

PROJECT NAME: RIVER ROCK RANCH  
 TREE ORDINANCE: 2006  
 MAJOR LARGE TREES: CEDAR, ELM, LIVE OAK, HACKBERRY, MOUNTAIN CEDAR  
 MAJOR SMALL TREES: MOUNTAIN LAUREL  
 TOTAL ACRES IN SITE: 183.88

UNITS	TREE CANOPY GROSS AC.	TREE CANOPY PRESERVATION REQ.	ACRES OF TREE CANOPY PRESERVED WITHIN TREE SAVE AREAS	ACRES OF TREE CANOPY PRESERVED
1	25.69	7.71	4.04	0.99
2	8.39	2.52	2.53	0.50
2B	8.57	2.57	3.60	0.28
2C PHASE 1	7.96	2.39	2.86	0.07
2C PHASE 2	1.98	0.59	0.63	0.09
3A PHASE 1	8.68	2.60	2.30	0.16
3A PHASE 2	12.91	3.87	1.31	0.14
3B	17.53	5.26	8.60	-
4	11.02	3.31	2.57	0.10
TOTAL	102.73	30.82	28.44	2.33

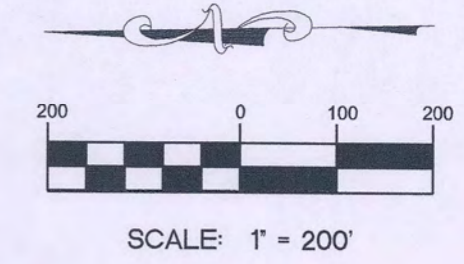
FLOOD PLAIN	21.05	16.84	*20.34
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\* EXCLUDING 0.29 AC. ROW / 0.42 AC. EASEMENTS

TREE CANOPY PRESERVATION REQ. (AC)	TREE CANOPY PRESERVED (AC)	TREE CANOPY DEFICIT (AC)	TREE CREDIT FOR TREE MITIGATION (AC)
30.82	28.44	0.05	0.60
0.55 AC SURPLUS			

- NOTES:
- TREE CANOPY LIMITS WERE DERIVED USING THE TREE STAND DELINEATION METHOD.
  - TREE PRESERVATION AREAS AT MDP STAGE ARE APPROXIMATE. AS GRADING AND FINAL DESIGN ARE ACCOMPLISHED, PRESERVATION AREAS WILL BE ADJUSTED AS NEEDED.
  - AS THE GRADING PLAN IS FINALIZED, PROPOSED GRADES WILL BE PROVIDED AT THE PLATING STAGE TO ENSURE MINIMUM TREE PRESERVATION REQUIREMENTS WILL BE MET.
  - MINIMUM FLOODPLAIN BUFFER REQUIREMENTS WILL BE MET BY PRESERVING NO LESS THAN THE 80% MINIMUM OF THE TREES IN THE FLOODPLAIN BUFFER AREA.
  - INCHES IN CANOPY ASSUMES 875 SF OF TREE CANOPY IS EQUIVALENT TO 16.7 DIAMETER INCHES.
  - PRESERVATION INCHES REQUIRED BASED ON 30% OF TOTAL CANOPY.

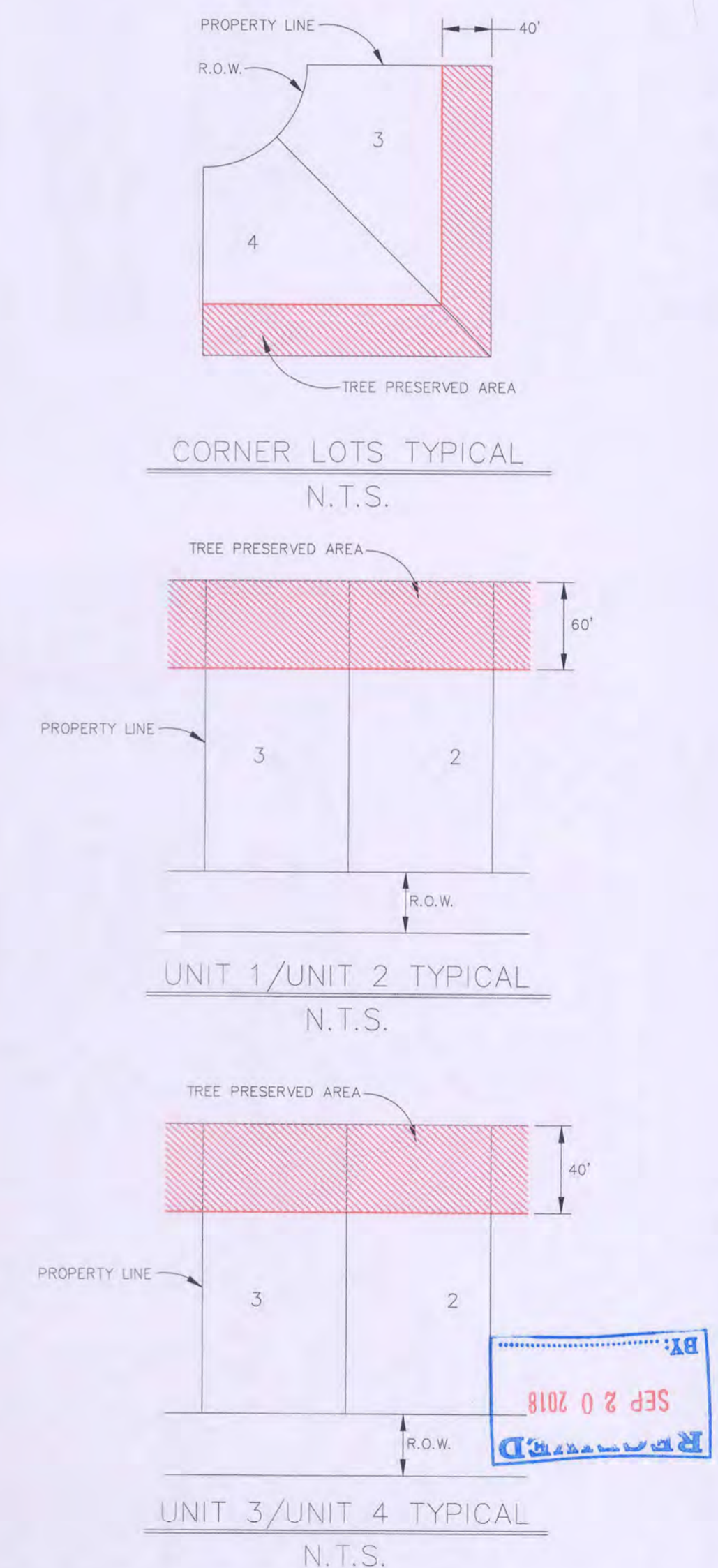
- KEY NOTES:
- ENTRY (LEFT, RIGHT, & ISLAND)
  - WATER QUALITY POND #1
  - OPEN SPACE ON RIVER RANCH
  - OPEN SPACE BETWEEN RIVER TRACE AND WOODLAND BEND
  - PARK ON RIVER RANCH
  - WATER QUALITY POND #2
  - WATER QUALITY POND #3
  - WATER QUALITY POND #4
  - WATER QUALITY POND #5



LEGEND:

- TREE AREA SAVED (Red hatched pattern)
- TREE PROTECTION AREA IN FLOODPLAIN (Blue hatched pattern)
- UNITS (Black dashed line)
- 100 YR FLOOR PLAN (Black solid line)
- ADDITIONAL ACRES TREE CANOPY PRESERVED (Green hatched pattern)

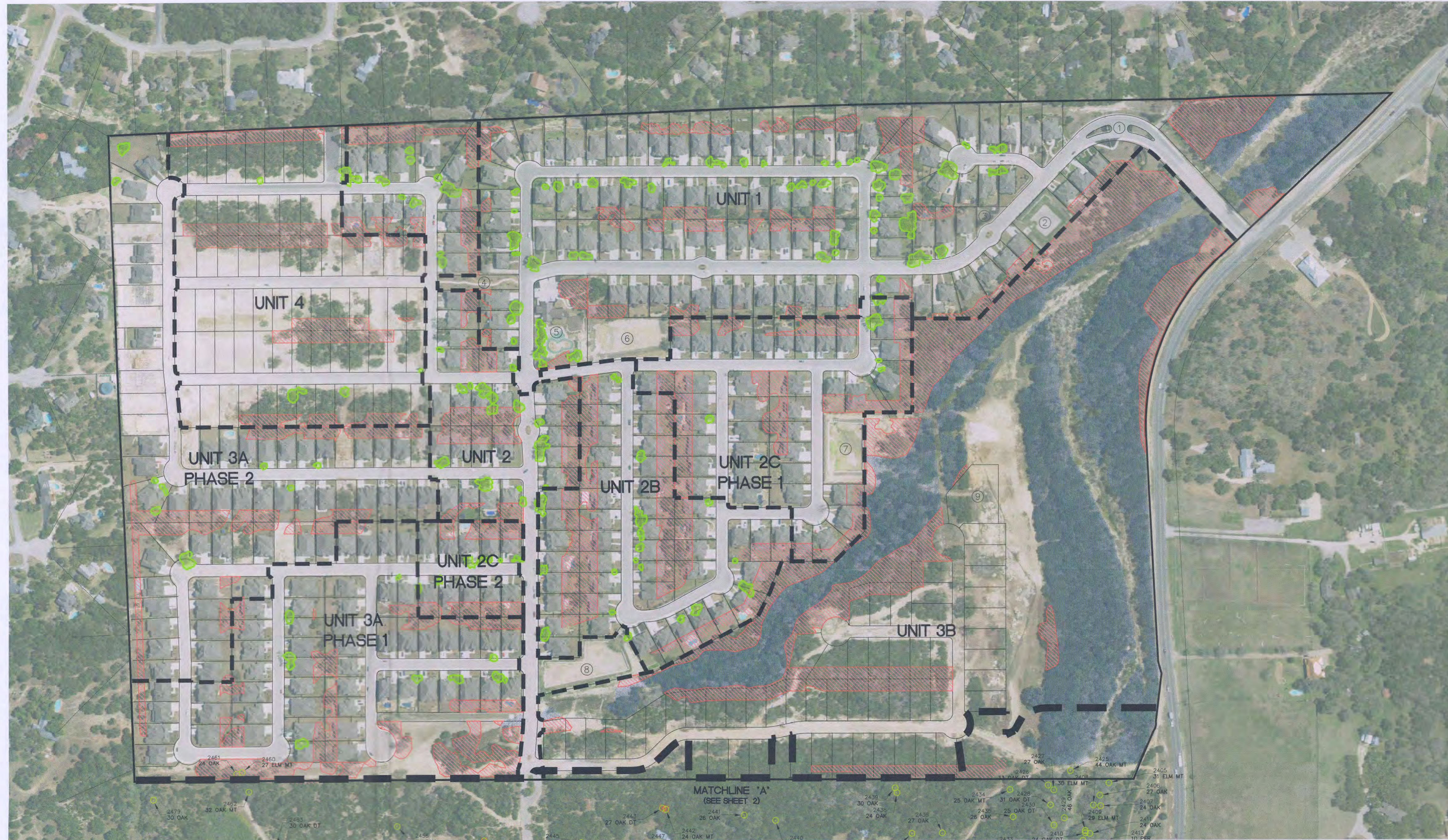
TREE SAVED AREA DETAILS



AMENDMENT NOTE:  
 RIVER ROCK RANCH MASTER TREE PRESERVATION PLAN, AP#1803747 AMENDED PER MDP# 036B-06 AND PUD# 06-033B

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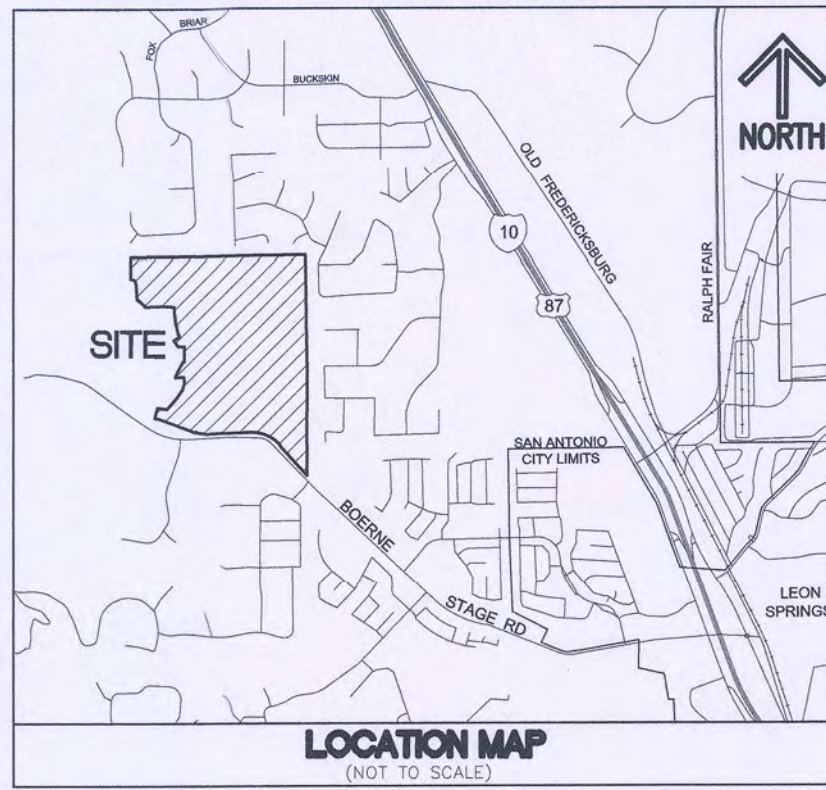
AERIAL IMAGERY VAN RAUB SE QUARTER QUAD 2015 FROM TINRIS ORTHOPHO TO DATASETS

NO.	DATE	REVISIONS

**COURSEN-KOEHLER**  
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RIVER ROCK RANCH  
 MASTER TREE PRESERVATION PLAN  
 AP# 1803747  
 RECEIVED  
 18 SEP 20 10 23:33

JOB NO.: 11020.00  
 DATE: JUNE 7, 2012  
 DESIGN: KJK  
 DRAWN: ESP  
 CHECKED:



PROJECT NAME: RIVER ROCK RANCH  
 TREE ORDINANCE: 2010  
 MAJOR LARGE TREES: CEDAR, ELM, LIVE OAK, HACKBERRY, MOUNTAIN CEDAR  
 MAJOR SMALL TREES: MOUNTAIN LAUREL  
 TOTAL ACRES IN SITE: 45.9

UNITS	TREE CANOPY GROSS AC.	TREE CANOPY PRESERVATION REQ.	ACRES OF TREE CANOPY TREE SAVE AREAS WITH UNDERBRUSHING	ACRES OF TREE CANOPY TREE SAVE AREAS NO UNDERBRUSHING	ACRES OF TREE CANOPY WITH ENERGY CONSERVATION
3B2	1.59	0.48	0.00	0.00	0.24
3B3	0.18	0.05	0.06	0.00	0.00
3B4	6.53	1.96	2.09	6.20	0.00
3B5	3.69	1.11	1.82	0.00	0.15
5	27.54	8.26	1.18	0.00	2.19
TOTAL	39.53	11.86	5.15	6.20	2.58
TOTAL ACRES OF TREE CANOPY PRESEVED				13.93	

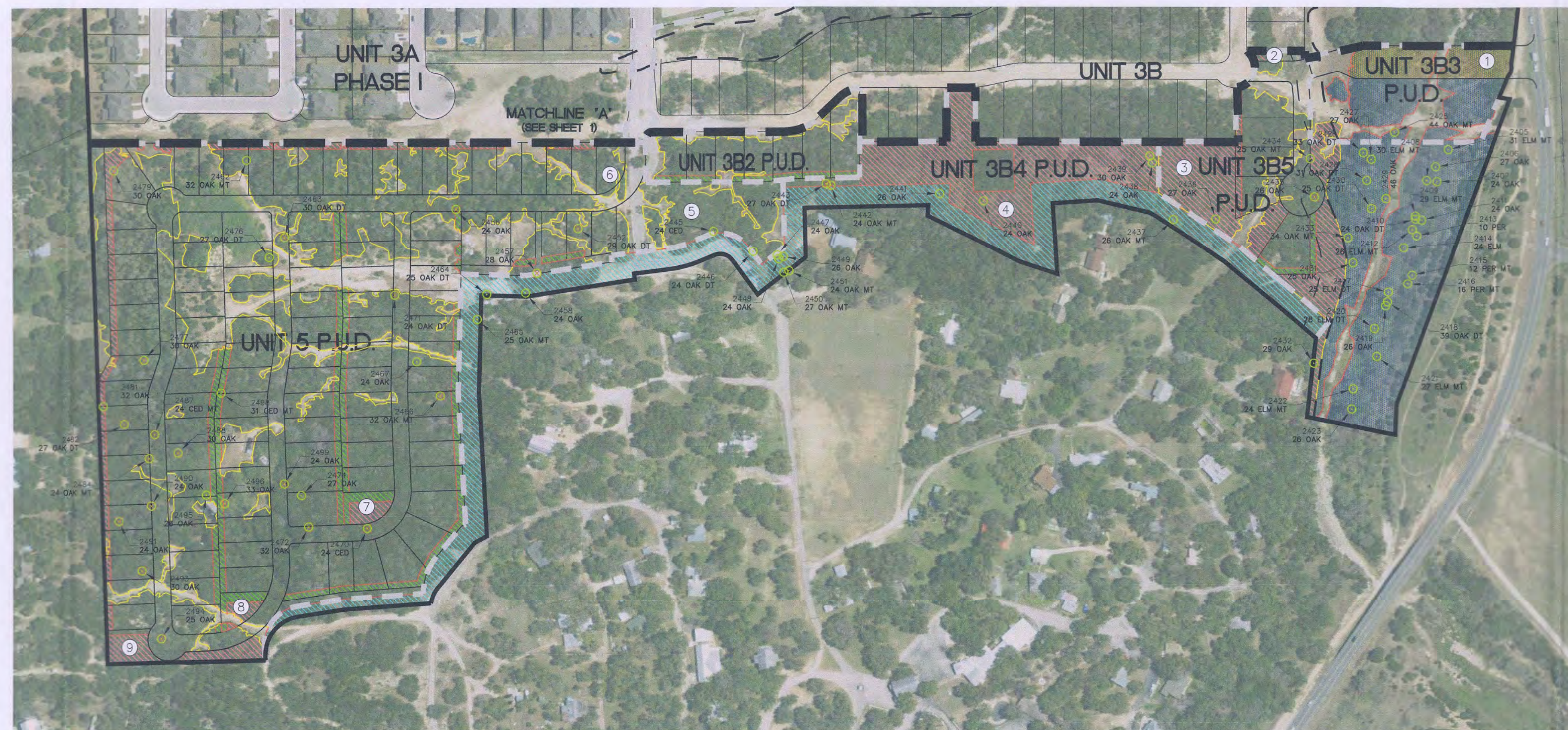
	TREE CANOPY GROSS AC.	80% TREE CANOPY PRESERVATION REQ.	TREE CANOPY SAVED AC.
FLOOD PLAIN	5.40	4.32	4.74
60' BUFFER	1.04	0.83	0.84

CANOPY PLANTED	PLANTED TREES	TREE AREA (SF)	ALLOWABLE PERCENTAGE	CREDITED AREA (SF)	CREDITED AREA (AC)
TREES IN RESIDENTIAL LOTS (LARGE TREE SPECIES @ 875 SF)	250 TREES	218,750	90% CREDIT	196,875	4.52
TREES IN VARIANCE AREAS (LARGE TREE SPECIES @ 875 SF)	53 TREES	46,375	90% CREDIT	41,738	0.96
TOTAL:				238,613	5.48

FINAL CANOPY	30% TREE CANOPY PRESERVATION REQ. (AC)	TREE CANOPY PRESERVED (AC)	CANOPY PLANTED (AC)	38% FINAL TREE CANOPY REQ. (AC)	FINAL TREE CANOPY (AC)
	11.86	13.93	5.48	15.02	19.41
	2.07 AC SURPLUS		4.39 AC SURPLUS		

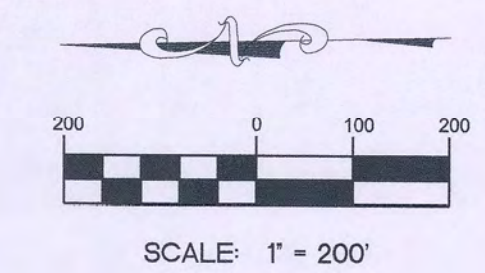
HERITAGE TREE MITIGATION	TREES SAVED (AC)	TREES SAVED (SF)	EQUIVALENT NUMBER OF TREES	TOTAL TREE DIAMETER
REQUIRED HERITAGE TREE MITIGATION	-	-	-	1,086 IN
EXCESS INITIAL PRESERVATION	2.07	90,169	103 - 16.7" TREES	1,720 IN

MITIGATION OF HERITAGE TREES SATISFIED WITH EXCESS INITIAL PRESERVATION



#### HERITAGE TREES

TAG NO.	SIZE & SPECIES	LOCATED WITHIN ROW	INCHES PRESERVED	INCHES REMOVED
2434	25" OAK MT		25	
2436	27" OAK		27	
2437	26" OAK MT		26	
2438	24" OAK		24	
2439	30" OAK		30	
2440	24" OAK		24	
2441	26" OAK		26	
2442	24" OAK MT			24
2443	27" OAK DT			27
2445	24" CEDAR		24	
2446	24" OAK DT		24	
2447	24" OAK		24	
2448	24" OAK		24	
2449	26" OAK		26	
2450	27" OAK MT		27	
2451	24" OAK DT		24	
2452	29" OAK DT		29	
2454	30" OAK DT		30	
2456	24" OAK	YES		24
2457	28" OAK			28
2458	24" OAK		24	
2462	32" OAK MT		32	
2463	30" OAK DT	YES		30
2464	25" OAK DT		25	
2465	25" OAK MT		25	
2466	32" OAK MT			32
2467	24" OAK		24	
2470	24" CEDAR	YES		24
2471	24" OAK DT	YES		24
2472	32" OAK	YES		32
2474	27" OAK		27	
2476	27" OAK DT		27	
2477	30" OAK			30
2479	30" OAK		30	
2481	32" OAK		32	
2482	27" OAK DT		27	
2484	24" OAK DT		24	
2487	24" CEDAR MT		24	
2488	30" OAK		30	
2490	24" OAK	YES		24
2491	24" OAK		24	
2493	30" OAK		30	
2494	25" OAK	YES		25
2495	26" OAK		26	
2496	33" OAK		33	
2498	31" CEDAR MT		31	
2499	24" OAK	YES		24
TOTAL:			688	569



#### LEGEND

- TREE AREA SAVED UNDERBRUSHING COUNTED AT 100%
- TREE AREA SAVED NO UNDERBRUSHING COUNTED AT 150%
- TREE AREA SAVED ENERGY CONSERVATION COUNTED AT 150%
- TREE PROTECTION AREA IN FLOODPLAIN
- TREE AREA IN FLOODPLAIN TO BE REMOVED
- UNITS
- EXISTING TREE CANOPY
- HERITAGE TREE
- HERITAGE TREE TO BE REMOVED

#### KEY NOTES

- 1 BRIDGE
- 2 OPEN SPACE (0.07 AC)
- 3 OPEN SPACE (1.01 AC)
- 4 OPEN SPACE AND FUTURE PARK (2.31 AC)
- 5 DETENTION POND
- 6 WATER QUALITY POND #6
- 7 OPEN SPACE (0.19 AC)
- 8 OPEN SPACE (0.17 AC)
- 9 OPEN SPACE (0.52 AC)

#### HERITAGE TREES IN FLOODPLAIN

TAG NO.	SIZE & SPECIES	LOCATED WITHIN ROW	INCHES PRESERVED	INCHES REMOVED
2405	31" ELM MT		31	
2406	27" OAK		27	
2407	24" OAK		24	
2408	30" ELM MT		30	
2409	29" ELM MT		29	
2410	24" OAK DT		24	
2411	24" OAK		24	
2412	26" ELM MT		26	
2413	10" PERSIMMON		10	
2414	24" ELM		24	
2415	12" PERSIMMON MT		12	
2416	16" PERSIMMON MT		16	
2417	25" ELM DT		25	
2418	39" OAK DT		39	
2419	26" OAK		26	
2420	28" ELM DT		28	
2421	27" ELM MT		27	
2422	24" ELM MT		24	
2423	26" OAK		26	
2425	44" OAK MT		44	
2426	33" OAK DT		33	
2427	27" OAK		27	
2428	31" OAK DT		31	
2429	46" OAK		46	
2430	25" OAK DT		25	
2431	25" OAK		25	
2433	34" OAK MT		34	
TOTAL:			737	0

#### HERITAGE TREES IN FLOODPLAIN BUFFER

TAG NO.	SIZE & SPECIES	LOCATED WITHIN ROW	INCHES PRESERVED	INCHES REMOVED
2432	29" OAK		29	
2435	26" OAK	YES		26
TOTAL:			29	26

CALCULATIONS:  
 26 INCHES \* (3:1) = 78 INCHES TO BE MITIGATED  
 53 - 2" OAKS PLANTED FOR MITIGATION  
 TOTAL INCHES MITIGATED FOR VARIANCE = 106"  
 ADDITIONAL INCHES BEYOND 3:1 REQUIREMENT = 28"  
 REFERENCE PAGE 2 OF 3

#### NOTES:

1. TREE CANOPY LIMITS WERE DERIVED USING THE TREE STAND DELINEATION METHOD.
2. TREE PRESERVATION AREAS AT MDP STAGE ARE APPROXIMATE. AS GRADING AND FINAL DESIGN ARE ACCOMPLISHED, PRESERVATION AREAS WILL BE ADJUSTED AS NEEDED.
3. AS THE GRADING PLAN IS FINALIZED, PROPOSED GRADES WILL BE PROVIDED AT THE PLATTING STAGE TO ENSURE MINIMUM TREE PRESERVATION REQUIREMENTS WILL BE MET.
4. IF REQUIRED, ADDITIONAL PRESERVATION/MITIGATION WILL BE PROVIDED BY:  
 A. DESIGNATION OF ADDITIONAL TREE PRESERVATION AREAS  
 B. PLANTING OF ADDITIONAL TREES
5. MINIMUM FLOODPLAIN BUFFER REQUIREMENTS WILL BE MET BY PRESERVING NO LESS THAN THE 80% MINIMUM OF THE TREES IN THE FLOODPLAIN BUFFER AREA.
6. INCHES IN CANOPY ASSUMES 875 SF OF TREE CANOPY IS EQUIVALENT TO 16.7 DIAMETER INCHES.
7. PRESERVATION ACRES REQUIRED BASED ON 30% OF TOTAL NON-HERITAGE TREE CANOPY FOR MASTER DEVELOPMENT PLANS.
8. AREAS MARKED "NO UNDERBRUSHING" ARE WITHIN A PROPOSED 50' BUFFER EASEMENT THAT WILL REMAIN UNDEVELOPED.

AMENDMENT NOTE:  
 RIVER ROCK RANCH MASTER TREE PRESERVATION PLAN, AP#1803747 AMENDED PER MDP# 18-00009

ENGINEER:  
 COURSEN-KOEHLER ENGINEERING & ASSOCIATES  
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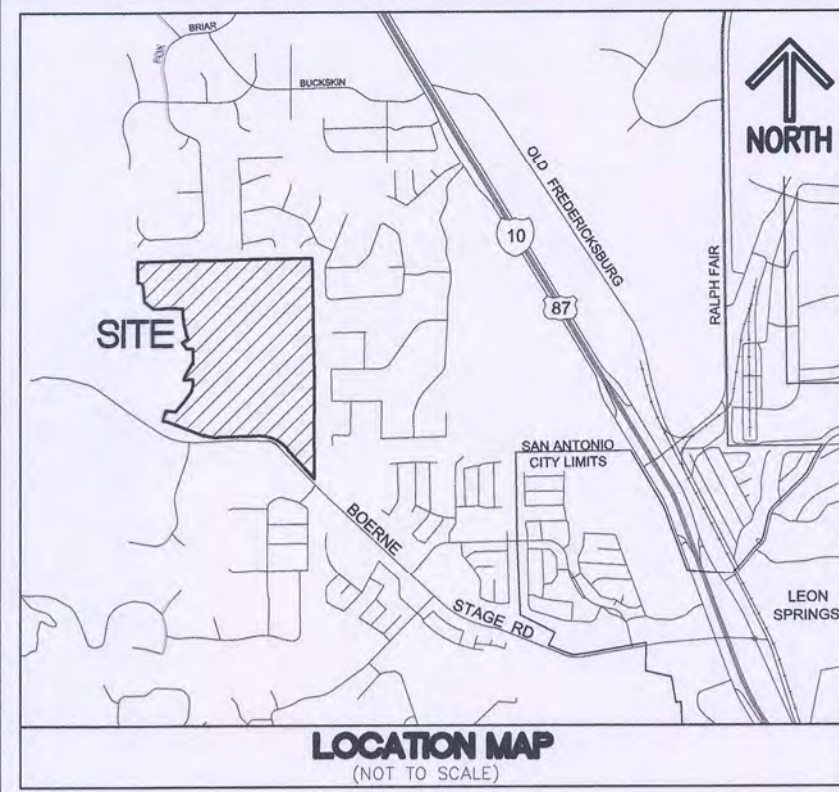
OWNER/ DEVELOPER  
 GREEN LAND VENTURE, LTD  
 916 E. BLANCO, SUITE 100  
 BOERNE, TEXAS 78006  
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NO.	DATE		REVISIONS
	BY	DATE	

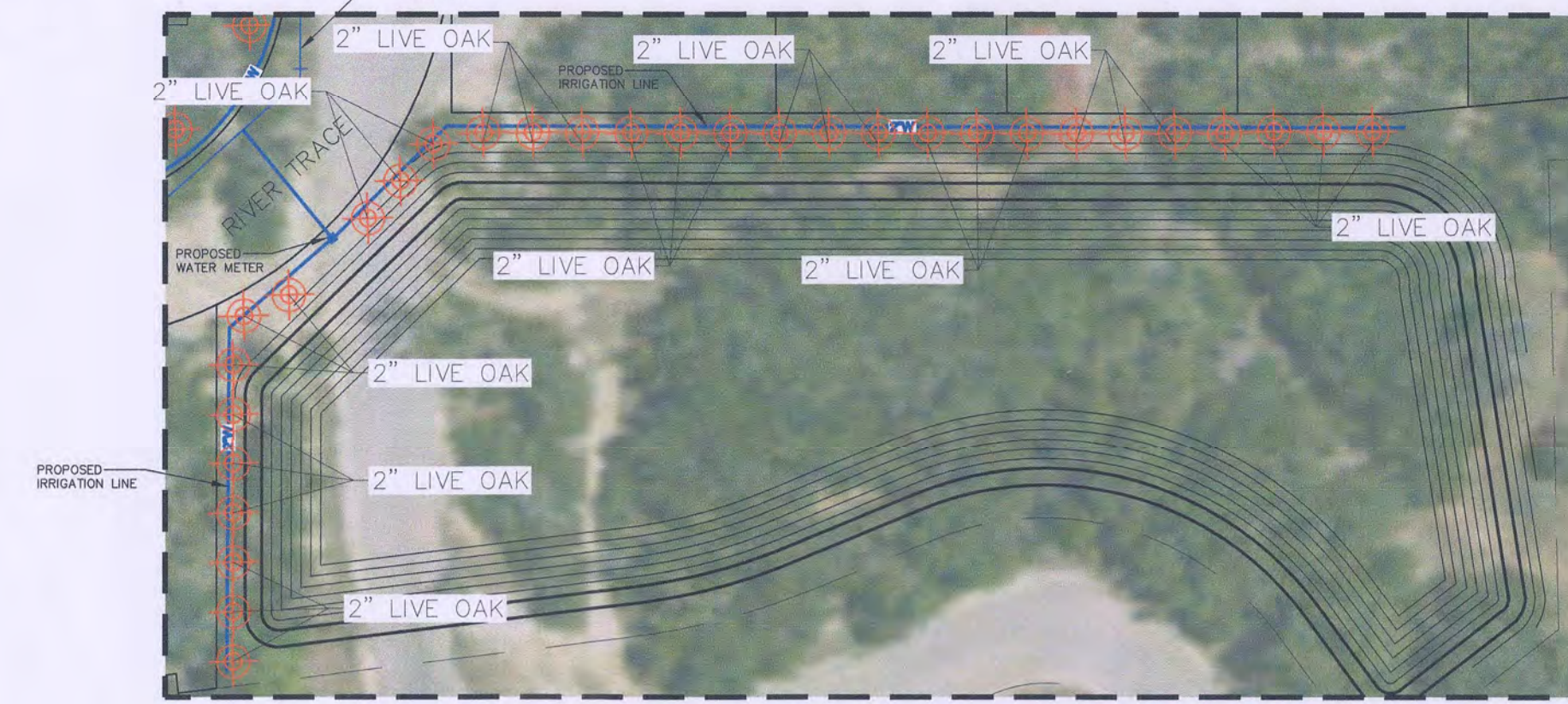
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RIVER ROCK RANCH  
 MASTER TREE PRESERVATION PLAN  
 AP# 1803747  
 TREE STAND DELINEATION

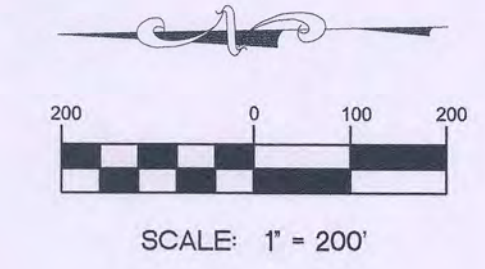
JOB NO.: 11290.00  
 DATE: SEPTEMBER 5, 2018  
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 CHECKED:



AREA A  
N.T.S.

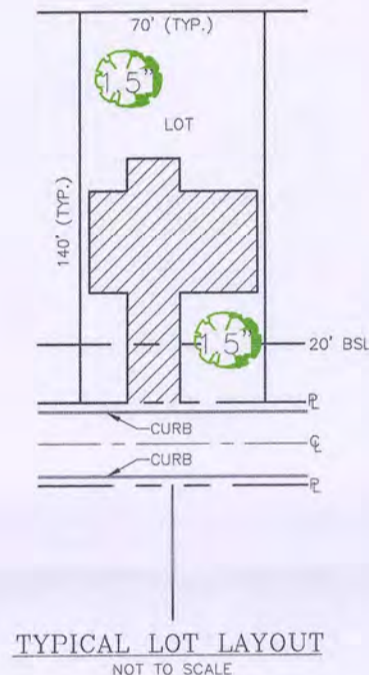
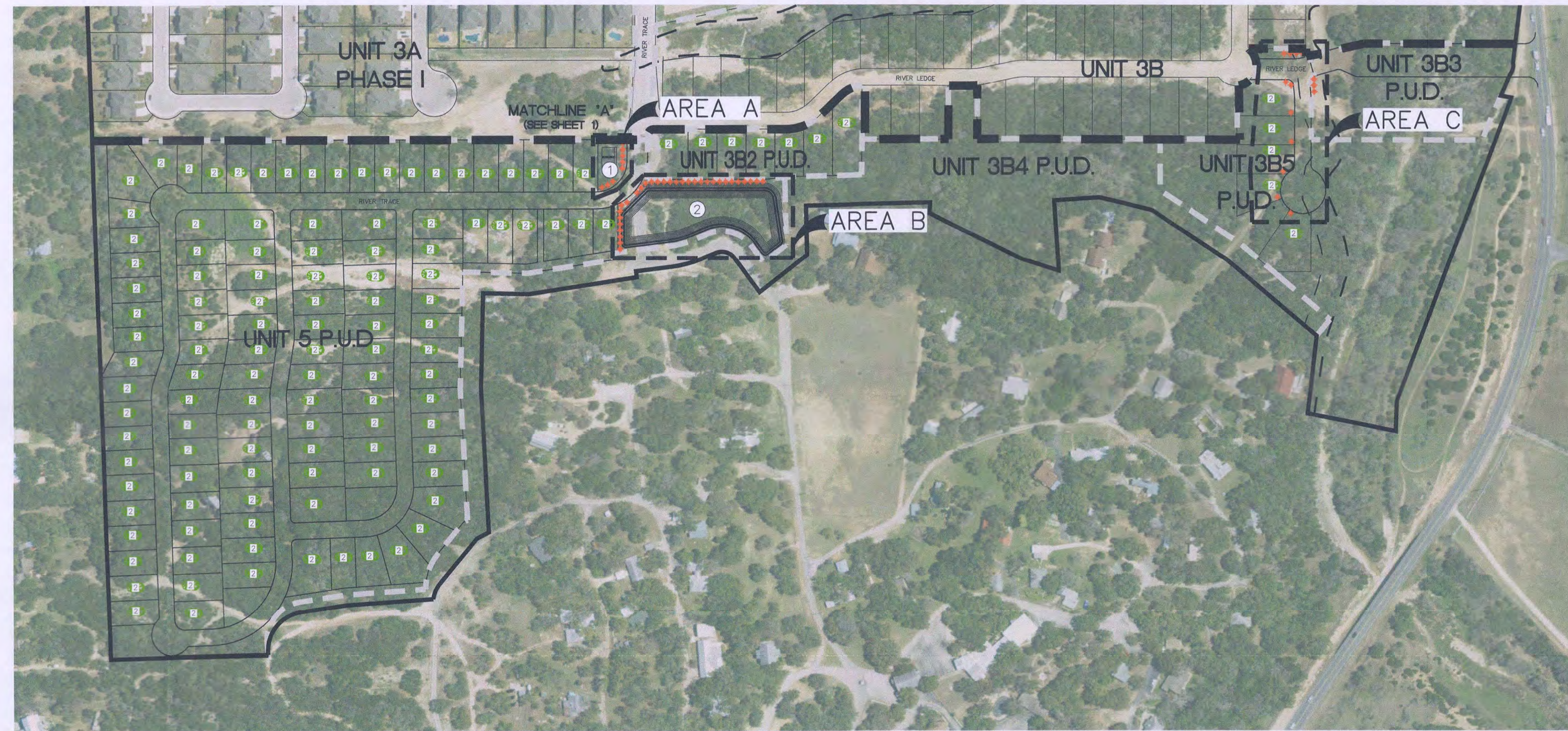


AREA B  
N.T.S.



- LEGEND**
- -

- KEY NOTES**
- ① WPAP POND
  - ② DETENTION POND



**RESIDENTIAL TREE PLANTING**

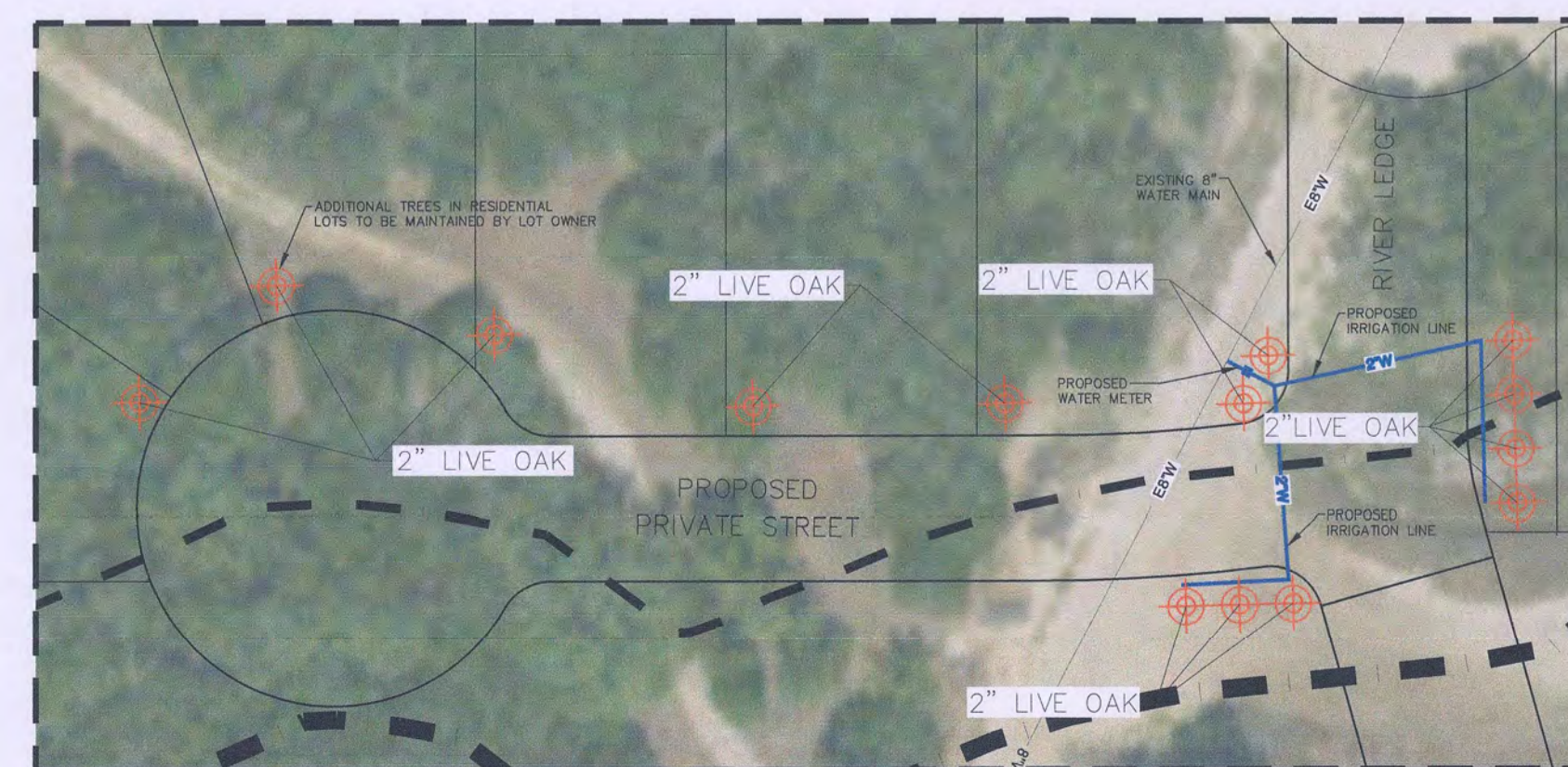
TREE LOCATION	# OF LOTS	# OF TREES	# OF INCHES
UNIT 5	113	226	339"
UNIT 3B2	7	14	21"
UNIT 3B3	0	0	0"
UNIT 3B4	0	0	0"
UNIT 3B5	5	10	15"
TOTAL	125	250	375"

- NOTE:
- TWO (1.5") TREES PLANTED IN EACH RESIDENTIAL LOT
  - CALCULATED ACREAGE ADDED TO FINAL TREE CANOPY

**HERITAGE TREE MITIGATION FOR VARIANCE**

TREE LOCATION	# OF TREES	# OF INCHES
AREA A	8	16"
AREA B	31	62"
AREA C	14	28"
TOTAL	53	106"
ADDITIONAL BEYOND 3:1 REQUIREMENTS FOR VARIANCE	14	28"

- NOTE:
- TOTAL MITIGATION REQUIREMENTS FOR REMOVAL OF 26" HERITAGE TREE IN 60' FLOOD PLAIN BUFFER = 78"
  - 2" TREES PLANTED FOR HERITAGE TREE MITIGATION
  - VARIANCE MITIGATION TREES SHOWN IN RESIDENTIAL LOTS ARE IN ADDITION TO THE STANDARD TWO 1.5" RESIDENTIAL TREE PLANTING REQUIREMENTS
  - ADDITIONAL VARIANCE TREES IN RESIDENTIAL LOTS TO BE MAINTAINED BY LOT OWNER
  - CALCULATED ACREAGE ADDED TO FINAL TREE CANOPY



AREA C  
N.T.S.

NO.	DATE	BY

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**RIVER ROCK RANCH  
MASTER TREE PRESERVATION PLAN  
AP# 1803747  
TREE MITIGATION PLAN**

JOB NO.:	11290.00
DATE:	SEPTEMBER 5, 2018
DESIGN:	DAD
DRAWN:	DAD
CHECKED:	

**ENGINEER:**  
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**1.1.1 ELEVATION**  
X T & S

**1.1.2 LEVEL I & FENCE PROTECTION**  
X T & S

**1.1.3 LEVEL II & FENCE PROTECTION**  
X T & S

**1.1.4 LEVEL II B FENCE PROTECTION**  
X T & S

**1.1.5 BORING THRU TREE ROOT ZONE**  
X T & S

**1.1.6 TREE REMOVAL DIAGRAM**  
X T & S

**1.4 BRANCH PRUNING DETAIL**  
X T & S

**1.5 BRANCH CLEARANCE DETAIL**  
X T & S

**1.6 NEW TREE PLANTING DETAIL**  
X T & S

**3.1 TREE GRATE/FRAME @ PAVERS**  
X T & S

**3.2 SECTION: PAVES @ TREE GRATE**  
X T & S

**3.3 ELEVATED WALKWAY CONCRETE DECKING**  
X T & S

**3.3.4 ELEVATED WALKWAY SECTION**  
X T & S

**3.3.2 ELEVATED WALKWAY STEEL DECKING**  
X T & S

**3.1.3 GENERAL NOTES**

**TREE PROTECTION TABLE**

TREE SHEET #	TREE CALIPER #	STATION OR LOCATION	PROTECTION MEASURE	REMOVAL DATE	REMARKS

**TREE INVENTORY SUMMARY**

TREE #	TREE CALIPER	STATION OR LOCATION	PROTECTION MEASURE	REMOVAL DATE	REMARKS

**2.1 EXPOSED ROOT PROTECTION DETAIL**  
X T & S

**2.2 TREE GRATE DETAIL**  
X T & S

**2.2.1 TREE GRATE PLAN VIEW**  
X T & S

**2.2.2 SECTION: PAVES @ ASPHALT**  
X T & S

**2.2.3 TREE WELL SECTION**  
X T & S

**2.2.4 SECTION: TREE GRATE FRAME**  
X T & S

**4.1 TREE AERATION DETAIL A**  
X T & S

**4.2 TREE AERATION DETAIL B**  
X T & S

**4.2.1 PLAN VIEW B**  
X T & S

**4.2.2 PLAN VIEW B**  
X T & S

**4.2.3 PLAN VIEW C**  
X T & S

**4.2.4 PLAN VIEW C**  
X T & S

**4.3 SEGMENTAL GRAVITY WALL**  
X T & S

**4.3.2 LIMESTONE BOULDER GRAVITY WALL**  
X T & S

**4.4.1 TREE AERATION DETAIL C**  
X T & S

**4.4.2 TREE AERATION DETAIL C**  
X T & S

**4.4.3 TREE AERATION DETAIL D**  
X T & S

**4.4.4 TREE AERATION DETAIL D**  
X T & S

**4.4.5 TREE AERATION SECTION C**  
X T & S

PREPARED BY PERIMETER PAVING WITH & ASSOC. INC.  
A.S.E. DESIGN SHEET  
CITY OF SAN ANTONIO  
DEPARTMENT OF PUBLIC WORKS  
CITY OF SAN ANTONIO  
TREE PROTECTION DETAILS  
TREE PRESERVATION

DESIGNER	DATE	CHECKED	DATE	SCALE

PREPARED BY PERIMETER PAVING WITH & ASSOC. INC.  
A.S.E. DESIGN SHEET  
CITY OF SAN ANTONIO  
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TREE PROTECTION DETAILS  
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DESIGNER	DATE	CHECKED	DATE	SCALE