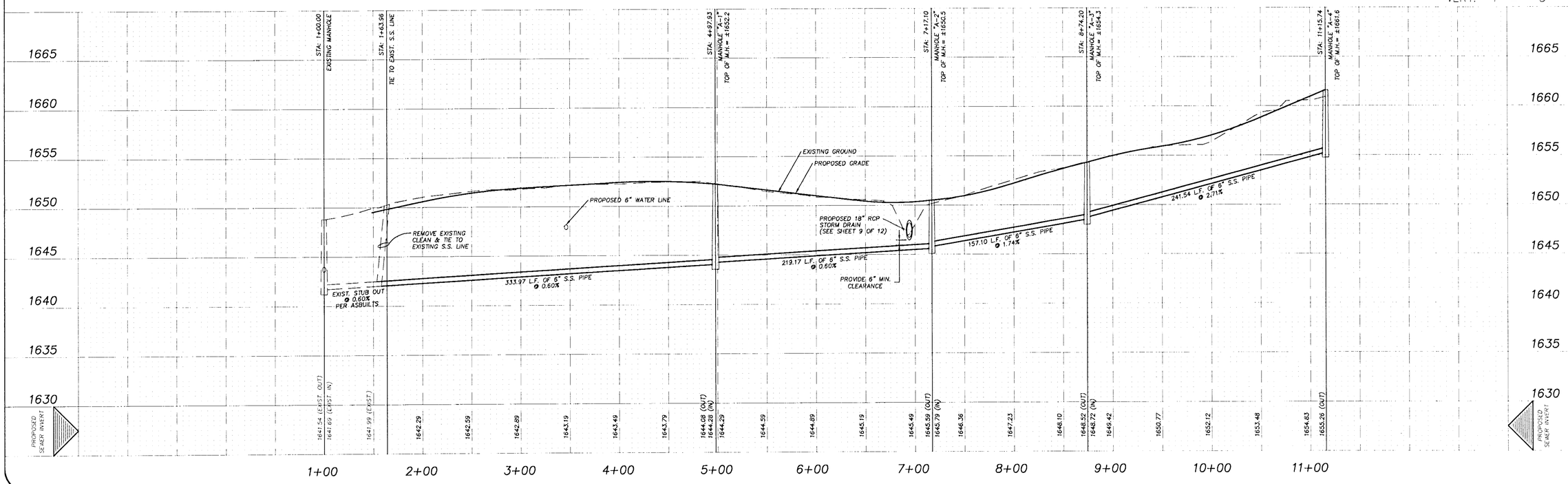


TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS COVERING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATIONS.

LINE "A"
STA: 1+00 TO END

HORZ: 1" = 50'
VERT: 1" = 5'



Rev.

STATE OF TEXAS
KENNETH B. KOLICH
86300
LICENSED PROFESSIONAL ENGINEER
1-10-05

MATKIN-HOOVER ENGINEERING, INC.
CIVIL ENGINEERS
LAND PLANNERS
CONSULTANTS
P.O. Box 54
1499 S. MAIN
BOERNE, TEXAS 78006
PH: 830-249-0600

LEGION HILLS, PHASE IV
SANITARY SEWER LINE "A" - PLAN AND PROFILE - STA. 1+00 TO END
FOR
CITY OF KERRVILLE
KERRVILLE, TEXAS

JOB NO. 2144.00
DATE NOV. 2004
DESIGNED MBM
CHECKED KBK
SHEET 7 OF 12

TRENCH EXCAVATION SAFETY PROTECTION

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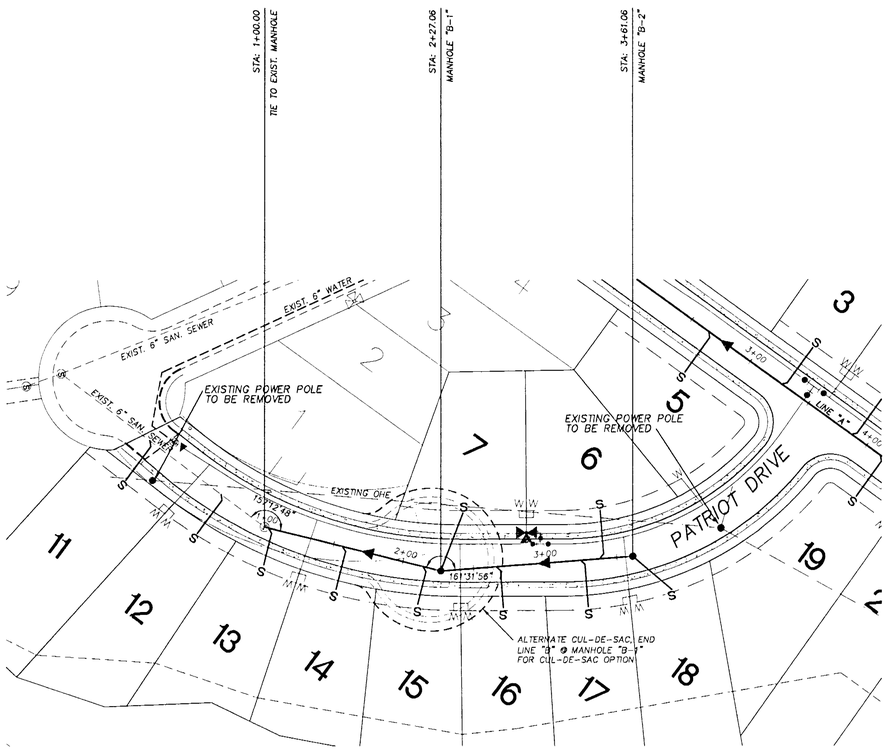
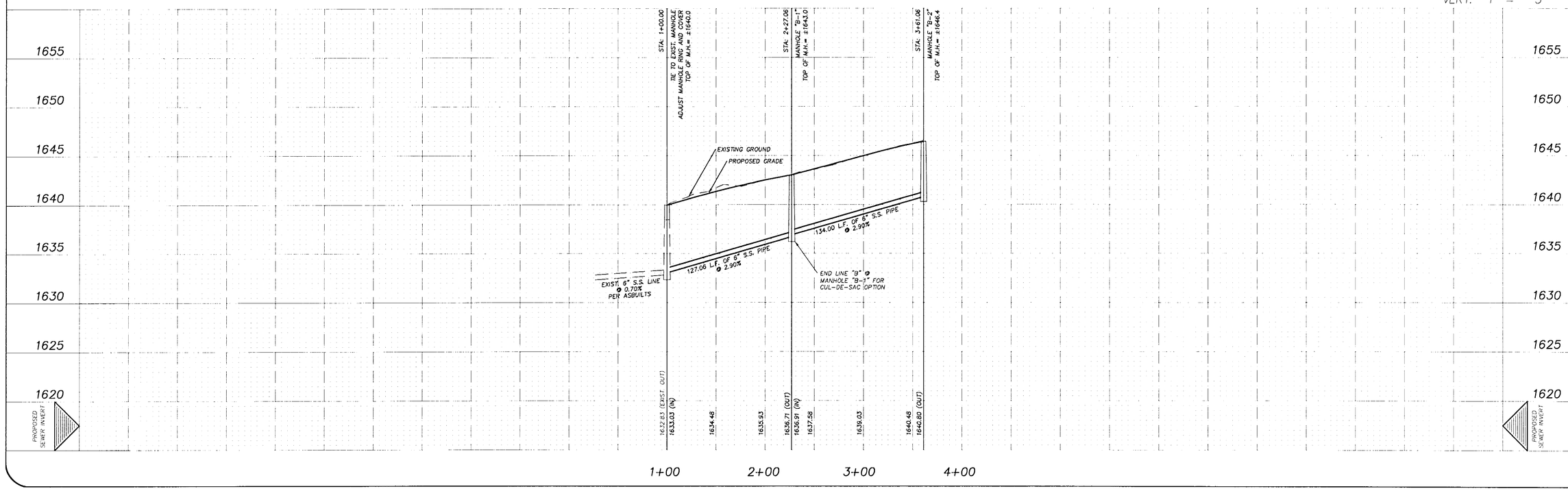
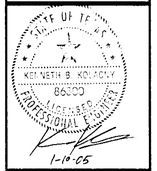


LINE "B"
STA: 1+00 TO END



Rev.



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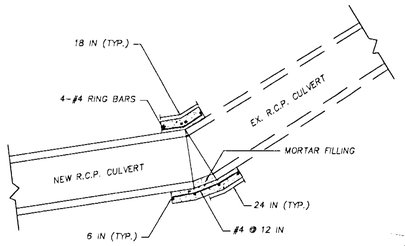
CIVIL ENGINEERS
LAND PLANNERS
CONSULTANTS

LEGION HILLS, PHASE IV
SANITARY SEWER LINE "B" - PLAN AND PROFILE - STA. 1+00 TO END
FOR
CITY OF KERRVILLE
KERRVILLE, TEXAS

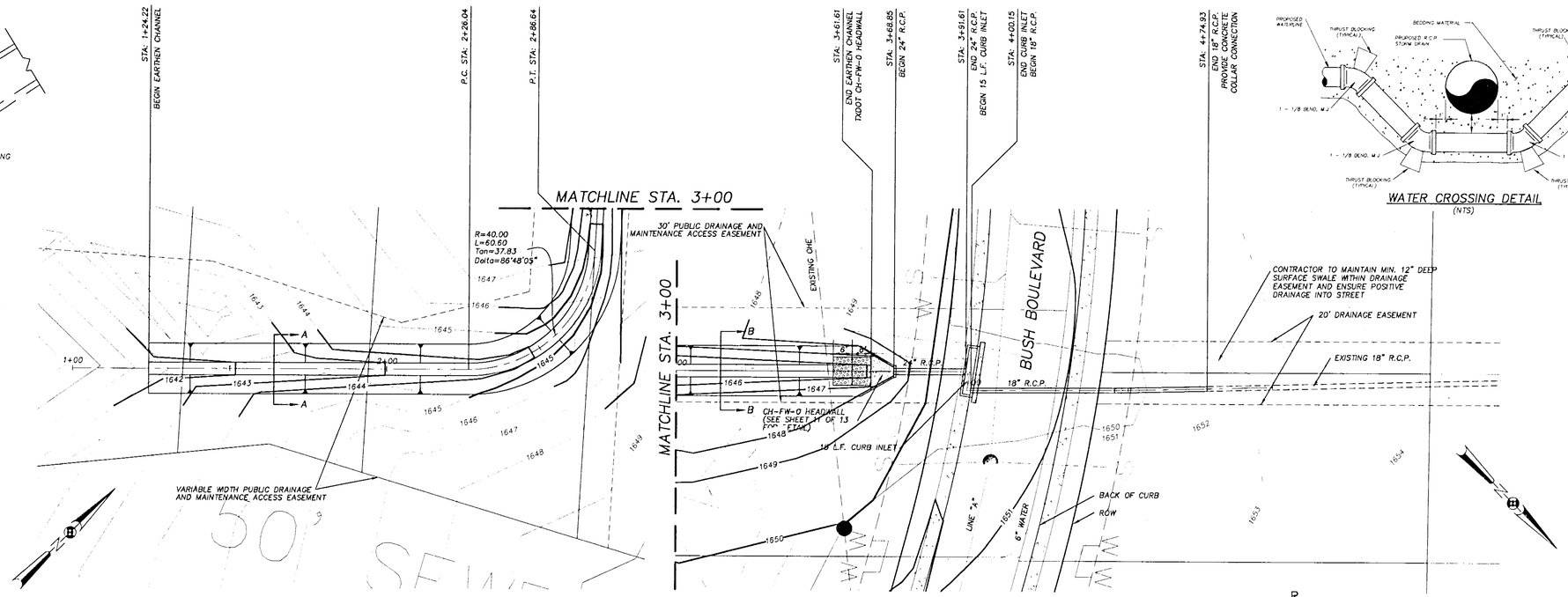
JOB NO. 2144.00
DATE NOV. 2004
DESIGNED MBM
CHECKED KBK
SHEET 8 OF 12

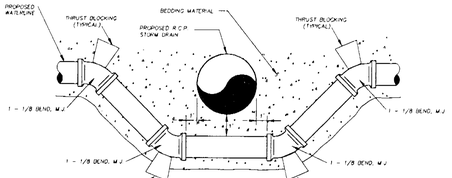


CONCRETE COLLAR DETAIL
(NTS)

NOTES:

1. PAYMENT FOR CONCRETE, REINFORCING STEEL AND ALL INCIDENTAL MATERIAL WILL NOT BE MADE SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
2. CONCRETE FOR COLLAR SHALL BE CLASS B.





WATER CROSSING DETAIL
(NTS)

TRENCH EXCAVATION SAFETY PROTECTION

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24" R.C.P. CALCULATION
STA: 3+68.85 TO 3+91.61

Q_{25} = 28.0 cfs
n = 0.013
S = 1.50%
Dn = 19.9 in.
Vn = 10.0 fps
D = 24 in.

18" R.C.P. CALCULATION
STA: 4+00.15 TO 4+74.93

Q_{25} = 4.47 cfs
n = 0.013
S = 0.50%
Dn = 10.1 in.
Vn = 4.40 fps
D = 18 in.

CURB INLET CALCULATION

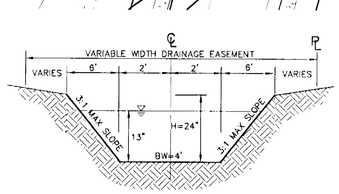
$$L = \frac{Q_{25}}{C_W \times H^{3/2}}$$

Q = 21.30 cfs
C = 3.00

0.50 ft (6" CURB)
+ 0.25 ft (3" DEPRESSION)
= 0.75 ft = H

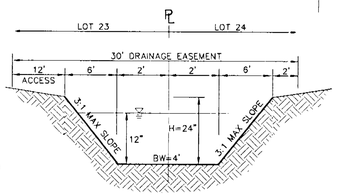
L = 10.93 ft.
USE L = 15 ft.

DRAIN "A"
STA: 1+00 TO END



H = 2.0 ft.
Q25 = 40 cfs
BW = 4 ft.
n = 0.035
S = 2.1%
Dn = 1.08 ft.
Vn = 5.00 fps

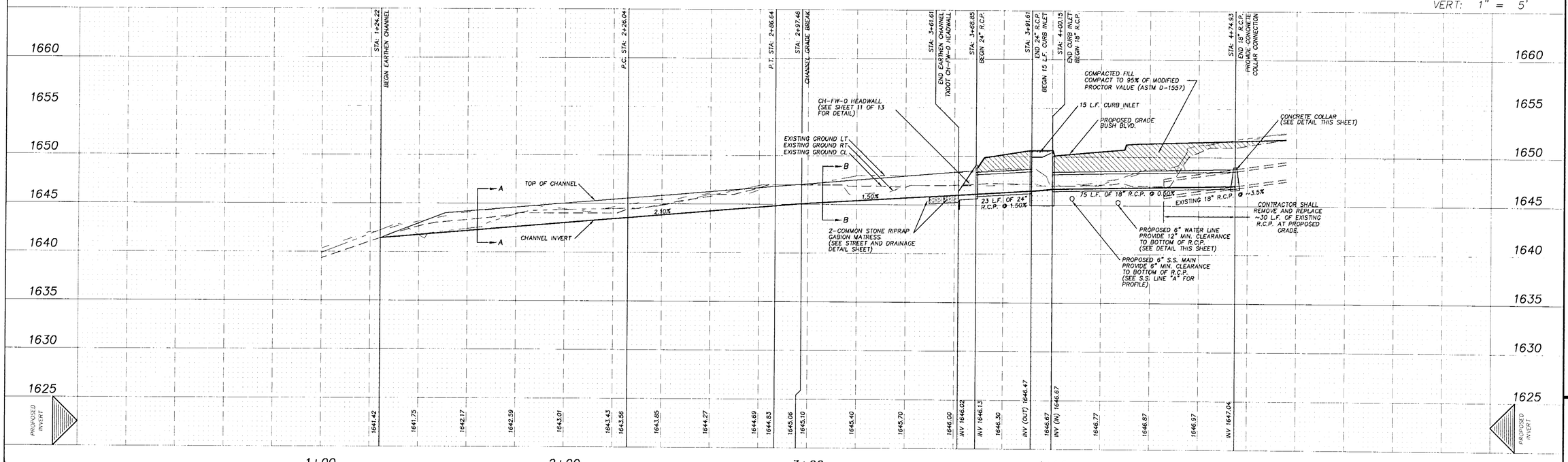
SECTION "A-A"
STA. 1+24.22 TO 2+97.46



H = 2.0 ft.
Q25 = 28 cfs
BW = 4 ft.
n = 0.035
S = 1.5%
Dn = 1.00 ft.
Vn = 4.01 fps

SECTION "B-B"
STA. 2+97.46 TO 3+61.61

HORZ: 1" = 20'
VERT: 1" = 5'



Rev.

STATE OF TEXAS
KENNETH B. KOLKS
68630
REGISTERED PROFESSIONAL ENGINEER
1-10-05

MATKIN-HOOVER ENGINEERING, INC.
CIVIL ENGINEERS
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LEGION HILLS, PHASE IV
DRAIN "A" - PLAN AND PROFILE - STA. 1+00 TO END
FOR
CITY OF KERRVILLE
KERRVILLE, TEXAS

JOB NO. 2144.00
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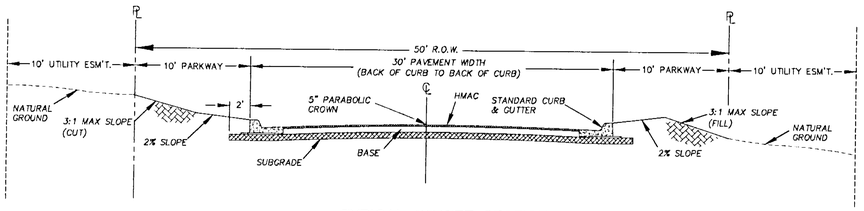
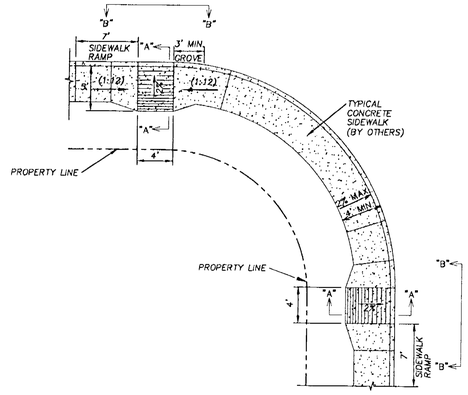
SHEET 9 OF 12

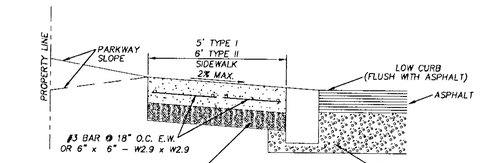


TYPICAL STREET SECTION
N.T.S.

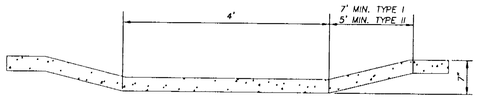
NOTE:
CONTRACTOR TO INSTALL WHEELCHAIR RAMPS UNDER THIS CONTRACT AS INDICATED. HOWEVER, SIDEWALKS ARE NOT INCLUDED IN THIS CONTRACT. SIDEWALKS WILL BE INSTALLED BY INDIVIDUAL PROPERTY OWNERS AS REQUIRED BY CITY ORDINANCE.



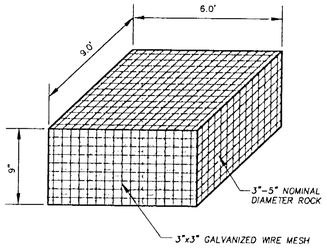
WHEEL CHAIR RAMP DETAIL
N.T.S.



SECTION A–A
N.T.S.

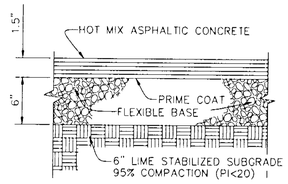


SECTION B–B
(THROUGH CURB AT WHEELCHAIR RAMP)
N.T.S.

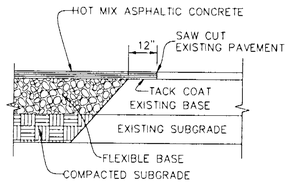


NOTE:
ROCK GABIONS SHALL BE CONSTRUCTED AND INSTALLED PER TXDOT STANDARD SPECIFICATIONS

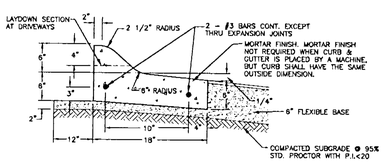
COMMON STONE RIPRAP GABION MATTRESS
N.T.S.



ASPHALT PAVEMENT
N.T.S.

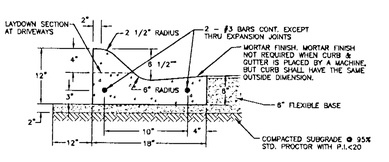


MATCH EXISTING PAVEMENT
N.T.S.



NOTE: EXPANSION JOINTS ARE TO BE CONSTRUCTED AT CURB RETURNS,DRIVEWAY APPROACH SLABS, AND AT 60' MAXIMUM INTERVALS. 3/4" BITUMINOUS FIBERBOARD AND 2 EACH - 5/8"X10" DOWEL PINS WITH SLEEVES TO BE USED AT EXPANSION JOINTS.

SPILL CURB AND GUTTER DETAIL
USED WHEN ADJACENT PAVEMENT SLOPES AWAY FROM GUTTER



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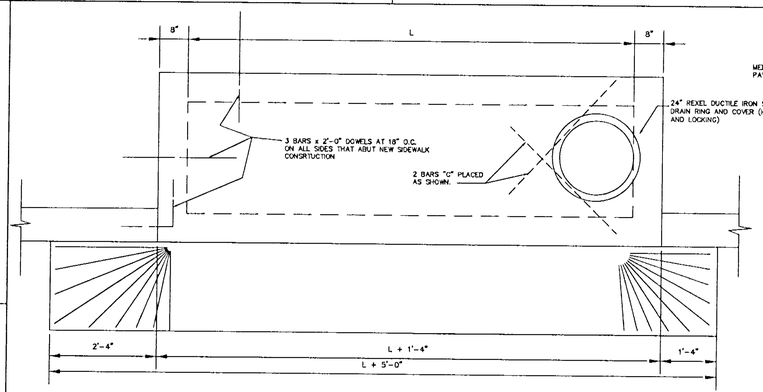
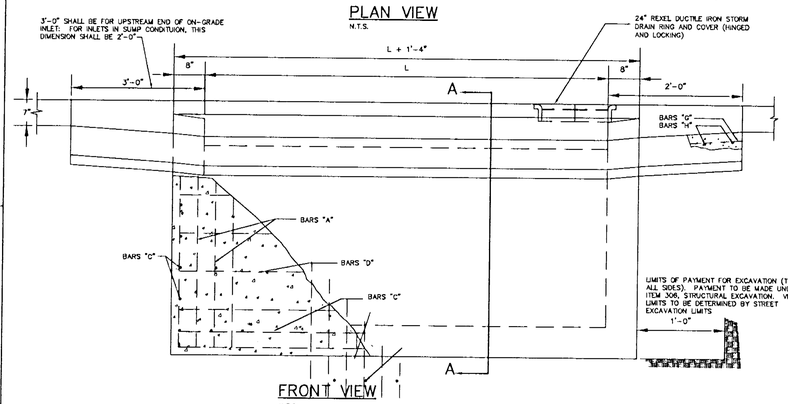
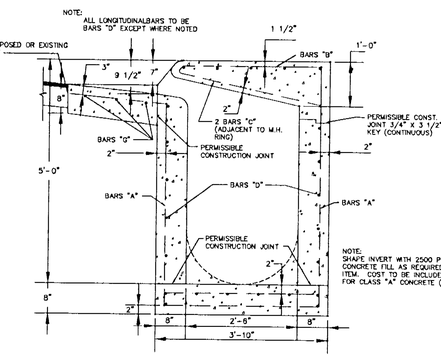
CATCH CURB AND GUTTER DETAIL
USED WHEN ADJACENT PAVEMENT SLOPES AWAY FROM GUTTER



PLAN VIEW
N.T.S.

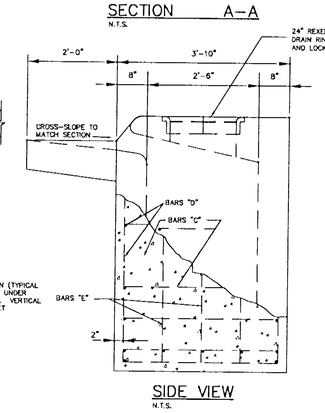


FRONT VIEW
N.T.S.



SECTION A–A
N.T.S.

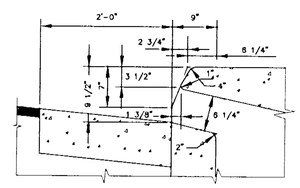
NOTE:
SHAPE INVERT WITH 2500 P.S.I. CONCRETE FILL AS REQUIRED. NON-PAY ITEM. COST TO BE INCLUDED WITH PAYMENT FOR CLASS "A" CONCRETE (INLETS).



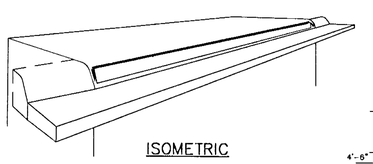
SIDE VIEW
N.T.S.

REINFORCING STEEL SCHEDULE

L=10'	A	27	4	5"OC	13'-9 1/2"	249
	B	27	4	5"	5'-1"	93
	C	30	4	9"	3'-8"	70
	D	22	4	10"	11'-1"	163
	E	10	4	10 1/2"	6'-10"	46
	F	12	5	12"	2'-3"	27
	G	3	4	12"	14'-8"	30
	H	5	5	12"	1'-8"	9
*CONCRETE TOTAL=5.75CY MANHOLE CASTING=100LBS. STEEL TOTAL=687LBS						
L=15'	A	39	4	5"OC	13'-9 1/2"	359
	B	39	4	5"	5'-1"	134
	C	38	4	9"	3'-6"	84
	D	22	4	10"	16'-1"	236
	E	10	4	10 1/2"	6'-10"	46
	F	17	5	12"	2'-3"	38
	G	3	4	12"	19'-8"	40
	H	5	5	12"	1'-8"	9
*CONCRETE TOTAL=7.97CY. MANHOLE CASTING=100LBS STEEL TOTAL=946LBS						



OPENING DETAIL FOR CURB SECTION



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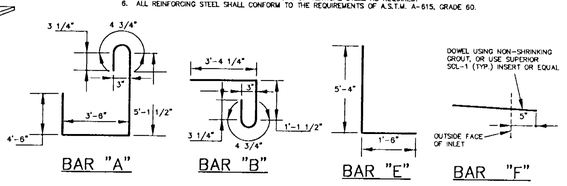
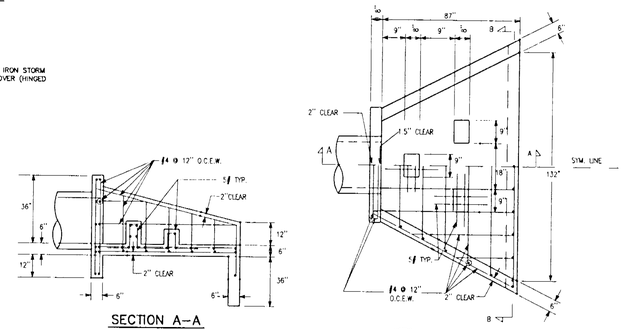
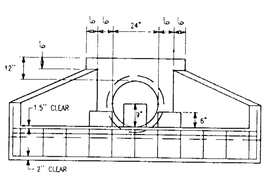


BAR "A" BAR "B" BAR "E" BAR "F"



NOTES:
1. CHAMFER ALL EXTERNAL VISIBLE CORNERS
2. USE TXDOT SAFETY END TREATMENT TYPE II DETAIL FOR SLOPE WALLS.

CH–FW–0 HEADWALL W/ BAFFLE BLOCKS
N.T.S.



SECTION B–B
N.T.S.

GENERAL NOTES:

1. ALL BARS INTERCEPTING MANHOLE RING & REINFORCING CONCRETE PIPE SHALL BE FIELD CUT.
2. CONCRETE FOR STRUCTURES SHALL BE CLASS "A", 3000 P.S.I. IN 28 DAYS.
3. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
4. ALL EXPOSED CORNERS SHALL BE CHAMFERED TO 3/4".
5. CONSTRUCTION JOINT SHOWN AT FLOWLINE MAY BE RAISED A MAXIMUM OF 8" AT THE CONTRACTOR'S DISCRETION. ADJUST LENGTH OF VERTICAL STEEL AS REQUIRED.
6. ALL REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M. A-615, GRADE 60.

NOTE:
ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS PROJECT SHALL CONFORM TO ALL APPLICABLE CITY OF KERRVILLE STANDARD SPECIFICATIONS FOR SUBDIVISION CONSTRUCTION. IT IS THE CONTRACTORS RESPONSIBILITY TO OBTAIN THE LATEST ADOPTED SPECIFICATIONS FROM THE PUBLIC WORKS DEPARTMENT.

STATE OF TEXAS
KENNETH B. HOVE III
86000
REGISTERED PROFESSIONAL ENGINEER
1-10-05

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BOERNE, TEXAS 78006
PH: 830-249-0600

LEGION HILLS, PHASE IV
STREET & DRAINAGE DETAIL SHEET
FOR
CITY OF KERRVILLE
KERRVILLE, TEXAS

JOB NO. 2144.00
DATE NOV. 2004
DESIGNED MBM
CHECKED KBK
SHEET 10 OF 12

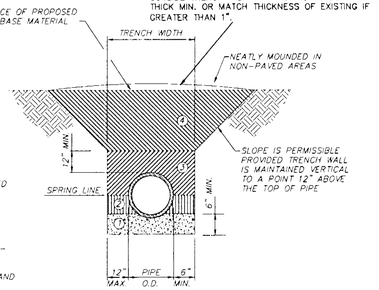
SANITARY SEWER SYSTEM DETAILS

SPECIAL PAVING NOTES–
WHEN PIPE IS IN EXISTING PAVEMENT THE PAVEMENT SHALL BE REPAIRED PER "MATCH EXISTING PAVEMENT" DETAIL SHEET 4. CONTRACTOR TO NOTE THAT THE PAVEMENT SHALL BE SAWCUT AND PATCHED TO 12" OUTSIDE TRENCH WIDTH. PATCH IS TO BE 1" THICK MIN. OR MATCH THICKNESS OF EXISTING IF GREATER THAN 1".

1. SUBGRADE FILLER – GRADED CLEAN, WASHED CRUSHED LIMESTONE. SAMS MOD. OR S AGGREGATE COMPACTED TO 95% DRY DENSITY

2. & 3. INITIAL BACKFILL – THE INITIAL BACKFILL FOR THE PVC PIPE SPECIFIED SHALL BE "SUBGRADE FILLER" AS DEFINED ABOVE AND SHALL BE PLACED IN TWO (2) LIFTS. THE FIRST LIFT SHALL BE SPREAD UNIFORMLY AND SIMULTANEOUSLY ON EACH SIDE AND UNDER THE SHOULDERS OF THE PIPE TO THE MID-POINT OR SPRING LINE OF THE PIPE AND COMPACTED TO 95% MAXIMUM DRY DENSITY.

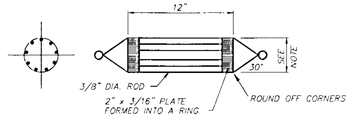
4. SECONDAY BACKFILL – SECONDARY BACK-FILL SHALL GENERALLY CONSIST OF MATERIALS REMOVED FROM THE TRENCH AND SHALL BE FREE OF BRUSH, DEBRIS AND TRASH. REFER TO SPECIFICATIONS. COMPACTED TO 95% MAX. DRY DENSITY. NO ROCKS LARGER THAN 6" IN DIAMETER WILL BE ALLOWED. CONTRACTOR SHALL PROVIDE 6" WIDE METALLIC LOCATION TAPE PLACED 2 FEET BELOW FINAL GRADE AND COLORED AS SPECIFIED IN THE CITY OF KERRVILLE STANDARD SPECIFICATIONS.



PVC PIPE EMBEDMENT DETAIL
SCALE : NONE

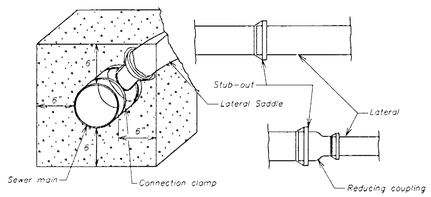
NOTE:
MANDREL MUST HAVE ODD NUMBER OF RUNNERS, 9 MINIMUM

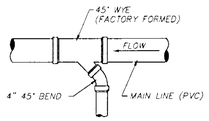
AFTER CONSTRUCTION IS COMPLETED, TRUE O.D. DIMENSION FOR THE FULL LENGTH OF "B" TO 0.010 INCH BY TOOL AND LATH OR GRINDING.



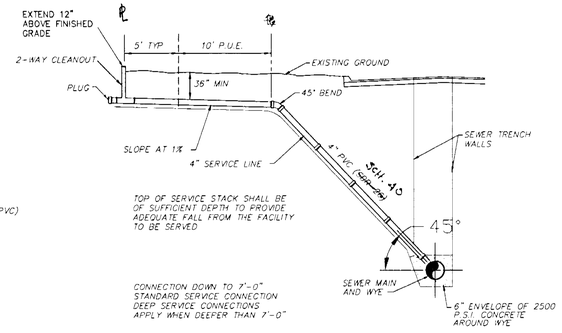
MANDREL CONSTRUCTION DETAIL
FOR 5.0 % DEFLECTION
SCALE : NONE

LATERAL CONNECTION TO EXISTING SEWER MAIN/STUB-OUT





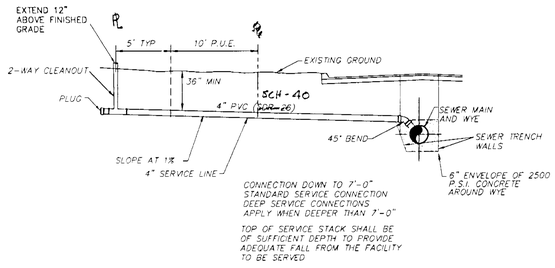
PLAN - SINGLE SERVICE
SCALE : NONE



TOP OF SERVICE STACK SHALL BE OF SUFFICIENT DEPTH TO PROVIDE ADEQUATE FALL FROM THE FACILITY TO BE SERVED

CONNECTION DOWN TO 7'-0" STANDARD SERVICE CONNECTION DEEP SERVICE CONNECTIONS APPLY WHEN DEEPER THAN 7'-0"

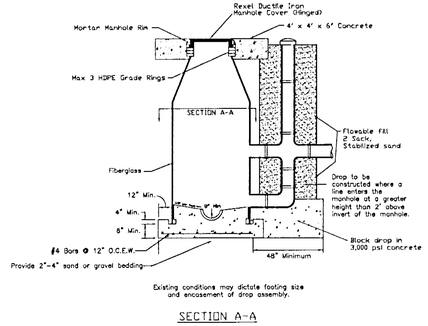
TYPICAL
DEEP SERVICE CONNECTION
SCALE : NONE



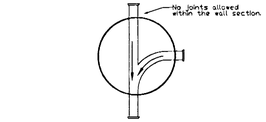
CONNECTION DOWN TO 7'-0" STANDARD SERVICE CONNECTION DEEP SERVICE CONNECTIONS APPLY WHEN DEEPER THAN 7'-0"

TOP OF SERVICE STACK SHALL BE OF SUFFICIENT DEPTH TO PROVIDE ADEQUATE FALL FROM THE FACILITY TO BE SERVED

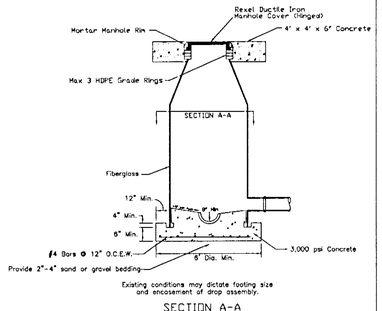
TYPICAL
STANDARD SERVICE CONNECTION
SCALE : NONE



SECTION A-A

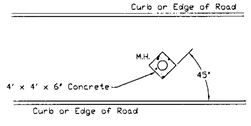


DROP MANHOLE DETAIL
SCALE : NONE



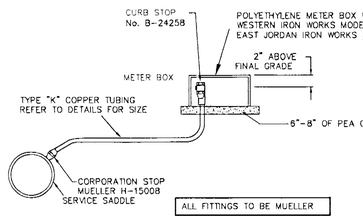
SECTION A-A

FIBERGLASS MANHOLE DETAIL
SCALE : NONE

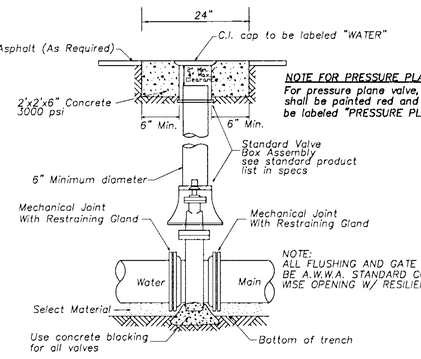


MANHOLE POSITION IN PAVEMENT
SCALE : NONE

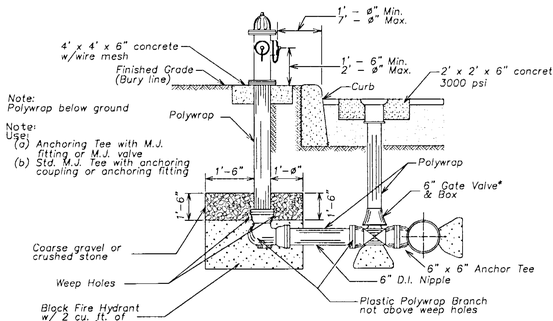
WATER SYSTEM DETAILS



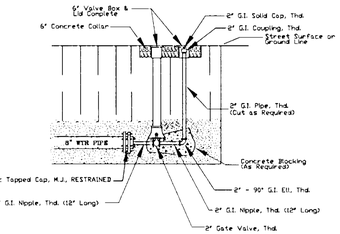
TYPICAL WATER SERVICE CONNECTION
SCALE : NONE



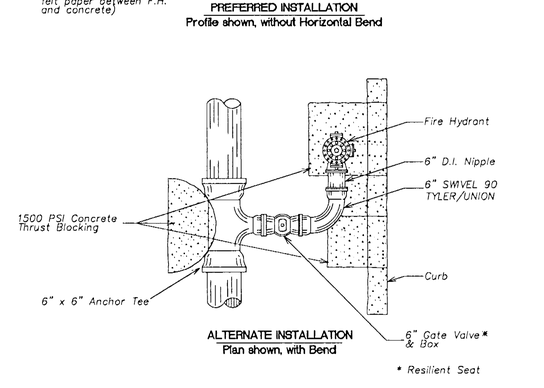
GATE VALVE DETAIL
SCALE : NONE



PREFERRED INSTALLATION
Profile shown, without Horizontal Bend



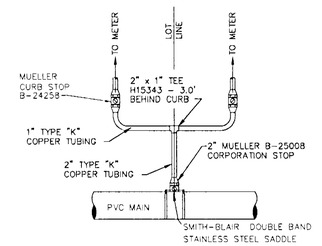
2" PERMANENT BLOW-OFF ASSEMBLY DETAIL
SCALE : NONE



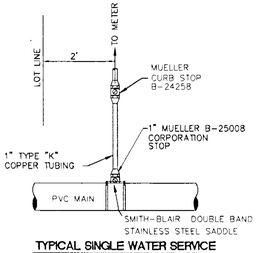
ALTERNATE INSTALLATION
Plan shown, with Bend

* Resilient Seat

FIRE HYDRANT INSTALLATION



TYPICAL DOUBLE WATER SERVICE
SCALE : NONE



TYPICAL SINGLE WATER SERVICE
SCALE : NONE

THRUST BLOCKING NOTES

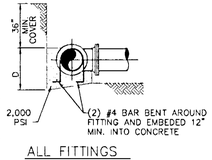
1. THRUST BLOCKING SHALL BE PLACED AGAINST UNDISTURBED SOIL.

2. CONCRETE THRUST BLOCKING SHALL BE PROVIDED WHERE CHANGES IN DIRECTION OCCURS, AT TEES, BENDS, CROSSES, CHANGES IN SIZES, STOPS(DEAD ENDS), VALVES, AND OR AS SHOWN BELOW.

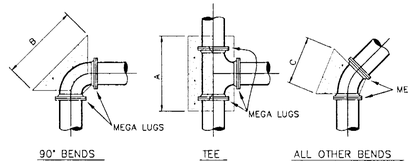
3. CONTRACTOR SHALL USE THE FOLLOWING TABLE OF DIMENSIONS FOR THRUST BLOCKING AREA.

THRUST BLOCK SCHEDULE

PIPE SIZE	A PLUGS& TEES	B 90° B	C 45° B	D GATE VALVES
4" OR 6"	1'0"	1-2"	1-2"	NONE
8"	1'3"	1-6"	1-6"	NONE
12"	2'8"	3'0"	2'3"	1'0"



ALL FITTINGS



90° BENDS TEE ALL OTHER BENDS

THRUST BLOCK DETAILS
SCALE : NONE

NOTE:
ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS PROJECT SHALL CONFORM TO ALL APPLICABLE CITY OF KERRVILLE STANDARD SPECIFICATIONS FOR SUBDIVISION CONSTRUCTION. CONTRACTORS RESPONSIBILITY TO OBTAIN THE LATEST ADOPTED SPECIFICATIONS FROM THE PUBLIC WORKS DEPARTMENT.

Rev.

STATE OF TEXAS
KENNETH B. KOLLENY
86000
LICENSED PROFESSIONAL ENGINEER
1-10-05

MATKIN-HOOVER ENGINEERING, INC.
CIVIL ENGINEERS
LAND PLANNERS
CONSULTANTS
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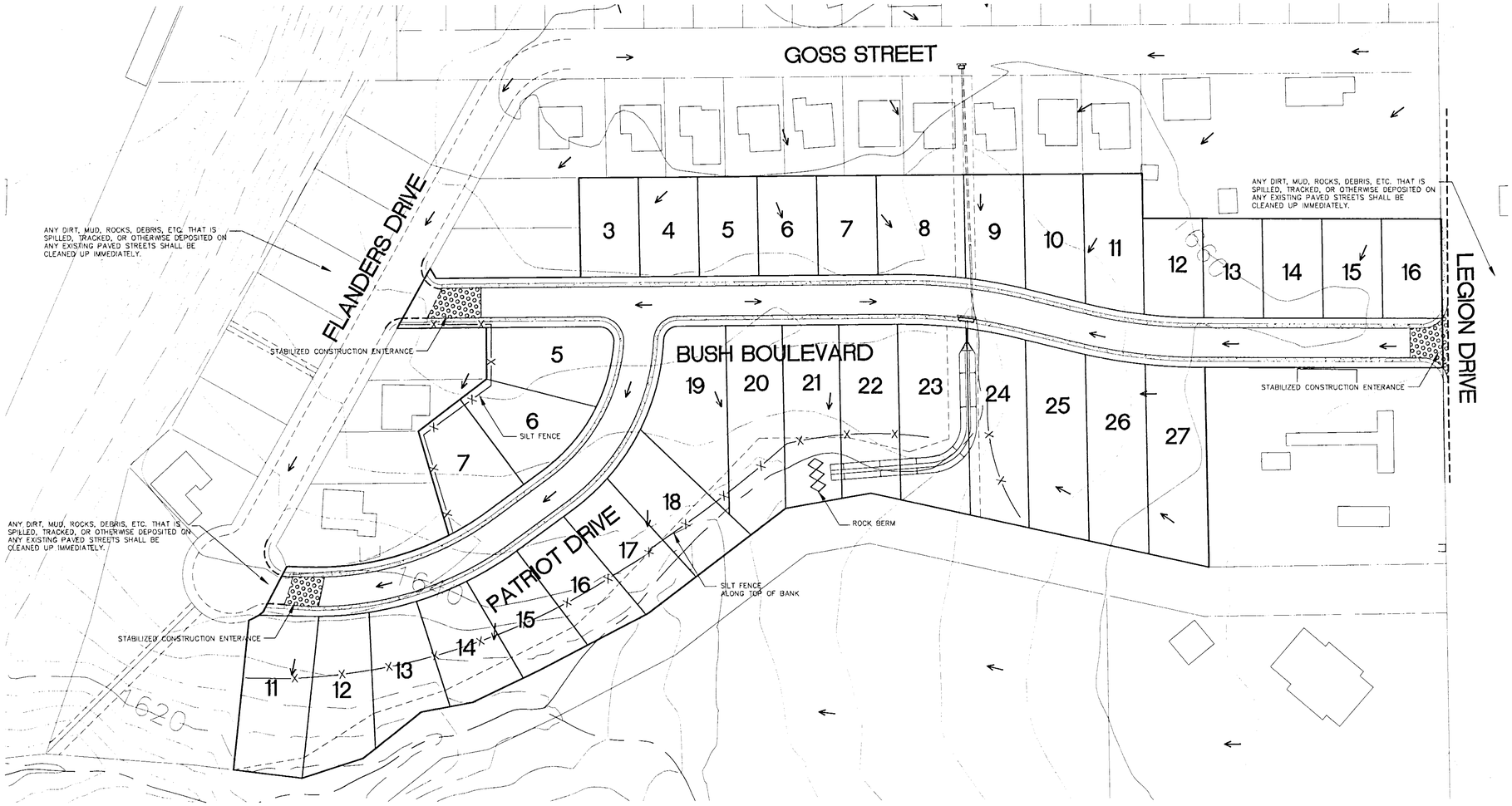
1499 S. MAIN
BOERNE, TEXAS 78006
PH: 830-249-0600

LEGION HILLS, PHASE IV
UTILITY DETAIL SHEET
FOR
CITY OF KERRVILLE
KERRVILLE, TEXAS

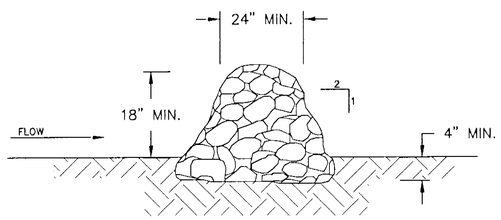
JOB NO. 2144.00
DATE NOV 2004
DESIGNED KBM
CHECKED KBK
SHEET 11 OF 12



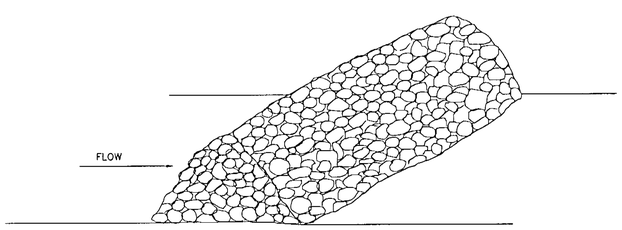
Scale: 1" = 60'

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS COVERING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATIONS.

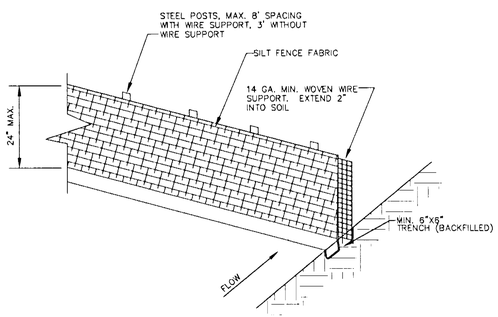


SECTION



ROCK BERM DETAIL

NOTES:
1. USE ONLY OPEN-GRADED ROCK, WITH MOST OF THE FINES REMOVED.
2. STONE SHALL BE CRUSHED AND, UNLESS OTHERWISE SPECIFIED, SHALL BE AT LEAST 3 INCHES IN DIAMETER AND LESS THAN 1 CUBIC FOOT IN VOLUME.
3. THE ROCK BERM SHALL BE EMBEDDED INTO SOIL A MINIMUM OF 4 INCHES.
4. THE ROCK BERM SHALL BE INSPECTED AFTER EACH RAIN, AND THE STONE SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.



SILT FENCE DETAIL

NOTES:
1. POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.
3. THE TRENCH SHOULD BE A MIN. OF 6" DEEP AND 6" WIDE TO ALLOW FOR THE SILT FENCE TO BE LAID IN THE GROUND AND BACKFILLED.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POSTS.

STATE OF TEXAS
LANCE B. KOEHLER
68000
LICENSED PROFESSIONAL ENGINEER
1-18-05

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LEGION HILLS, PHASE IV
EROSION AND SEDIMENTATION CONTROL PLAN
FOR
CITY OF KERRVILLE
KERRVILLE, TEXAS

JOB NO. 2144.00
DATE NOV. 2004
DESIGNED MBM
CHECKED KBK
SHEET 12 OF 12