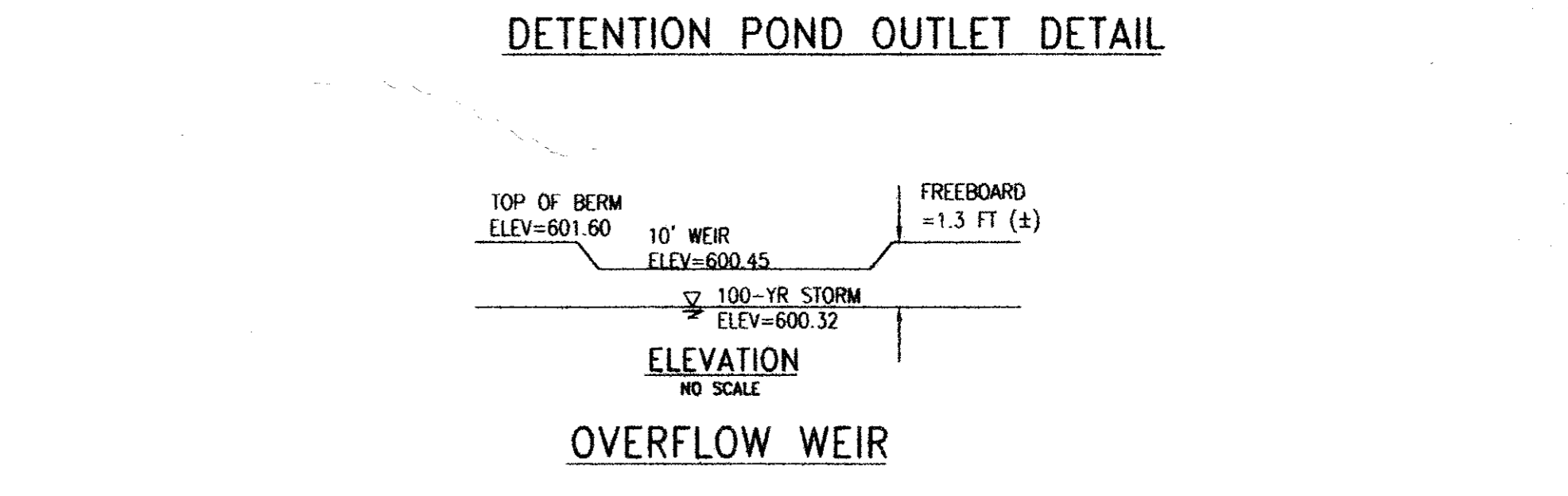
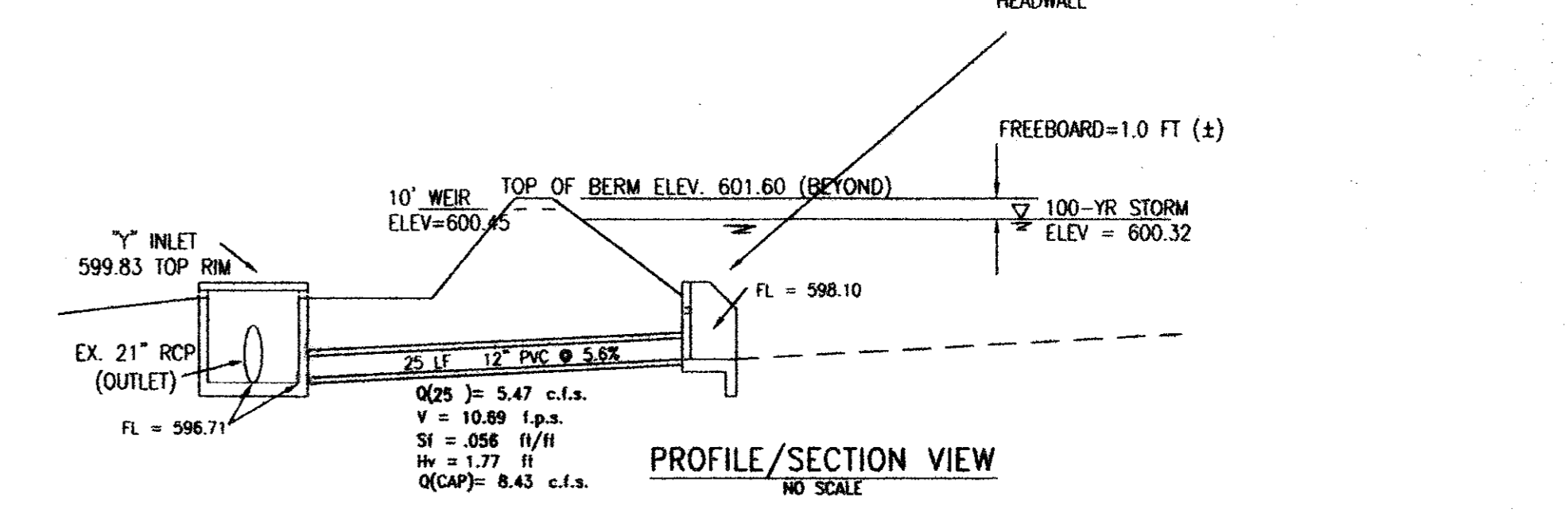
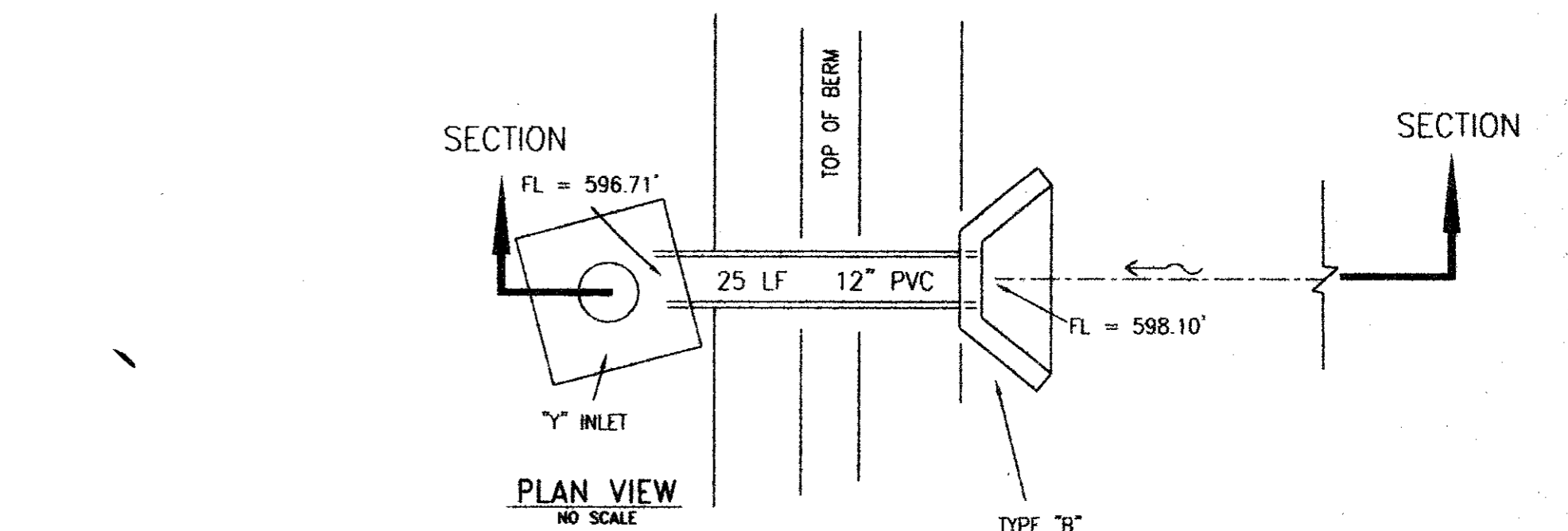


- FIELD LAYOUT NOTES:**
1. THE CONTRACTOR IS RESPONSIBLE FOR PRESERVING THE HORIZONTAL CONTROLS AND BENCHMARKS AS SET BY THE ENGINEER UNTIL DRAINAGE, PAVEMENT AND UTILITY IMPROVEMENTS ARE ACCEPTED BY THE OWNER. IN THE EVENT CONTROLS ARE DISTURBED OR DESTROYED, THE ENGINEER MAY CHARGE THE CONTRACTOR FOR SETTING NEW CONTROLS.
  2. THE CONTRACTOR IS RESPONSIBLE PROVIDING ROUGH GRADE STAKING AND FINAL GRADE STAKING OF BUILDING PADS AND PAVEMENT. THE CONTRACTOR SHALL USE SURVEY INSTRUMENTS OR LASERS FOR LAYOUT OF DETAILS FROM THE ENGINEERING CONTROL POINTS.
  3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PRESERVE AND PROTECT ALL UTILITIES AS REQUIRED.
  4. THE LOCATION AND ELEVATIONS OF THOSE EXISTING PUBLIC UTILITIES SHOWN IN THESE DRAWINGS HAVE BEEN OBTAINED FROM PUBLIC RECORDS. THE CONTRACTOR SHALL CONFIRM AND VERIFY THE ELEVATION AND LOCATION OF THOSE UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
  5. UTILITY CONTRACTOR SHALL RECORD THE LOCATIONS OF ALL WATER AND SEWER LINES RELATIVE TO OTHER SITE FEATURES, SUCH AS PARKING AND BUILDING LINES, AND RECORD ANY ADDITIONS, DELETIONS OR REVISIONS TO THESE PLANS WHICH OCCUR IN THE FIELD. THIS INFORMATION IS TO BE FURNISHED TO THE ENGINEER IMMEDIATELY UPON INSTALLATION.
  6. PAVING CONTRACTOR SHALL COORDINATE LOCATION OF ALL WATER AND SEWER LINES WITH UTILITY CONTRACTOR AND MARK LOCATIONS ON CURBS.
  7. ALL GRADES ARE TO TOP OF CURB (TC), TOP OF PAVEMENT (TP) OR FINISHED GRADE (GR) AS NOTED.

- WATER AND SANITARY SEWER NOTES:**
1. UNLESS OTHERWISE NOTED, ALL MATERIAL & CONSTRUCTION SHALL CONFORM TO THE STANDARD SPECIFICATIONS OF THE CITY OF ADDISON, TEXAS AND THE NCTCOG STANDARD SPECIFICATIONS FOR PUBLIC WORKS.
  2. IN THE EVENT AN ITEM IS NOT COVERED IN THE CITY'S SPECIFICATIONS, THE CITY ENGINEER'S DECISION SHALL APPLY.
  3. ALL WATER LINES, 12" & UNDER, MUST BE DUCTILE IRON OR A.W.W.A. C900 PVC MECHANICAL JOINT, OR SINGLE RUBBER GASKET TYPE.
  4. ALL CAST IRON FITTINGS MUST BE OF THE MECHANICAL JOINT TYPE OR SLIP JOINT & SHALL BE CLASS D OR CLASS 250 ON SIZES 12" OR SMALLER IN ACCORDANCE WITH A.W.W.A. SPECIFICATIONS C111.64.
  5. ALL WATER MAINS 4" & 6" IN SIZE SHALL HAVE A MINIMUM COVER OF 42". MAINS 8" IN SIZE SHALL HAVE A MINIMUM COVER OF 48". MAINS LARGER THAN 10" IN SIZE SHALL HAVE A MINIMUM COVER OF 60", AND ALL MAINS SHALL HAVE SUFFICIENT COVER TO CLEAR UTILITIES.
  6. ALL SEWER PIPE SHALL BE VITRIFIED CLAY OR PVC SDR 35 SEWER PIPE.
  7. GATE VALVES SHALL BE MUELLER BRAND OR APPROVED EQUAL.
  8. ALL WATER & SANITARY SEWER MAINS & SERVICES SHALL HAVE A MINIMUM OF 10.0 FOOT LATERAL SEPARATION.
  9. METER BOX SHALL BE CORRUGATED METAL BOX WITH CAST IRON TOP & LID. METER BOX SHALL BE LOCATED ADJACENT TO CURB & INSTALLED AFTER PARKING PAVEMENT HAS BEEN PROPERLY BACKFILLED.
  10. CONTRACTOR SHALL VERIFY ALL EXISTING INVERT ELEVATIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY VARIANCES.
  11. WATER SERVICES 1-1/2" OR LESS SHALL BE "AS SHOWN", TYPE "K" COPPER WITH A CORPORATION AT THE MAIN AND CURB STOP.
  12. THE USE OF DUCTILE IRON PIPE WILL REQUIRE CATHODIC PROTECTION AND POLYETHYLENE TUBE WRAP 8 MIL THICK AND SEAMLESS.
  13. FOR WATER SERVICE CONNECTIONS, CONTRACTOR SHALL EXPOSE THE MAIN AND "MISSILE" SERVICE LINES TO AVOID OPEN CUTS.
  14. TRENCH SAFETY SYSTEMS SHALL BE PROVIDED BY THE CONTRACTOR AS PROVIDED IN SUBPART P - EXCAVATION, TRENCHING AND SHORING, PART 1926 OF THE CODE OF FEDERAL REGULATIONS WHICH DESCRIBES SAFETY AND HEALTH REGULATIONS AS ADMINISTERED BY THE U.S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (O.S.H.A.) THE STANDARDS SPECIFIED BY THE O.S.H.A. REGULATIONS SHALL BE THE MINIMUM ALLOWED ON THIS PROJECT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DESIGN AND INSTALL ADEQUATE TRENCH SAFETY SYSTEMS FOR ALL TRENCHES EXCAVATED ON THIS PROJECT.
  15. BEFORE BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL FURNISH TO THE CITY FOR APPROVAL A TRENCH SAFETY PLAN FOR THIS PROJECT. THE TRENCH SAFETY PLAN MUST BE PREPARED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS. IN ADDITION, ALL TRENCH SAFETY SYSTEMS UTILIZED IN THIS PROJECT MUST BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TEXAS. THE CONTRACTOR SHALL BE TOTALLY RESPONSIBLE FOR THE SAFETY OF ALL PERSONS INVOLVED IN THE CONSTRUCTION OF THIS PROJECT.

**LEGEND**

| EXISTING | PROPOSED | DESCRIPTION                |
|----------|----------|----------------------------|
| 630TC    | 630TC    | TOP OF CURB ELEVATION      |
| 630C     | 630C     | CUTTER ELEVATION           |
| 630TP    | 630TP    | TOP OF PAVEMENT ELEVATION  |
| 630      | 630      | CONTOUR LINE               |
| W.M.     | W.M.     | WATER METER                |
| W.V.     | W.V.     | WATER VALVE                |
| M.H.     | M.H.     | MANHOLE                    |
| U.P.     | U.P.     | UTILITY POLE OR POWER POLE |
| TEL      | TEL      | TELEPHONE PEDESTAL         |
| F.H.     | F.H.     | FIRE HYDRANT               |
| I.R.F.   | I.R.F.   | IRON ROD FOUND/SET         |
| L.P.     | L.P.     | LIGHT POLE                 |
| G.M.     | G.M.     | GAS METER                  |
| G        | G        | UNDERGROUND GAS LINE       |
| W        | W        | WATER LINE                 |
| SS       | SS       | SANITARY SEWER LINE        |
| TEL      | TEL      | UNDERGROUND TELEPHONE LINE |
| USE      | USE      | UNDERGROUND ELECTRIC LINE  |



**OVERFLOW WEIR:**

|                          |      |    |      |
|--------------------------|------|----|------|
| LENGTH OF WEIR           | FEET | Lw | 10   |
| COEFF. OF WEIR           |      | Cw | 0.7  |
| HEAD ABOVE WEIR (FOR Op) | FEET | Hw | 0.49 |

FROM  $Q_w = 2/3 * C_w * (2/g)^{0.5} * L_w * H_w^{3/2}$

**OUTLET ORIFICE**

|                          |        |                |        |
|--------------------------|--------|----------------|--------|
| DIAMETER                 | INCHES | D <sub>i</sub> | 12     |
| ELEVATION FLOW LINE PIPE | FEET   | E <sub>o</sub> | 598.10 |
| OUTFLOW FROM BASIN       | CFS    | Q <sub>o</sub> | 5.04   |

ORIFICE PLATE IN HEADWALL, ORIFICE AREA A<sub>o</sub>  
 $Q = C * A_o * (2gh)^{0.5}$  FOR C=0.61  
 WHERE H=(E<sub>w</sub>-E<sub>o</sub>-(D<sub>i</sub>/12/2)), IN FEET

**OUTLET PIPE:**

|                                    |         |                |       |
|------------------------------------|---------|----------------|-------|
| DIAMETER OF PIPE                   | INCHES  | D <sub>p</sub> | 12    |
| AREA OF PIPE                       | SQ. FT. | A <sub>p</sub> | 0.785 |
| SLOPE                              | FT/FT   | S              | 0.056 |
| MAX. VELOCITY OF FLOW, PIPE        | FT/SEC  | V <sub>p</sub> | 10.69 |
| MAX. QUANTITY OF FLOW, PIPE        | CFS     | Q <sub>p</sub> | 8.43  |
| VELOCITY HEAD (V <sup>2</sup> /2G) | FEET    | H <sub>v</sub> | 1.77  |

MANNING'S EQUATION, FOR n=0.013  
 $A_p = (3.142 * D^2/4) / 144$   
 $V_m = 1.486 / n * (D/48)^{0.667} * S^{0.5}$   
 $H = V^2/64.4$

**DETENTION POND STAGE-STORAGE TABLE**

| WATER SURF ELEV. | AREA INCR. | HEIGHT SURF. | AVG. SURF. AREA, A | INCR. SURF. AREA, A | CUMULATIVE IN. VOL. | CUMULATIVE SUM(A*H) |
|------------------|------------|--------------|--------------------|---------------------|---------------------|---------------------|
| 598.1            | 0          | 0            | ---                | ---                 | ---                 | ---                 |
| 599.0            | 1667       | 0.9          | 833.5              | 750.15              | 750.15              | 750.15              |
| 600.0            | 2581       | 1.0          | 2124               | 2124                | 2874.15             | 2874.15             |
| 601.0            | 3529       | 1.0          | 3055               | 3055                | 5929.15             | 5929.15             |

**DETENTION CRITERIA:**  
 100-YR STORM (DEVELOPED) PEAK FLOW RATE DETAINED TO RELEASE (Q<sub>m</sub>=12.67 CFS)  
 AT 25-YR STORM (UNDEVELOPED) PEAK FLOW RATE (Q<sub>m</sub>=5.47 CFS)

|   |          |  |
|---|----------|--|
| 3 | 03/18/99 | PER TOWN OF ADDISON, PUBLIC WORKS DEPARTMENT COMMENTS          |
| 2 | 03/03/99 | PER CITY OF CARROLLTON STAFF COMMENTS & CITY OF ADDISON REVIEW |
|   | 12/30/98 | ISSUED FOR OWNER'S REVIEW                                      |

**NO. DATE DESCRIPTION OF REVISION/ISSUE**

**GRADING & UTILITY PLAN**  
**1601 SURVEYOR BLVD.**  
**HENNESSEY ENGINEERING, INC.**  
 1417 W. MAIN STREET, CARROLLTON, TX 75006  
 TEL: (972) 245-9478 FAX: (972) 245-7087  
**CARROLLTON, DALLAS CO., TEXAS**

| DESIGN | DRAWN | DATE     | SCALE  | NOTES | FILE | NO. |
|--------|-------|----------|--------|-------|------|-----|
| H-E    | ZAM   | 12/30/98 | 1"=30' |       | 9876 | C-2 |

3-18-99