

# PUMPS

FLYGT NP3153, IMPELLER 274 SH 23 HORSEPOWER, THREE (3) PHASE, 460 VOLT.

## DESIGN FLOW CALCULATIONS

### PHASE I

53 lots X 4 people X 120 gal/day X 1 day X 4 PF = 70.67 gpm ~ 70 gpm  
1 lot person 1440 min

### ULTIMATE

Castle Ridge Estates Build Out  
191 lots X 4 people X 120 gal/day X 1 day X 4 PF = 254.67 gpm ~ 250 gpm  
1 lot person 1440 min.

Offsite Area 29.2 acres ~ 52 Lots  
52 lots X 4 people X 120 gal/day X 1 day X 4 PF = 69.3 gpm ~ 70 gpm  
1 lot person 1440 min

TOTAL FLOW = 320 gpm

## WET WELL VOLUME STORAGE CALCULATIONS

Per TCEQ, assume 10 starts/hr., 6 min. cycle time.

$$V = \frac{(T_{min})(Q_{gpm})}{4}$$

For 102,000 gpd (~70 gpm) initial flow  
For 460,800 gpd (~320 gpm) ultimate flow

$$V = \frac{(T_{min})(Q_{gpm})}{4} = \frac{(6 \text{ min} * 320 \text{ gpm})}{4} = 480 \text{ gallons} = 64.17 \text{ cf}$$

$$\text{Area of wetwell} = \frac{V}{H} = \frac{64.17 \text{ cf}}{4 (7')^2} = 38.5 \text{ sf}$$

$$\text{Required depth} = \frac{V}{\text{Area}} = \frac{64.17 \text{ cf}}{38.5 \text{ sf}} = 1.67 \text{ ft.}$$

Assume/use 2.0 ft. between "On" and "Off"

## EMERGENCY STORAGE FOR ULTIMATE CONDITION

Per TCEQ, assume 20 minute power outage.

High level alarm = 436.00  
Wet Well Rim = 448.00

Storage Volume Required for minimum 20 minute power outage.  
320 gpm \* 20 minutes = 6400 gal .

Storage Volume of Wet Well  
R = 3.5 ft  
H = 12 ft  
V =  $\pi R^2 H = 461.8 \text{ cf} = 3454 \text{ gal}$

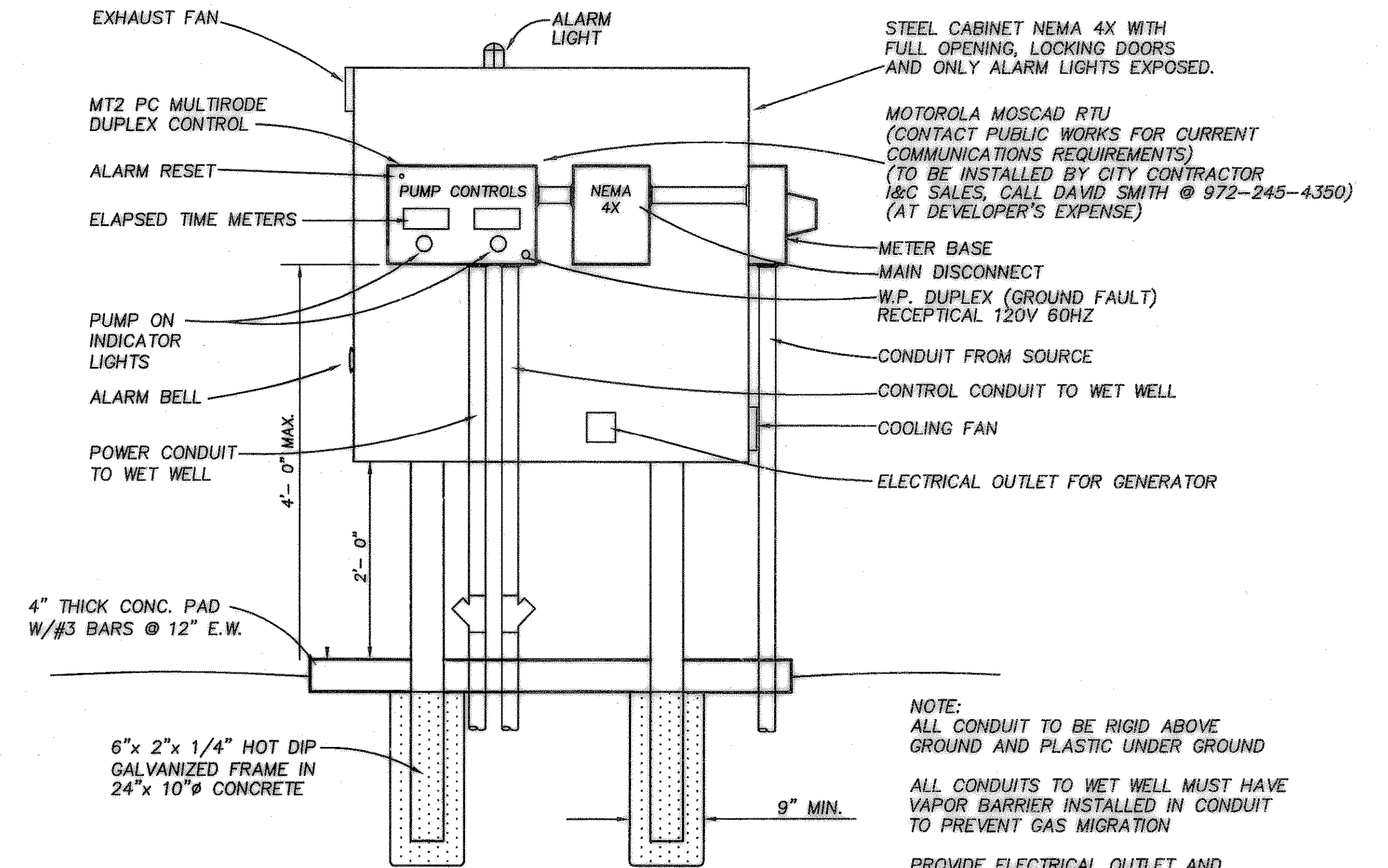
Storage Volume in Collection System Piping (8" Trunk Lines)  
V =  $\pi R^2 L = \pi * 0.33 * L * 7.48 \text{ gal/cf} = 2.62 \text{ gal/ft}$   
At Elev = 448.0 there is approx. 531 LF of storage in the collection system.  
V = 531 lf \* 2.62 gal/ft = 1391 gal

Storage Volume in Manholes  
Manhole #1 0+43.54 Flowline = 439.48  
R = 2 ft  
H = 448.00-439.48=8.52 ft  
V =  $\pi R^2 H = 107.1 \text{ cf} = 801 \text{ gal}$   
Manhole #2 1+04.15 Flowline = 439.87  
R = 2 ft  
H = 448.00-439.87=8.13 ft  
V =  $\pi R^2 H = 102.2 \text{ cf} = 764 \text{ gal}$

Manhole #3 3+52.42 Flowline = 444.48  
R = 2 ft  
H = 448.00-444.48=3.52 ft  
V =  $\pi R^2 H = 44.2 \text{ cf} = 331 \text{ gal}$

TOTAL VOLUME OF STORAGE BELOW EL. 448.00

Wetwell = 3454 gal  
Piping = 1391 gal  
Manholes = 801+764+331 = 1896 gal  
6741 gal  
6741 gal / 320 gpm = 21.0 minutes



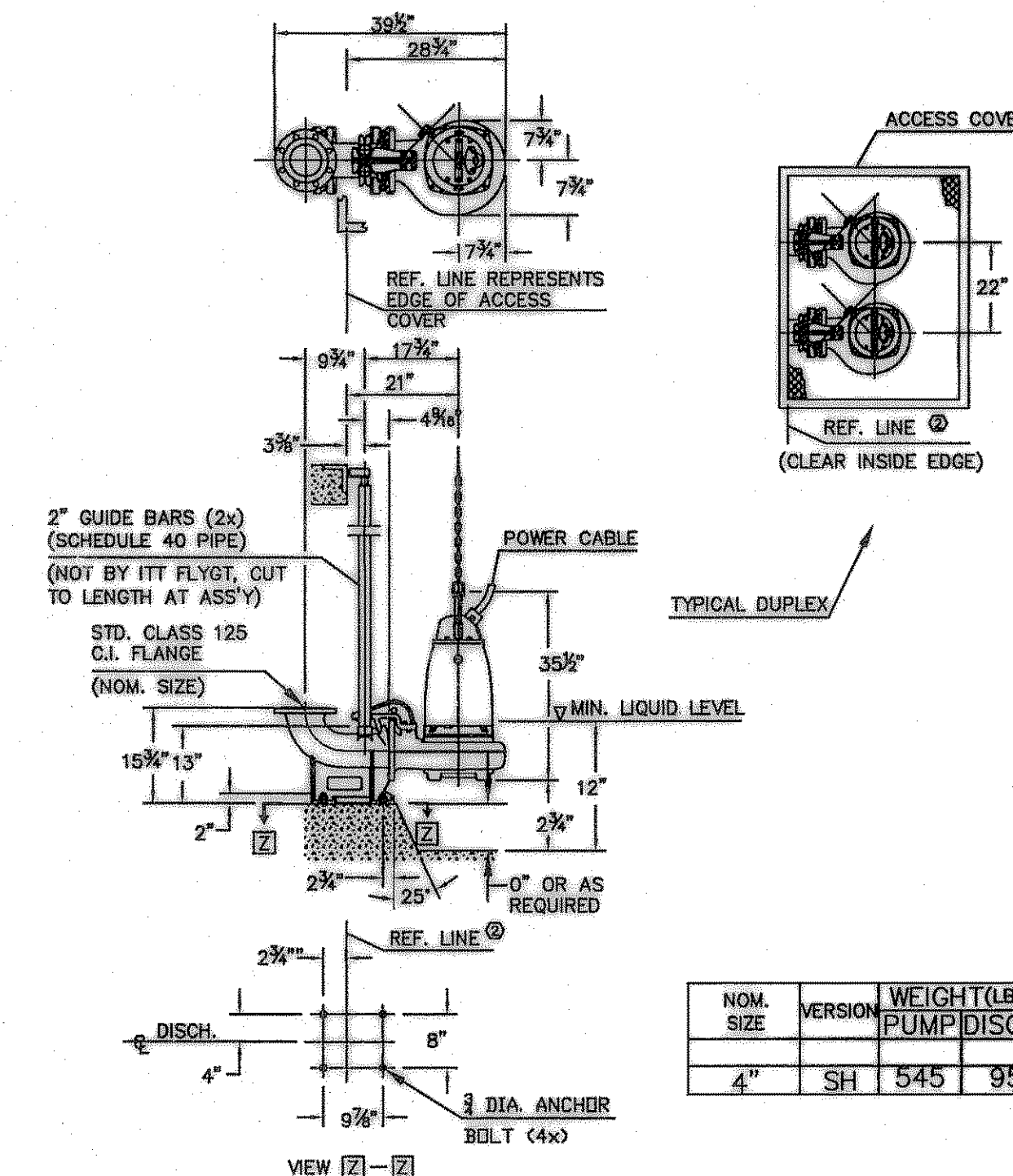
CONTROL PANEL DETAIL  
NOT TO SCALE

NOTE:  
ALL CONDUIT TO BE RIGID ABOVE GROUND AND PLASTIC UNDER GROUND  
ALL CONDUITS TO WET WELL MUST HAVE VAPOR BARRIER INSTALLED IN CONDUIT TO PREVENT GAS MIGRATION  
PROVIDE ELECTRICAL OUTLET AND MANUAL TRANSFER SWITCH FOR EMERGENCY GENERATOR OPERATION.

## GENERAL NOTES

THE FOLLOWING ITEMS SHALL BE PROVIDED:

- Fused main disconnect.
- Lightning arrestor.
- Ammeter for each pump.
- Run light for each pump.
- Seal fail Relays with Pilot Light.
- Main and Generator power transfer switch (Emergency Receptacle (Reversed)).  
Control panel, main disconnect and transformer.
- Elapsed time meters for each pump.
- 110 V receptacle inside control panel.
- All fasteners, anchor bolts etc., inside wet well and valve vault to be stainless steel.
- Two extra fuses of every size and type used stored at the location where it will be needed.
- Hallogen night lighting on aluminum pole with photo cell.
- Sign for gate listing  
City of Rockwall Castle Ridge Estates  
Lift Station  
Emergency #
- Drive and parking shall be 6" thick - 3500 P.S.I. reinforced concrete.
- Aluminum or galvanized control panel frame.
- 8' security black vinyl coated chain link fence with 6' swing gates.

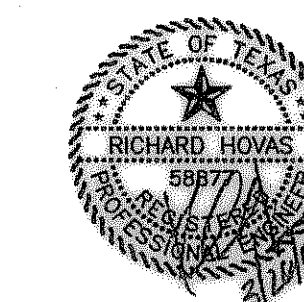


NP-3153 PUMP DIMENSIONS  
NOT TO SCALE

NOM. SIZE	VERSION	WEIGHT(LBS.)	PUMP DISCH.
4"	SH	545	95

AS BUILT PLANS  
05/11/07

The alignment and grade were set on the ground for construction per the plans. The engineer did not verify alignment or grades after construction. We are not aware of any changes or revisions to these plans during construction except as noted.



LIFT STATION DETAIL						
CASTLE RIDGE ESTATES PHASE 1						
CITY OF ROCKWALL, TEXAS						
TIPTON ENGINEERING, INC.						
ENGINEERING • SURVEYING • PLANNING						
6330 Broadway Blvd. • Suite C • Garland, Texas 75043 • (972) 226-2867						
DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
TE, Inc.	TE, Inc.		1"=40' H.	TE, Inc.	4802	19A