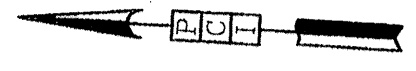
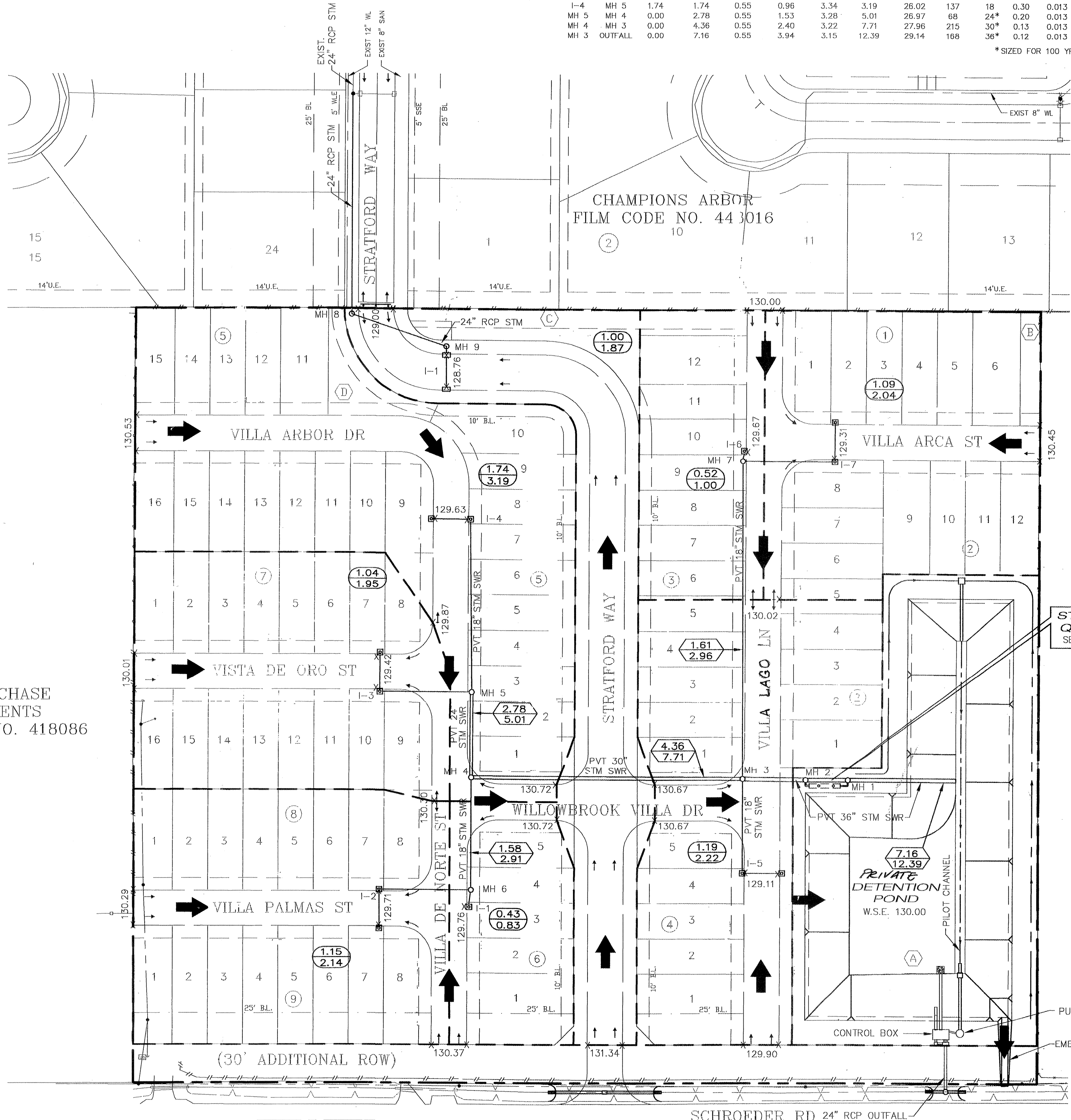


STORM SEWER CALCULATIONS
CITY OF HOUSTON 2 YEAR RAINFALL

MH/Inlet From	MH/Inlet To	Drainage Area Ac.	Total Area Ac.	Runoff Coefficient C	C*A	2 year Intensity (In/Hr)	Sum of Flows (cfs)	Time of Conc. (minutes)	Reach Length (feet)	Diameter (inches)	Slope %	Manning's n	Design Capacity (cfs)	Design Velocity (fps)	Fall (feet)	Flow Line upstrm (ft)	Flow Line downstrm (ft)	Actual Velocity (fps)	Hydraulic Gradient (%)	Change in Head (ft)	Hydraulic Gradient Upstrm (ft)	Hydraulic Gradient Dnstrm (ft)	Gutter El Upstream (ft)	Natural Upstrm (ft)	Ground Dnstrm (ft)
MH 9	EXIST	1.00	1.00	0.55	0.55	3.41	1.87	25.00	253	24	0.18	0.013	9.6	3.1	0.46	123.71	123.26	2.37	0.01	0.02	125.28	125.26	128.38	131.1	128.0
I-3	MH 5	1.04	1.04	0.55	0.57	3.40	1.95	25.07	73	18	0.30	0.013	5.8	3.3	0.22	122.94	122.72	2.94	0.03	0.03	124.25	124.22	129.04	130.2	130.1
I-2	MH 6	1.15	1.15	0.55	0.63	3.39	2.14	25.25	73	18	0.30	0.013	5.8	3.3	0.22	123.71	123.49	3.02	0.04	0.03	125.02	124.99	129.33	130.5	130.4
MH 6	MH 4	0.43	1.58	0.55	0.87	3.35	2.91	25.84	89	18	0.30	0.013	5.8	3.3	0.27	123.49	123.22	3.27	0.08	0.07	124.79	124.72	129.67	130.4	130.3
I-7	MH 7	1.09	1.09	0.55	0.60	3.40	2.04	25.15	72	18	0.30	0.013	5.8	3.3	0.22	125.11	124.89	2.98	0.04	0.03	126.42	126.39	128.93	125.4	129.9
MH 7	MH 3	0.52	1.61	0.55	0.89	3.35	2.96	25.87	252	18	0.30	0.013	5.8	3.3	0.76	122.98	122.22	3.28	0.08	0.20	123.92	123.72	129.29	129.9	130.9
I-5	MH 3	1.19	1.19	0.55	0.65	3.39	2.22	25.31	75	18	0.30	0.013	5.8	3.3	0.23	123.71	123.48	3.05	0.04	0.03	125.01	124.98	128.73	130.1	130.9
I-4	MH 5	1.74	1.74	0.55	0.96	3.34	3.19	26.02	137	18	0.30	0.013	5.8	3.3	0.41	125.43	125.02	3.34	0.09	0.13	126.65	126.52	129.25	130.1	130.1
MH 5	MH 4	0.00	2.78	0.55	1.53	3.28	5.01	26.97	68	24	0.20	0.013	10.1	3.2	0.14	122.22	122.08	3.21	0.05	0.03	124.12	124.08	129.66	130.1	130.3
MH 4	MH 3	0.00	4.36	0.55	2.40	3.22	7.71	27.96	215	30*	0.13	0.013	14.8	3.0	0.28	120.62	120.34	3.04	0.04	0.08	122.92	122.84	129.86	130.3	130.9
MH 3	OUTFALL	0.00	7.16	0.55	3.94	3.15	12.39	29.14	168	36*	0.12	0.013	23.1	3.3	0.20	119.84	118.65	3.33	0.03	0.06	122.70	121.65	129.04	130.9	129.8

* SIZED FOR 100 YR FLOW



DEPTH OF 100 YEAR FLOODING

MH/INLET NO.	TOP OF CURB	WATER SURFACE ELEV	PONDING DEPTH
I-1	129.76	130.30	6.5"
I-2	129.71	130.30	7.1"
I-3	129.42	129.87	5.4"
I-4	129.63	130.00	4.4"
I-5	129.11	130.00	10.7"
I-6	129.67	130.02	4.2"
I-7	129.31	130.02	8.5"
I-8	128.76	129.00	2.9"

Privately owned utilities within private properties shall be reviewed and released by the County Engineer's Office.

"SWQMP Permit Requirements"

"Upon completion of construction the permanent storm water quality feature will be cleaned of all sediment and debris that may have accumulated. Additionally all disturbed areas related to this project will be completely stabilized. This will be done prior to submitting an "As-Built Certificate" and calling for final inspection. Harris County Engineering will not pass the Final Inspection or issue the Certificate of Compliance until the required final cleanup and stabilization have been completed. The development is not approved for operation until a Certificate of Compliance has been issued."

LEGEND

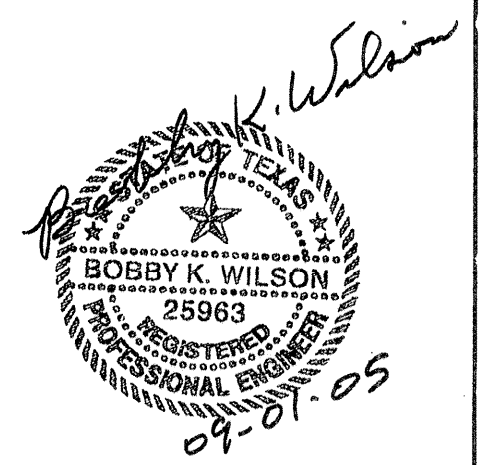
- 1.00
1.87 DRAINAGE AREA IN ACRES
- 10.00
17.03 AREA CONTRIBUTING TO LINE IN ACRES
- DRAINAGE AREA DIVIDE
- ← DIRECTION OF 100 YEAR EXTREME EVENT
- X 130.00 TOP OF CURB ELEVATION

STEEPLECHASE APARTMENTS
FILM CODE NO. 418086

- RESTRICTED RESERVE "A"
COMPENSATING OPEN SPACE
AND DETENTION/DRAINAGE
63,962 S.F. - 1.4684 AC.
- RESTRICTED RESERVE "B"
OPEN SPACE
1,448 S.F. - 0.0332 AC.
- RESTRICTED RESERVE "C"
OPEN SPACE
7,412 S.F. - 0.1702 AC.
- RESTRICTED RESERVE "D"
OPEN SPACE
3,065 S.F. - 0.0704 AC.

BENCH MARK
BENCHMARK: NATIONAL GEODETIC SURVEY MARKER
Y1216, 1973 ADJ., ELEV = 125.994
Y1216, 1978 ADJ., ELEV = 125.406
Y1216, 1988 ADJ., ELEV = 123.94
ELEVATIONS ARE BASED ON 1973 ADJUSTMENT

FLOOD PLAIN STATEMENT:
No portion of this tract lies within a "100 year flood hazard area" as designated on The National Flood Insurance Program - Flood Insurance Rate Map issued by the Federal Emergency Management Agency under Community Panel Number 480287 0435 J for Harris County, Texas dated November 6, 1996.



PROVIDENT CONSULTING, INC.
1405 ALLSTON ST.
HOUSTON, TEXAS 77068
(713)802-1019

PRIVATE UTILITY LINES SHOWN

CENTERPOINT ENERGY, ENTEX

SBC VALID FOR ONE YEAR
APPROVED ONLY FOR UNDERGROUND FACILITIES

CENTERPOINT ENERGY
APPROVED ONLY FOR CROSSING UNDERGROUND FACILITIES
UNLESS NOTED VALID AT TIME OF REVIEW ONLY.

VILLAS AT WILLOWBROOK
in
HARRIS COUNTY MUD 191
HARRIS COUNTY, TEXAS
**DRAINAGE AREA MAP
& STORM WATER
QUALITY PLAN**

TRAFFIC
ST. & BRIDGE
STORMWATER
SWQ

FILE NO:
DRAWING SCALE:
1" = 50'
VERT: HORZ:
SHEET No: 4 OF 24

