

DRAINAGE PLANS FOR: RICHARDSON RESIDENCE 208 ASHWORTH DRIVE ROLLINGWOOD, TX 78746 SUBMITTAL DATE: APRIL 10, 2022

OWNER: Andrew Richardson
208 Ashworth Drive
Rollingwood, TX 78747

ARCHITECT: Finn Nordfjord
Cornerstone Architects
7000 Bee Caves Rd., Suite 200
Austin, TX 78746
(512) 329-0007

ENGINEER/: Chris Maxwell-Gaines, P.E.
PERSON Innovative Water Solutions LLC
PREPARING 501 W. Powell Lane, Suite 206
PLAN Austin, TX 78753
(512) 490-0932

PROJECT ADDRESS: 208 ASHWORTH DRIVE
ROLLINGWOOD, TX 78746

PARCEL ID: 110540

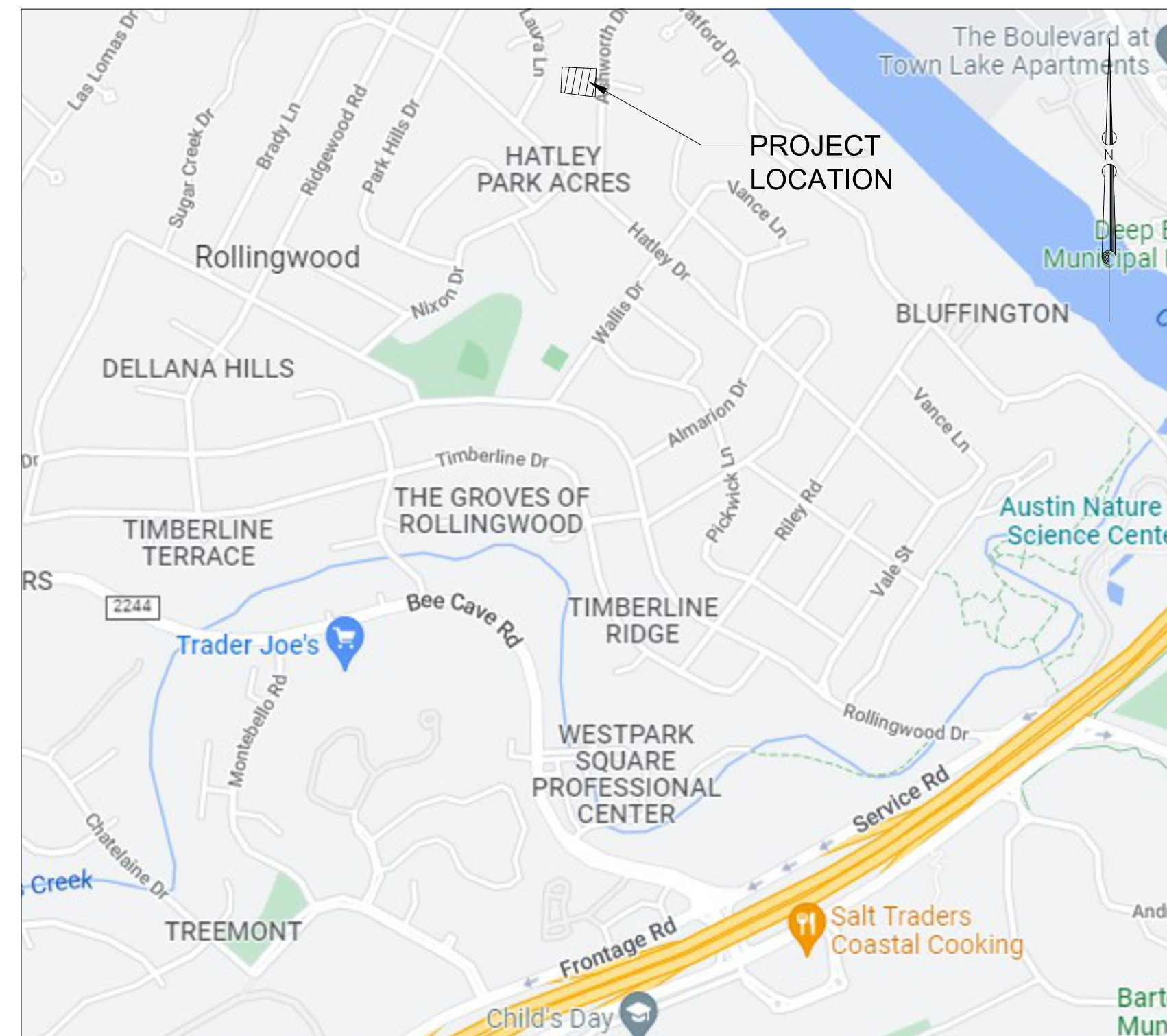
ACREAGE: 0.407 AC

LEGAL DESCRIPTION: LOT 21 ROLLINGWOOD PARK ESTATES SEC 2

FLOODPLAIN: THIS PROPERTY DOES NOT LIE WITHIN THE 100 YEAR
FLOOD-PLAIN, AND HAS A ZONE "X" RATING AS SHOWN ON
FEMA FIRM MAP 48453C0445K, DATED JANUARY 22, 2020.

GENERAL NOTES:

- ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAIN WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF ROLLINGWOOD MUST RELY ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.
- CONTRACTOR SHALL CALL THE ONE CALL SYSTEM (1-800-344-8377) FOR UTILITY LOCATIONS PRIOR TO ANY WORK IN CITY EASEMENTS OR STREET R.O.W.
- FOR SLOPES OR TRENCHES GREATER THAN FIVE FEET IN DEPTH: ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA STANDARDS MAY BE PURCHASED FROM OSHA, 611 EAST 6TH STREET, AUSTIN, TEXAS.)
- ALL SITE WORK MUST ALSO COMPLY WITH ENVIRONMENTAL REGULATIONS.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TRAFFIC CONTROL PERMIT PRIOR TO CONSTRUCTION IN THE RIGHT-OF-WAY.



VICINITY MAP
N.T.S.

PROJECT DESCRIPTION:

DEMOLITION OF THE EXISTING TWO STORY HOUSE AND CONSTRUCTION OF A NEW TWO STORY HOUSE WITH POOL / PATIO, AND TERRACED BACKYARD.

INDEX OF SHEETS

- COVER SHEET
- DRAINAGE AREA MAPS AND CALCULATIONS
- PROPOSED DRAINAGE AND GRADING PLAN
- EROSION AND SEDIMENT CONTROL PLAN - DETAILS AND NOTES
- RAINWATER HARVESTING SYSTEM PLAN FOR TCEQ REQUIREMENTS

APPROVED BY:

CITY OF ROLLINGWOOD

DATE

REVISIONS/CORRECTIONS:

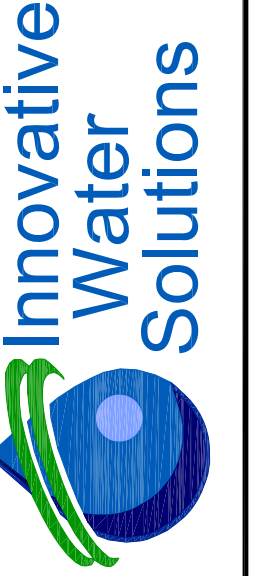
NO.	REVISION DESCRIPTION	REVIEWED BY	DATE

DESIGNED BY: CMG	PROJECT NO.: 208 ASHWORTH
DRAWN BY: CMG	FILE NO.: 208 ASHWORTH DRAINAGE-2203
CHECKED BY: BW	DATE: APRIL 2022
	SCALE: AS SHOWN

COVER PAGE	
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RICHARDSON RESIDENCE
208 ASHWORTH DRIVE
ROLLINGWOOD, TX 78746




 RAINWATER HARVESTING,
 GRAYWATER RECOVERY, &
 WATER CONSERVATION CONSULTING
 P.O. Box 9963
 Austin, Texas 78766
 Phone: (512) 490-0932
<http://www.watercache.com>



1 EXISTING DRAINAGE AREA MAP
SCALE: 1" = 40'

Impervious Cover Report
208 Ashworth Drive, Rollingwood, TX

Area Description	Existing		Proposed		WPAP Requirements	
	SF	%	SF	%	SF	%
Lot	17743.12		17743.12		17743.12	
Residence	1,662.21	9.4%	5160.84	29.1%	1995	11.2%
Driveway	1,448.92	8.2%	659.43	3.7%	659.43	3.7%
Sidewalks/Porches	76.27	0.4%	592.89	3.3%	592.89	3.3%
Wood Deck (50%)	0	0.0%	0	0.0%	0	0.0%
Pool	0	0.0%	275.03	1.6%	275.03	1.6%
AC Pads	0	0.0%	21.33	0.1%	21.33	0.1%
Total	3187.4	18.0%	6709.52	37.8%	3543.68	20.0%

Net Increase in Impervious Cover: **3522.12** sf

Time of Concentration (T_c) Calculation

Area	L _{max} (feet)	L _{allow} (feet)	n	S	T _c (min)	T _c (min)
Ex	100	10.9	0.24	0.027	11.2	6.7
E1	100	78.8	0.24	0.128	6.2	3.7
E2	100	116.2	0.24	0.115	6.6	4.0
E3	11.67		0.015	0.083	0.1	0.1
E4	20.2		0.015	0.083	0.2	0.1
E5	86.3		0.015	0.06	0.8	0.5
P1	100	93.92	0.24	0.133	6.1	3.7
P2	100	156.9	0.24	0.09	7.4	4.4
P3	65.4		0.015	0.083	0.5	0.3
P4	37.5		0.015	0.083	0.2	0.1
P5	59.5		0.015	0.088	0.5	0.3

Note: For any T_c below 5, the minimum used in HEC-HMS model is 5.0 minutes.

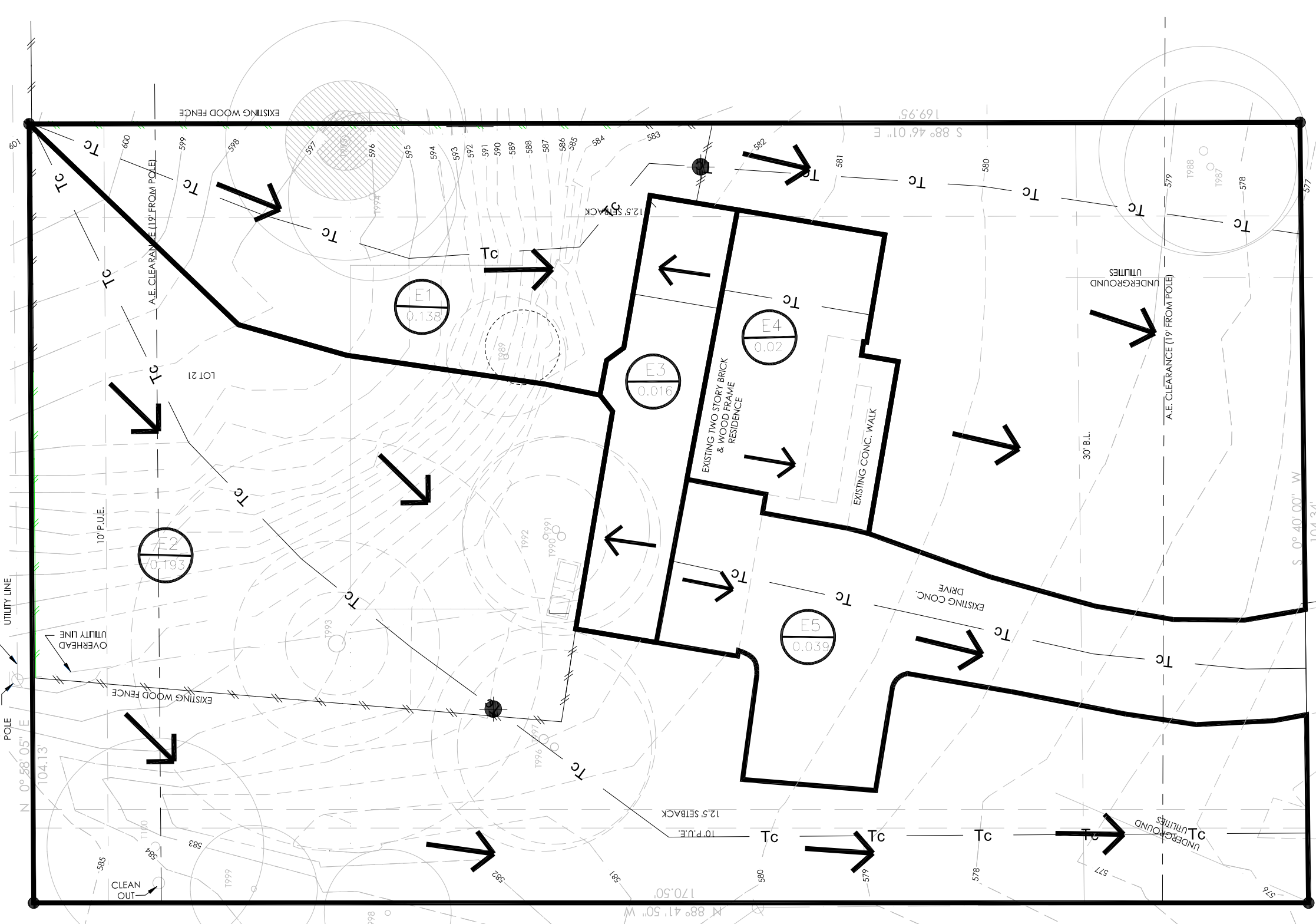
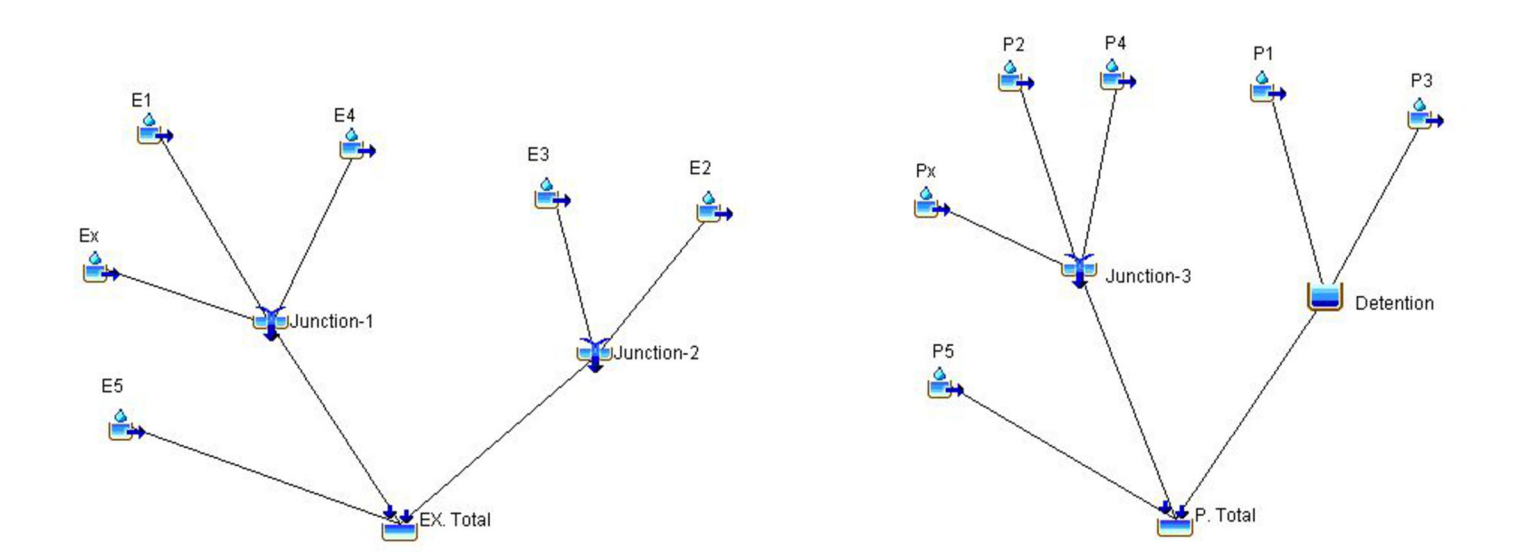
Hydrologic Calculations (SCS Method)
208 Ashworth Drive, Rollingwood, TX

Hydrologic Element	Drainage Area (mi ²)	2 yr Peak discharge (cfs)	10 yr Peak discharge (cfs)	25 yr Peak discharge (cfs)	100 yr Peak discharge (cfs)
Existing					
Ex	0.00018159	0.3	0.6	0.8	1.2
E1	0.00021686	0.3	0.6	0.9	1.4
E2	0.00030296	0.4	0.9	1.3	1.9
E3	2.4553E-05	0.1	0.1	0.1	0.2
E4	3.15E-05	0.1	0.1	0.2	0.2
E5	6.0579E-05	0.1	0.2	0.3	0.4
Ex Total	0.00081804	1.3	2.6	3.5	5.3
Proposed					
Px	0.00018159	0.3	0.6	0.8	1.2
P1	0.00025338	0.4	0.8	1.1	1.6
P2	0.00016049	0.2	0.5	0.7	1.0
P3	0.00011852	0.3	0.4	0.6	0.8
P4	2.8512E-05	0.1	0.1	0.1	0.2
P5	7.7535E-05	0.2	0.3	0.4	0.5
Detention	0.000382	0.3	0.4	0.4	0.4
P Total	0.00081804	1.1	1.8	2.3	3.3

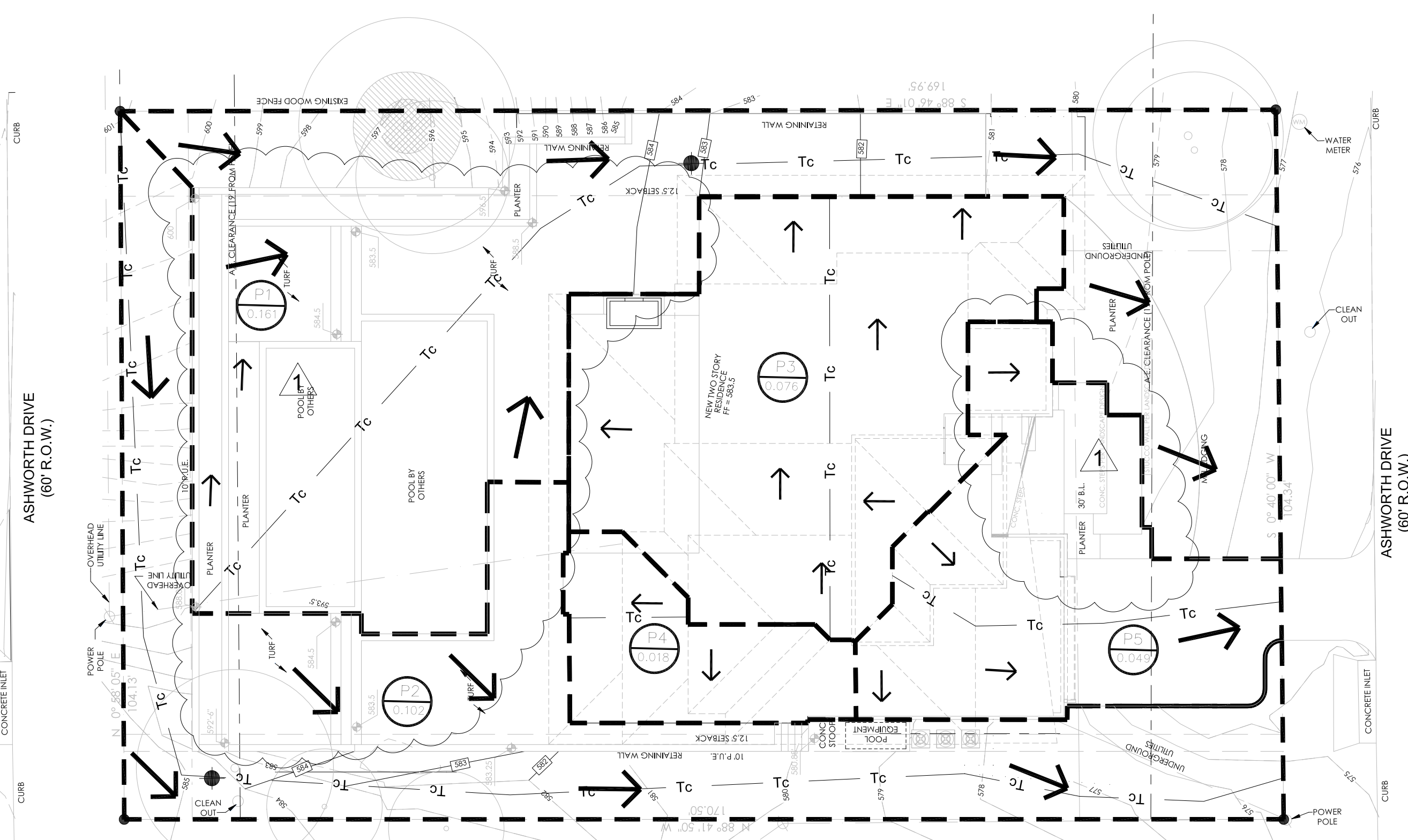
Impervious Cover

Hydrologic Element	Pervious Number	Impervious Number	Weighted Number	Impervious Cover %
Ex	80	98	85.8	32.0%
E1	80	98	80.0	0.0%
E2	80	98	80.0	0.0%
E3	80	98	98.0	100.0%
E4	80	98	98.0	100.0%
E5	80	98	98.0	100.0%
P1	80	98	80.7	4.0%
P2	80	98	80.7	3.8%
P3	80	98	98.0	100.0%
P4	80	98	98.0	100.0%
P5	80	98	98.0	100.0%

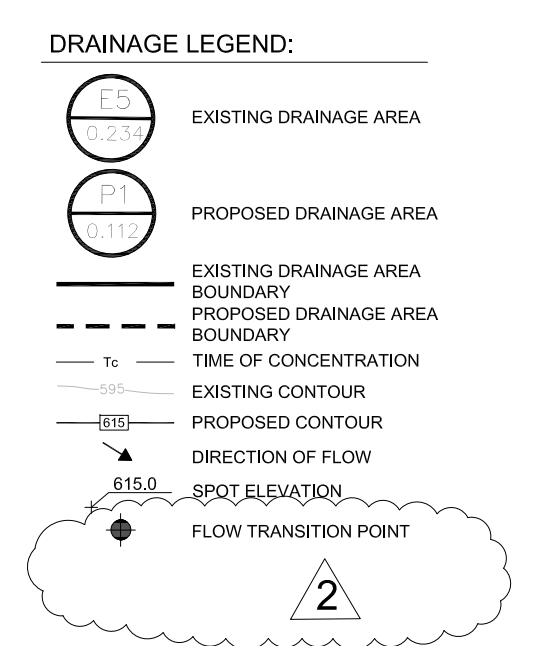
HEC-HMS MODEL



2 EXISTING ON-SITE DRAINAGE MAP
SCALE: 1" = 15'



3 PROPOSED DRAINAGE AREA MAP
SCALE: 1" = 15'



NO.	BY	DATE	REVISION
1	CMG	9/6/22	CHANGE TO LANDSCAPE DESIGN
2	CMG	10/3/22	DRAINAGE REVIEW CHANGES

DESIGNED BY: CMG
DRAWN BY: CMG
CHECKED BY: BFB

PROJECT NO.: RICHARDSON RESIDENCE
FILE NO.: 208 ASHWORTH DRIVE PLANING
DATE: APRIL 2022
SCALE: AS SHOWN

DRAINAGE AREA MAPS AND CALCULATIONS

RICHARDSON RESIDENCE
208 ASHWORTH DRIVE
ROLLINGWOOD, TX

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY CHRIS MAXWELL-GAINES, P.E. 99248, ON APRIL 10, 2022. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

Innovative Water Solutions
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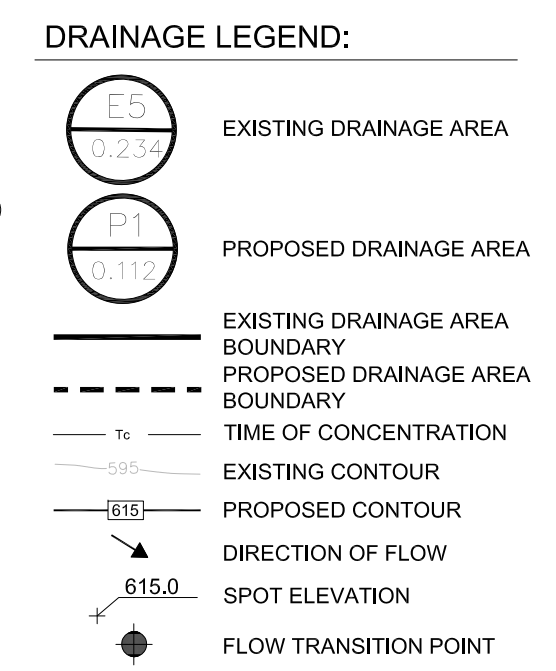
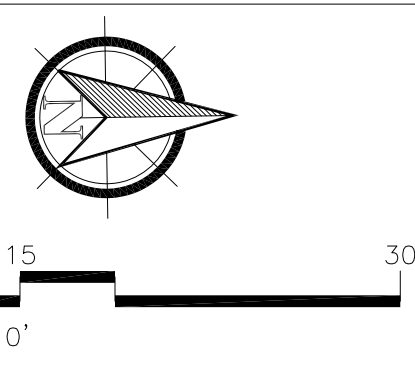
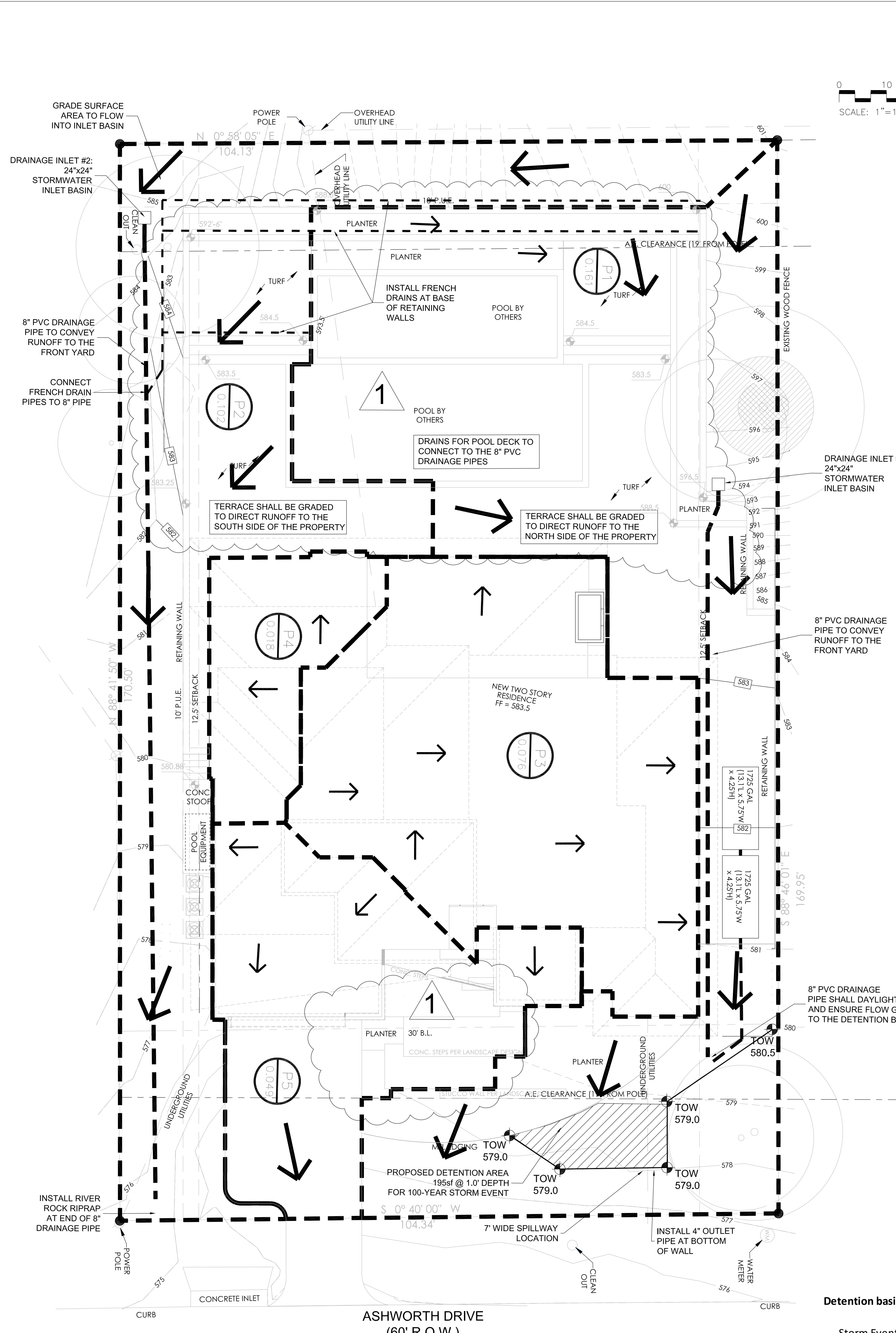
STATE OF TEXAS
99248
CHRIS MAXWELL-GAINES
LICENSED PROFESSIONAL ENGINEER

Chris Maxwell-Gaines

SHT 2 OF 5



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Drainage Pipe Flow Calculations

	C	i (in/hr)	A (ac)	Q (cfs)
Drainage Inlet #1 Area	0.33	6.307	0.0844	0.176
Drainage Inlet #2 Area	0.33	6.307	0.0915	0.190

$Q = C \cdot i \cdot A$
where,
Q = peak runoff (cfs)
C = composite coefficient
i = average intensity of rainfall for a period of time equal to the time of concentration (in/hr)
A = area contributing runoff to the point of design (ac)

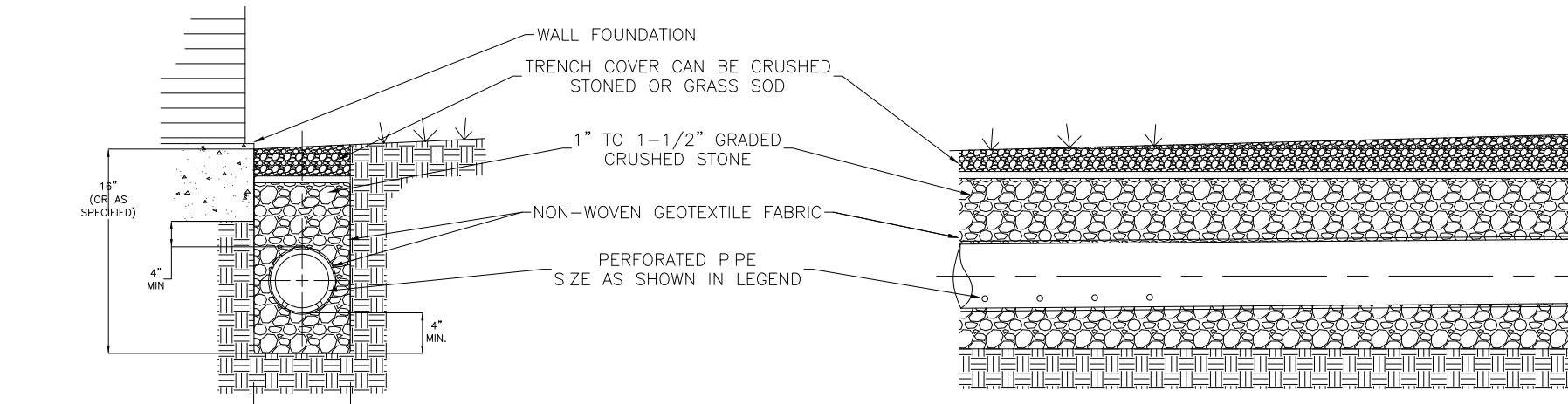
	n	A	R	S	Q (cfs)
Drainage Inlet #1 Pipe Capacit	0.012	0.349	0.16667	0.029	3.174352
Drainage Inlet #1 Pipe Capacit	0.012	0.349	0.16667	0.0516	4.234294

$Q = (1.49/n) \cdot (AR)^{2/3} \cdot S^{1/2}$
where,
Q = Pipe Flow, cfs
A = Cross-sectional area of flow, ft²
n = Coefficient of roughness of pipe
R = Hydraulic radius = A/W p, ft
S = Friction slope in pipe, ft/ft

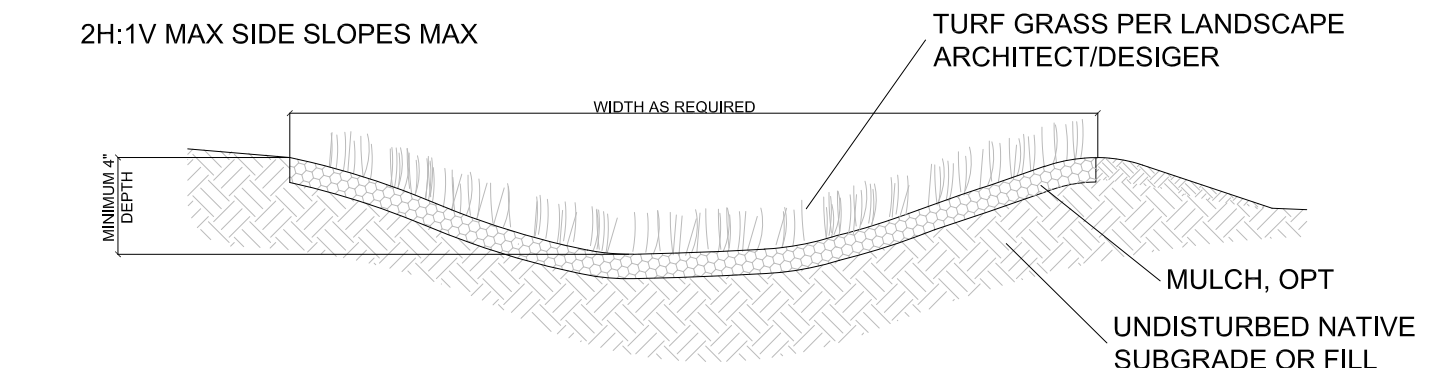
NOTE: FLOW FROM THE FRENCH DRAIN PIPE WILL BE MINIMUM AS IT IS A SYSTEM TO RELIEVE HYDROSTATIC PRESSURE ON THE RETAINING WALLS.

GENERAL SITE NOTES:

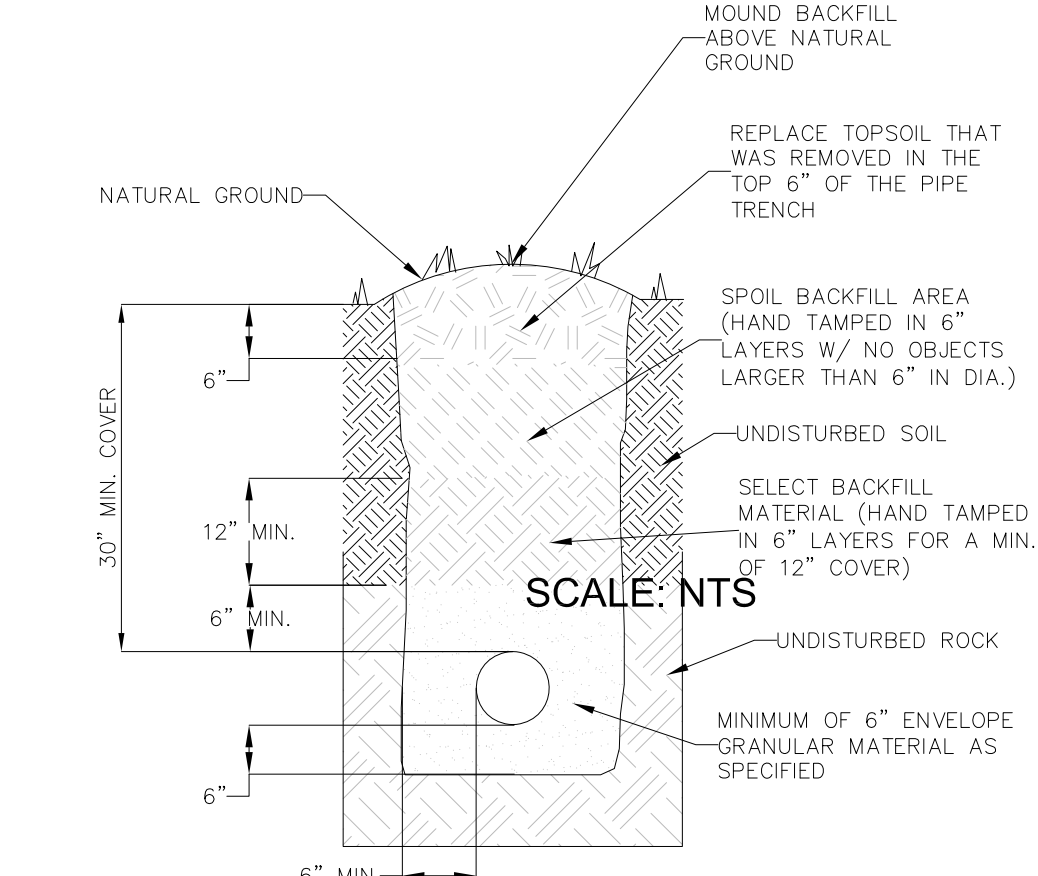
- THE CONTRACTOR TO PROVIDE FINISHED GRADING AS SHOWN ON PLANS TO PROVIDE PROPER DRAINAGE OF SURFACE WATER AWAY FROM THE BUILDING(S).
- FINAL LOCATION OF PROPOSED RESIDENCE SHALL BE DETERMINED BY THE CONTRACTOR.
- UTILITY LINE LOCATIONS ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY FOR EXACT LOCATIONS.
- ANY EXISTING PAVEMENT, CURBS, AND/OR SIDEWALKS DAMAGED OR REMOVED WILL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S SOLE EXPENSE.
- EROSION CONTROL BARRIERS SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- STABILIZED TEMPORARY CONSTRUCTION ENTRANCE SHALL BE IN PLACE PRIOR TO COMMENCEMENT OF CONSTRUCTION UNLESS AN EXISTING IMPERVIOUS SURFACE OR DRIVEWAY IS BEING USED AS THE CONSTRUCTION SITE ENTRANCE.
- ALL CONSTRUCTION MATERIALS AND WASTE SHALL BE STORED ONSITE DURING CONSTRUCTION.
- LANDSCAPE PLANS TO BE PROVIDED BY OTHERS.
- NO EXISTING TREES OR TREE LIMBS SHALL BE REMOVED OR DISTURBED WITHOUT OWNER APPROVAL.
- CONTRACTOR SHALL CLEAN UP AREAS AFFECTED BY DAILY WORK AND REMOVE DEBRIS AND MATERIALS FROM THE SITE UPON COMPLETION OF THE WORK.
- DISPOSAL OF SPOIL IS THE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR SHALL THOROUGHLY REVIEW PLANS AND ALL RELATED CONSTRUCTION DOCUMENTS TO VERIFY AND COORDINATE DIMENSIONS, LOCATIONS, ELEVATIONS, FLOW LINES, PLACEMENT AND APPLICABILITY OF CONSTRUCTION COMPONENTS AS WELL AS THEIR RELATIONSHIP TO EACH OTHER AND THE EXISTING CONDITIONS.
- ANY DISCREPANCIES, CONFLICTS, AND OMISSIONS THAT ARE CRITICAL TO THE BID SHALL BE ADDRESSED BY THE CONTRACTOR PRIOR TO HIS/HER BID, OR INCLUDED IN THE BID AS A PROPOSAL SOLUTION AND CHANGES TO DELIVER A COMPLETE PROJECT. ANY CHANGES AND ADDITIONAL WORKS REQUIRED TO CLARIFY DISCREPANCIES, CONFLICTS, AND OMISSIONS THAT ARE NOT IDENTIFIED WITH THE BID ARE CONSIDERED NON-CRITICAL TO THE BID, AND SHALL BE COMPLETED AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL BE COMPETENT AND EXPERIENCED IN THE TYPE OF CONSTRUCTION USED AND HAVE FULL KNOWLEDGE OF CONSTRUCTION METHODS AND PROCEDURES. CONTRACTOR SHALL COORDINATE ALL TRADES TO PROVIDE A COMPLETE PROJECT.
- THESE DRAWINGS, IN GENERAL, ARE DIAGRAMMATIC, AND NOT INTENDED TO BE USED AS A MANUAL. FABRICATION, CONSTRUCTION METHODS, AND PLACEMENT SHALL COMPLY WITH STANDARD CONSTRUCTION PRACTICE AND APPLICABLE LOCAL CODE(S). IN THE ABSENCE OF THE LOCAL CODE, THE INTERNAL BUILDING CODE (LATEST EDITION) SHALL APPLY.
- THE EXACT LOCATIONS OF STRUCTURES AND IMPROVEMENTS SHOWN ON ENGINEER'S PLANS ARE BASED ON THE ARCHITECTURAL SITE PLAN AND/OR OWNER'S PLAN. THE ARCHITECT AND THE CONTRACTOR, ARE RESPONSIBLE FOR VERIFYING ALL SITE RESTRICTIONS, SUCH AS BUILDING SETBACKS, RESTRICTIVE COVENANTS, PROPERTY LINES, AND HOMEOWNERS ASSOCIATIONS LIMITATIONS.
- THE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH OCCUR DUE TO THEIR FAILURE TO LOCATE AND PRESERVE ANY AND ALL UTILITIES.



FRENCH DRAIN DETAIL
SCALE: NTS



VEGETATED SWALE DETAIL
SCALE: NTS



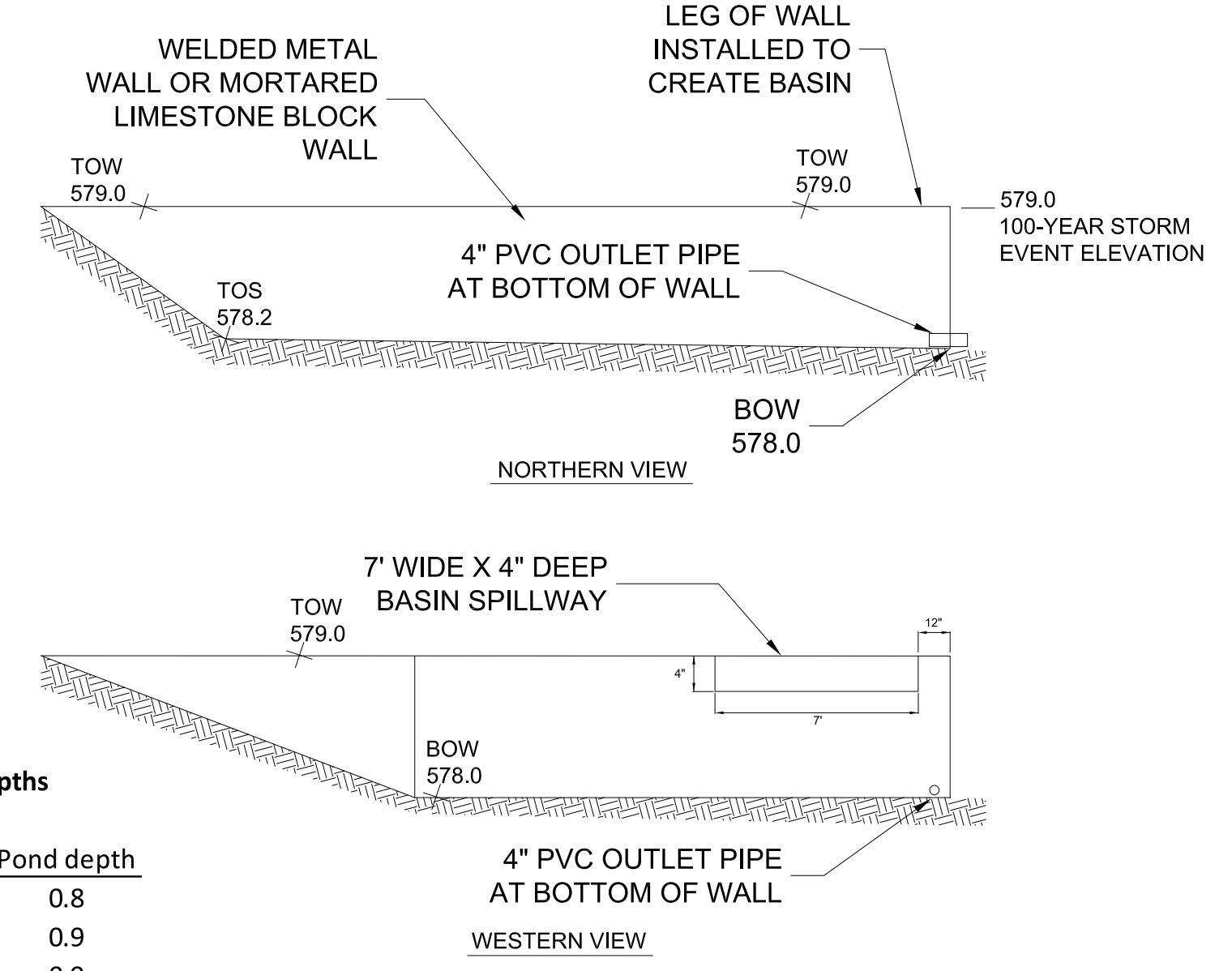
PIPE EMBEDMENT DETAIL
SCALE: NTS

FOR RAINWATER HARVESTING SYSTEM DESIGN AND DETAILS, SEE SHEET 5.

Detention basin depths

Storm Event	Pond depth
2-year	0.8
10-year	0.9
25-year	0.9
100-year	1.0

DETENTION BASIN ELEVATIONS
SCALE: NTS



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DESIGNED BY: CMG
DRAWN BY: CMG
CHECKED BY: BW
PROJECT NO.: RICHARDSON RESIDENCE
FILE NO.: 208 ASHWORTH DRAINAGE PLAN
DATE: APRIL 2022
SCALE: 1" = 10'

NO. BY DATE REVISION
1 CMG/9/16/22 CHANGES TO LANDSCAPE DESIGN
2 CMG/10/13/22 DRAINAGE REVIEW CHANGES

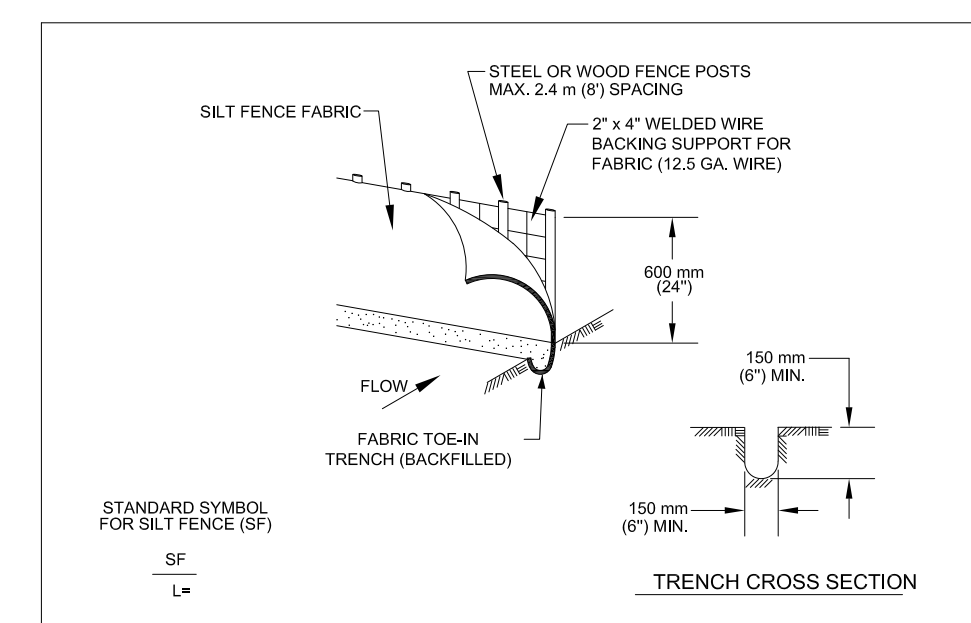
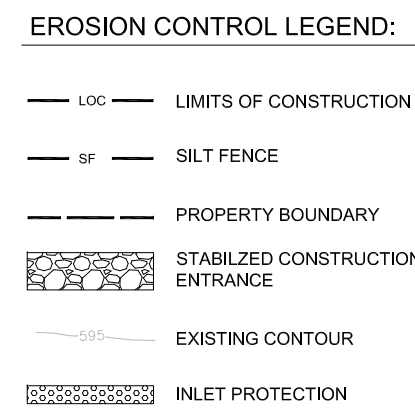
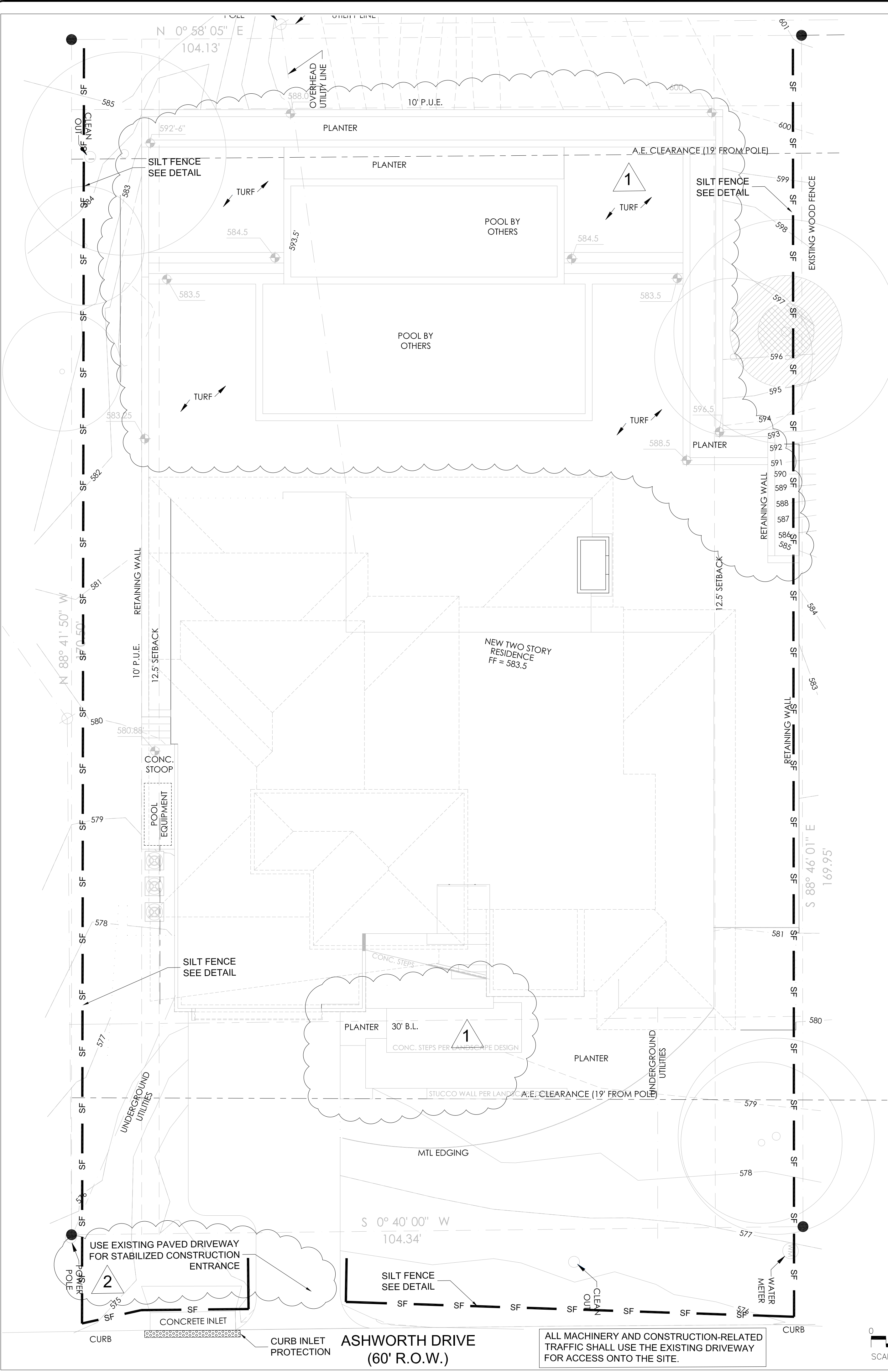
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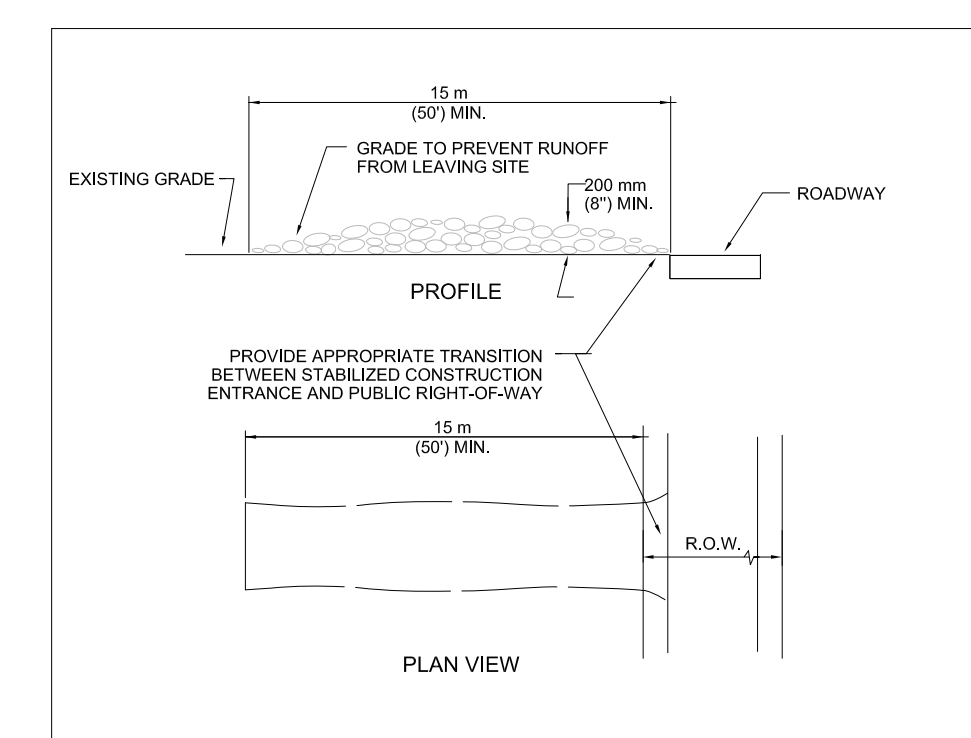
STATE OF TEXAS
CHRIS MAXWELL-GAINES
99248
LICENSED PROFESSIONAL ENGINEER

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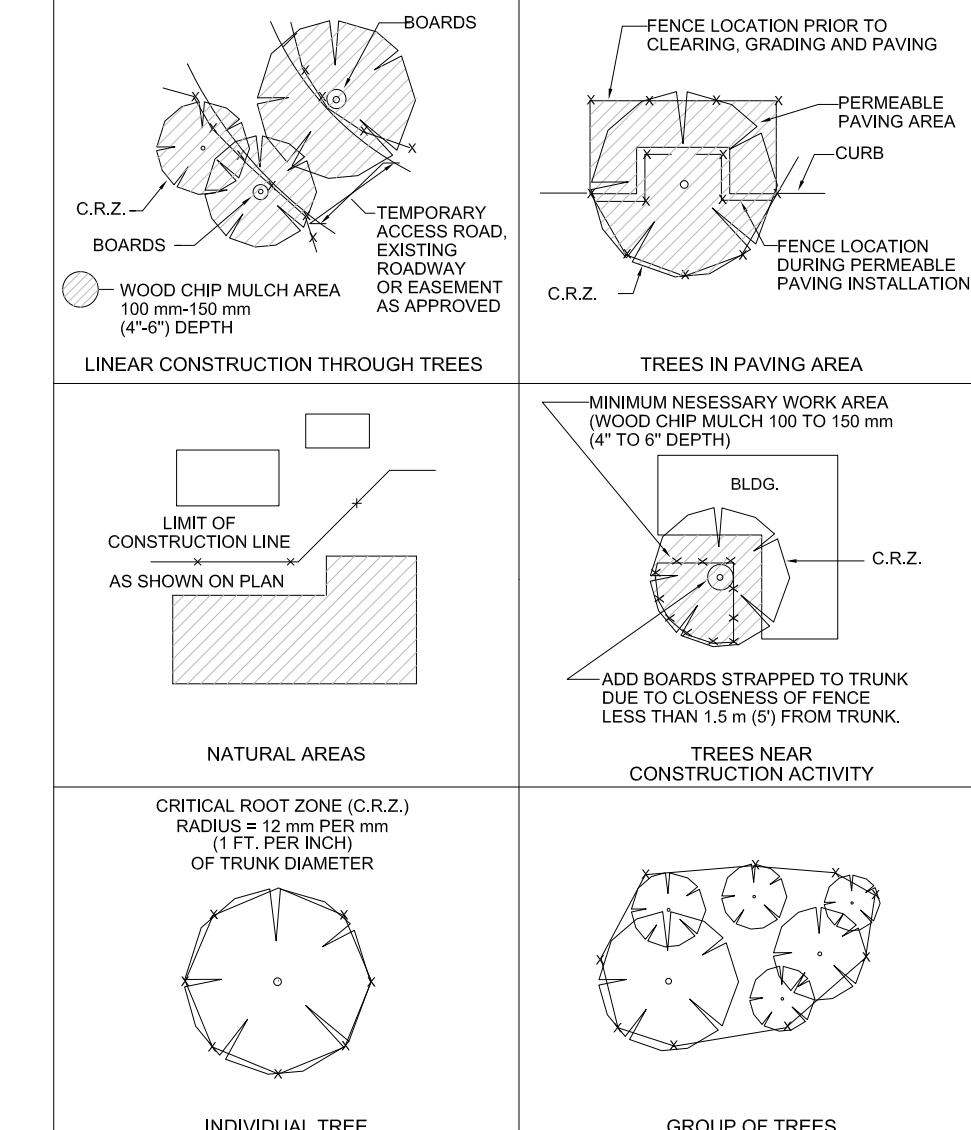
SHT 3 OF 5



CITY OF AUSTIN
 WATERBARRIER PROTECTION DEPARTMENT
 RECORD COPY SIGNED BY MORGAN BYARS 09/01/2011 ADOPTED
 THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
 STANDARD NO. 642S-1



CITY OF AUSTIN
 WATERBARRIER PROTECTION DEPARTMENT
 RECORD COPY SIGNED BY J. PATRICK MURPHY 5/23/00 ADOPTED
 THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
 STANDARD NO. 641S-1



CITY OF AUSTIN
 WATERBARRIER PROTECTION DEPARTMENT
 RECORD COPY SIGNED BY J. PATRICK MURPHY 11/15/99 ADOPTED
 THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
 STANDARD NO. 610S-1

EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).
2. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND INSPECTING, ON A REGULAR BASIS, ALL EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES INCLUDING THE SILT FENCES, CONSTRUCTION ENTRANCES, ROCK FILTER DAMS, ETC. DURING CONSTRUCTION/DEMOLITION AND INCLUDING THE REMOVAL AND PROPER DISPOSAL OF ANY ACCUMULATED SILT AND DEBRIS.
4. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS AND AFTER SIGNIFICANT RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.
5. ANY MAJOR VARIATION IN MATERIALS OR LOCATIONS OF CONTROLS OR FENCES FROM THOSE SHOWN ON THE APPROVED PLAN WILL REQUIRE A REVISION AND MUST BE APPROVED BY THE REVIEWING ENGINEER, ENVIRONMENTAL SPECIALIST OR CITY ARBORIST AS APPROPRIATE. MAJOR REVISIONS MUST BE APPROVED BY THE CITY. MINOR CHANGES TO BE MADE AS FIELD REVISIONS TO THE EROSION AND SEDIMENTATION CONTROL PLAN MAY BE REQUIRED BY THE ENVIRONMENTAL INSPECTOR DURING THE COURSE OF CONSTRUCTION TO CORRECT INADEQUACIES.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND INSPECTING, ON A REGULAR BASIS, ALL EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES INCLUDING THE SILT FENCES, CONSTRUCTION ENTRANCES, ROCK FILTER DAMS, ETC. DURING CONSTRUCTION/DEMOLITION AND INCLUDING THE REMOVAL AND PROPER DISPOSAL OF ANY ACCUMULATED SILT AND DEBRIS.
7. THE CONTRACTOR SHALL NOT BEGIN ANY WORK UNTIL TREE PROTECTION AND THE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES SUCH AS SILT FENCE, CONSTRUCTION ENTRANCES, ROCK FILTER DAMS, ETC. HAVE BEEN INSTALLED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE STREETS FREE OF MUD, DIRT, DEBRIS AND MATERIAL AT ALL TIMES AND SHALL CLEAN/SWEEP THE STREETS ON A REGULAR BASIS AND AT THE DIRECTION OF THE CITY.
9. INCREASED STORMWATER PEAK FLOWS DURING CONSTRUCTION MUST BE MITIGATED WITH TEMPORARY BEST MANAGEMENT PRACTICES TO PREVENT HARM TO NEIGHBORING PROPERTIES.
10. THE VEGETATIVE STABILIZATION OF AREAS DISTURBED BY CONSTRUCTION SHALL BE AS FOLLOWS:

TEMPORARY VEGETATIVE STABILIZATION:

5. FROM SEPTEMBER 15 TO MARCH 1, SEEDING SHALL BE WITH COOL SEASON COVER CROPS (WHEAT AT 0.5 POUNDS PER 1000 SF, OATS AT 0.5 POUNDS PER 1000 SF, CEREAL RYE GRAIN AT 0.5 POUNDS PER 1000 SF) WITH A TOTAL RATE OF 1.5 POUNDS PER 1000 SF. COOL SEASON COVER CROPS ARE NOT PERMANENT EROSION CONTROL.
6. FROM MARCH 2 TO SEPTEMBER 14, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF 1 POUND PER 1000 SF.
- A. FERTILIZER SHALL BE WATER SOLUBLE WITH AN ANALYSIS OF 15-15-15 TO BE APPLIED ONCE AT PLANTING AND ONCE DURING THE PERIOD OF ESTABLISHMENT AT A RATE OF 1/2 POUND PER 1000 SF.
- B. HYDROMULCH SHALL COMPLY WITH TABLE 1, BELOW.
- C. TEMPORARY EROSION CONTROL SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1 1/2 INCHES HIGH WITH 95% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 16 SQUARE FEET EXIST.
- D. WHEN REQUIRED, NATIVE GRASS SEEDING SHALL COMPLY WITH REQUIREMENTS OF THE CITY OF AUSTIN ENVIRONMENTAL CRITERIA MANUAL.

PERMANENT VEGETATIVE STABILIZATION:

1. FROM SEPTEMBER 15 TO MARCH 1, SEEDING IS CONSIDERED TO BE TEMPORARY STABILIZATION ONLY. IF COOL SEASON COVER CROPS EXIST WHERE PERMANENT VEGETATIVE STABILIZATION IS DESIRED, THE GRASSES SHALL BE MOWED TO A HEIGHT OF LESS THAN ONE-HALF (1/2) INCH AND THE AREA SHALL BE RE-SEEDING IN ACCORDANCE WITH 2. BELOW.
2. FROM MARCH 2 TO SEPTEMBER 14, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF 1 POUND PER 1000 SF WITH A PURITY OF 95% WITH 85% GERMINATION. BERMUDA GRASS IS A WARM SEASON GRASS AND IS CONSIDERED PERMANENT EROSION CONTROL.
- A. FERTILIZER SHALL BE WATER SOLUBLE WITH AN ANALYSIS OF 15-15-15 TO BE APPLIED ONCE AT PLANTING AND ONCE DURING THE PERIOD OF ESTABLISHMENT AT A RATE OF 1/2 POUND PER 1000 SF.
- B. HYDROMULCH SHALL COMPLY WITH TABLE 2, BELOW.
- C. THE PLANTED AREA SHALL BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF SIX INCHES. THE IRRIGATION SHALL OCCUR AT DAILY INTERVALS (MINIMUM) DURING THE FIRST TWO MONTHS. RAINFALL OCCURRENCES OF 1/2 INCH OR MORE SHALL POSTPONE THE WATERING SCHEDULE FOR ONE WEEK.
- D. PERMANENT EROSION CONTROL SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1 1/2 INCHES HIGH WITH 95% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 16 SQUARE FEET EXIST.

SEQUENCE OF CONSTRUCTION AND MAJOR ACTIVITIES:

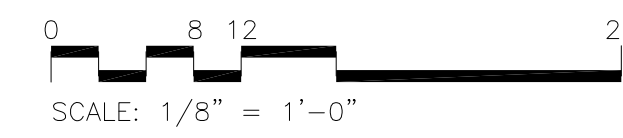
- PRIOR TO SITE GRADING ACTIVITIES:
1. INSTALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS AS SHOWN ON THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN PRIOR TO SITE DISTURBANCE.
 2. INSTALL TREE PROTECTION AS SHOWN ON THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN PRIOR TO SITE DISTURBANCE.
 3. SCHEDULE A PRECONSTRUCTION MEETING WITH CONTRACTORS AS NECESSARY.
 4. CONTACT "TEXAS 811" AT 811 TO LOCATE EXISTING UTILITIES.
- SITE GRADING:
5. BEGIN SITE CLEARING GRUBBING, AND/OR TOPSOIL STRIPPING, AND DEMOLITION ACTIVITIES.
 6. ESTABLISH SOIL STOCKPILE, PROVIDE COVER, AND INSTALL SILT FENCE AROUND PERIMETER.
 7. CONTRACTOR SHALL TAKE SPECIAL CARE WHEN GRADING IN THE VICINITY OF CRITICAL ROOT ZONES.
 8. STABILIZE DISTURBED AREAS WITH BARE GROUND WHERE CONSTRUCTION WILL CEASE FOR MORE THAN 14 DAYS WITH VEGETATION OR OTHER SOIL STABILIZATION MEASURES TO PREVENT EROSION.
 9. CONSTRUCT SITE UTILITIES AND STORM SEWER, CONSTRUCT DRIVEWAYS, HARDSCAPE, AND RESIDENCE.
 10. ROUGH OUT OF THE PERMANENT STORMWATER DETENTION FACILITY SHALL BE INSTALLED SO THAT IT IS AVAILABLE DURING THE CONSTRUCTION PHASE.

FINALIZATION:

11. COMPLETE CONSTRUCTION AND START REVEGETATION OF THE SITE AND INSTALLATION OF LANDSCAPING.
12. PERMANENT WATER QUALITY CONTROLS AND DETENTION POND SHALL BE CLEANED OUT AND SEDIMENT BUILDUP SHALL BE REMOVED PRIOR TO/ CONCURRENTLY WITH REVEGETATION OF SITE.
13. REMOVE TEMPORARY EROSION AND SEDIMENTATION CONTROLS AND COMPLETE ANY NECESSARY FINAL REVEGETATION RESULTING FROM REMOVAL OF THE CONTROLS. CONDUCT ANY MAINTENANCE AND REHABILITATION OF THE WATER QUALITY PONDS OR CONTROLS.
14. MONITOR VEGETATED AREAS UNTIL VEGETATION IS ESTABLISHED AND/ OR MONITOR STABILIZED AREAS UNTIL FINAL STABILIZATION IS REACHED.
15. SCHEDULE INSPECTION VISIT BY DESIGN ENGINEER TO PROVIDE LETTER OF CONCURRENCE.
16. SCHEDULE FINAL INSPECTION WITH CITY INSPECTOR.

MAINTENANCE REQUIREMENTS AND SCHEDULE FOR DETENTION PONDS

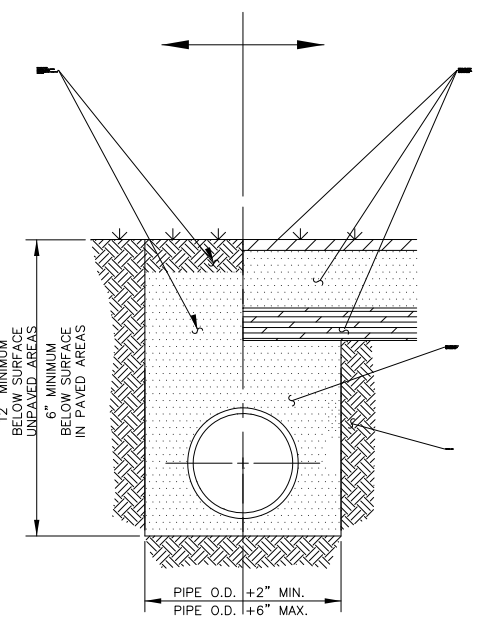
- INSPECT POND AFTER INTENSE RAINFALL EVENTS AND ON A REGULAR BASIS FOR THE FOLLOWING:
1. INSPECT THE ENTIRE POND INCLUDING THE WEIR AND DRAINAGE OUTLET PIPES FOR ACCUMULATED SEDIMENT, PAPER, TRASH, AND DEBRIS AND REMOVE AS NEEDED.
 2. INSPECT POND FOR BARE SOIL AND REVEGETATE AS NEEDED.
 3. MAINTAIN VEGETATION TO PREVENT HEIGHT FROM EXCEEDING EIGHTEEN (18) INCHES.
 4. MEASURE DEPTH AND WIDTHS OF POND AND RESHAPE POND AS NECESSARY TO MAINTAIN SHAPE PER APPROVED DRAINAGE PLAN. NOTE: OVERTIME, THE POND WILL ACCUMULATE SEDIMENT, LAWN CLIPPINGS, AND LEAVES THAT WILL BUILD UP AND VOLUME WILL BE LOST IF NOT MAINTAINED AND RESHAPED AS NEEDED.
 5. INSPECT POND FOR SIGNS OF EROSION OR ANY SHIFTING, COLLAPSING, OR DETERIORATION OF THE POND BERM, OUTLET PIPES, AND WEIRS AND RESTORE TO APPROVED DRAINAGE PLAN DESIGN.



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PROJECT NO. 208 ASHWORTH
 FILE NO. 208 ASHWORTH DRAINAGE PLAN/IMG
 DATE: APRIL 2022
 SCALE: 1/8" = 1'
 DESIGNED BY: CMG
 DRAWN BY: CMG
 CHECKED BY: BW
 RICHARDSON RESIDENCE
 208 ASHWORTH DRIVE
 ROLLINGWOOD, TX
 EROSION AND SEDIMENTATION CONTROL PLAN
 DETAILS AND NOTES
 INNOVATIVE WATER SOLUTIONS
 RAINWATER HARVESTING, GRAYWATER RECOVERY, & WATER CONSERVATION CONSULTING
 P.O. Box 9963 Austin, Texas 78766
 Phone: (512) 450-0832
 http://www.watercache.com

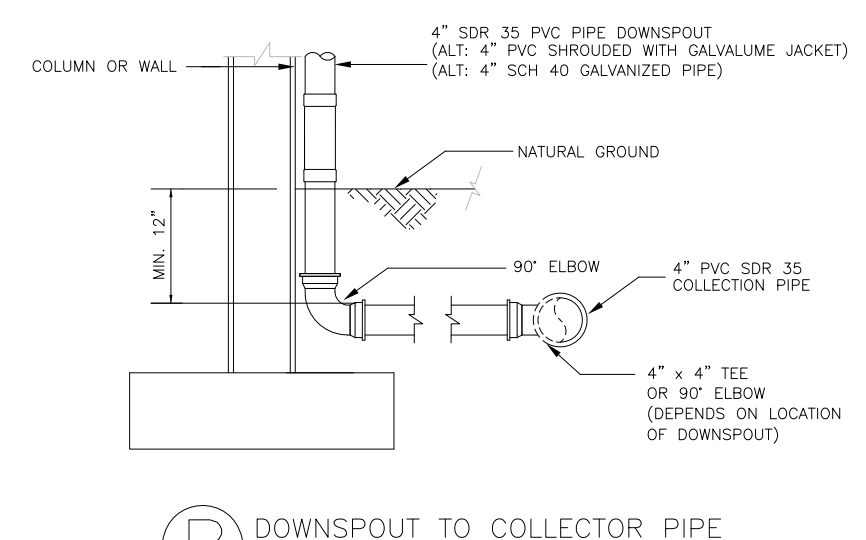
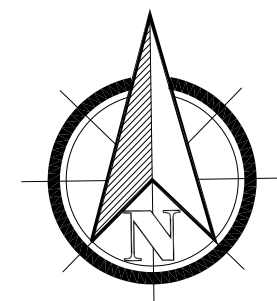


A RAINWATER COLLECTION PIPE EMBEDMENT (PAVED & NON-PAVED SURFACES)
SCALE: NTS

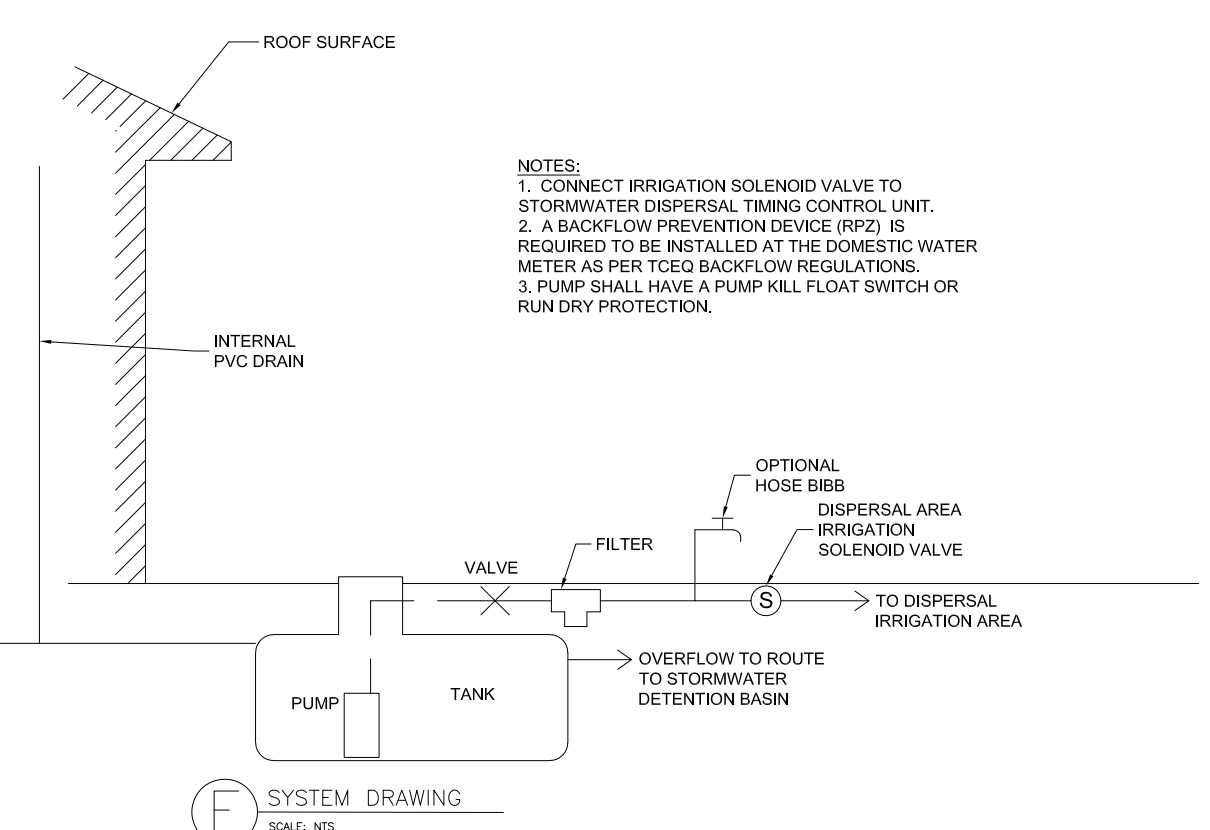
LEGEND:

	GUTTER & DOWNSPOUT LOCATION
	4" RAINWATER COLLECTION PIPING
	1/2" PRESSURE LINE
	WASTEWATER
	ELECTRICAL CONDUIT
	GAS LINE
	RAINWATER COLLECTION AREA

NOTE: SEE ARCHITECTURAL PLANS FOR EXACT DOWNSPOUT LOCATIONS

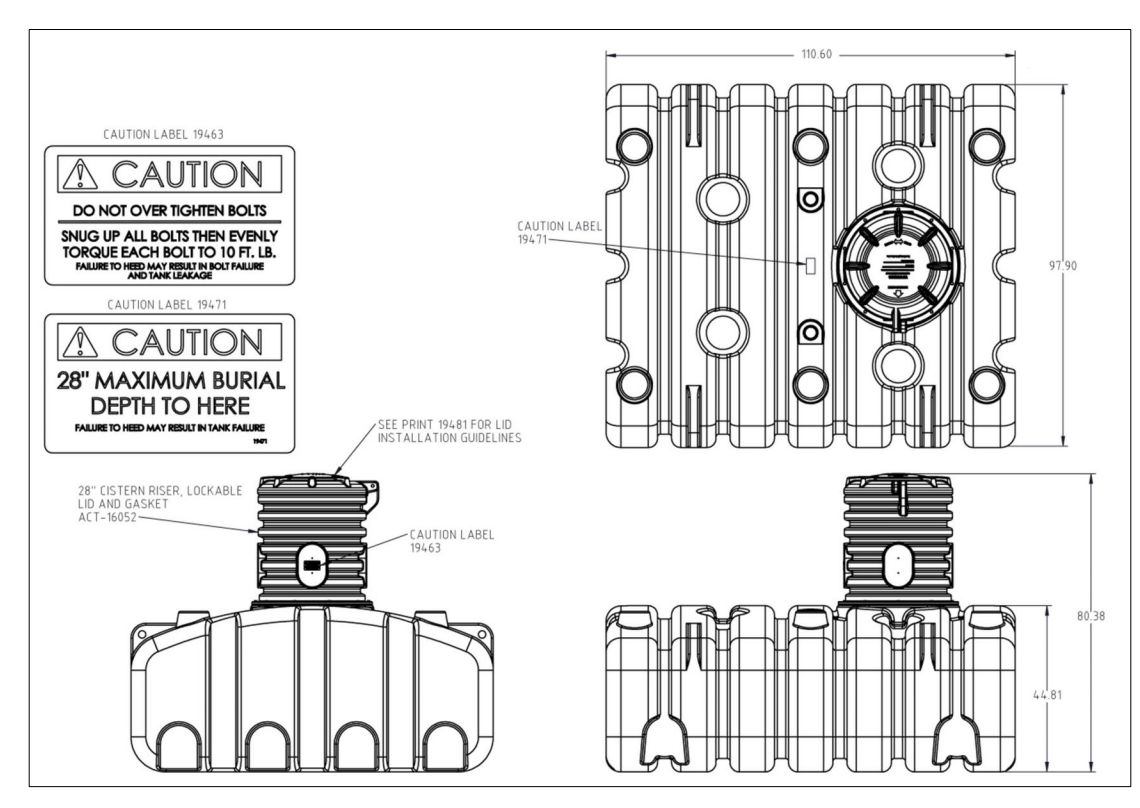


B DOWNSPOUT TO COLLECTOR PIPE
SCALE: NTS



C RAINWATER COLLECTION SYSTEM AND DETENTION CONTROL SYSTEM SCHEMATIC
SCALE: NTS

SYSTEM SPECIFICATIONS:
RAINWATER CISTERN: (2) 1,725 GALLON UNDERGROUND POLYETHYLENE CISTERNS
PUMP: GRUNDFOS SBA 3-40 A, 1 HP SUBMERSIBLE PUMP, 115V
CONTROL SYSTEM: DETENTION TIMER AND CONTROL SYSTEM, PROVIDED BY IWS
CONTROL SYSTEM:
ONCE FLOAT SWITCH IN CISTERN IS ACTIVATED, THE CONTROL SYSTEM WILL DELAY 12 HOURS. AFTER 12 HOURS, THE ACTIVATED VALVE WILL OPEN AT 3 HOUR INTERVALS FOR 5 MINUTES. THERE WILL BE A 3 HOUR WAIT TIME BETWEEN DISPERSAL EVENTS.



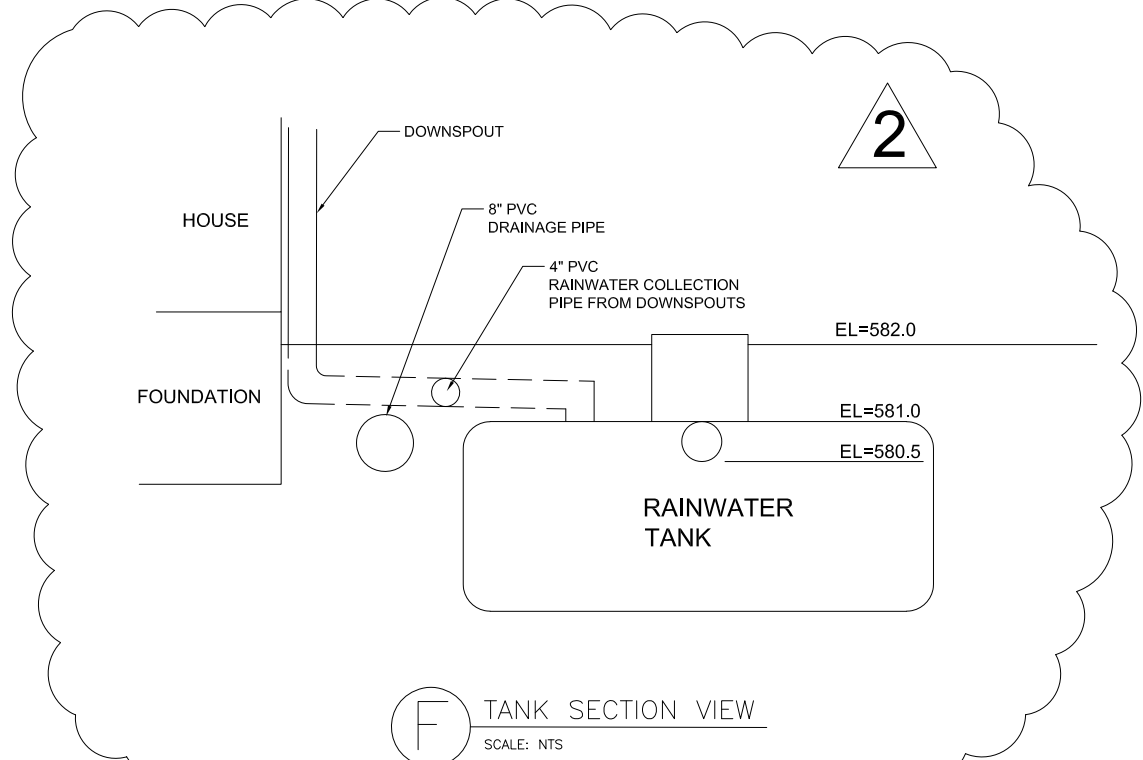
D CISTERNS DRAWING
SCALE: NTS

RAINWATER COLLECTION SYSTEM NOTES:

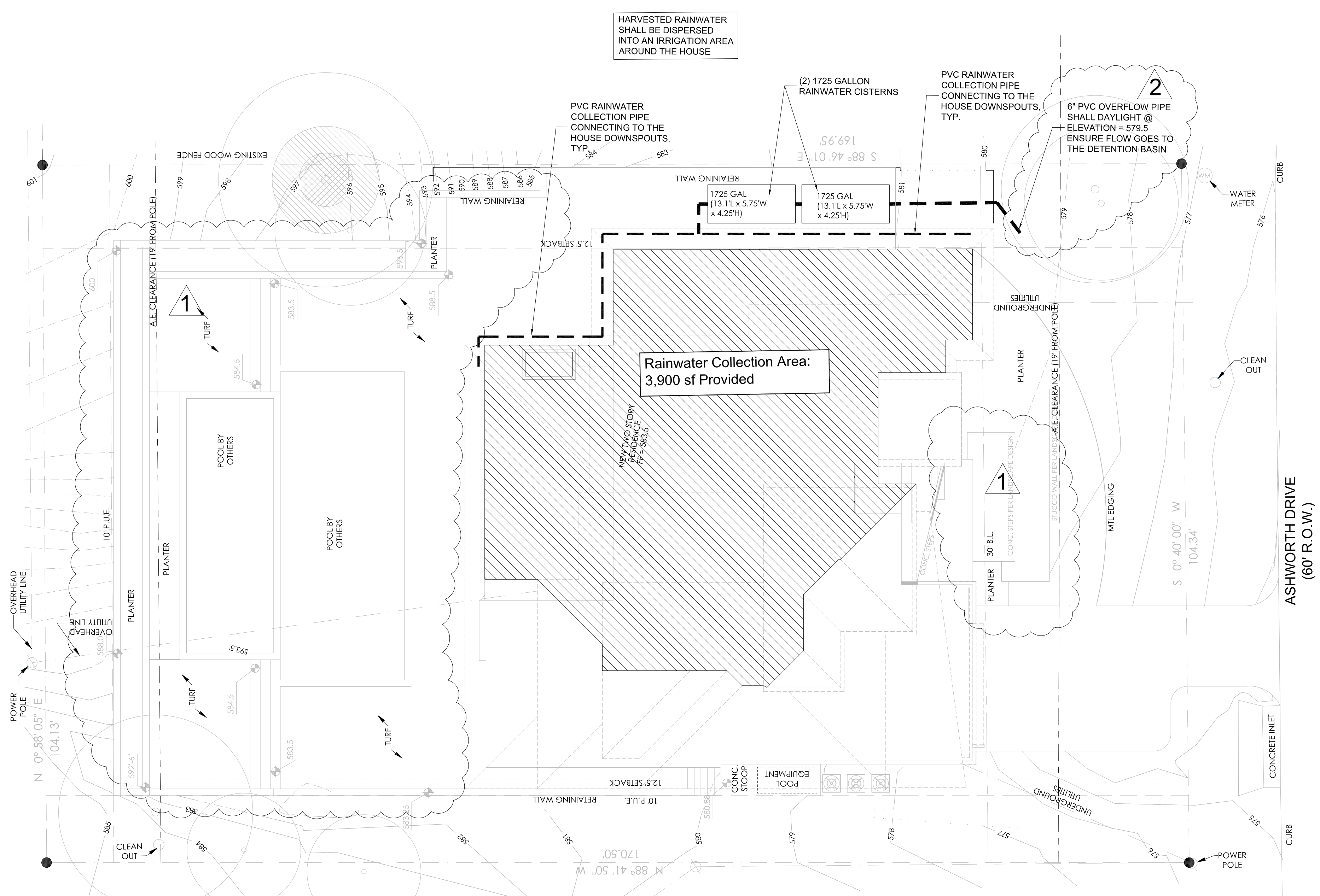
- THIS PROPERTY DOES NOT REQUIRE A TCEQ EDWARDS AQUIFER WATER POLLUTION ABATEMENT PLAN (WPAP) SINCE THE EFFECTIVE IMPERVIOUS COVER IS BELOW 20%. THE EFFECTIVE IMPERVIOUS COVER WAS REDUCED TO 20% THROUGH THE IMPLEMENTATION OF A RAINWATER COLLECTION SYSTEM. THE RAINWATER COLLECTION SYSTEM HAS BEEN DESIGNED TO CAPTURE RAINWATER FROM THE ROOF AREAS IN ORDER TO REDUCE THE TOTAL IMPERVIOUS COVER TO LESS THAN 20%. TCEQ DOES NOT INCLUDE ROOF AREAS IN THE CALCULATION OF IMPERVIOUS COVER IF THE ROOF AREAS ARE BEING COLLECTED INTO A RAINWATER COLLECTION SYSTEM. THE HARVESTED RAINWATER SHALL BE DOSED OUT OF THE TANK WITHIN 7 DAYS AS PER TCEQ CHAPTER 213. THE PROPERTY OWNER WILL EXECUTE A DEED AFFIDAVIT THAT WILL DOCUMENT THE PROPERTY'S EXEMPTION FROM EDWARDS AQUIFER WPAP AND REQUIRE THE PROPERTY OWNER TO MAINTAIN THE PROPER OPERATION OF THE RAINWATER COLLECTION SYSTEM.
- RAINWATER COLLECTION SYSTEM SHALL COLLECT RAINWATER TO BE USED SOLELY FOR IRRIGATION PURPOSES ONLY AND BE RELEASED OUTDOORS. NO CONNECTION TO ANY INDOOR PLUMBING SHALL BE MADE.
- THE RAINWATER COLLECTION PIPING AND OVERFLOW PIPING SHALL BE BURIED A MINIMUM OF 6".
- OVERFLOW WATER FROM THE RAINWATER COLLECTION CISTERN SHALL BE ROUTED AS SHOWN ON PLANS TO FLOW AWAY FROM ANY STRUCTURE.
- THE REQUIRED VOLUME OF RAINWATER MUST BE EMPTIED WITHIN 7 DAYS AFTER A RAIN EVENT ENDS.
- DISPERSAL RATE, THE INFILTRATION RATE AT WHICH THE SOIL CAN ACCEPT THE IRRIGATED STORM WATER MUST BE ESTABLISHED USING THE STEPS OUTLINED IN SECTION 1.6.7.4. OTHER METHODS OF DEMONSTRATING SITE-SPECIFIC PERMEABILITY MAY BE APPROVED BY THE DIRECTOR. THE APPLICATION RATE MAY NOT EXCEED THE INFILTRATION RATE ON ANY PORTION OF THE DISPERSAL AREA.
- DISPERSAL AREA, CALCULATIONS MUST BE PROVIDED WHICH DEMONSTRATE THAT ADEQUATE DISPERSAL AREA WILL BE PROVIDED BASED ON THE APPLICATION RATE, SOIL PERMEABILITY, WATER QUALITY VOLUME, AND THE ACTUAL IRRIGATION TIME. THE IRRIGATION AREA AND SYSTEM MUST BE INCLUDED WITHIN THE WATER QUALITY EASEMENT.
- DISPERSAL AREA SLOPE, DISPERSAL MUST NOT OCCUR ON LAND WITH SLOPES GREATER THAN 10%.
- ALL DISPERSAL SYSTEM DISTRIBUTION AND LATERAL PIPING MUST BE SCHEDULED 40 PURPLE PVC. ALL PIPES AND ELECTRICAL BUNDLES PASSING BENEATH DRIVEWAYS OR PAVED AREAS MUST BE SLEEVED WITH PVC CLASS 200 PIPE WITH SOLVENT WELDED JOINTS. SLEEVE DIAMETER MUST EQUAL TWICE THAT OF THE PIPE OR ELECTRICAL BUNDLE. BURIED PIPING MUST BE MARKED WITH DETECTABLE MARKING TAPE LABELED "CAUTION: BURIED NON-POTABLE WATER LINE BELOW".
- VALVES, ALL VALVES MUST BE DESIGNED SPECIFICALLY FOR SEDIMENT BEARING WATER, AND BE OF APPROPRIATE DESIGN FOR THE INTENDED PURPOSE. ALL REMOTE CONTROL, GATE, AND QUICK COUPLING VALVES MUST BE LOCATED IN TEN-INCH OR LARGER PLASTIC VALVE BOXES WITH PURPLE CAPS. ALL PIPES AND VALVES MUST BE MARKED TO INDICATE THAT THEY CONTAIN NON-POTABLE WATER. ALL PIPING MUST BE BURIED TO PROTECT IT FROM WEATHER AND VANDALISM. THE DEPTH AND METHOD OF BURIAL MUST BE ADEQUATE TO PROTECT THE PIPE FROM VEHICULAR TRAFFIC SUCH AS MAINTENANCE EQUIPMENT. VELOCITIES IN ALL PRELINES SHOULD BE SUFFICIENT TO PREVENT SETTLING OF SOLIDS. THE IRRIGATION DESIGN AND LAYOUT MUST BE INTEGRATED WITH THE TREE PROTECTION PLAN AND PRESENTED AS PART OF THE SITE PLAN OR SUBDIVISION CONSTRUCTION PLAN.
- VEGETATION: THE IRRIGATION AREA MUST HAVE NATIVE VEGETATION OR BE RESTORED OR RE-ESTABLISHED WITH NATIVE VEGETATION, UNLESS APPROVED BY THE DIRECTOR. THESE AREAS MUST NOT RECEIVE ANY FERTILIZERS, PESTICIDES, OR HERBICIDES.
- SOIL: A MINIMUM OF 12 INCHES OF SOIL, WITH THE IDENTIFIED PERMEABILITY RATES, MUST BE PRESENT IN THE DISPERSAL AREA. SOIL ENHANCEMENT IS ALLOWED TO ACHIEVE THIS REQUIREMENT.

TCEQ Edward's Aquifer WPAP Rainwater Harvesting System Design Calculations
208 Ashworth Drive, Rollingwood, TX

Area of lot (sf)	17,743
Impervious Cover (sf)	20%
Impervious Cover - Proposed (sf)	3,549
Impervious Cover - Required capture (sf)	6709.52
Required Rainwater Capture Depth (inches)	1.5
Water Quality Volume (gallons)	2,955
On-site soil	Cs
Soil Infiltration Rate (in/hr)	0.06
Drawdown Time (hours)	168
Required Irrigation Field Area (sf): WQV/(Infil rate x drawdown)	470,371
Provided Irrigation Field Area (sf)	470.4



E TANK SECTION VIEW
SCALE: NTS

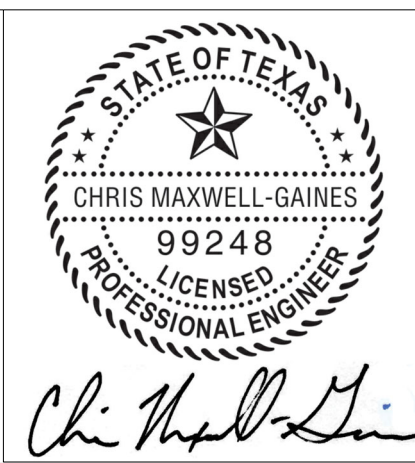


RAINWATER HARVESTING SYSTEM FOR TCEQ REQUIREMENTS

RICHARDSON RESIDENCE
208 ASHWORTH DRIVE
ROLLINGWOOD, TX

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