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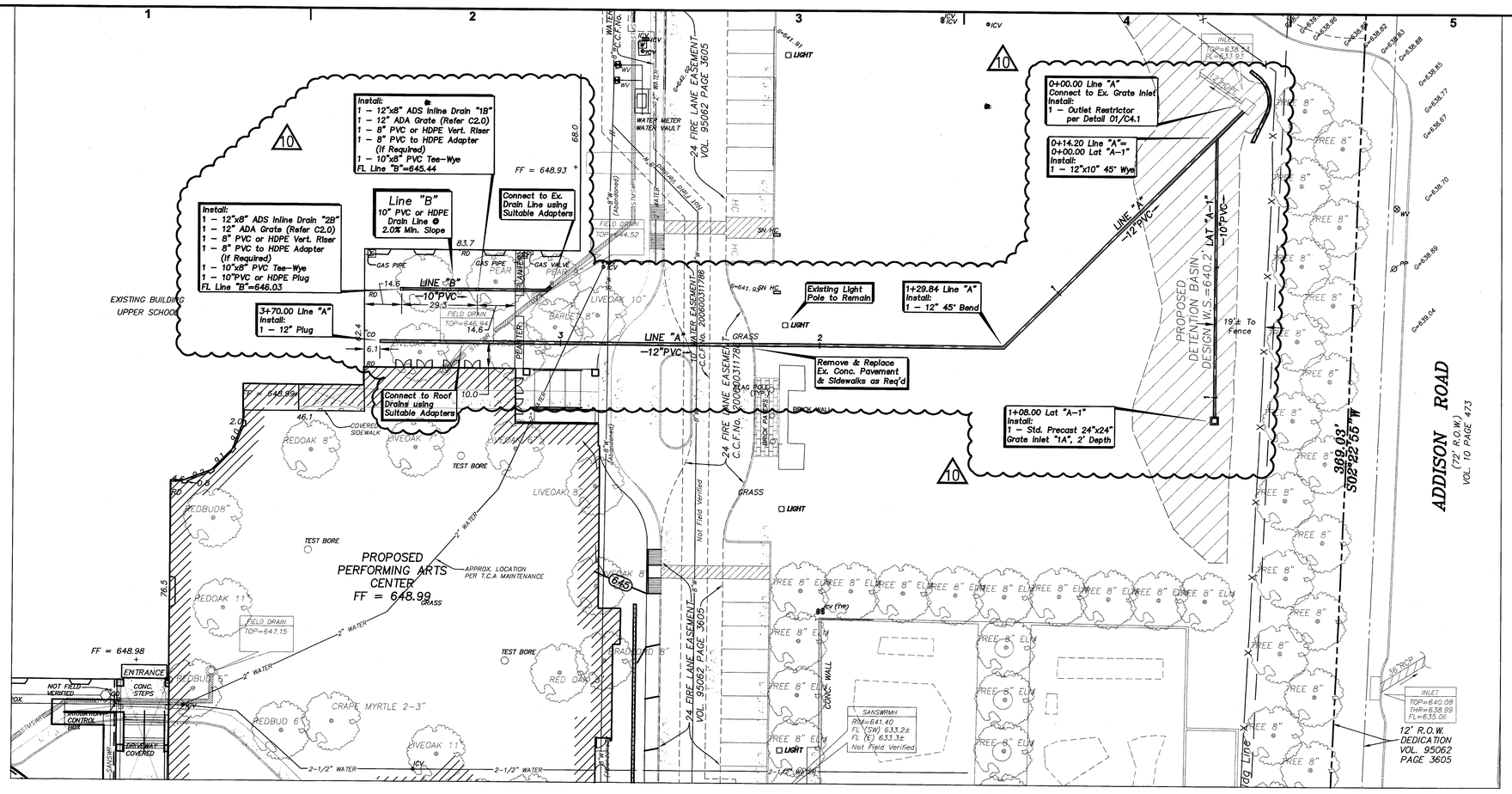


BASIN OUTLET FLOW CALCULATIONS

Equation for Full Flow through a Culvert:

$$H = \text{Head Req'd} = \left[1 + Ke + \frac{29.2(n^2)L}{R^{1.33}}\right]\left[\frac{V^2}{2g}\right]$$

Ke = Entrance Coefficient = 0.5 (square edge)
n = Roughness Coefficient = 0.015 (rough surface)
A = Area = 3.14*(0.5^2)
= 0.796 SF
R = Area/Perimeter = r/2 = 0.25'
V = Velocity = Q/A
= 4.7 cfs (Table 2) / 0.796 SF = 5.9 fps
g = 32.2 ft/s^2
L = Length = 135' (estimated, to 30" pipe)

$$H = \left[1 + 0.5 + \frac{29.2(0.015^2)135}{0.25^{1.33}}\right]\left[\frac{5.9^2}{2*32.2}\right]$$

$H_{required}$ = 3.8'

Field Conditions:

H_{actual} = 640.2 (Design W.S.) – 635.3 (Outlet FL)
= 4.9' > $H_{required}$ = 3.8'

Actual head under field conditions will exceed head required for full pipe flow; therefore, the 12" outlet pipe is adequate for the proposed flow, even if there are minor losses.

0 20 40 60
GRAPHIC SCALE
1" = 20'

STORM SEWER NOTES

1. All RCP storm drain shall be Class III or Class IV as indicated on the plans in accordance with Town of ADDISON standards and NCTCOG Item 501.6. Roof drains shall be SDR–35 PVC pipe per NCTCOG Item 507.17 or smooth–lined HDPE pipe per NCTCOG Item 501.23.

2. All work shall be performed in accordance with Town of ADDISON standards and NCTCOG Items 501, 504, 505, & 508.

3. RCP shall be installed in accordance with plan details and NCTCOG Item 508. Where a non–standard bend is specified, the Contractor shall use the closest standard bend and achieve the desired angle by pulling the pipe joints per the pipe manufacturer's specifications.

4. Roof drain lines and fittings shall be installed per manufacturer's recommendations. All wyes and bends, if required, shall be prefabricated. PVC or HDPE roof drain tees, bends, wyes and end plugs shall be injection–molded whenever available; Contractor shall not fabricate fittings in the field.

5. Where leads or pipe terminate into an existing system, a concrete collar per Town of ADDISON standard details shall be poured at the junction to form a watertight connection. Roof drain lines shall be grouted in place where they terminate into curb inlets. Roof drain pipe connections shall be made using adapters recommended by the pipe manufacturer.

6. Changes in alignment of the storm drain are not contemplated, however, if necessary, the Developer reserves the right to make changes. Any changes in alignment will be compensated for at the unit prices bid for the materials actually installed.

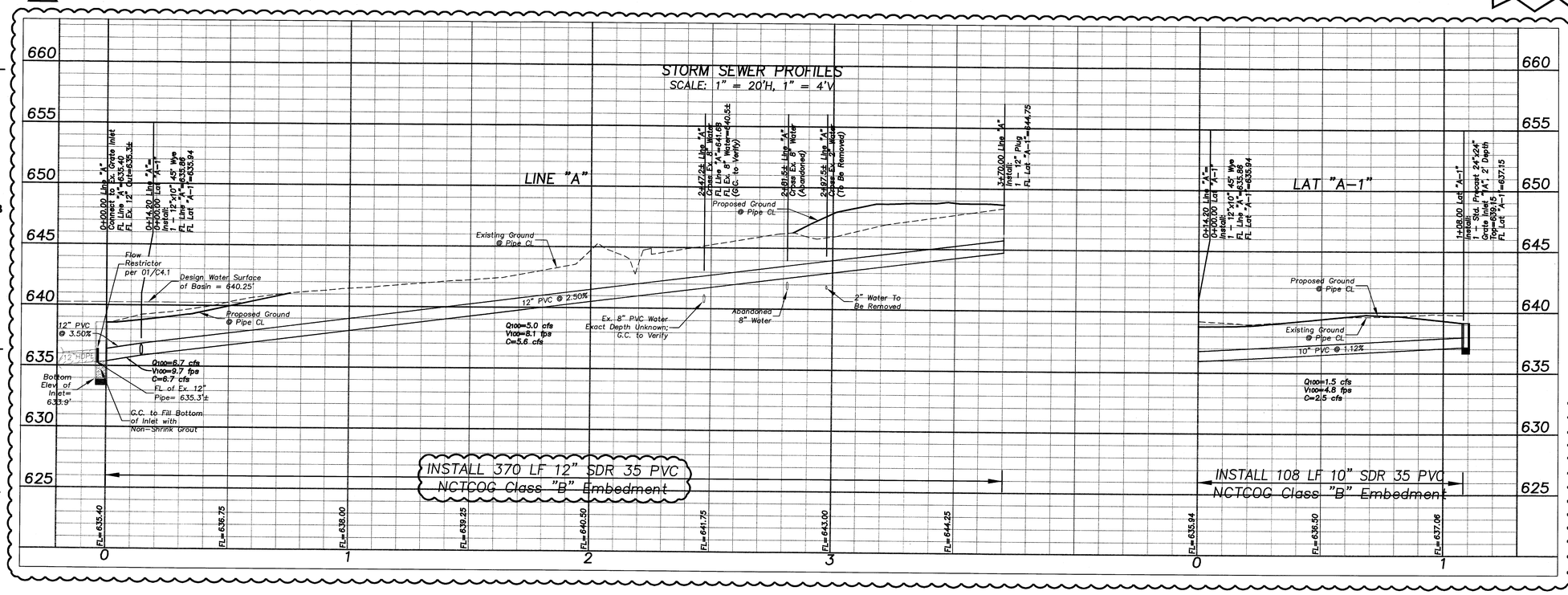
7. All proposed drainage gratings with elongated openings to be placed in pedestrian areas shall be installed with the long dimension of the openings perpendicular to the dominant direction of travel.

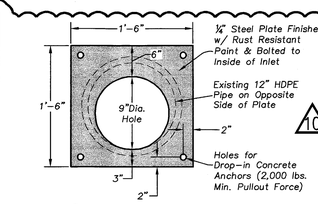
8. Concrete for these structures shall be Class "A" with 3,000 PSI minimum compressive strength when tested at 28 days.

9. Wye connections shall be made at a 45° angle unless otherwise noted on plan. Units of length are feet unless otherwise marked as inches (") centimeters (cm), meters (m) or yards (yd).

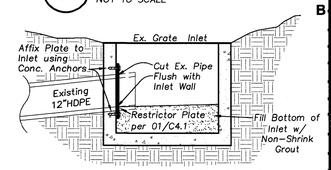
10. Refer to Sheet C1.0 for other general notes applicable to storm sewer.

!! WARNING !!
BURIED OIL, NATURAL GAS, & FIBER OPTIC LINES LOCATED IN THE WORK AREA. LOCATIONS SHOWN ON PLANS ARE APPROXIMATE. CONTRACTOR TO VERIFY LOCATION OF LINES & COORDINATE WITH UTILITY COMPANIES PRIOR TO CONSTRUCTION.





01 FLOW RESTRICTOR
NOT TO SCALE



02 FLOW RESTRICTOR INSTALLATION
NOT TO SCALE

THE SEAL APPEARING ON THIS DRAWING IS AUTHORIZED BY DAVID A. VILBIG, P.E. NO. 67207 ON MAR. 30 2009

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Original Issue Date	March 30, 2009	Engineer	David A. Vilbig, P.E.	Project Manager	Chris Walton, P.E.	Drafter(s)	CMW

Rev	Date	Description
–	June 19, 2009	Issued for Construction
1	May 18, 2009	Sheet added
10	August 28, 2009	Pond revised, outlet restrictor added

TRINITY CHRISTIAN ACADEMY NEW PERFORMING ARTS BLDG.

BUILDING CONSTRUCTION PLANS
17001 ADDISON RD., ADDISON, TX 75001

STORM SEWER PLAN & PROFILE

Project : AS-081

C4.1

DO NOT SCALE DRAWING

Sep 14, 2009 – 4:58pm User: Chris C:\DOCUME~1\Chris\LOCALS~1\Temp\AcPublish_2760\169-27 PLAN.dwg