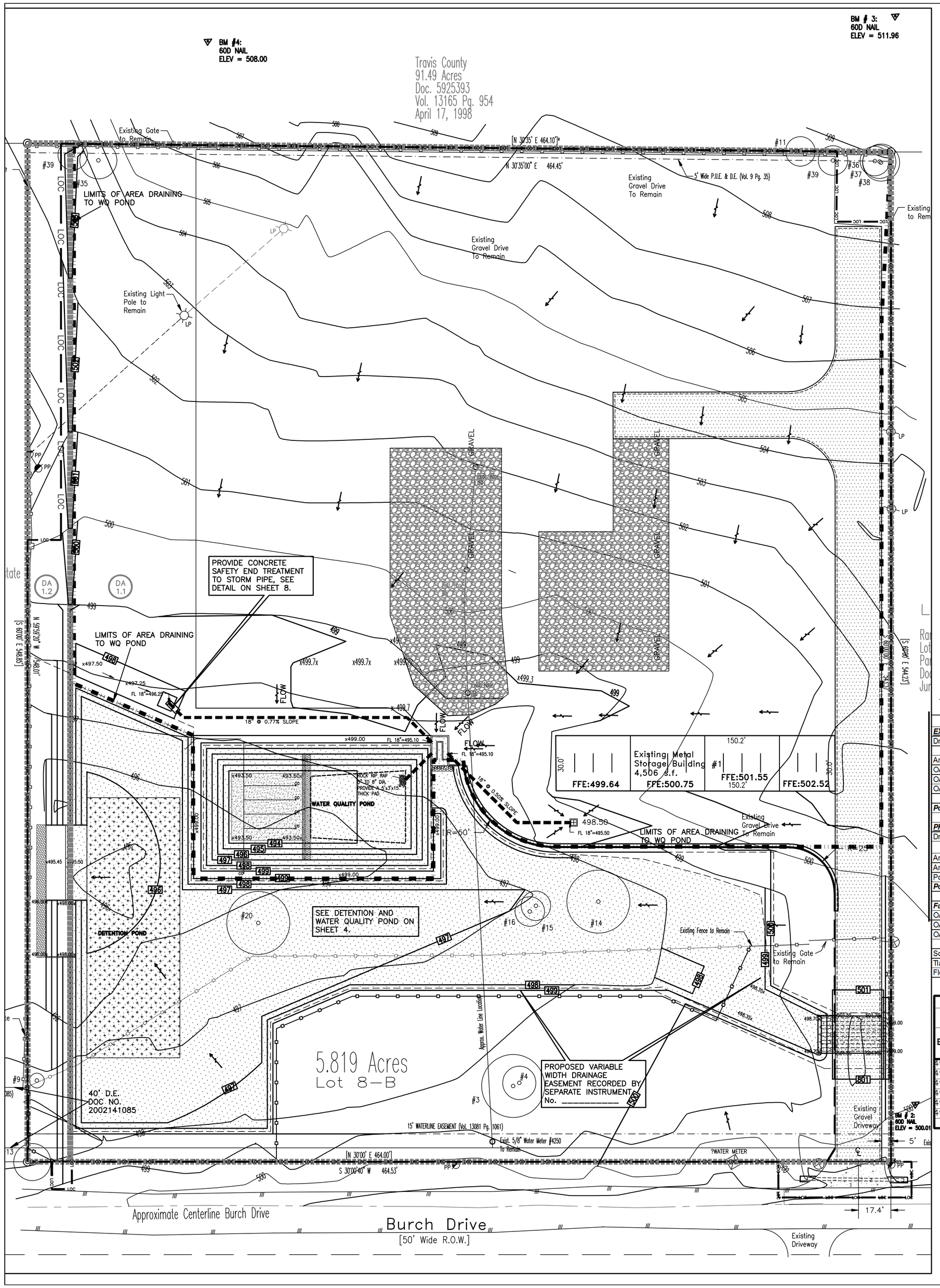

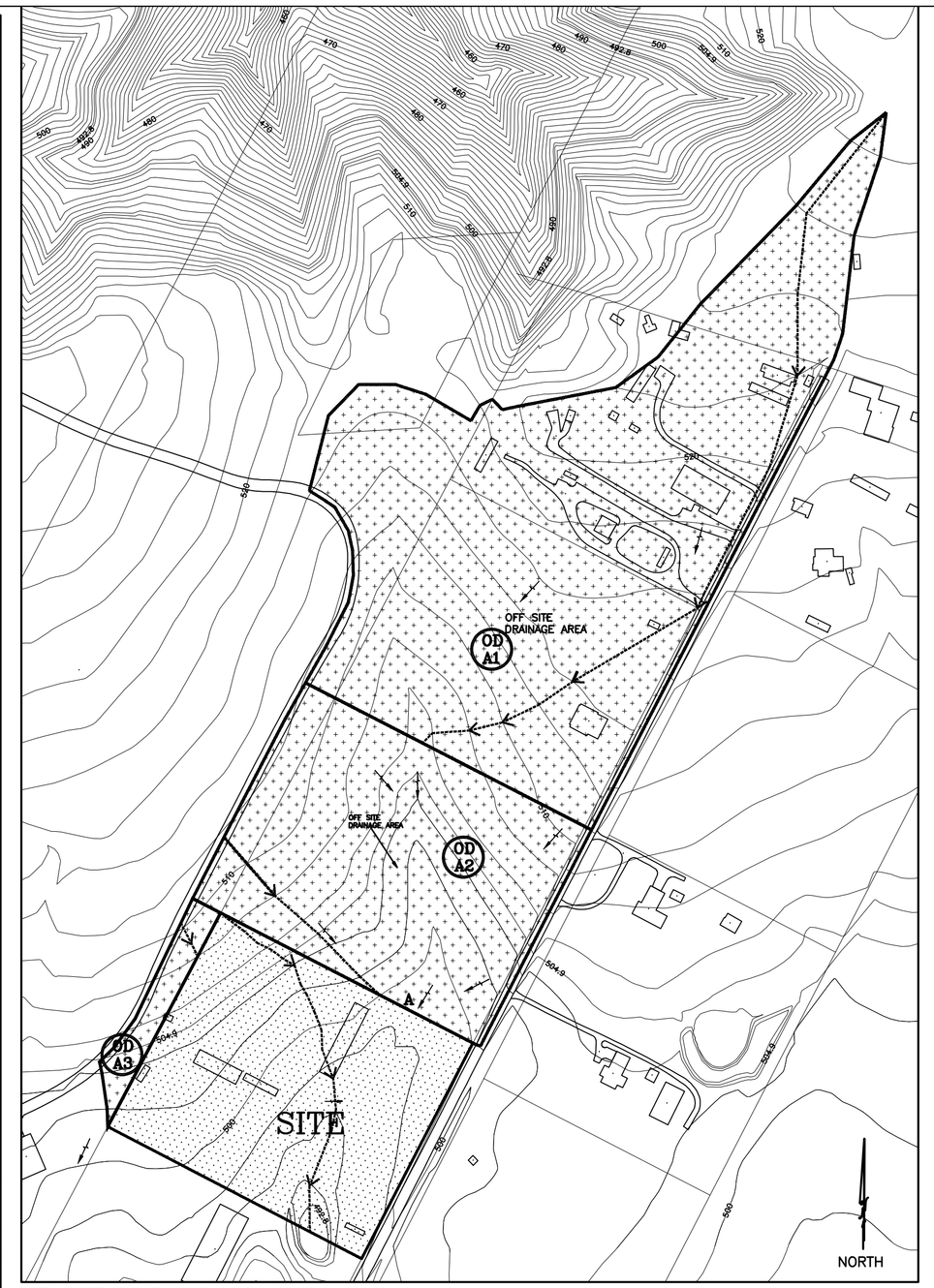

OFF SITE DRAINAGE AREA MAP
SCALE 1":200'

```
                    TIME OF CONCENTRATION AND TRAVEL TIME          Version 2.10
 Project : BURCH STORAGE                          User: MQR        Date: 11-24-2007
 County  : TRAVIS          State: TX        Checked: _____        Date: _________
 Subtitle: TIME OF CONCENTRATION

 ------------------------------------- Subarea #1 - S1 -------------------------------
 Flow Type   2 year   Length   Slope   Surface   n   Area    Wp   Velocity   Time
             rain     (ft)     (ft/ft) code          (sq/ft) (ft) (ft/sec)   (hr)
 -------------------------------------------------------------------------------------
 Sheet       3.44     300      0.03    E                                      0.323
 Shallow Concent'd    200      0.02    U                                      0.024
 Open Channel         202                                        6           0.009
                                                   Time of Concentration = 0.36*
                                                                           =====
 ------------------------------------- Subarea #2 - OA1 ------------------------------
 Flow Type   2 year   Length   Slope   Surface   n   Area    Wp   Velocity   Time
             rain     (ft)     (ft/ft) code          (sq/ft) (ft) (ft/sec)   (hr)
 -------------------------------------------------------------------------------------
 Sheet       3.44     300      .01     E                                      0.500
 Shallow Concent'd    443      0.011   U                                      0.073
 Open Channel         875                                        6           0.041
                                                   Time of Concentration = 0.61*
                                                                           =====
 ------------------------------------- Subarea #3 - OA2 ------------------------------
 Flow Type   2 year   Length   Slope   Surface   n   Area    Wp   Velocity   Time
             rain     (ft)     (ft/ft) code          (sq/ft) (ft) (ft/sec)   (hr)
 -------------------------------------------------------------------------------------
 Sheet       3.44     12.5     0.02    A                                      0.004
 Sheet        137.5   0.025   E                                               0.186
 Shallow Concent'd    278      0.037   U                                      0.025
                                                   Time of Concentration = 0.21*
                                                                           =====
 ------------------------------------- Subarea #4 - OA3 ------------------------------
 Flow Type   2 year   Length   Slope   Surface   n   Area    Wp   Velocity   Time
             rain     (ft)     (ft/ft) code          (sq/ft) (ft) (ft/sec)   (hr)
 -------------------------------------------------------------------------------------
 Sheet       3.44     12.5     0.02    A                                      0.004
 Sheet                60       0.033   E                                      0.086
                                                   Time of Concentration = 0.09*
                                                                           =====
 ------------------------------------- Subarea #5 - S1.1 -----------------------------
 Flow Type   2 year   Length   Slope   Surface   n   Area    Wp   Velocity   Time
             rain     (ft)     (ft/ft) code          (sq/ft) (ft) (ft/sec)   (hr)
 -------------------------------------------------------------------------------------
 Sheet       3.44     150      0.033   E                                      0.178
 Shallow Concent'd    134      0.016   U                                      0.018
                                                   Time of Concentration = 0.20*
                                                                           =====
 ------------------------------------- Subarea #6 - S1.2 -----------------------------
 Flow Type   2 year   Length   Slope   Surface   n   Area    Wp   Velocity   Time
             rain     (ft)     (ft/ft) code          (sq/ft) (ft) (ft/sec)   (hr)
 -------------------------------------------------------------------------------------
 Sheet       3.44     36       0.027   E                                      0.062
                                                   Time of Concentration = 0.06*
                                                                           =====
      --- Sheet Flow Surface Codes ---
 A Smooth Surface          F Grass, Dense        --- Shallow Concentrated ---
 B Fallow (No Res.)        G Grass, Burmuda      ---     Surface Codes    ---
 C Cultivated < 20 % Res.  H Woods, Light              P Paved
 D Cultivated > 20 % Res.  I Woods, Dense              U Unpaved
 E Grass-Range, Short      J Range, Natural
```

**SEE OFF SITE FULLY DEVELOPED TIME OF CONCENTRATION CALCULATIONS ON SHEET 4

DETENTION POND STAGE-STORAGE-DISCHARGE TABLE

STORM EVENT	STAGE (FT)	AREA (AC)	CUMULATIVE STORAGE (AC-FT)	DISCHARGE (CFS)
	495.50	0.00	0.00	0.0
	496.00	0.06	0.01	5.4
2 YR	497.00	0.50	0.30	23.7
10 YR	497.70	0.67	0.70	57.8
25 YR	497.90	0.73	0.80	77.7
	498.00	0.75	0.90	85.60
100 YR	498.30	0.81	1.20	117.7
100 YR FD	498.70	0.89	1.50	184.4
	499.00	0.94	1.77	--
FD: FULLY DEVELOPED UPSTREAM				

DRAINAGE SUMMARY TABLE

Drainage Area	Tc (hr)	Tlag (hr)	Area (S.F.)	Area (Acres)	Area (Sq.Miles)	Cover Type	Hyd. Cond.	Soil type	Hyd. Gp.	Imp. Cover (s.f.)	Imp. Cover (%)	CN (Soil)	CN (IC)	Total CN	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
EXISTING CONDITIONS																		
Area 1	0.36	0.216	253476.00	5.82	0.00909	Grass	GOOD	ChC2	C	0	0.0%	79	98	79.00	6.9	17.3	22.8	34.0
OA 1	0.61	0.366	641658.00	14.73	0.02302	Grass	GOOD	ChC2	C	48841	7.6%	79	98	80.45	15	36.5	47.9	70.9
OA2	0.21	0.126	291139.00	6.68	0.01044	Grass	GOOD	ChC2	C	5850	2.0%	79	98	79.38	9.6	23.8	31.4	46.7
OA3	0.09	0.054	23930.00	0.55	0.00086	Grass	GOOD	ChC2	C	4512	18.9%	79	98	82.58	1	2.3	3	4.3
Point of analys											Total discharge before development =				25.50	64.70	85.80	128.7
PROPOSED CONDITIONS																		
Drainage Area	Tc (hr)	Tlag (hr)	Area (S.F.)	Area (Acres)	Area (Sq.Miles)	Cover Type	Hyd. Cond	Soil type	Hyd. Gp.	Imp. Cover (s.f.)	Imp. Cover* (%)	CN (Soil)	CN (IC)	Total CN	Q2 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
Area 1.1	0.20	0.120	240872.00	5.53	0.00864	Grass/IC	GOOD	EuC	C	151371	62.8%	79	98	90.94	12.80	25.10	31.30	43.70
Area 1.2	0.06	0.050	12604.00	0.29	0.00045	Grass/IC	GOOD	EuC	C	0	0.0%	79	98	79.00	0.4	1.1	1.50	2.2
Pond Discharge															23.7	57.7	77.70	117.70
Point of analys											Total discharge after development =				24.3	59.10	79.60	121.10
											Runoff Decrease after Development=				1.20	5.60	6.20	7.60
Fully Developed Conditions Upstream																		
OA 1	0.17	0.103	641658.00	14.73	0.02302	Grass	GOOD	ChC2	C	417077.7	65.0%	79	98	91.35				111.1
OA2		0.080	291139.00	6.68	0.01044	Grass	GOOD	ChC2	C	189240.35	65.0%	79	98	91.35				56.9
OA3		0.080	23930.00	0.55	0.00086	Grass	GOOD	ChC2	C	15554.5	65.0%	79	98	91.35				4.7

Soil Hydrologic Group from Soil Survey of Travis County, Texas
Tlag> Tcx0.6 or 0.05hr
Flows calculated with HEC-HMS Program

WATER QUALITY STAGE-STORAGE TABLE

FILTRATION POND STAGE vs. AREA vs. STORAGE					SEDIMENTATION POND STAGE vs. AREA vs. STORAGE					TOTAL WATER QUALITY POND STAGE vs. AREA vs. STORAGE				
ELEV. (ft)	AREA (ft2)	INC. VOLUME (ft3)	CUM. VOLUME (ft3)	DEPTH (ft)	ELEV. (ft)	AREA (ft2)	INC. VOLUME (ft3)	CUM. VOLUME (ft3)	DEPTH (ft)	ELEV. (ft)	AREA (ft2)	INC. VOLUME (ft3)	CUM. VOLUME (ft3)	DEPTH (ft)
493.50	1422		0	0.00	493.50	0		0	0.00	493.50	1422		0	0.00
494.00	1599	755	755	0.50	494.00	975	244	244	0.50	494.00	2574	999	999	0.50
495.00	1890	1745	2500	1.50	495.00	2430	1703	1946	1.50	495.00	4320	3447	4446	1.50
496.00	2397	2144	4643	2.50	496.00	2907	2669	4615	2.50	496.00	5304	4812	9258	2.50
497.00	2850	2624	7267	3.50	497.00	3420	3164	7778	3.50	497.00	6270	5787	15045	3.50
498.00	3339	3095	10361	4.50	498.00	3969	3695	11473	4.50	498.00	7308	6789	21834	4.50

POND NOTES

SEE DETENTION AND WATER QUALITY POND PLAN AND DETAILS ON SHEET 4.

TREE LIST NOTE

REFER TO THE EROSION/SEDIMENTATION CONTROLS AND TREE PROTECTION PLAN ON SHEET 5 FOR TREE LIST.

DRAINAGE NOTES

1. UPON COMPLETION OF THE PROPOSED SITE IMPROVEMENTS, AND PRIOR TO THE RELEASE TO THE CERTIFICATE OF OCCUPANCY BY THE WATERSHED PROTECTION AND DEVELOPMENT REVIEW DEPARTMENT, THE DESIGN ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED DETENTION AND FILTRATION FACILITIES WERE CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS.
2. THE CONTRACTOR SHALL CALL ONE CALL CENTER (1-800-344-8377) FOR UTILITY LOCATIONS PRIOR TO ANY WORK IN CITY EASEMENTS OR STREET R.O.W.

SCALE: 1" = 30'

LEGEND

- PROPERTY LINE
- ( ) RECORD INFORMATION
- FH EXISTING FIRE HYDRANT
- PP EXISTING POWER POLE
- E EXISTING OVERHEAD ELECTRIC LINE
- LP EXISTING LIGHT POLE
- EXISTING EDGE OF ASPHALT
- EXISTING FENCE
- WM EXISTING WATER METER
- 508 EXISTING CONTOUR
- 508.50 EXISTING ELEVATION
- #XX EXISTING TREE
- EXISTING EDGE OF PAVEMENT
- PROPOSED FIRELANE
- LOC LIMITS OF CONSTRUCTION
- PROPOSED CATCH BASIN
- 498 PROPOSED CONTOUR
- X 498.50 PROPOSED ELEVATION
- PROPOSED CRUSHED ASPHALT
- PROPOSED FLOW DIRECTION

STATE OF TEXAS
MAURICIO QUINTERO-RANGEL
94975
LICENSED
PROFESSIONAL ENGINEER
10-17-2014

MAURICIO QUINTERO-RANGEL, P.E.
F-12164
11312 ROBERT WOODING DR.
AUSTIN, TEXAS 78748
(512) 659-4386 TEL.
(512) 291-8714 FAX

GRADING AND DRAINAGE PLAN

BURCH STORAGES
4300 BURCH DRIVE
DEL VALLE, TEXAS 78617

NO.	REVISION/CORRECTION	BY	DATE

DATE: 11-14-2014
FILE36-BURCH-GD...
DRAWN: MQR
SHEET 3 OF 10

SP-2013-0480D