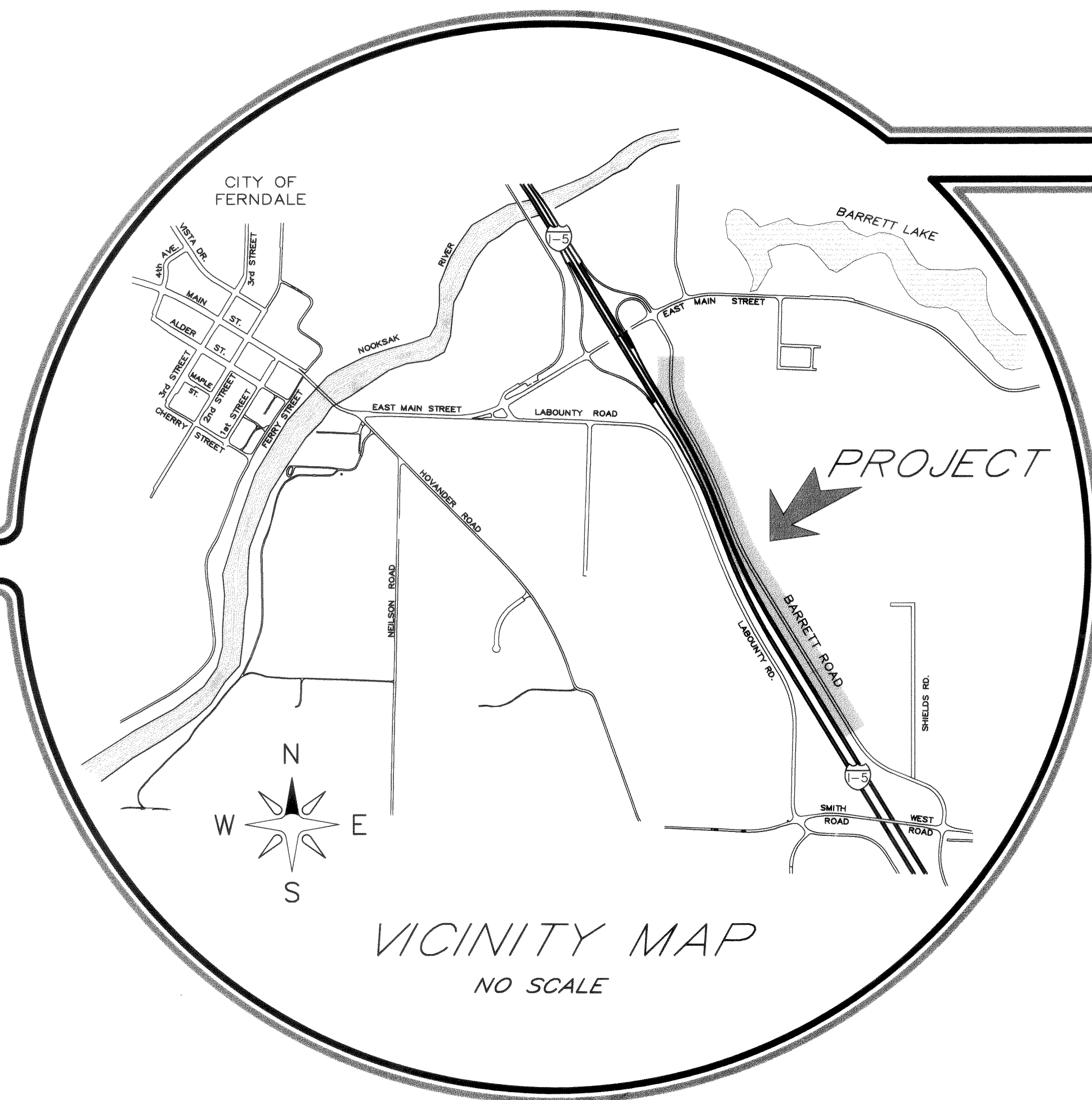


# BARRETT ROAD

## SANITARY SEWER EXTENSION

00201.001 2-2-06 42



1. Cover Sheet & Vicinity Map
2. Existing Conditions; Topographic & Planimetric Mapping
3. Existing Conditions; Section Subdivision, Zoning & Service Area
4. Service Zone Area & Preliminary Assessment Role (DESIGN)
5. Service Area, Collection System & Flow Calculations (DESIGN)
6. Sanitary Sewer Gravity Main Plan & Profile: Manhole #1 to #5 (DESIGN)
- 6A. Sanitary Sewer Gravity Main Plan & Profile: Manhole #1 to #5 (AS-BUILT)
7. Sanitary Sewer Gravity Main Plan & Profile: Manhole #6 to #9 (DESIGN)
- 7A. Sanitary Sewer Gravity Main Plan & Profile: Manhole #6 to #9 (AS-BUILT)
8. Sanitary Sewer Gravity Main Plan & Profile: Manhole #10 to #13 (DESIGN)
- 8A. Sanitary Sewer Gravity Main Plan & Profile: Manhole #10 to #13 (AS-BUILT)
9. Sanitary Sewer Gravity Main Plan & Profile: Manhole #14 to #16 (DESIGN)
- 9A. Sanitary Sewer Gravity Main Plan & Profile: Manhole #14 to #16 (AS-BUILT)
10. Sanitary Sewer Force Main Plan & Profile: Manhole #1 to Sta 12+50 (DESIGN)
11. Sanitary Sewer Force Main Plan & Profile: Sta 12+50 to 25+00 (DESIGN)
12. Sanitary Sewer Force Main Plan & Profile: Sta 25+00 to 35+29 (DESIGN)
13. Construction Details (DESIGN)
- 13A. Construction Details (AS-BUILT)
14. Barrett Road / Sewer Main Cross Sections (DESIGN)
15. Force Main Hydraulics & Pump Operating Curves (DESIGN)
16. Lift Station Plan & Details (DESIGN)
17. Lift Station Wiring Schedule & Pump Control Wiring Diagram (DESIGN)
18. Lift Station Electrical & Telemetry Details (DESIGN)
19. Schedule Of Materials & Quantities, Summary Specifications And Method Of Payment

DRAWN BY \_\_\_\_\_ DATE \_\_\_\_\_

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

JOB # 96106

### BARRETT ROAD SANITARY SEWER

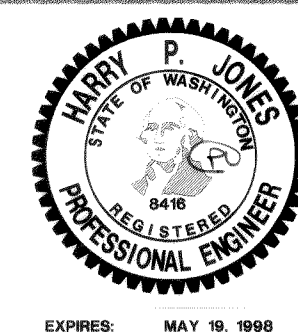
FOR:

CITY OF FERNDALE  
CARL D. TEITGE DEVELOPMENT INC. /  
VOYAGERS LANDING

#### PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN ACCURATELY  
DEPICTS THE MATERIALS, TYPES, AND LOCATIONS  
OF THE IMPROVEMENTS SHOWN HEREON AS OF  
THIS DATE.

*Harry P. Jones* *aug 6/97*  
HARRY P. JONES, P.E., PLS DATE



**JONES** ENGINEERS  
INCORPORATED, P.S.  
CONSULTING ENGINEERS  
851 COHO WAY, SUITE 307  
BELLINGHAM, WA 98225 (360) 733-8888

BARRETT ROAD SANITARY SEWER  
COVER SHEET

SHEET

1

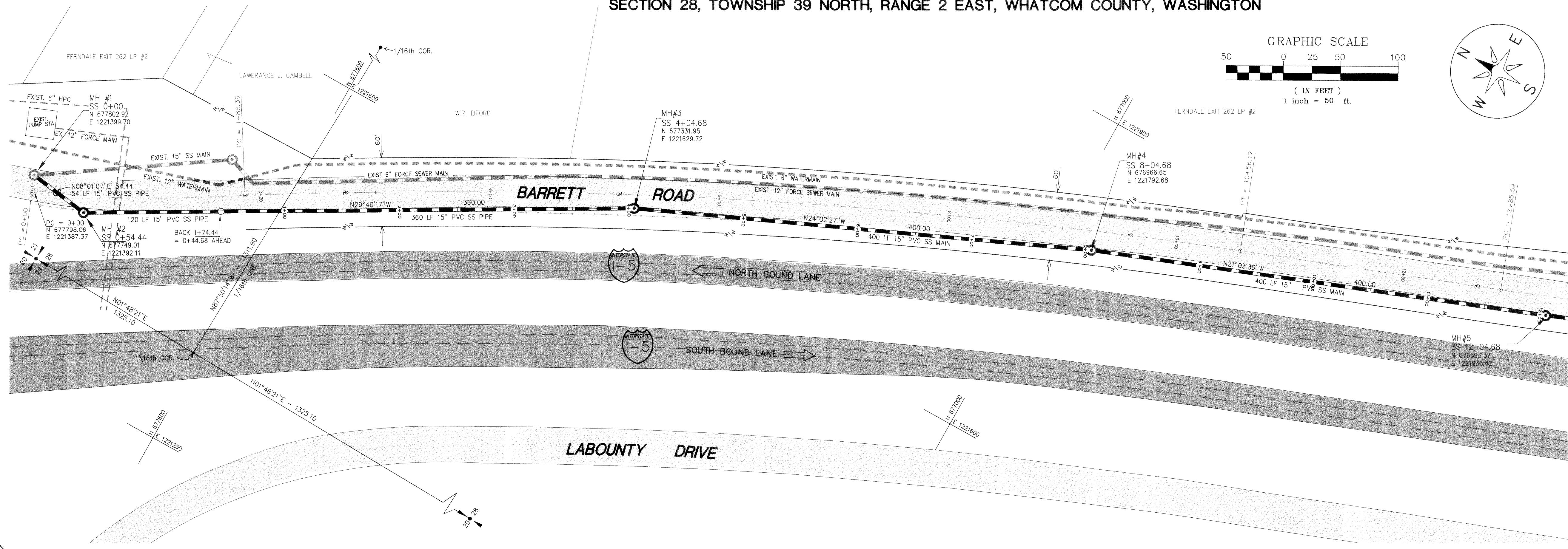
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19

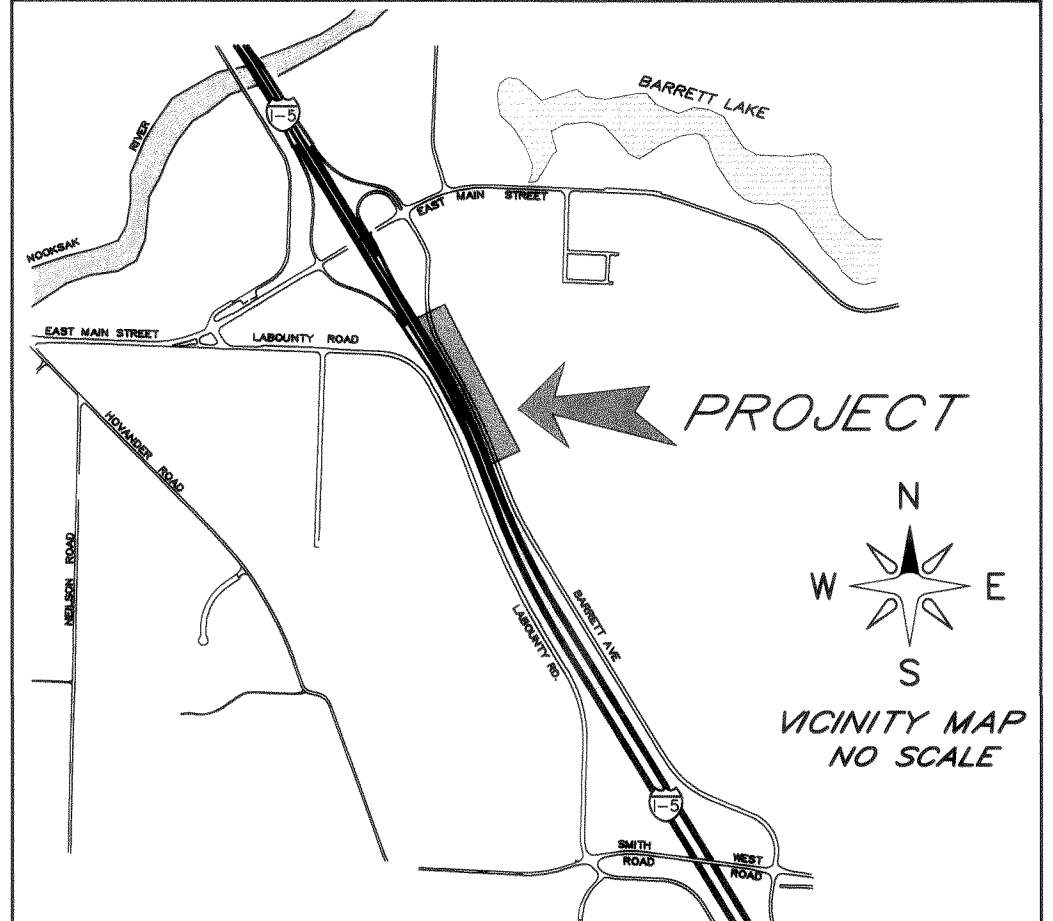


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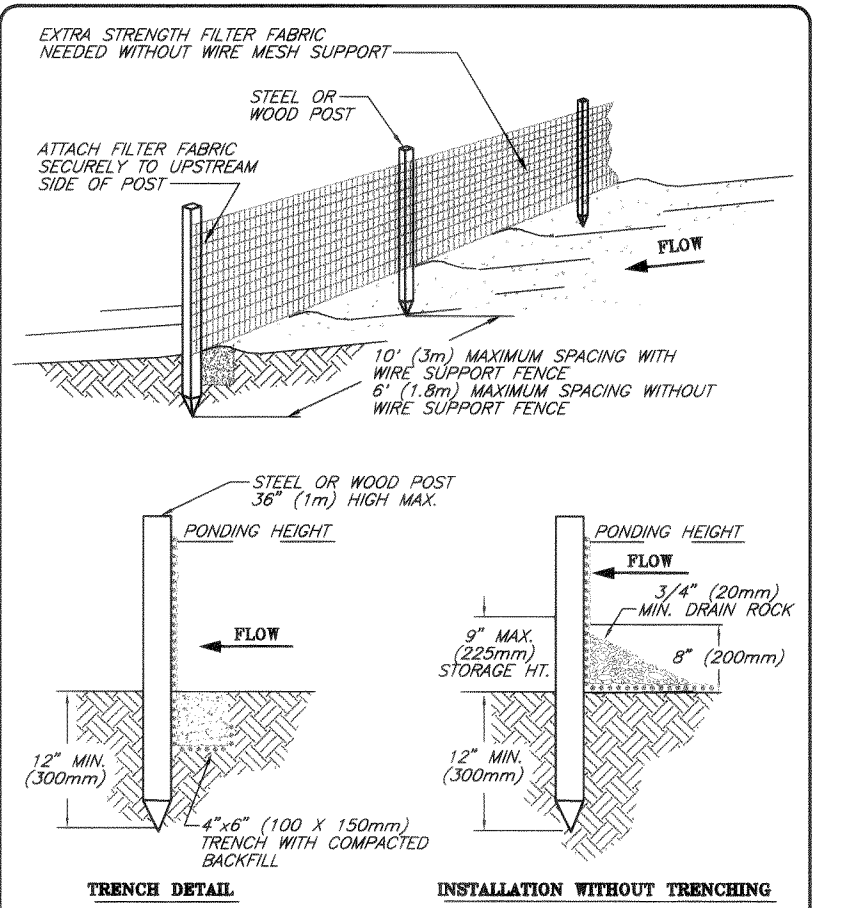
SECTION 28, TOWNSHIP 39 NORTH, RANGE 2 EAST, WHATCOM COUNTY, WASHINGTON



SANITARY SEWER JOB NO. 96106



SPECIAL DETAILS & NOTES



NOTES:  
1. SILT FENCE SHALL BE PLACED ON SLOPE  
CONTIGUOUS TO MAXIMUM FLOW EFFICIENCY.  
2. INSPECT AND REPAIR FENCE AFTER EACH  
STORM EVENT AND REMOVE SEDIMENT WHEN  
NECESSARY. 8" (200mm) MAXIMUM  
RECOMMENDED STORAGE HEIGHT.  
3. REMOVED SEDIMENT SHALL BE DEPOSITED  
TO AN AREA THAT WILL NOT CONTRIBUTE  
SEDIMENT OFF-SITE AND CAN BE PERMANENTLY  
STABILIZED.  
4. SEE SHEET 13A FOR CONSTRUCTION DETAILS.

SILT FENCE

CONTROL DATUM  
HORIZONTAL: NAD83 (91) WASH. STATE LAMBERT GRID- N. ZONE  
POSITION: F-10 CASED IP @ S.E. COR. SEC. 28, T39N, R2E, WM  
T. 39 N., R2E  
MERIDIAN: S. LINE OF SE4 OF SEC. 28  
S 88° 22' 49" E  
VERTICAL: NGVD 1929  
RR SPK #3 PNT. 1050  
N. OF SMITH RD. ON FRONTAGE RD. E. OF I-5  
ELEV. = 81.03

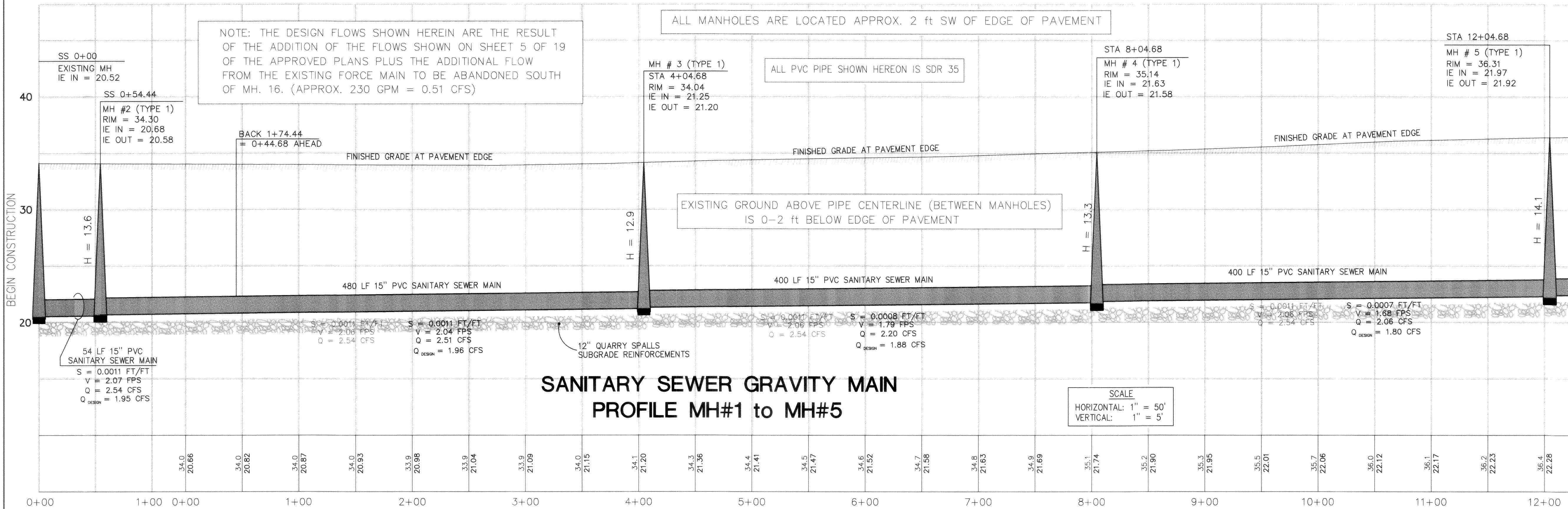
REVISIONS

NO	DATE	BY	NOTE
1.			
2.			
3.			
4.			
5.			

LEGEND

---	PROPOSED WATER MAIN (BY OTHERS)
---	EXISTING WATER MAIN
○	EXISTING MANHOLE
---	EXISTING 6" FORCE MAIN SEWER
---	EXISTING STORM DRAINAGE CULVERT
○	MANHOLE (TO BE CONSTRUCTED)
---	SANITARY SEWER GRAVITY MAIN (TO BE CONSTRUCTED)
---	CENTERLINE
---	LOT LINES (ON SITE)
---	PROPERTY/ROW LINE (OTHER)
---	SECTION SUBDIVISION LINE
---	FINISHED GRADE AT CENTERLINE (PROFILE)

SEE SHEET 13A FOR CONSTRUCTION DETAILS



NOTE: THE DESIGN FLOWS SHOWN HEREIN ARE THE RESULT OF THE ADDITION OF THE FLOWS SHOWN ON SHEET 5 OF 19 OF THE APPROVED PLANS PLUS THE ADDITIONAL FLOW FROM THE EXISTING FORCE MAIN TO BE ABANDONED SOUTH OF MH. 16. (APPROX. 230 GPM = 0.51 CFS)

ALL MANHOLES ARE LOCATED APPROX. 2 ft SW OF EDGE OF PAVEMENT

ALL PVC PIPE SHOWN HEREON IS SDR 35

EXISTING GROUND ABOVE PIPE CENTERLINE (BETWEEN MANHOLES) IS 0-2 ft BELOW EDGE OF PAVEMENT

SANITARY SEWER GRAVITY MAIN  
PROFILE MH#1 to MH#5

SCALE  
HORIZONTAL: 1" = 50'  
VERTICAL: 1" = 5'

BARRETT ROAD SANITARY  
SEWER EXTENSION

JOB # 96106

FOR:

CITY OF FERDALE  
CARL D. TEIGE DEVELOPMENT INC. /  
VOYAGERS LANDING

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN ACCURATELY  
DEPicts THE MATERIALS, TYPES, AND LOCATIONS  
OF THE IMPROVEMENTS SHOWN HEREON AS OF  
THIS DATE.

HARRY P. JONES, P.E.  
DATE



EXPIRES: MAY 19, 1998

**JONES** ENGINEERS  
INCORPORATED, P.S.  
CONSULTING ENGINEERS  
851 COHO WAY, SUITE 307  
BELLINGHAM, WA 98225 (360) 733-8888

BARRETT ROAD SANITARY SEWER  
SANITARY SEWER GRAVITY MAIN  
AS-BUILT PLAN & PROFILE MH#1 to MH#5

DEPARTMENT OF PUBLIC WORKS

FERDALE, WASHINGTON

APPROVED

This plan has been reviewed and found to be in conformance with department standards.

CITY ENGINEER: DATE:

SHEET

6A

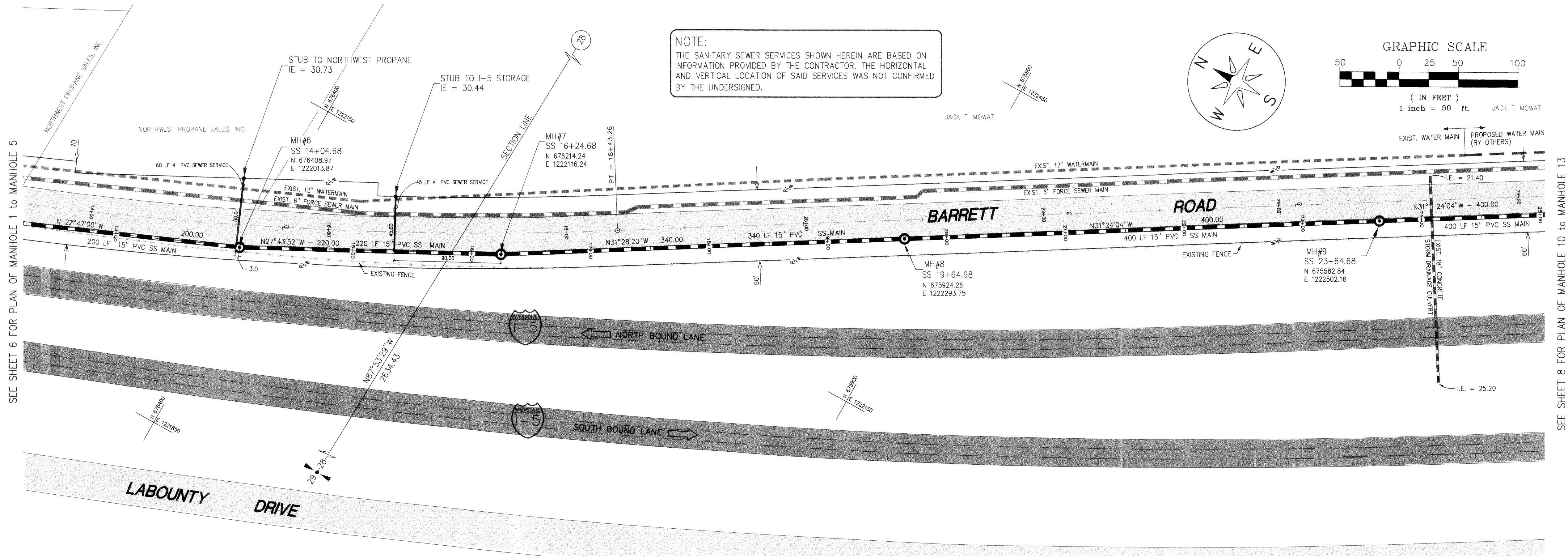
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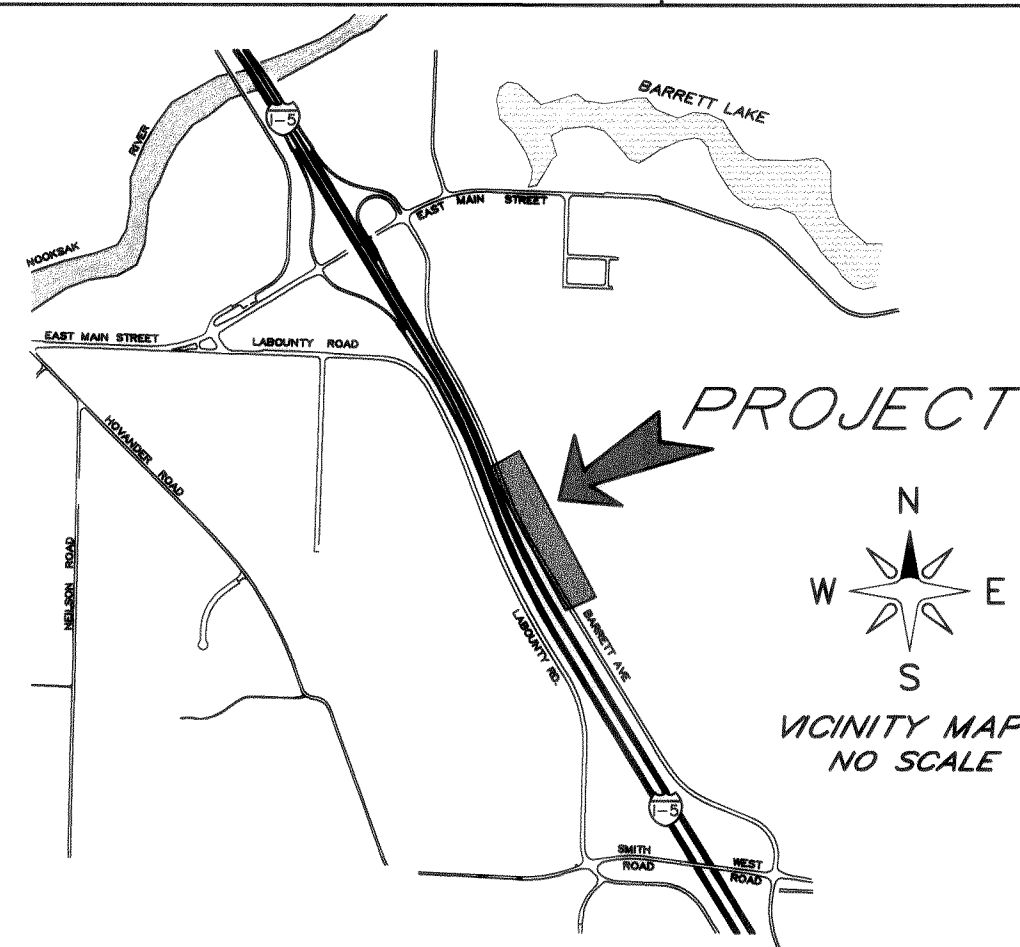


SECTION 28, TOWNSHIP 39 NORTH, RANGE 2 EAST, WHATCOM COUNTY, WASHINGTON



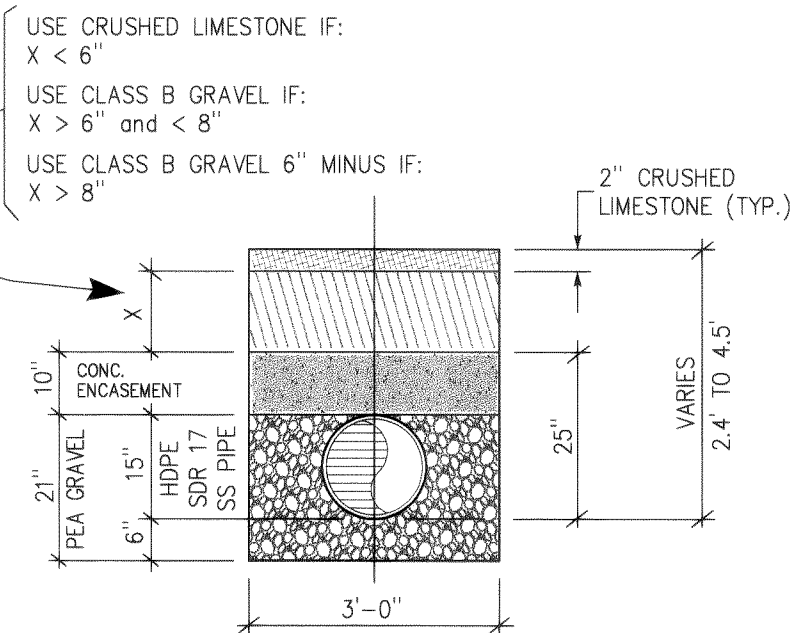
SANITARY SEWER

JOB NO. 96106



SPECIAL DETAILS & NOTES

PIPE ENCASEMENT DETAIL "A"



NOTE: SEE STRUCTURAL ANALYSIS SHEET 9  
CONCRETE ENCASEMENT SS STA 23+00 TO 36+65

CONTROL DATUM

HORIZONTAL: NAD83 (91) WASH. STATE LAMBERT GRID- N. ZONE  
POSITION: F-10 CASED IP @ S.E. COR. SEC. 28, T39N, R3E, WM  
MERIDIAN: S. LINE OF SE4 OF SEC. 28  
S 88° 22' 49" E  
VERTICAL: NGVD 1929  
RR SPK #5 PNT. 1050  
N. OF SMITH RD. ON FRONTAGE RD. E. OF I-5  
ELEV. = 81.03

REVISIONS

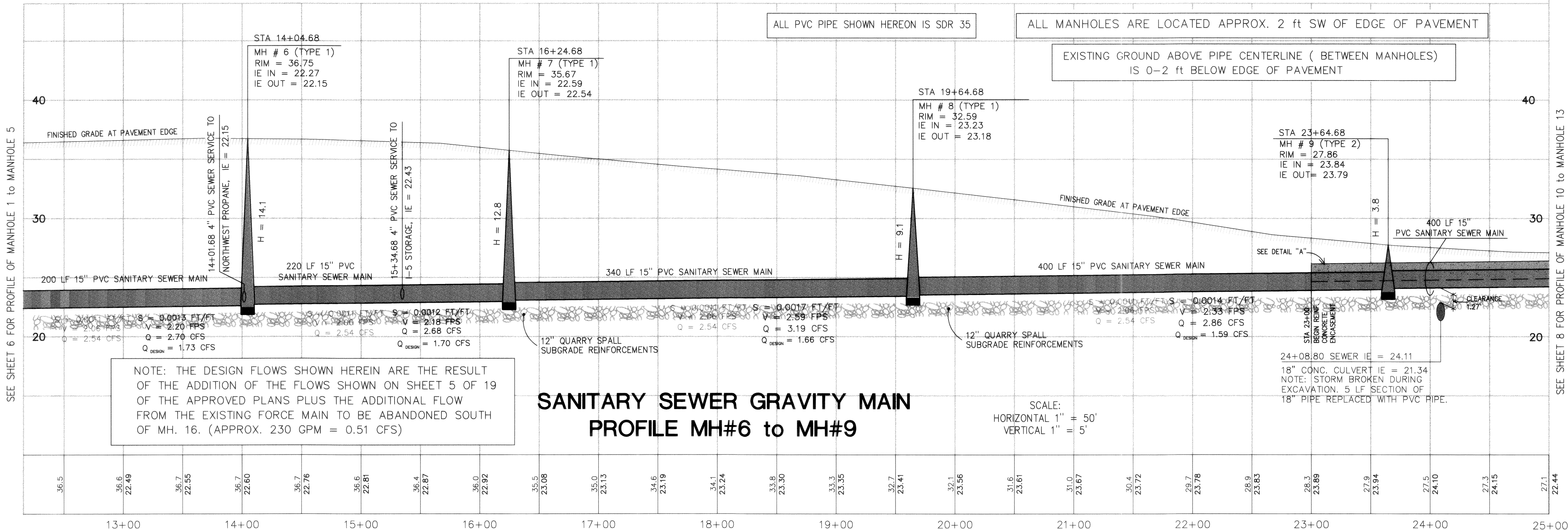
NO DATE BY NOTE

1.  
2.  
3.  
4.  
5.

LEGEND

--- PROPOSED WATER MAIN (BY OTHERS)  
--- EXISTING WATER MAIN  
--- EXISTING MANHOLE  
--- EXISTING STORM DRAINAGE CULVERT  
--- MANHOLE (TO BE CONSTRUCTED)  
--- SANITARY SEWER GRAVITY MAIN (TO BE CONSTRUCTED)  
--- CENTERLINE  
--- LOT LINES (ON SITE)  
--- PROPERTY/ROW LINE (OTHER)  
--- SECTION SUBDIVISION LINE  
--- FINISHED GRADE AT CENTERLINE (PROFILE)

SEE SHEET 13A FOR CONSTRUCTION DETAILS



SANITARY SEWER GRAVITY MAIN  
PROFILE MH#6 to MH#9

DRAWN BY \_\_\_\_\_ DATE \_\_\_\_\_

DRAWN BY \_\_\_\_\_ DATE \_\_\_\_\_

JOB # 96106

BARRETT ROAD SANITARY  
SEWER EXTENSION

FOR:

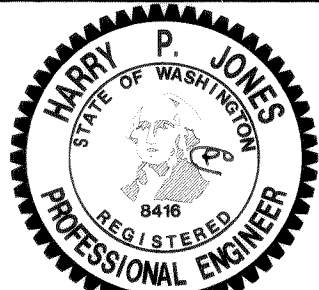
CITY OF FERNDAL  
CARL D. TEIGE DEVELOPMENT INC. /  
VOYAGERS LANDING

PROFESSIONAL CERTIFICATION

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THIS DATE.

*Harry P. Jones* Aug 14/97

HARRY P. JONES, PE, PLS DATE



EXPIRES: MAY 19, 1998

**JONES** ENGINEERS  
INCORPORATED, P.S.

CONSULTING ENGINEERS

851 COHO WAY, SUITE 307  
BELLINGHAM, WA 98225 (360) 733-8888

BARRETT ROAD SANITARY SEWER  
SANITARY SEWER GRAVITY MAIN  
AS-BUILT PLAN & PROFILE MH#6 to MH#9

DEPARTMENT OF PUBLIC WORKS

FERNDAL,  
WASHINGTON

APPROVED

This plan has been reviewed and found to  
be in conformance with department  
standards.

CITY ENGINEER \_\_\_\_\_ DATE \_\_\_\_\_

SHEET

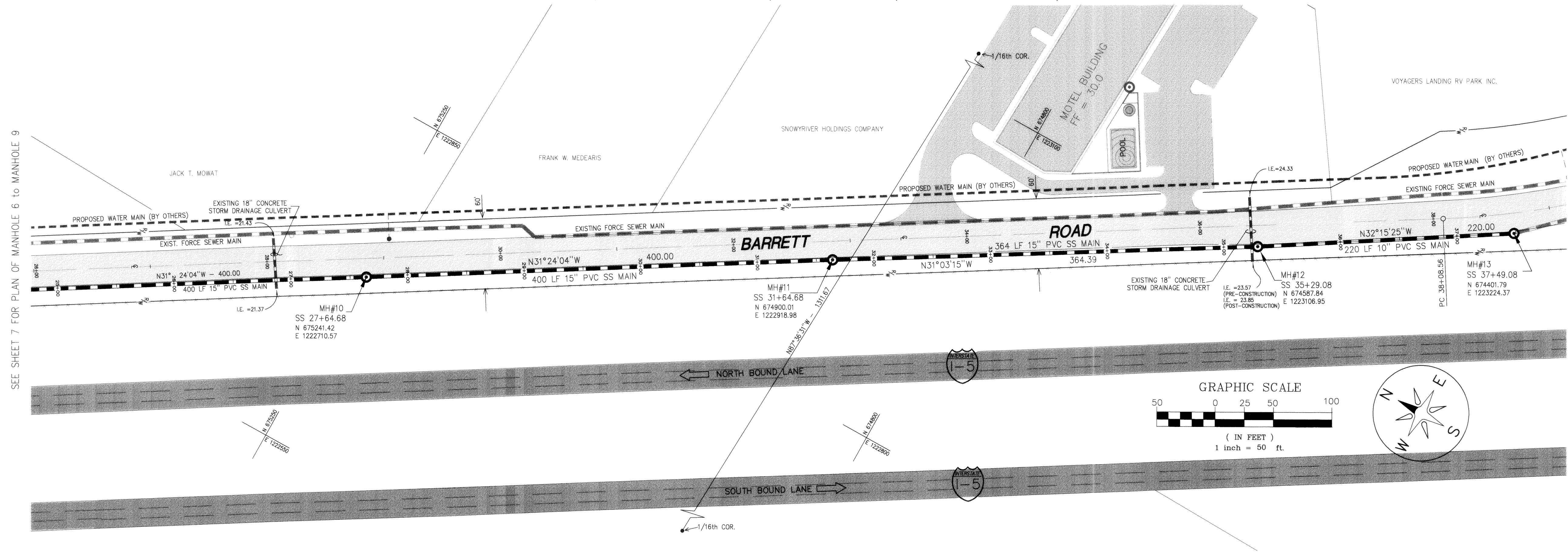
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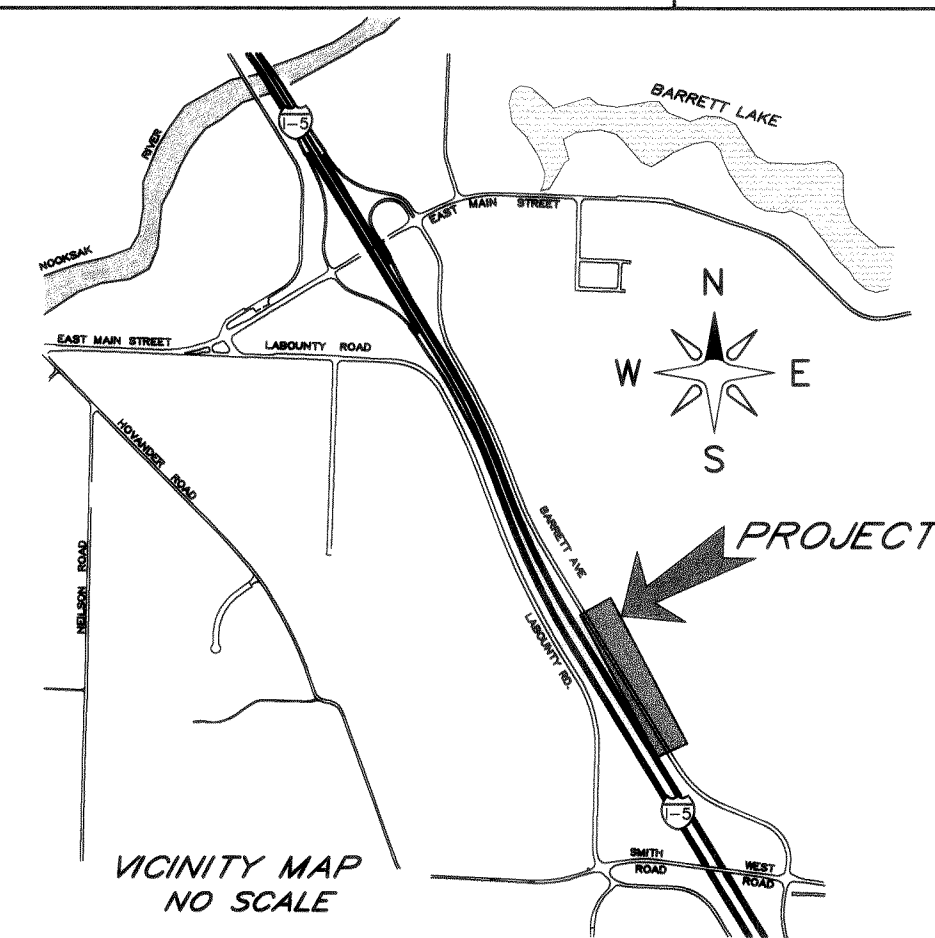


## SECTION 28, TOWNSHIP 39 NORTH, RANGE 2 EAST, WHATCOM COUNTY, WASHINGTON

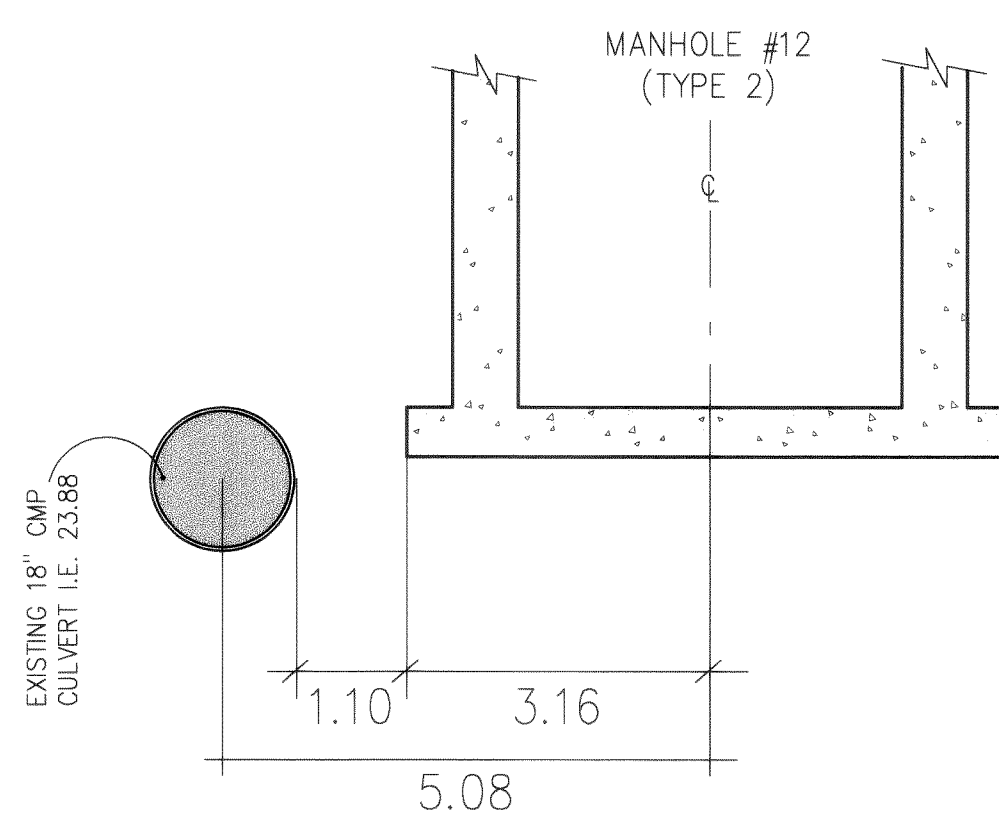


## SANITARY SEWER

JOB NO. 96106



## DETAIL "A" SCALE 1" = 2'



CONTROL DATUM  
NAD83 (91) WASH. STATE LAMBERT GRID - N. ZONE  
POSITION: F-10 CAGED IP @ S.E. COR SEC. 28, T39N, R2E, WM  
MERIDIAN: S. LINE OF SE 1/4 OF SEC. 28  
S 88° 22' 49" E  
VERTICAL: NVD 1929  
RR SPK #3 PNT. 1050  
N. OF SMITH RD. ON FRONTAGE RD. E. OF I-5  
ELEV. = 81.03

## REVISIONS

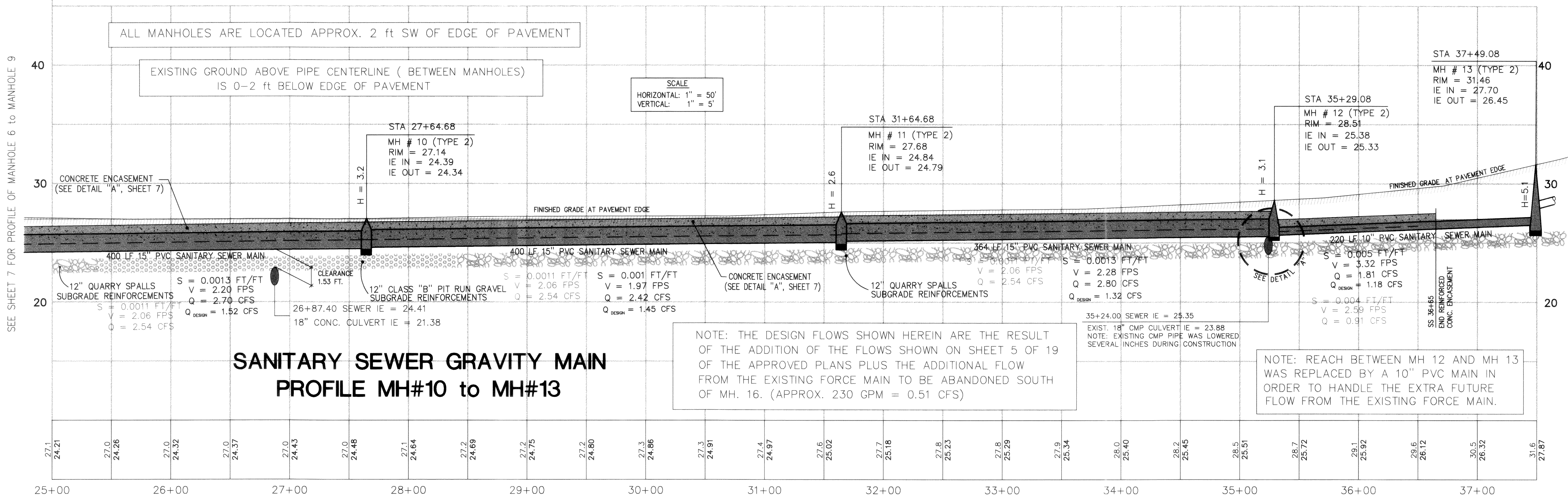
NO DATE BY NOTE

## LEGEND

- EXISTING WATER MAIN
- EXISTING OR FUTURE SS MAIN
- EXISTING MANHOLE
- HORIZONTAL DEFLECTION
- PROPOSED CLEAN-OUT
- MANHOLE (FUTURE CONSTRUCTION, BY OTHERS)
- MANHOLE (TO BE CONSTRUCTED)
- SANITARY SEWER GRAVITY MAIN (TO BE CONSTRUCTED)
- SANITARY SEWER MAIN (TO BE CONSTRUCTED, SUB END FOR FUTURE)
- SANITARY SEWER FORCE MAIN (TO BE CONSTRUCTED)
- SS MAIN (FUTURE CONSTRUCTION, BY OTHERS)
- CENTERLINE
- LOT LINES (ON SITE)
- PROPERTY/ROW LINE (OTHER)
- FENCE (EXISTING)
- FINISHED GRADE AT PAVEMENT EDGE (PROFILE)

SEE SHEET 13A FOR CONSTRUCTION DETAILS

ALL PVC PIPE SHOWN HEREON IS SDR 35

ALL MANHOLES ARE LOCATED APPROX. 2 ft SW OF EDGE OF PAVEMENT  
EXISTING GROUND ABOVE PIPE CENTERLINE ( BETWEEN MANHOLES )  
IS 0-2 ft BELOW EDGE OF PAVEMENTSCALE  
HORIZONTAL: 1" = 50'  
VERTICAL: 1" = 5'SANITARY SEWER GRAVITY MAIN  
PROFILE MH#10 to MH#13

NOTE: THE DESIGN FLOWS SHOWN HEREIN ARE THE RESULT OF THE ADDITION OF THE FLOWS SHOWN ON SHEET 5 OF 19 OF THE APPROVED PLANS PLUS THE ADDITIONAL FLOW FROM THE EXISTING FORCE MAIN TO BE ABANDONED SOUTH OF MH. 16. (APPROX. 230 GPM = 0.51 CFS)

NOTE: REACH BETWEEN MH 12 AND MH 13 WAS REPLACED BY A 10" PVC MAIN IN ORDER TO HANDLE THE EXTRA FUTURE FLOW FROM THE EXISTING FORCE MAIN.

BARRETT ROAD SANITARY  
SEWER EXTENSION

JOB # 96106

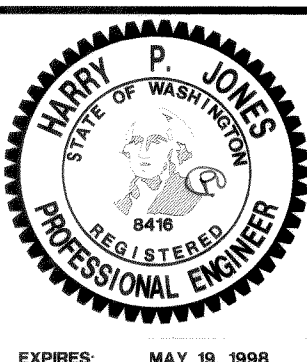
FOR:

CITY OF FERDALE  
CARL D. TEIGE DEVELOPMENT INC. /  
VOYAGERS LANDING

## PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN ACCURATELY  
DEPICTS THE MATERIALS, TYPES, AND LOCATIONS  
OF THE IMPROVEMENTS SHOWN HEREON AS OF  
THIS DATE.

*Harry P. Jones* 09/01/27  
HARRY P. JONES, P.E., PLS. DATE



**JONES** ENGINEERS  
INCORPORATED, P.S.  
CONSULTING ENGINEERS  
851 COHO WAY, SUITE 307  
BELLINGHAM, WA 98225 (360) 733-8888

BARRETT ROAD SANITARY SEWER  
SANITARY SEWER GRAVITY MAIN  
AS-BUILT PLAN & PROFILE MH#10 to MH#13DEPARTMENT OF PUBLIC WORKS  
FERDALE, WASHINGTON

APPROVED

This plan has been reviewed and found  
to be in conformance with department  
standards.

CITY ENGINEER: DATE:

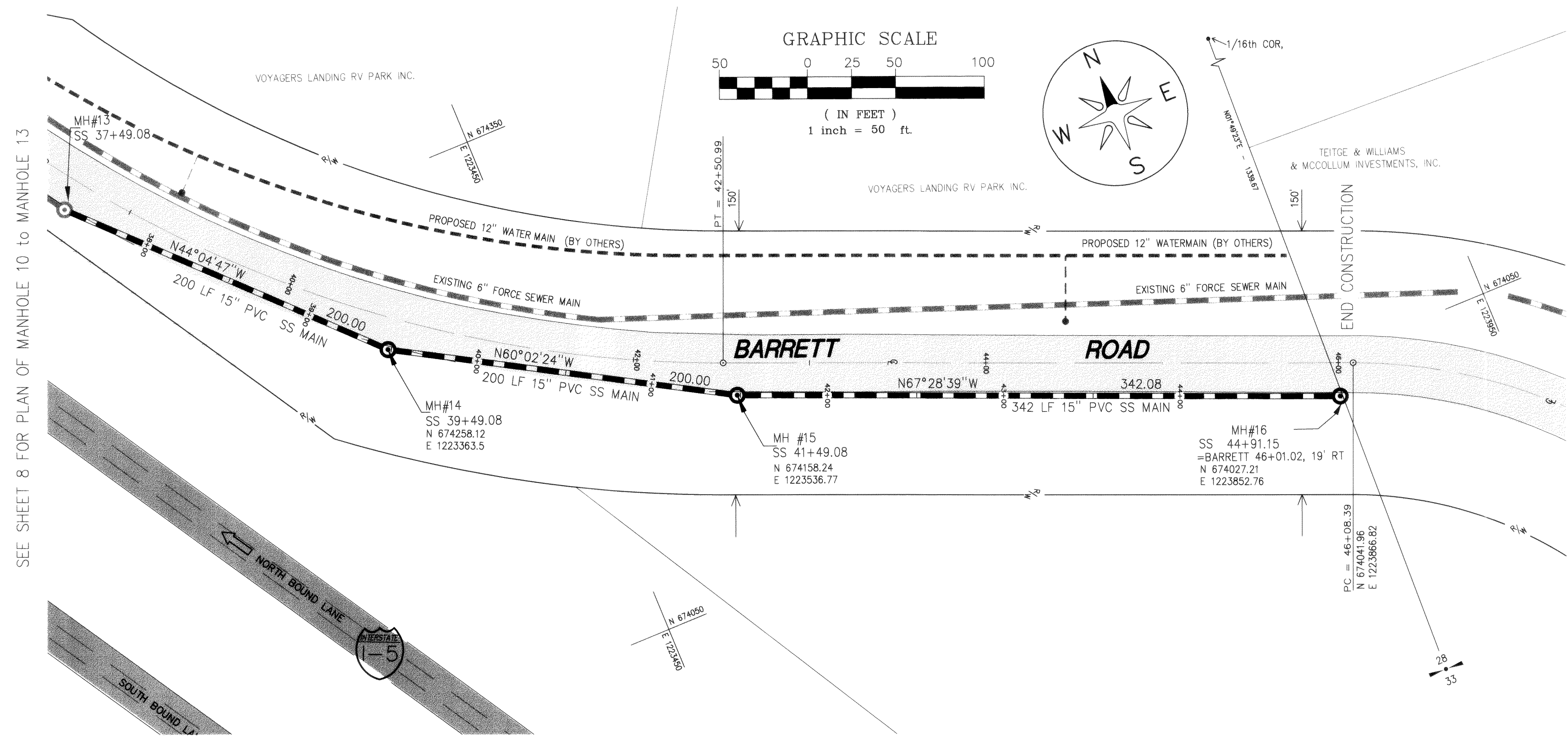
SHEET

8A

OF 19



SECTION 28, TOWNSHIP 39 NORTH, RANGE 2 EAST, W.M., WHATCOM COUNTY, WASHINGTON



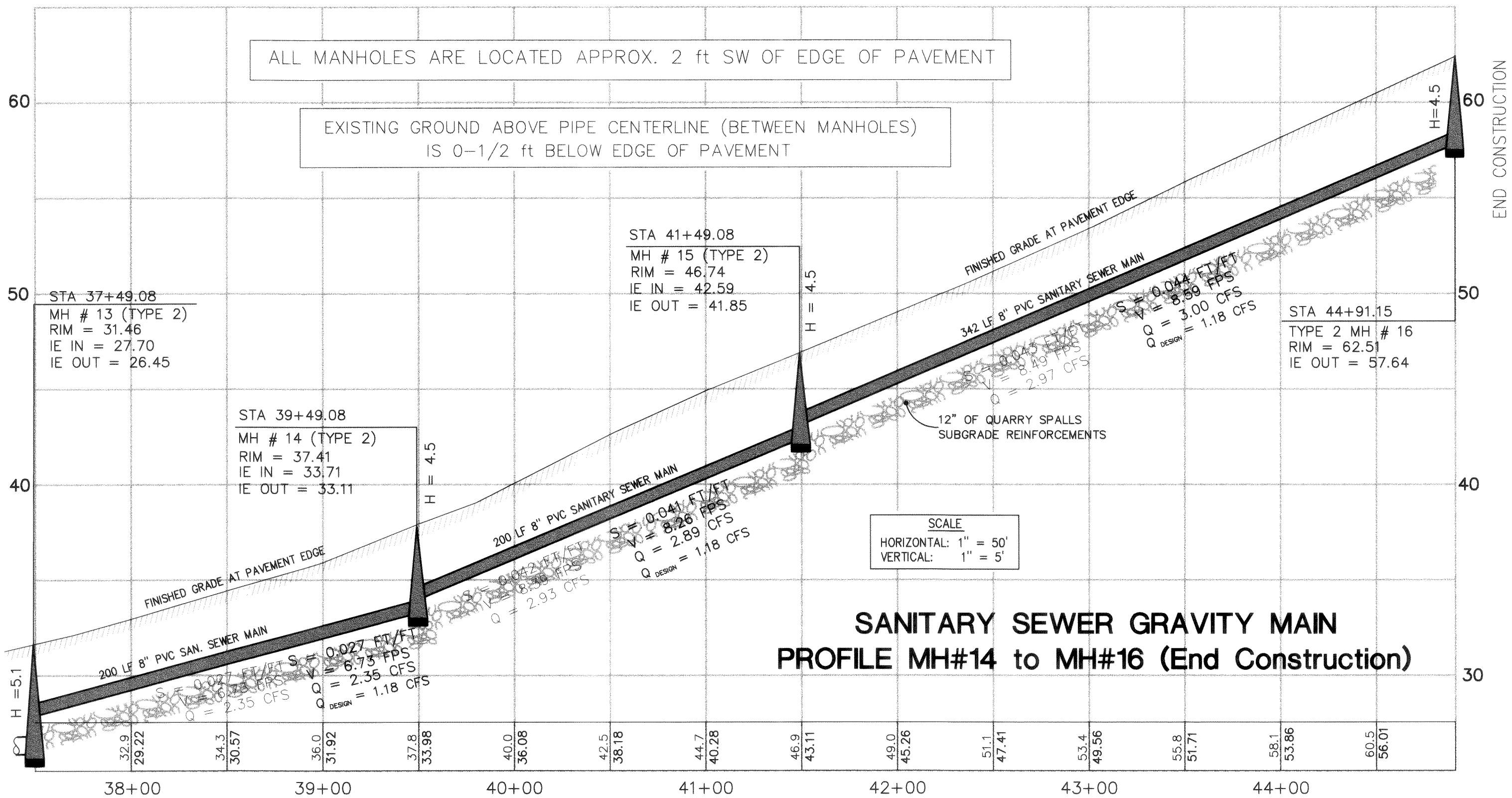
SEE SHEET 8 FOR PLAN OF MANHOLE 10 TO MANHOLE 13

ALL PVC PIPE SHOWN HEREON IS SDR 35

ALL MANHOLES ARE LOCATED APPROX. 2 ft SW OF EDGE OF PAVEMENT

EXISTING GROUND ABOVE PIPE CENTERLINE (BETWEEN MANHOLES) IS 0-1/2 ft BELOW EDGE OF PAVEMENT

SEE SHEET 8 FOR PROFILE OF MANHOLE 10 TO MANHOLE 13



SANITARY SEWER GRAVITY MAIN  
PROFILE MH#14 to MH#16 (End Construction)

NOTE: THE DESIGN FLOWS SHOWN HEREIN ARE THE RESULT OF THE ADDITION OF THE FLOWS SHOWN ON SHEET 5 OF 19 OF THE APPROVED PLANS PLUS THE ADDITIONAL FLOW FROM THE EXISTING FORCE MAIN TO BE ABANDONED SOUTH OF MH. 16. (APPROX. 230 GPM = 0.51 CFS)

PVC PIPE CONCRETE ENCASING STRUCTURAL ANALYSIS  
SEE SHEET #7 FOR CONCRETE CASING DETAIL.

LOADS on CONCRETE COVER  
H2O-44 LOADING  
From Handbook of PVC Pipe by Uni-Bell PVC Pipe Association, Third Edition  
16,000 lb point load over 18" x 20" area=6400 psf

In 1 linear foot, P = 6400 lb

$$Q_e = \frac{P}{bd} = \frac{6400 \text{ lb}}{3 \text{ ft} (1 \text{ ft})} = 2133 \text{ psf} = 14.8 \text{ psi}$$

$$Q_u = \frac{1.7(6400 \text{ lb})}{3 \text{ ft} (1 \text{ ft})} = 3627 \text{ psf}$$

$$V_u = Q_u \left( \frac{1}{2} b - d \right) = 3627 \left( \frac{1}{2} (3') - \frac{7}{12} \right) = 3325 \text{ ft/lb}$$

$$M_u = \frac{1}{8} w l^2 = \frac{1}{8} (3627 \text{ psf}) (3')^2 = 4080 \text{ ft/lb}$$

$$\phi V_c = \phi 2 \sqrt{f_c} b d = 0.85 (2) (\sqrt{3000}) (12') (7'') = 7821 \text{ lb/ft}$$

$$V_u \leq \phi V_n \quad 3325 \text{ lb/ft} < 7821 \text{ lb/ft} \text{ Therefore no reinforcement is needed}$$

Loads on PVC pipe from concrete  
P = 14.8 psi

15" PVC pipe SDR 35  
E = 400,000 psi

Modified Iowa Equation  
From Table 7.3

$$\frac{\Delta Y}{D} = \frac{D_o K P (100)}{2 E} + 0.061 E'$$

$$D_o = 1.0$$
$$K = 0.1$$
$$E' = 1000 \text{ psi}$$

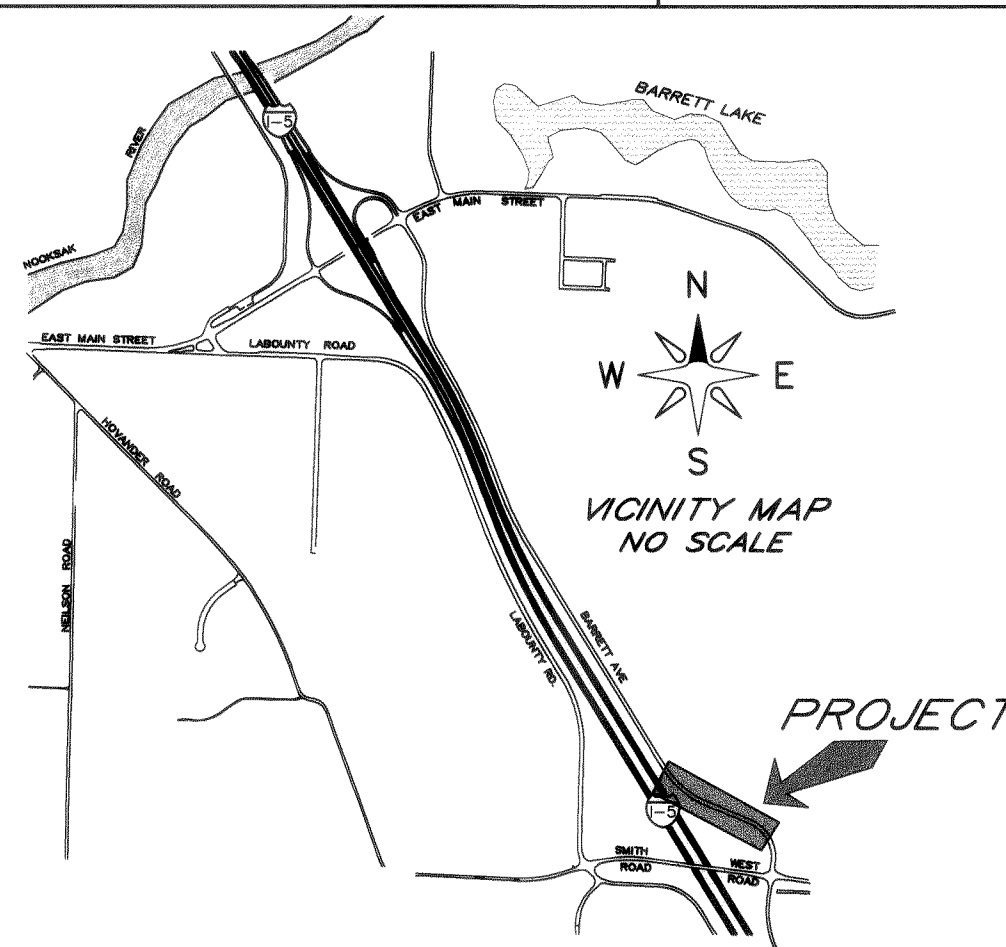
$$\frac{\Delta Y}{D} = \frac{1.0 (0.1) (14.8) (100)}{2 (400,000 \text{ psi})} + 0.061 (1000 \text{ psi}) = 2.2\%$$

$$P_{cr} = \frac{C E}{(1 - \nu^2) (SDR - 1)^3} = \frac{0.83 (2) (400,000)}{(1 - 0.38^2) (34)^3} = 19.7 \text{ psi} > 14.8 \text{ psi}$$

Therefore, a 15" SDR 35 PVC pipe and a 36" wide by 10" deep concrete slab are capable of withstanding the applied H<sub>2</sub>O loading.

CONTRACTOR SHALL RETAIN A SOIL TESTING CO. TO CONDUCT SOIL TESTS ON THE PIPELINE SUBGRADE AT 300 FT INTERVALS & SHALL SUBMIT TESTING RESULTS TO THE ENGINEER FOR APPROVAL. TEST RESULTS SHOULD DEMONSTRATE THAT THE PIPE SUBGRADE SOIL BEARING CAPACITY IS > or = 2,200 PSF

SANITARY SEWER JOB NO. 96106



LEGEND

- PROPOSED WATER MAIN (BY OTHERS)
- EXISTING WATER MAIN
- EXISTING MANHOLE
- EXISTING STORM DRAINAGE CULVERT
- MANHOLE (TO BE CONSTRUCTED)
- SANITARY SEWER GRAVITY MAIN (TO BE CONSTRUCTED)
- CENTERLINE
- LOT LINES (ON SITE)
- PROPERTY/ROW LINE (OTHER)
- SECTION SUBDIVISION LINE
- FINISHED GRADE AT CENTERLINE (PROFILE)

SEE SHEET 13A FOR CONSTRUCTION DETAILS

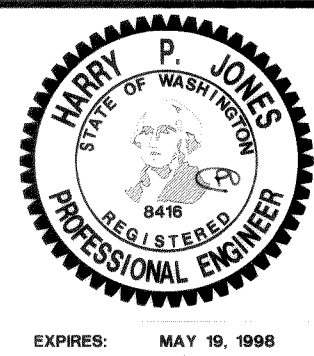
BARRETT ROAD SANITARY  
SEWER EXTENSION

FOR: CITY OF FERNDAL  
CARL D. TEIGE DEVELOPMENT INC. /  
VOYAGERS LANDING

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN ACCURATELY  
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THIS DATE:

HARRY P. JONES, P.E., PLS DATE: MAY 19, 1998



JONES ENGINEERS  
INCORPORATED, P.S.

CONSULTING ENGINEERS

851 COHO WAY, SUITE 307  
BELLINGHAM, WA 98225 (360) 733-8888

BARRETT ROAD SANITARY SEWER

SANITARY SEWER GRAVITY MAIN  
AS-BUILT PLAN & PROFILE MH#14 to MH#16 (end)

DEPARTMENT OF PUBLIC WORKS

FERNDAL,  
WASHINGTON

APPROVED

This plan has been reviewed and found  
to be in conformance with department  
standards.

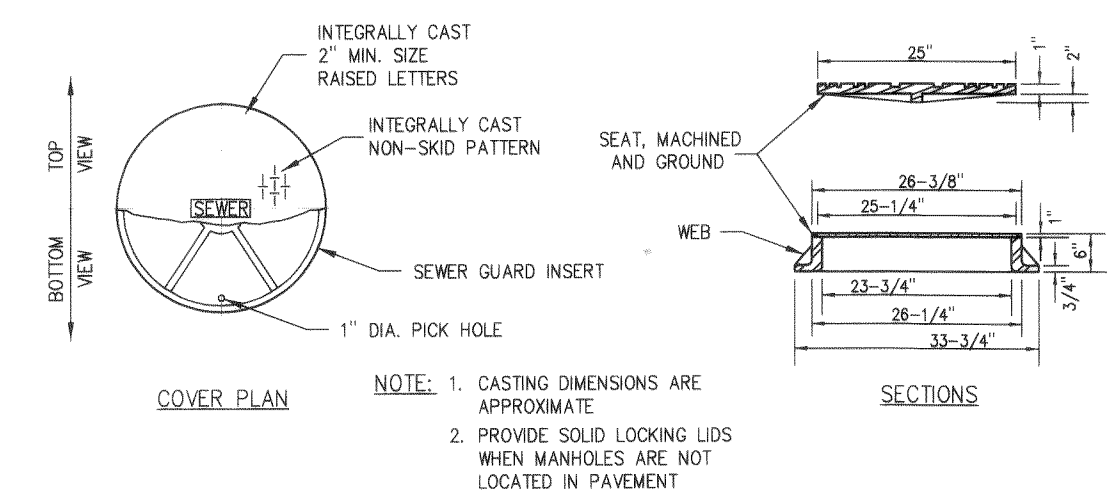
CITY ENGINEER: DATE:

SHEET

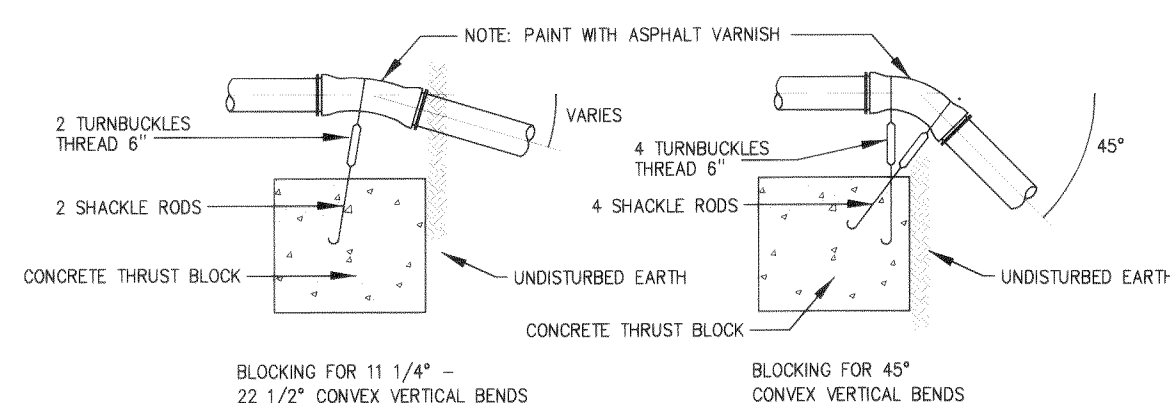
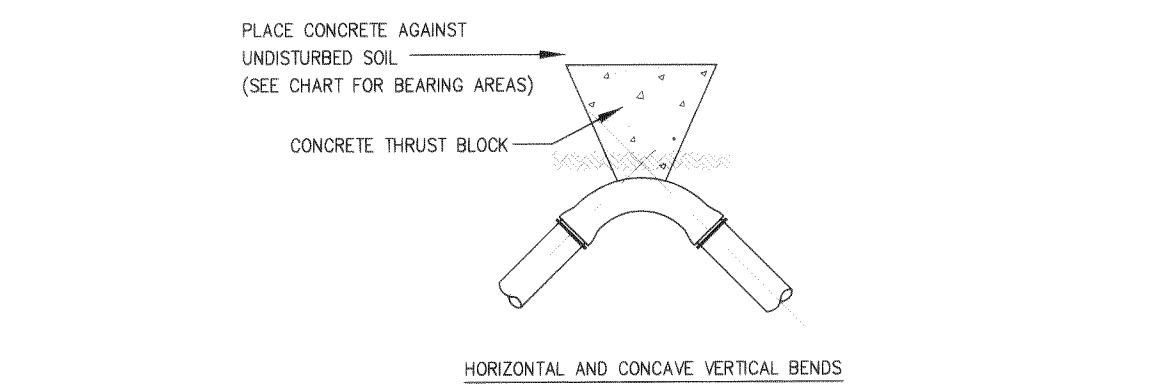
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OF 19

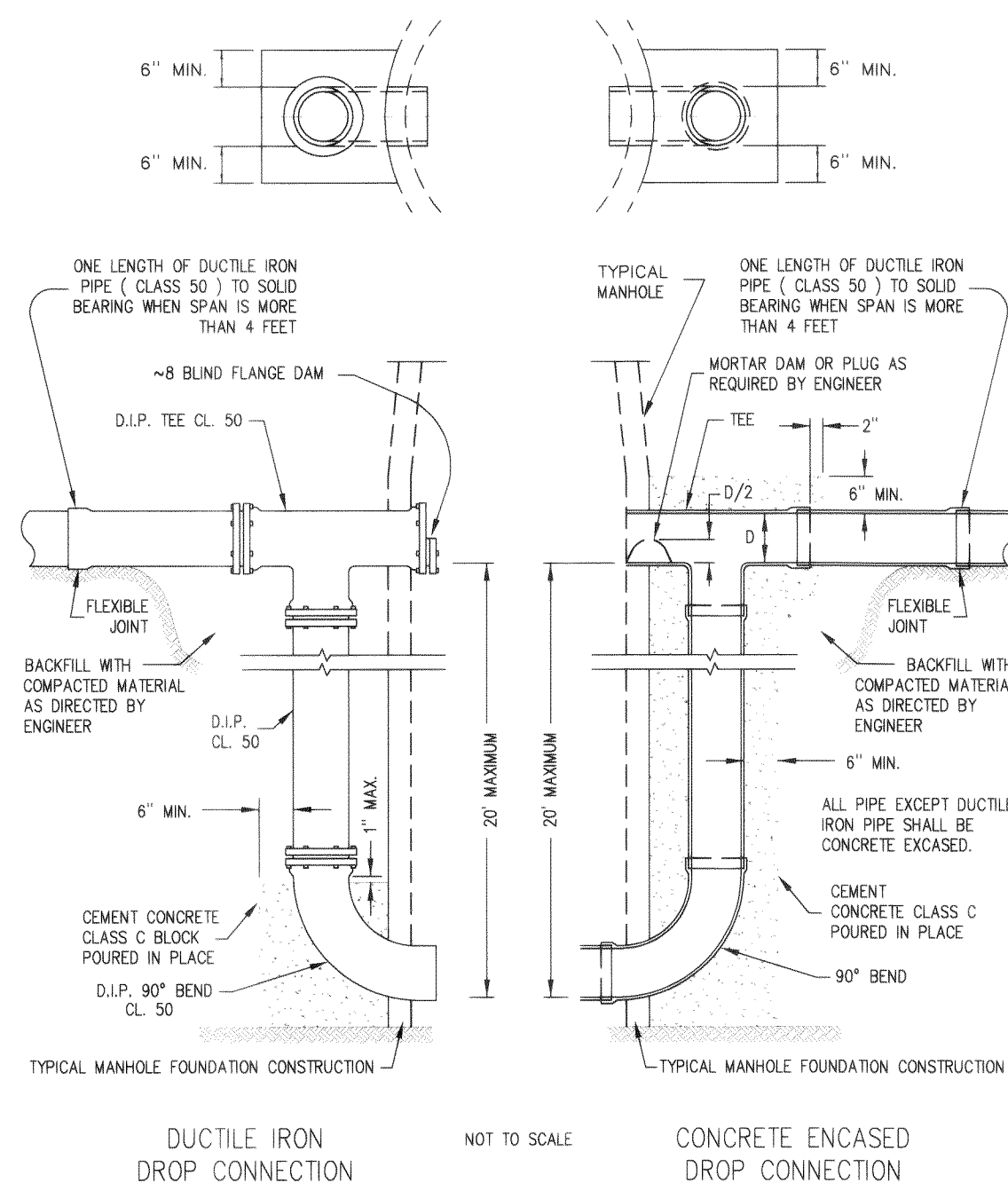
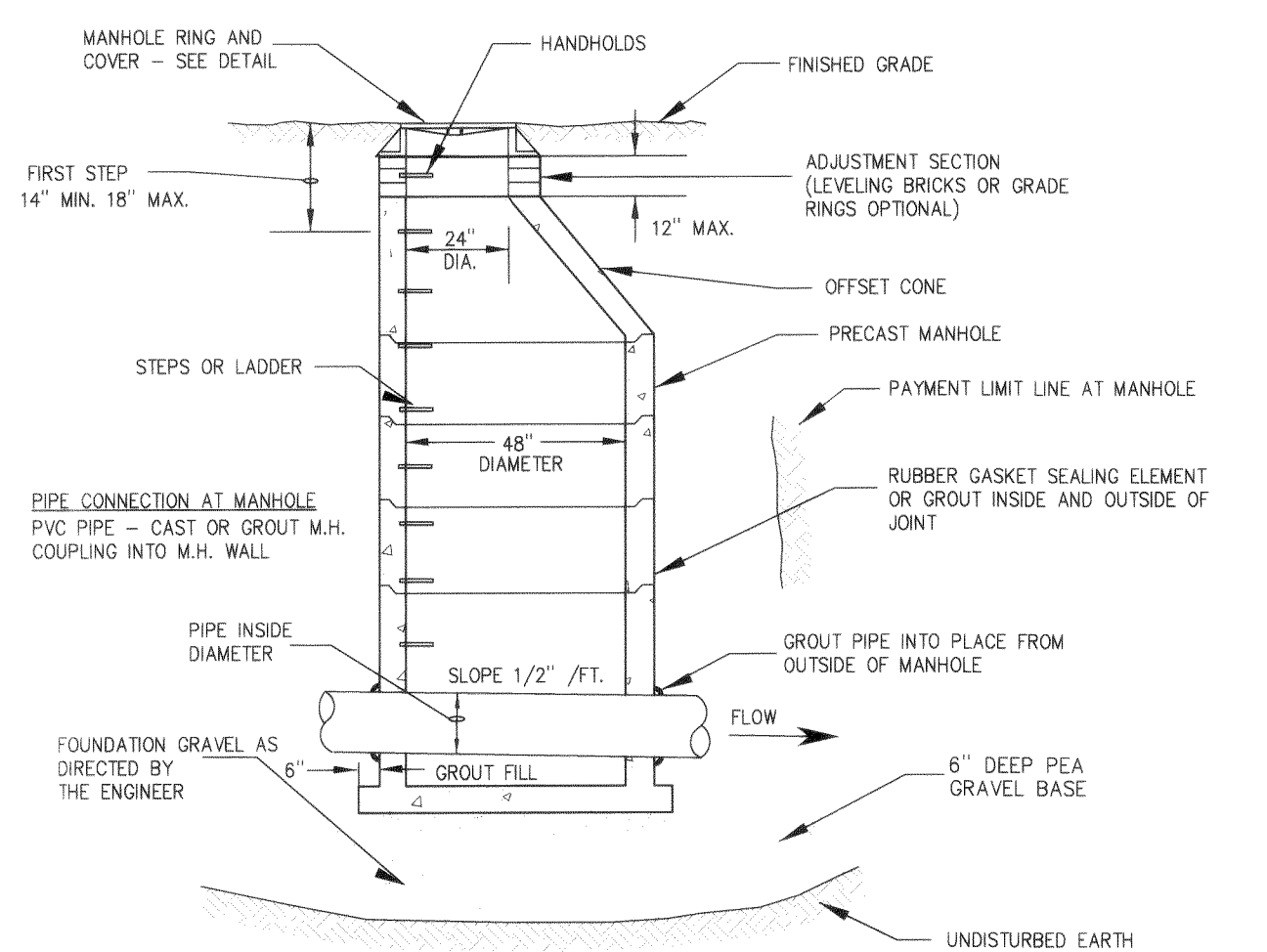




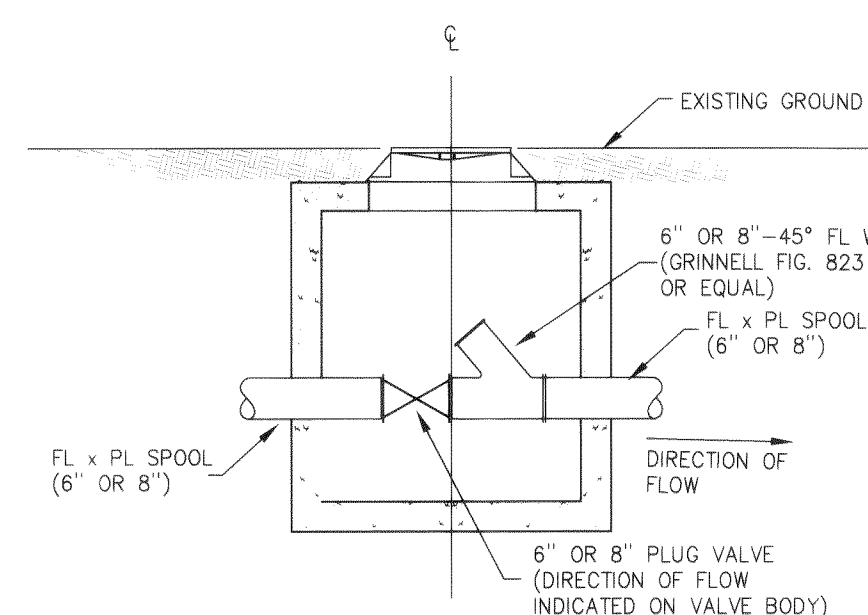
**MANHOLE FRAME AND COVER**  
**DETAIL # 6** NO SCALE



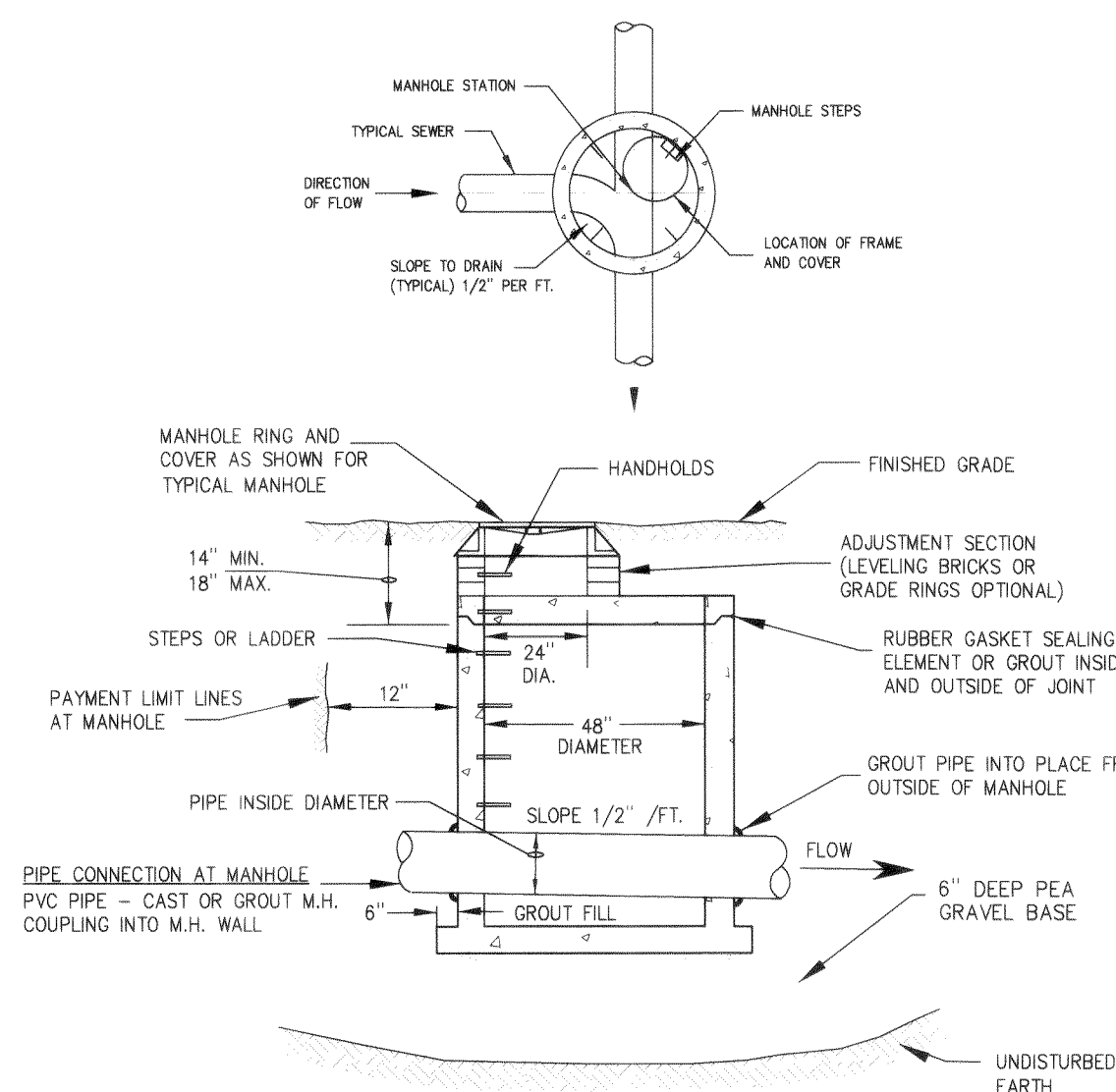
**THRUST BLOCK DETAILS - FORCE MAIN**  
**DETAIL # 8** NO SCALE



**OUTSIDE DROP MANHOLE CONNECTION**  
**DETAIL # 11** NO SCALE

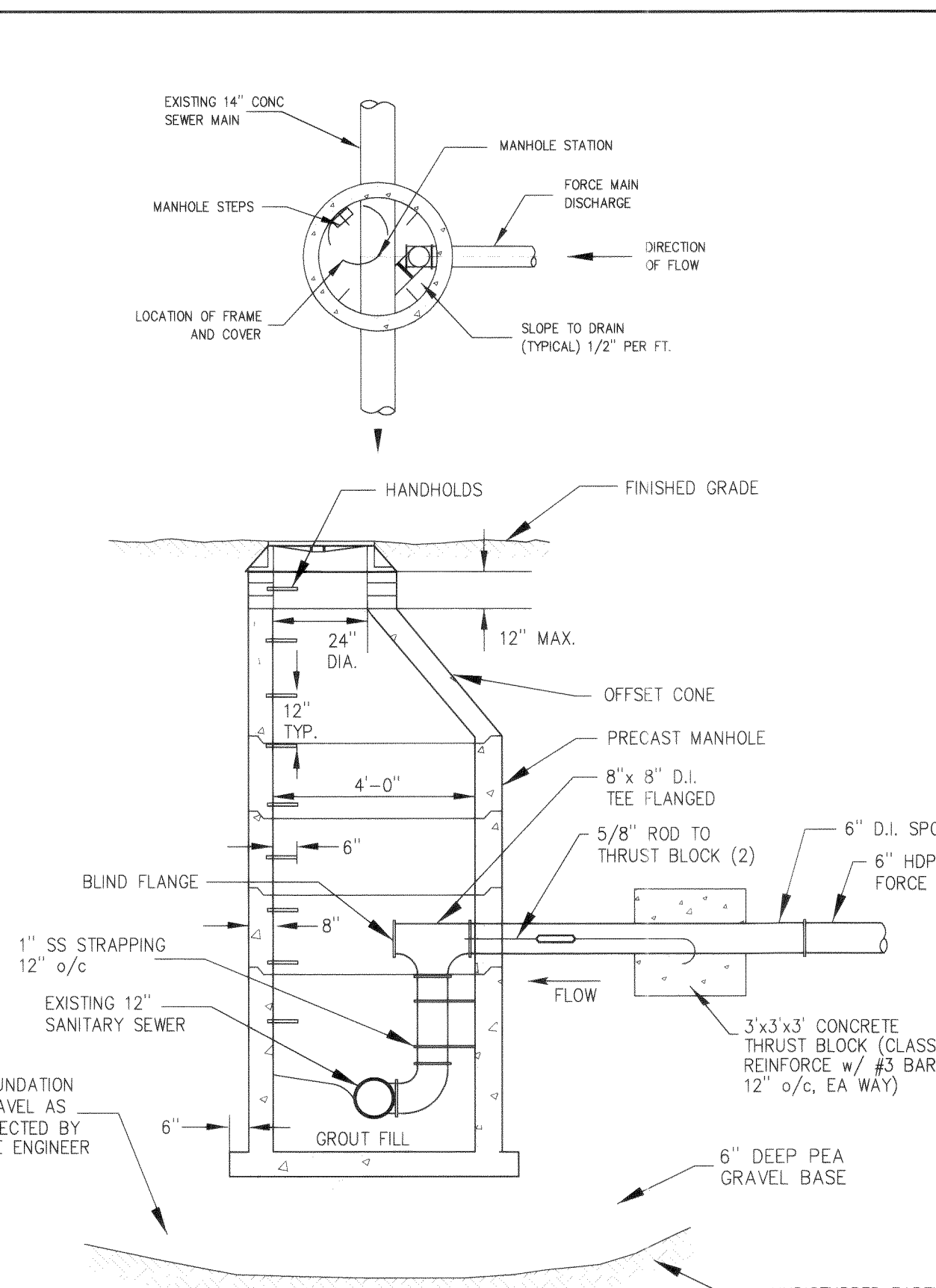
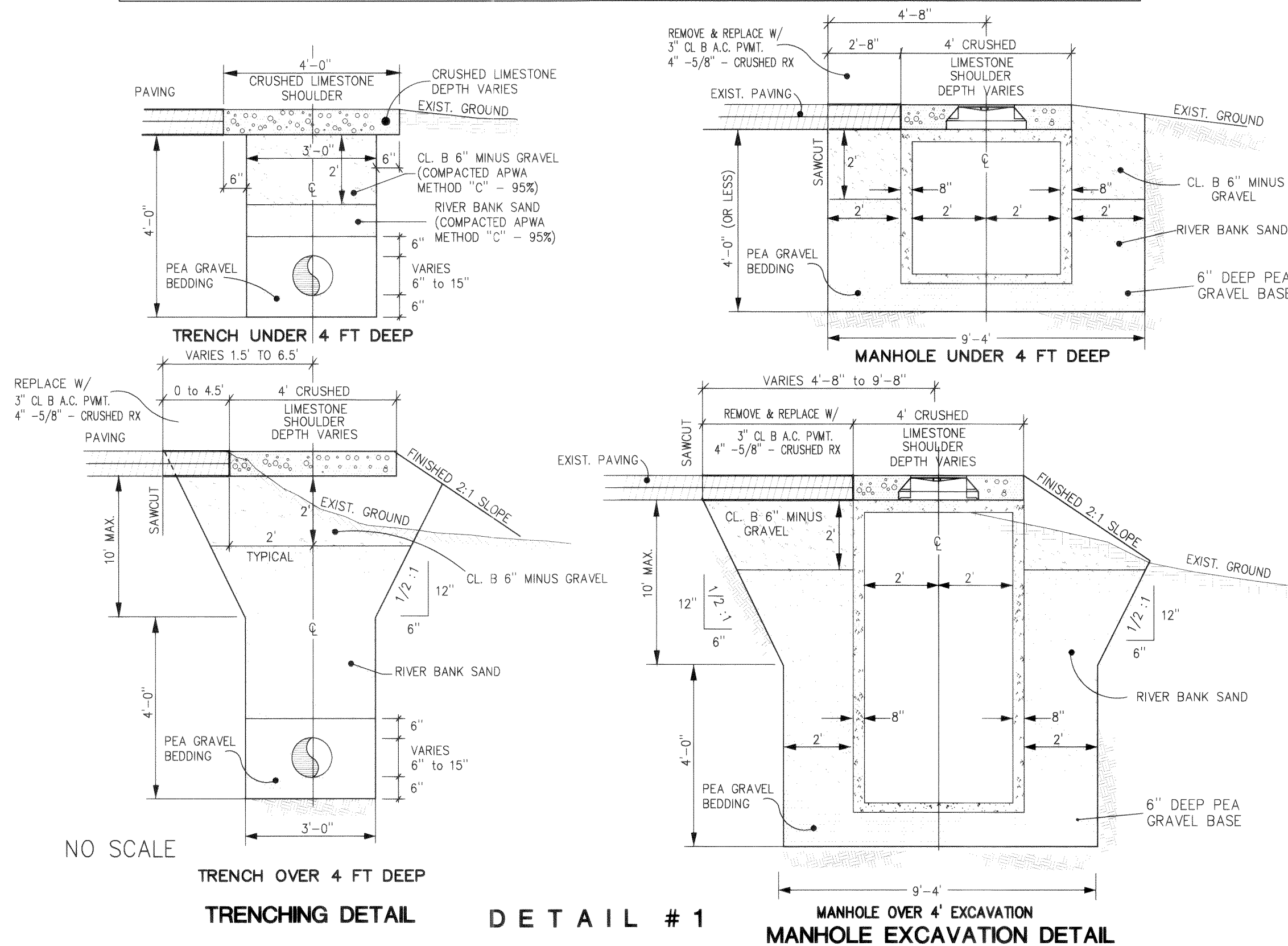


**CLEANOUT FOR 6" OR 8" FORCEMAIN**  
**DETAIL # 7**

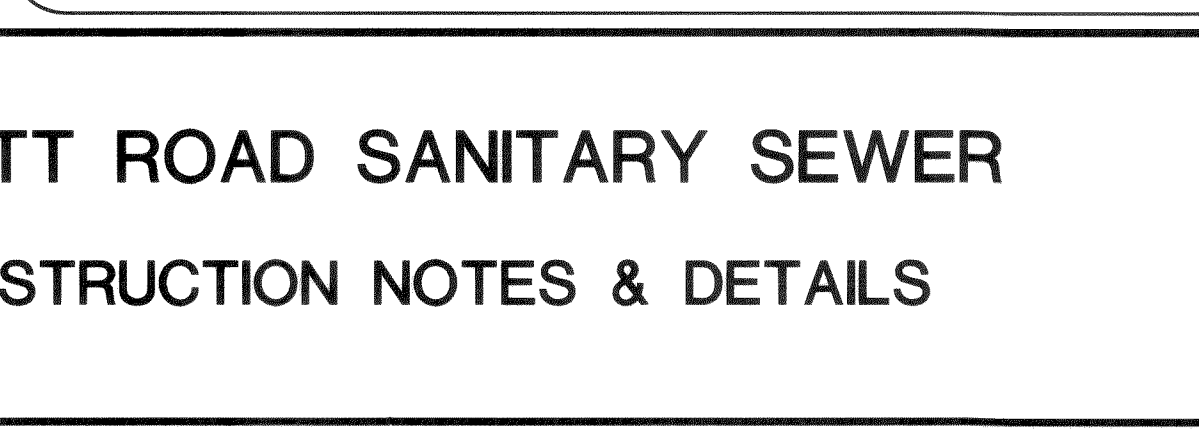
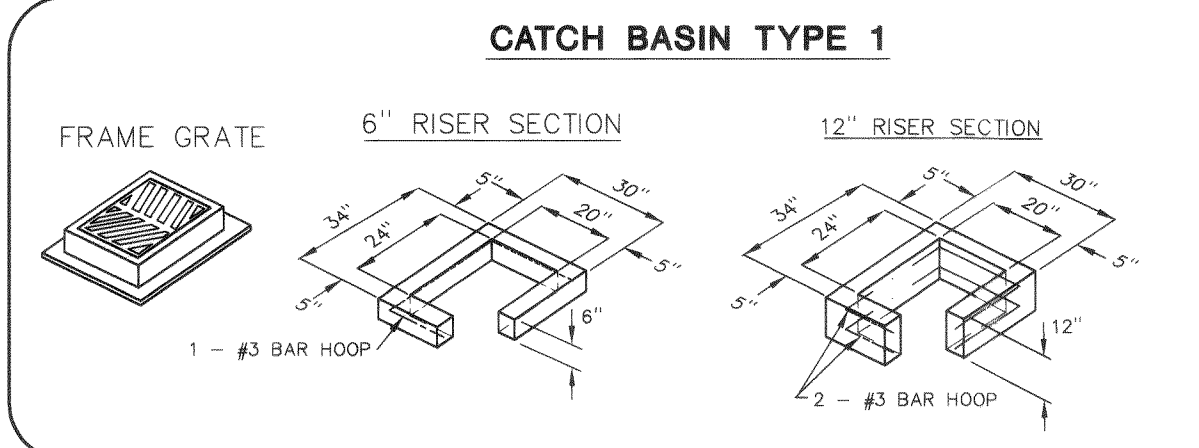
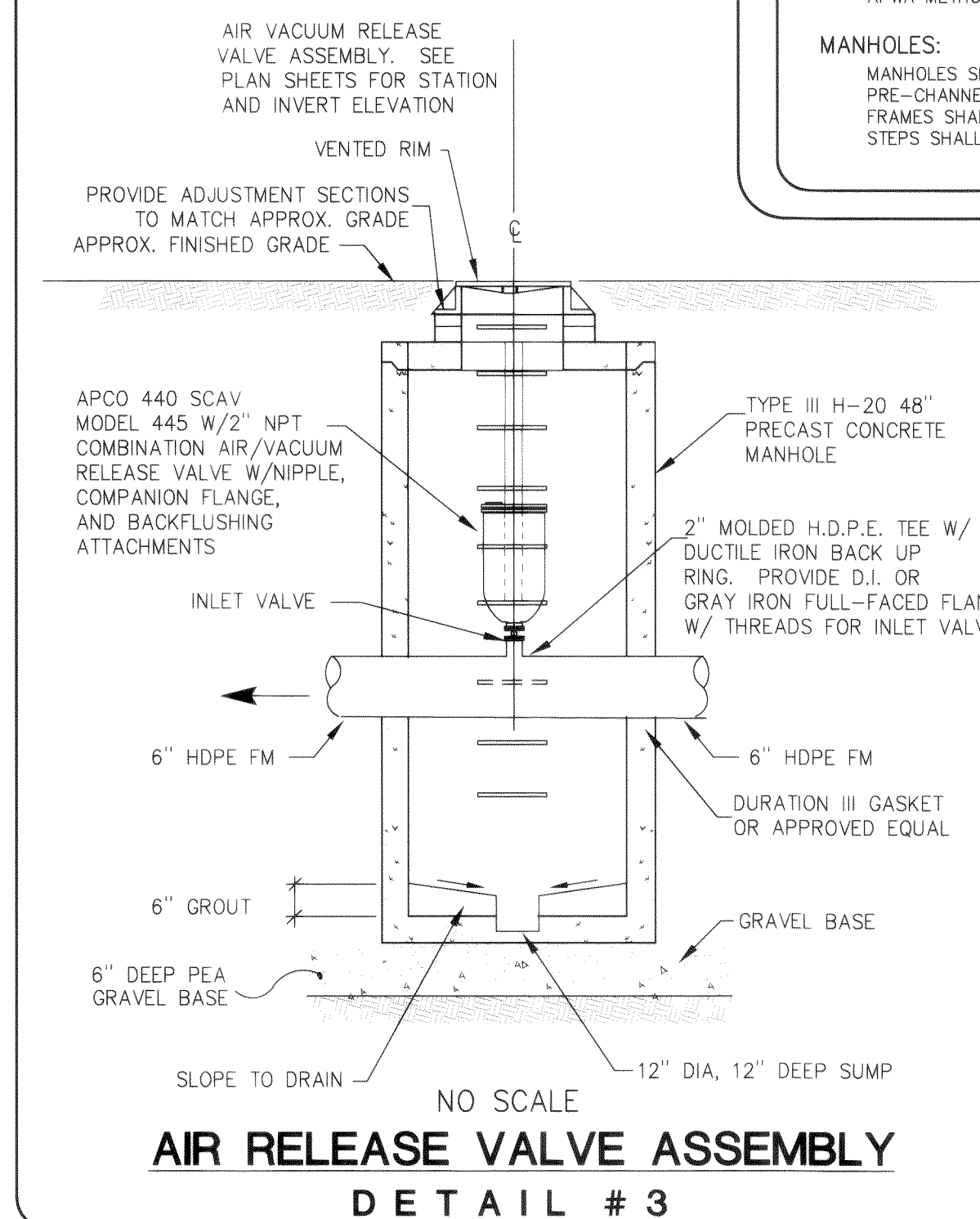


**PRECAST MANHOLE - TYPE 2**  
**DETAIL # 5** NO SCALE

- NOTES:**
1. ALL NATIVE EXCAVATION SHALL BE TRUCKED FROM SITE TO CONTRACTOR PROVIDED DUMP SITE.
  2. ALL TRENCH AND SHOULDER BACKFILL SHALL BE A CL. B GRAVEL & SHALL BE COMPACTED TO 95% - APWA METHOD C.
  3. PAVEMENT SHALL BE SAW CUT, TACKED AND COMPACTED TO 95% OF ABSOLUTE DENSITY.
  4. ROADWAY RECONSTRUCTION SHALL CONSIST OF 2-1/2" OF CL. B A.C. PAVEMENT OVER 2" OF 5/8" MINUS CRUSHED ROCK OVER COMPACTED SUBGRADE.
  5. UPON ROADWAY RECONSTRUCTION CONTRACTOR SHALL PROVIDE CHIP-SEAL COAT AND RE-STRIP THE ENTIRE FOG LINE.



**FORCE MAIN DISCHARGE**  
**DETAIL # 4** NO SCALE



**CONSTRUCTION NOTES**

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH A.P.W.A. STANDARD SPECIFICATIONS, 1996 EDITION.
2. SEWER MAIN SHALL BE A MINIMUM 8 INCHES DIAMETER PVC CONFORMING TO THE PROVISIONS OF ASTM D 3034.
3. TESTING OF THE SEWER SYSTEM SHALL BE DONE IN THE PRESENCE AND UNDER THE SUPERVISIONS OF THE ENGINEER.
4. ALL TRENCHES SHALL BE BACKFILLED WITH CLASS B BANK RUN GRAVEL OR SUITABLE NATURAL MATERIAL AS DIRECTED BY THE ENGINEER, AND COMPACTED TO 95% MODIFIED PROCTOR DENSITY. AS SHOWN IN DETAIL #1.
5. A REVOCABLE ENCROACHMENT PERMIT SHALL BE OBTAINED PRIOR TO COMMENCING WORK IN THE RIGHT-OF-WAY.
6. MANHOLE CONES ARE TO BE OFFSET SUCH THAT LADDER RUNGS ARE PARALLEL TO THE FLOW.
7. BEDDING SHALL BE PEA GRAVEL.

- SPECIAL INSPECTIONS:**  
(SEE DEVELOPMENT STANDARDS, SEC. 304)
- a) CONTRACTOR SHALL NOTIFY ENGINEER 24 HRS. IN ADVANCE OF INSPECTION.
  - b) PIPELINE SUBGRADE
  - c) PIPE BEDDING AND PIPE PLACEMENT
  - d) TRENCH BACKFILL
  - e) ROAD RESTORATION SUBGRADE
  - f) COMPLETION OF CONSTRUCTION
- CITY INSPECTIONS:**  
(SEE DEVELOPMENT STANDARDS, SEC. 302)
- a) UPON COMPLETION OF TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURE.
  - b) UPON COMPLETION OF TRENCHING AND PIPE PLACEMENT AND PRIOR TO BACKFILL OPERATIONS
  - c) DURING BACKFILL OPERATIONS.

- TESTING:**  
CONTRACTOR SHALL NOTIFY PUBLIC WORKS OFFICE 24 HRS. IN ADVANCE OF EACH REQUIRED INSPECTION. (SEE DEVELOPMENT STANDARDS, SEC. 303)
- UPON COMPLETION OF PIPELINE INSTALLATION THE CONTRACTOR SHALL PROVIDE ENGINEER WITH A VIDEOTAPE SEWER SCAN OF ENTIRE GRAVITY MAIN SYSTEM.
- a) AIR TESTING - GRAVITY MAIN  
TESTING SHALL BE IN ACCORDANCE WITH APWA 7.17.3 (4) WITH A RATING OF \_\_\_ PSI
  - b) AIR TESTING - FORCE MAIN  
TESTING SHALL BE IN ACCORDANCE WITH APWA 7.17.3 (4) WITH A RATING OF 64 PSI
  - c) FINISHED TRENCH GRADE/ROADWAY-SHOULDER SUBGRADE:  
CONTRACTOR SHALL PERFORM COMPACTION TESTS AT A MIN. OFF 300 FT O/C & PROVIDE RESULTS TO ENGINEER.

- REVOCABLE ENCROACHMENT PERMIT:**  
CONTRACTOR SHALL OBTAIN A REVOCABLE ENCROACHMENT PERMIT PURSUANT TO DEVELOPMENT STANDARDS, SEC. 704 (b)

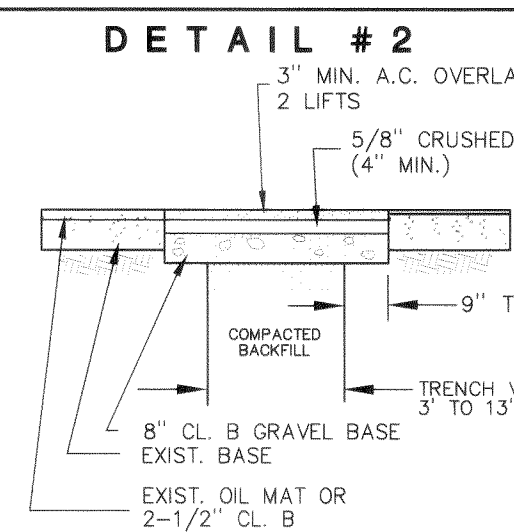
- PIPE MATERIAL & INSTALLATION:**  
GRAVITY STYLE: SDR 35 PVC PIPE SHALL CONFORM TO APWA SEC. 9-05.12 & ASTM D 3034  
FORCE MAIN STYLE: HDPE SDR 17 PIPE SHALL CONFORM TO ASTM SPECIFICATION D2321

- CONNECTION TO EXISTING LIVE SEWER MAIN:**  
CONTRACTOR SHALL INSTALL AS SHOWN ON DETAIL NO. 4, THIS SHEET.

- BEDDING SHALL BE INSTALLED IN ACCORDANCE WITH CITY STANDARD DETAIL SS-1 (APWA B-18c) A MINIMUM OF 4" PEA GRAVEL SHALL BE PLACED BENEATH THE PIPE FOR THE FULL TRENCH WIDTH AND SHALL BE HAND-TAMPED. FULL BARREL SUPPORT ON THE BEDDING MATERIAL SHALL BE ACHIEVED. SUBSEQUENT 6" LIFTS OF PEA GRAVEL SHALL BE PLACED AND COMPACTED TO 90% DENSITY, THESE LIFTS SHALL CONTINUE TO THE SPRING LINE OF THE PIPE. FURTHER LIFTS OF PEA GRAVEL SHALL CONTINUE UNTIL A DEPTH OF 6" OVER THE CROWN OF THE PIPE.**

- TRENCH BACKFILL:**  
SHALL CONSIST OF CLASS B BANK RUN GRAVEL & SHALL BE COMPACTED TO 95% DENSITY APWA METHOD C.

- MANHOLES:**  
MANHOLES SHALL CONFORM TO CITY STANDARD DETAIL SS-2 THRU SS-4 AND SHALL BE PRE-CHANNELED IN ACCORDANCE WITH CITY STANDARD 706-(3) (XII) (C)  
FRAMES SHALL CONFORM TO STANDARD DETAIL SS-9.  
STEPS SHALL CONFORM TO STANDARD DETAIL SS-4.



**PAVEMENT REPAIR DETAIL**  
**DETAIL # 2**

- EXISTING OIL MAT OR ASPHALT CONCRETE PAVEMENT**  
**NOTE:**  
ALL WORK SHALL BE DONE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR UTILITIES IN STREET AREAS"  
PAVEMENT OVERLAY No. 1, TACK ALL EDGES AND A TB BASE SURFACE BEFORE PLACING AC PAVEMENT AND SEAL ALL JOINTS WITH HOT ASPHALT (AR-4000W) BETWEEN EXISTING AND NEW AC PAVEMENT IMMEDIATELY AFTER FINISH ROLLING.  
PAVEMENT OVERLAY No. 2, TACK ALL EDGES BEFORE PLACING AC PAVEMENT AND SEAL ALL JOINTS WITH HOT ASPHALT (AR-4000W) IMMEDIATELY AFTER FINISH ROLLING.

**PAVEMENT REPAIR DETAIL**

- NOTES:**  
CONCRETE INLETS AND CATCH BASINS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478 (ASTM C 1382) & ASTM B90 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATION.  
AS AN ACCEPTABLE ALTERNATE TO REBAR, WELDED FABRIC SHALL BE USED FOR THE MINIMUM AREA OF 212 SQ. INCHES PER FOOT MAY BE USED, WELDED FABRIC SHALL BE USED FOR THE MINIMUM AREA OF 212 SQ. INCHES PER FOOT MAY BE USED, WELDED FABRIC SHALL NOT BE PLACED IN THE JOINTS.  
THE BOTTOM OF THE PRECAST BASE SECTION MAY BE ROUNDED.  
PRECAST BASES SHALL BE FURNISHED WITH GASKETS OR INDICATORS. INDICATORS SHALL BE USED TO CHECK THE STRENGTH OF THE JOINTS. INDICATORS MAY BE ON ALL 4 SIDES WITH MAX. DIAMETER OF 1/4" FOR CONCRETE BASES, 20" FOR CATCH BASINS TYPE 1, 20" FOR THE OTHER TYPES. INDICATORS MAY EITHER BE ROUND OR D SHAPE. PIPE IS TO BE INSTALLED IN FACTORY SUPPLIED INDICATORS.  
CONCRETE INLET/FACTOR BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-620. MATCHING SURFACES SHALL BE FINISHED TO NON-ROCKING FIT.  
THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SHALL NOT EXCEED 1/2" PER FT. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.  
THE MAXIMUM DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5 FT.

DEPARTMENT OF PUBLIC WORKS

FERNDALE, WASHINGTON

**APPROVED**

This plan has been reviewed and found to be in conformance with department standards.

CITY ENGINEER..... DATE.....

SHEET

**13A**

19

**BARRETT ROAD SANITARY SEWER EXTENSION**

**FOR: CITY OF FERNDALE**  
**CARL D. TEIGE DEVELOPMENT INC. / VOYAGERS LANDING**

**JOB # 96106**

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THIS DOCUMENT, CONSISTING OF PLANS, DESIGNS, AND SPECIFICATIONS, SHEETS 1 THRU 19, WAS PREPARED UNDER MY PERSONAL SUPERVISION AND MEETS CITY OF FERNDALE CODES AND STANDARDS AND FURTHER THAT SAID PLANS MEET THE GENERALLY ACCEPTED STANDARDS OF PRACTICE WITHIN THE STATE OF WASHINGTON.

**HARRY P. JONES, PE, PLS** DATE **Aug 1997**



**JONES ENGINEERS INCORPORATED, P.S.**  
**CONSULTING ENGINEERS**  
851 COHO WAY, SUITE 307  
BELLINGHAM, WA 98225 (360) 733-8888

**BARRETT ROAD SANITARY SEWER**  
**CONSTRUCTION NOTES & DETAILS**



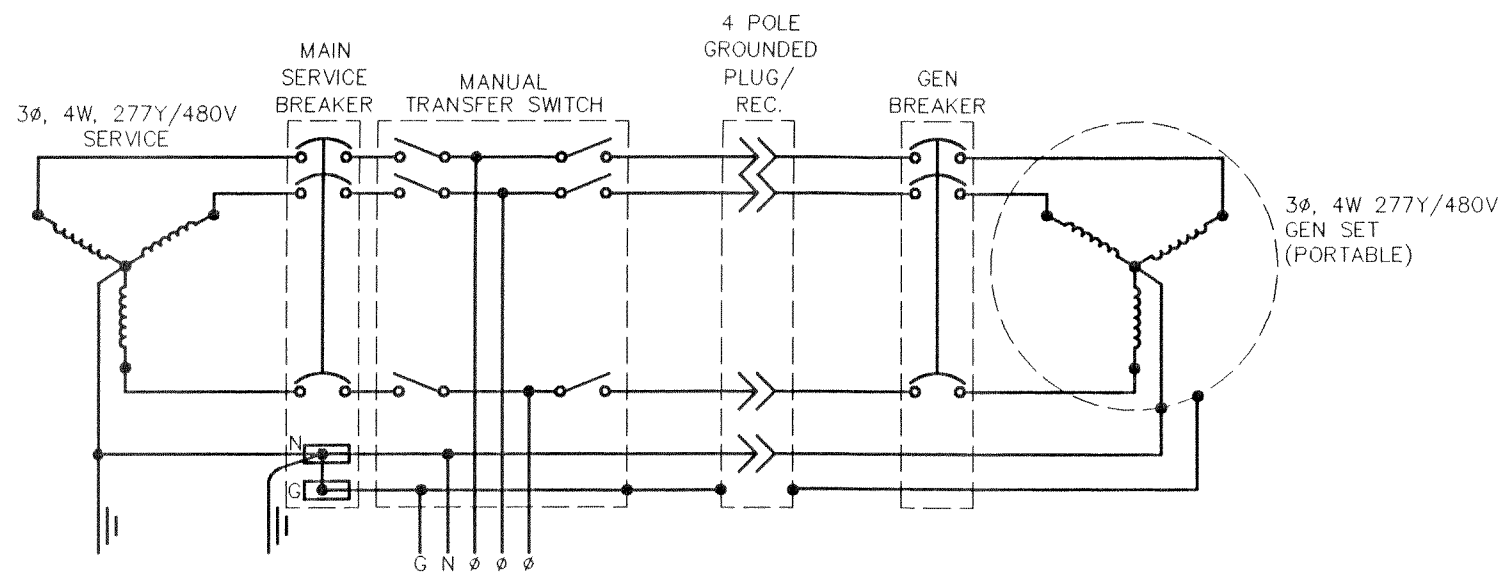
CONDUIT AND WIRE SCHEDULE				
TAG #	CONDUIT SIZE	WIRE SIZE	FROM	TO
F1	1-4" PVC	PUGET PRIMARY	SERVICE POLE	PWR XFMR
P1	1 1/2" C	3#6 AND 1#8 GND NEUTRAL	PWR XFMR	METER
P1A	1 1/2" C	3#6 AND 1#8 GND NEUTRAL	METER	SERVICE BRKR
P2	1 1/2" C	3#6 AND 1#8 GND NEUTRAL	SERVICE BRKR	MTS
P3	1 1/2" C	1#8 GROUND	SERVICE BRKR	GROUND
P4	1 1/2" C	3#6 AND 1#8 GND	GENERATOR REC	MTS
P6	3/4" C	3#12 AND 1#12 GND	MAIN PANEL	PUMP #1
P7	3/4" C	3#12 AND 1#12 GND	MAIN PANEL	PUMP #2
P8				
C1	1" PVC	12#14, 4#12 AND 1#12 GND	MAIN PANEL	WET WELL(FLOATS)
C2	1" PVC	5#14	MAIN PANEL	LIMIT SWITCHES
C3	1" PVC	AS REQUIRED PER MFR.	MAIN PANEL	PUMP OT/LK
C4	1" GRC	ANTENNA WIRE PER MFR.	MAIN PANEL	ANTENNA

LOAD CALCULATIONS

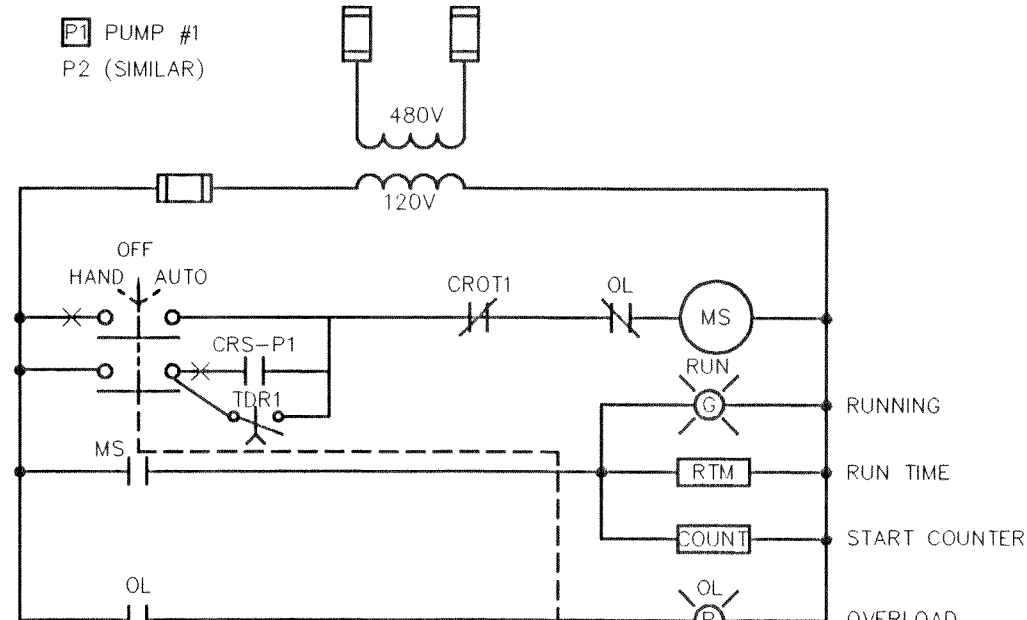
LOAD	HP	KVA	PF	TOTAL KVA
P1	10	12	1.25	15
P2	10	12	1	12
MISC.		1.5		1.5
TOTAL		25.5		28.5
= 35 AMPS @ 480V, 3P				

REVISIONS

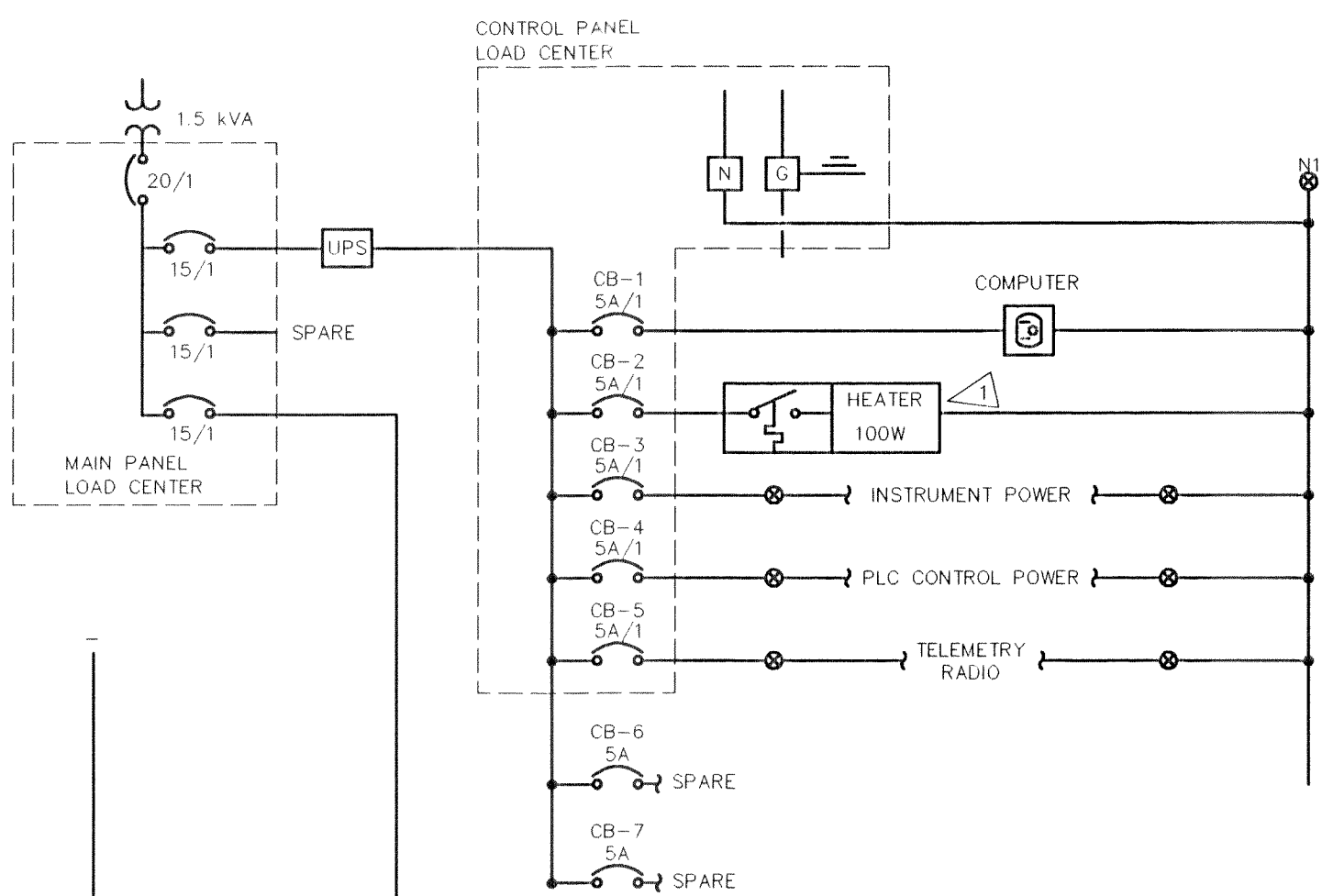
NO	DATE	BY	NOTE
1.			
2.			
3.			
4.			
5.			



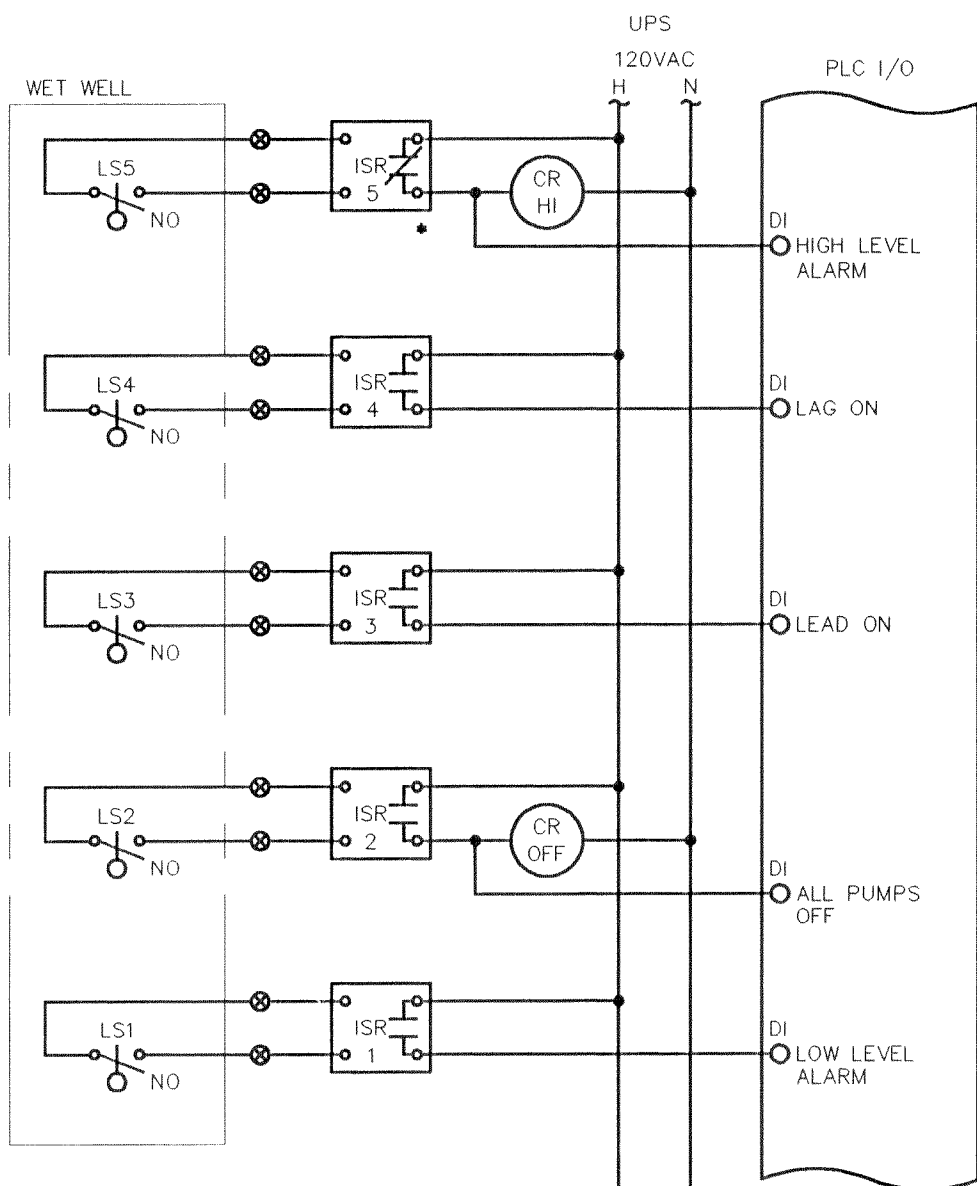
GENERATOR & TRANSFER SWITCH CONNECTION DIAGRAM



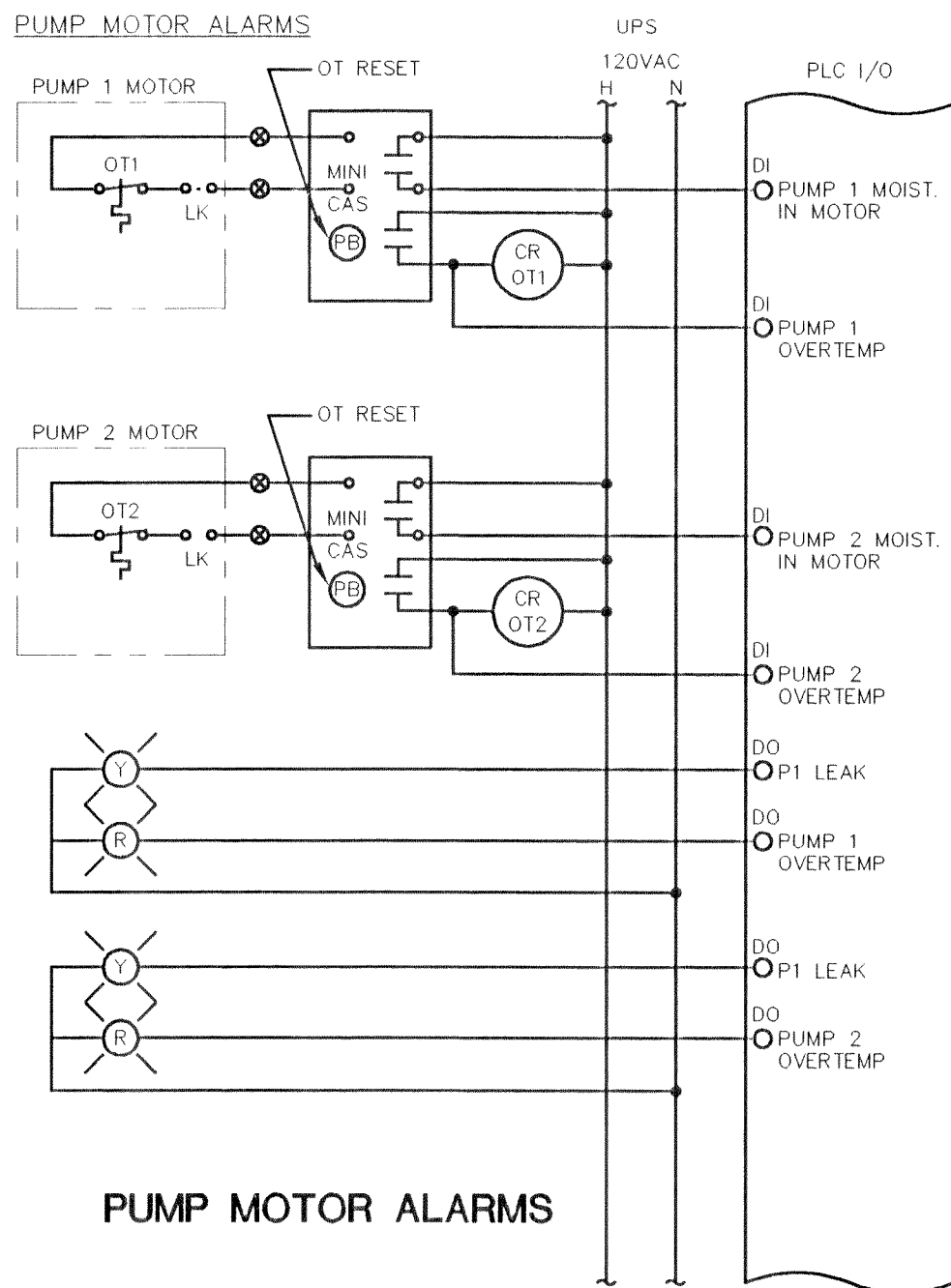
PUMP CONTROL



POWER DISTRIBUTION



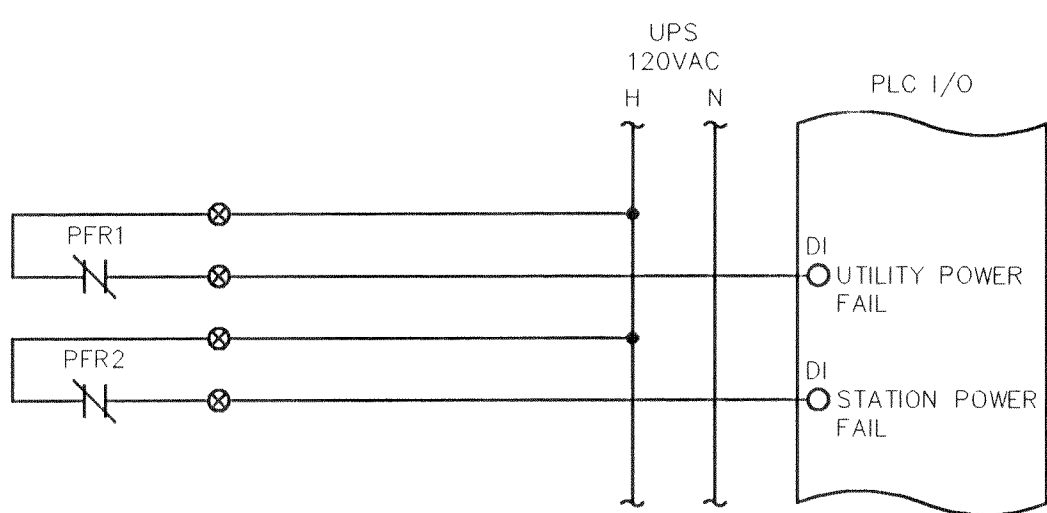
LEVEL CONTROL



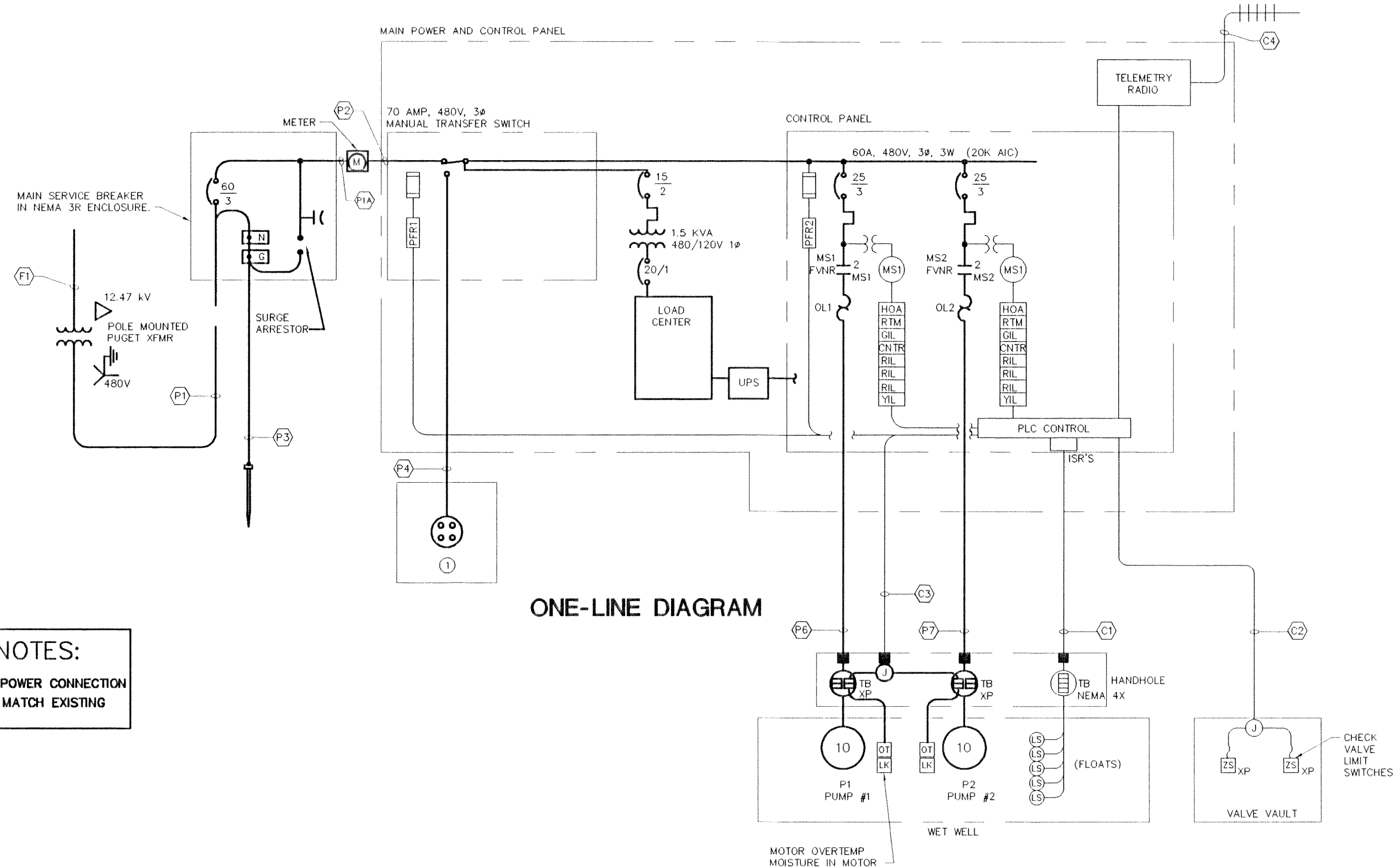
PUMP MOTOR ALARMS

NOTES:  
HEATER WITH BUILT IN THERMOSTAT AND FAN.

NOTES:  
GENERATOR POWER CONNECTION PROVIDE TO MATCH EXISTING PLUG



POWER FAIL



ONE-LINE DIAGRAM

DRAWN BY: B.J. DATE: 2/12/97  
CHECKED BY: V.M.F. DATE: 2/12/97

JOB # 96106

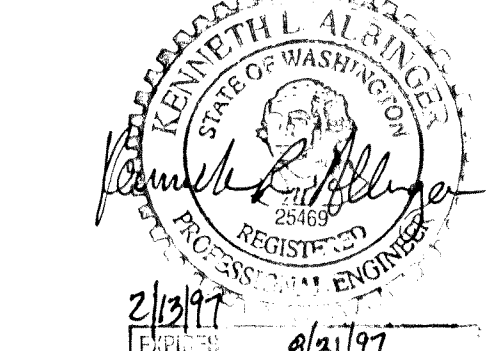
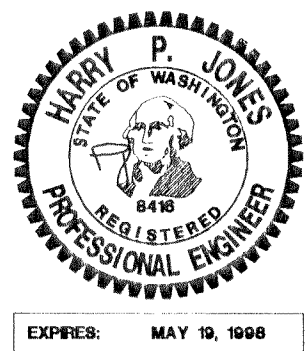
BARRETT ROAD SANITARY SEWER EXTENSION

FOR: CITY OF FERNDAL  
CARL D. TEIGE DEVELOPMENT INC. / VOYAGERS LANDING

PROFESSIONAL CERTIFICATION

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HARRY P. JONES, P.E. February 12, 1997



JONES ENGINEERS INCORPORATED, P.S.  
CONSULTING ENGINEERS  
851 COHO WAY, SUITE 307  
BELLINGHAM, WA 98226 (360) 733-8888

BARRETT ROAD SANITARY SEWER  
LIFT STATION WIRING SCHEDULE  
PUMP CONTROL WIRING DIAGRAM

DEPARTMENT OF PUBLIC WORKS  
FERNDAL, WASHINGTON  
APPROVED

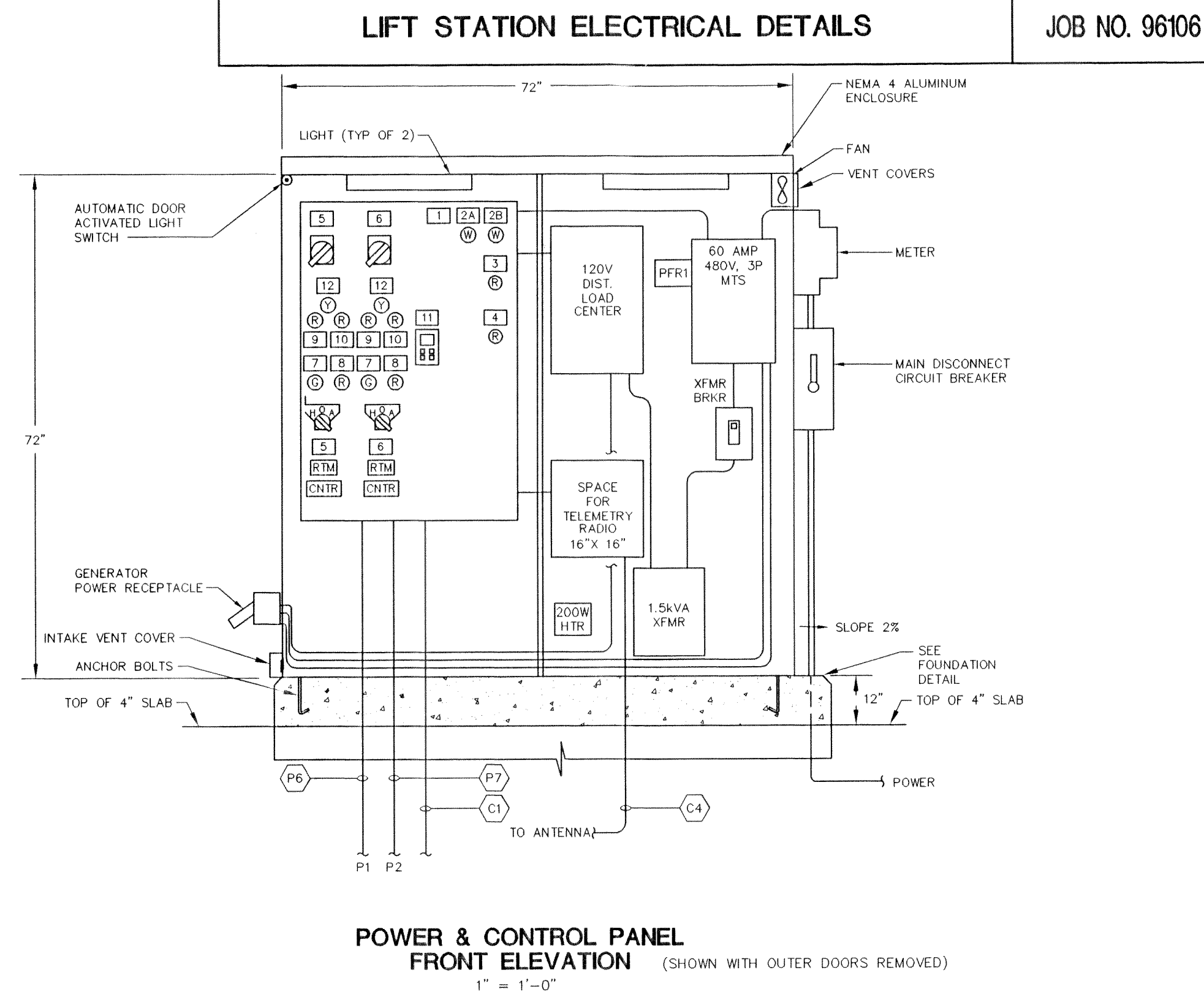
This plan has been reviewed and found to be in conformance with department standards.  
CITY ENGINEER: DATE:

SHEET 17  
OF 19

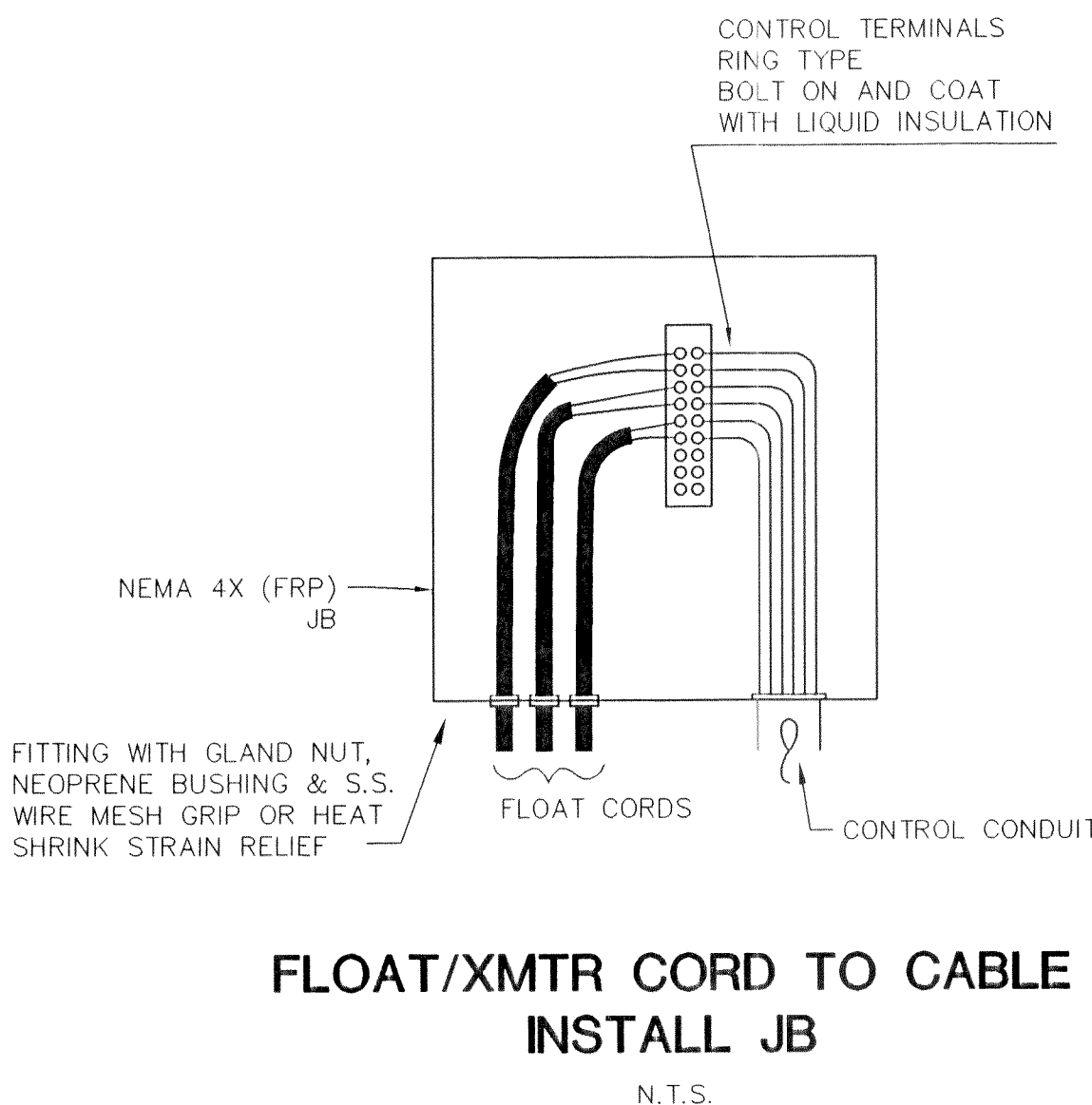
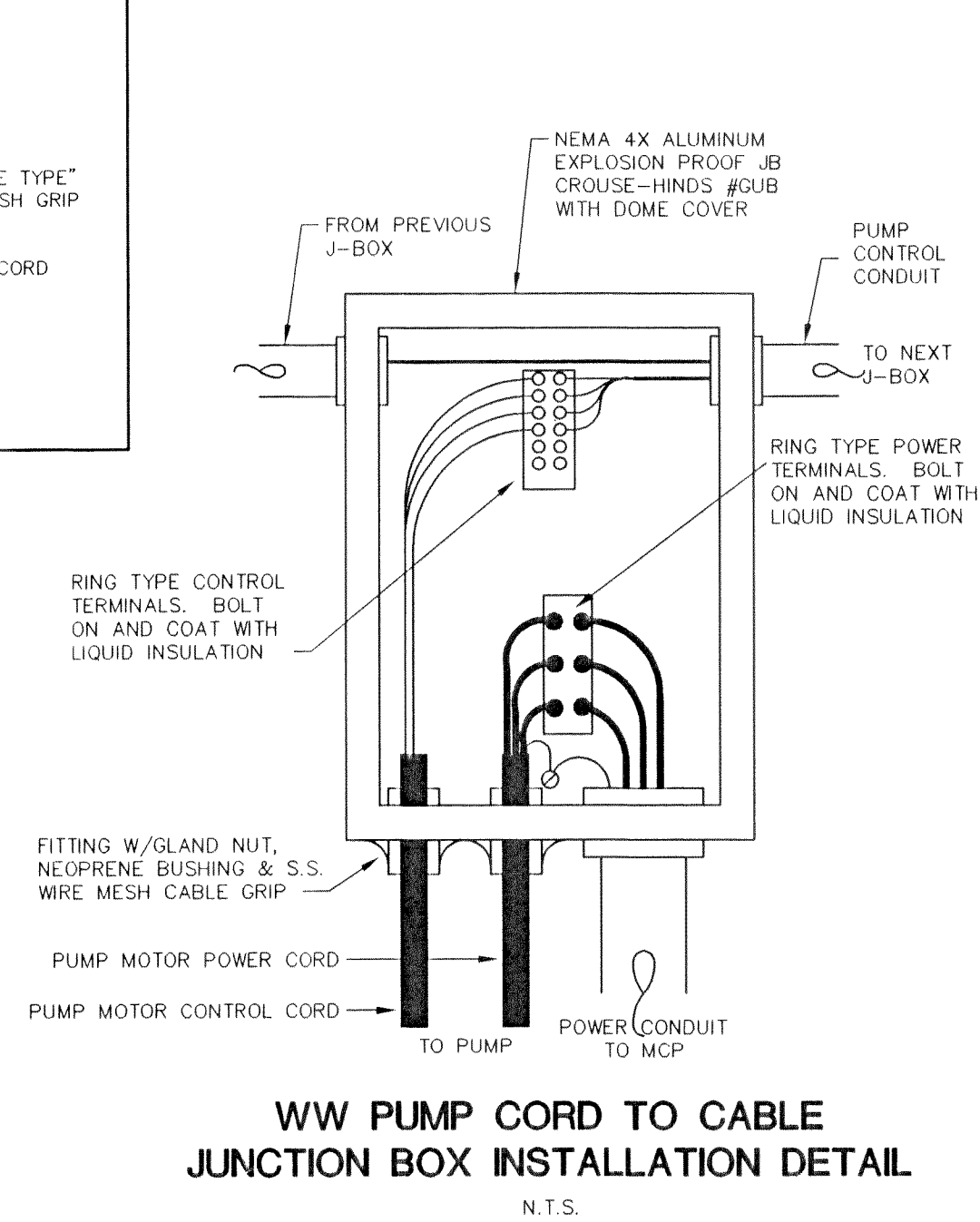
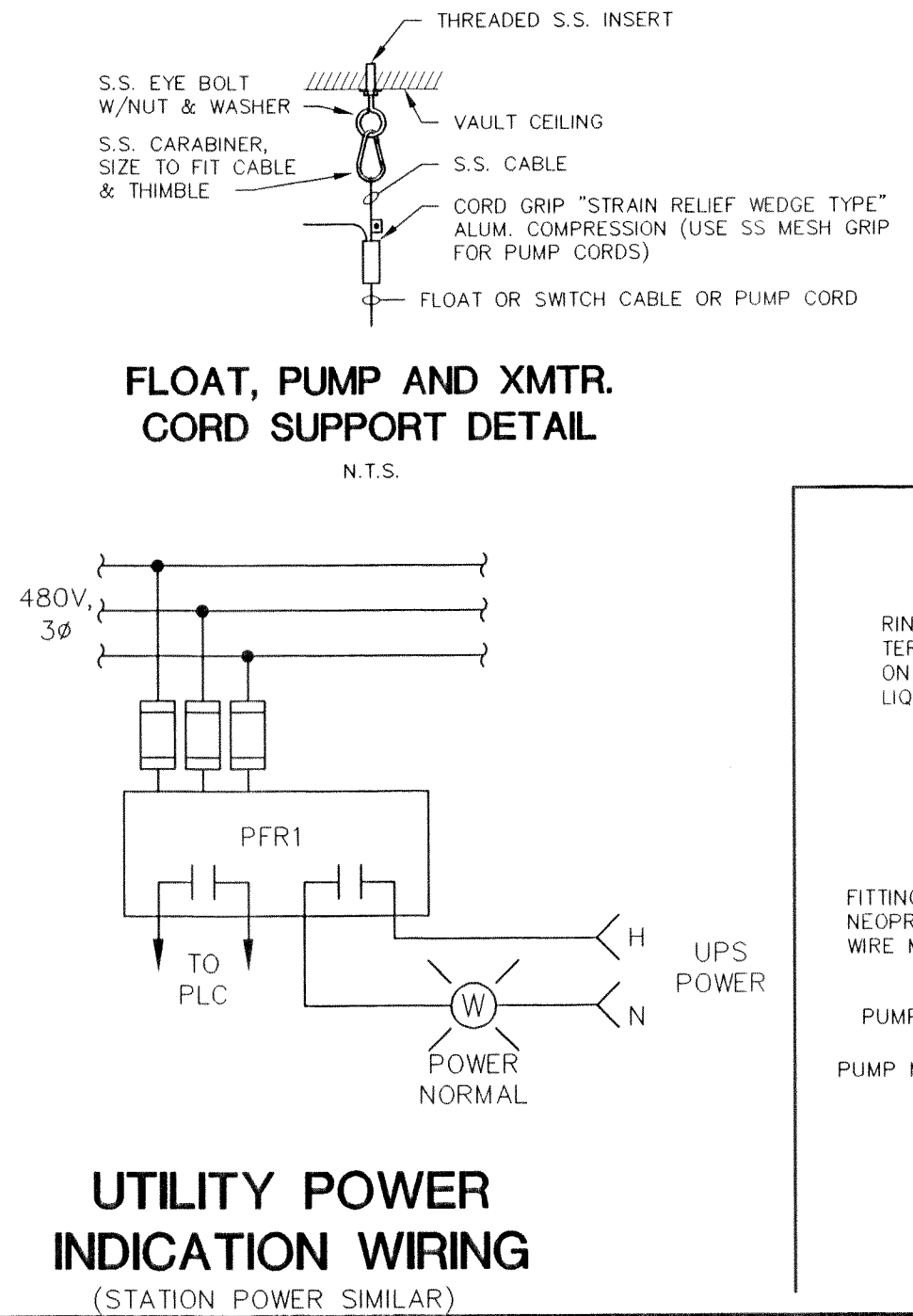
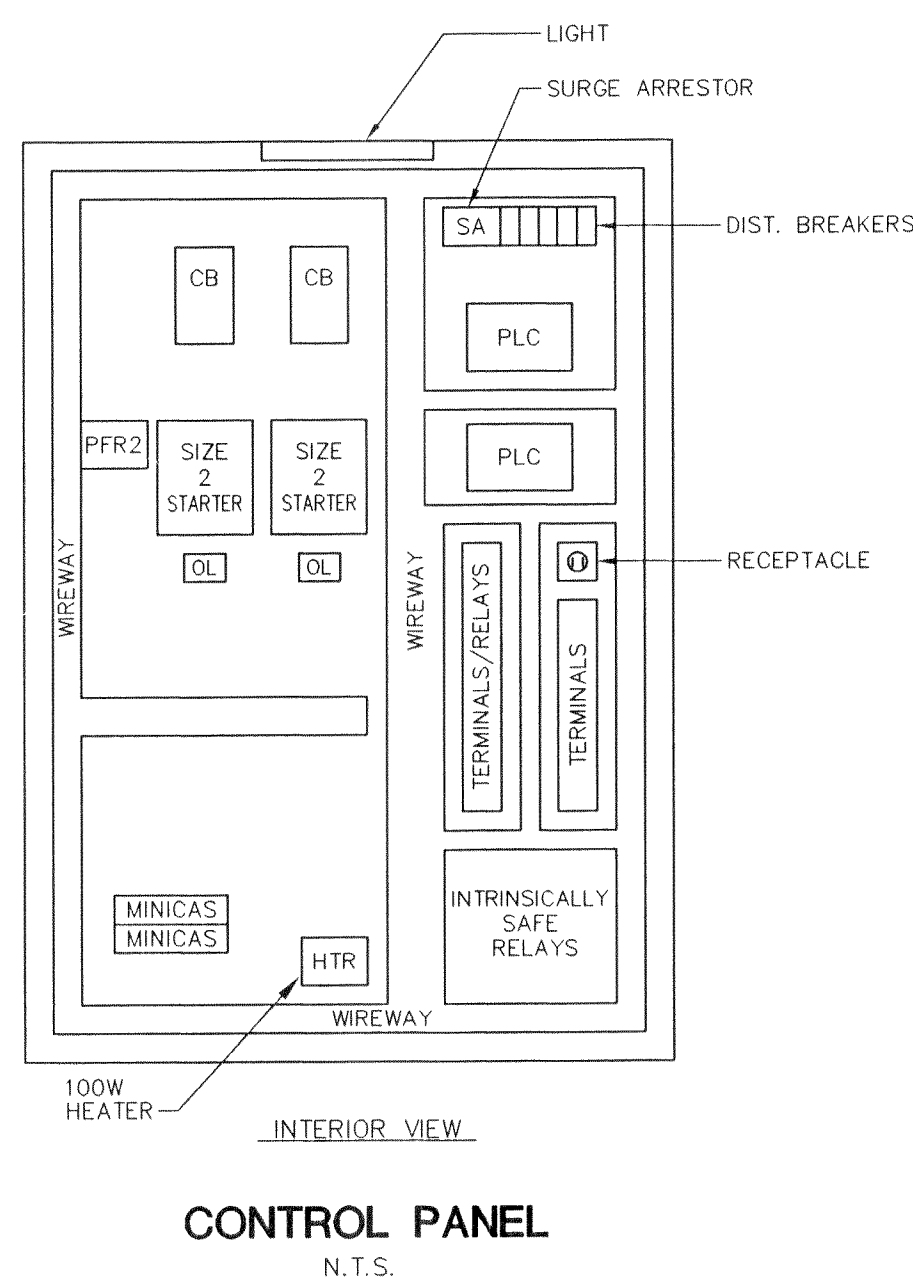
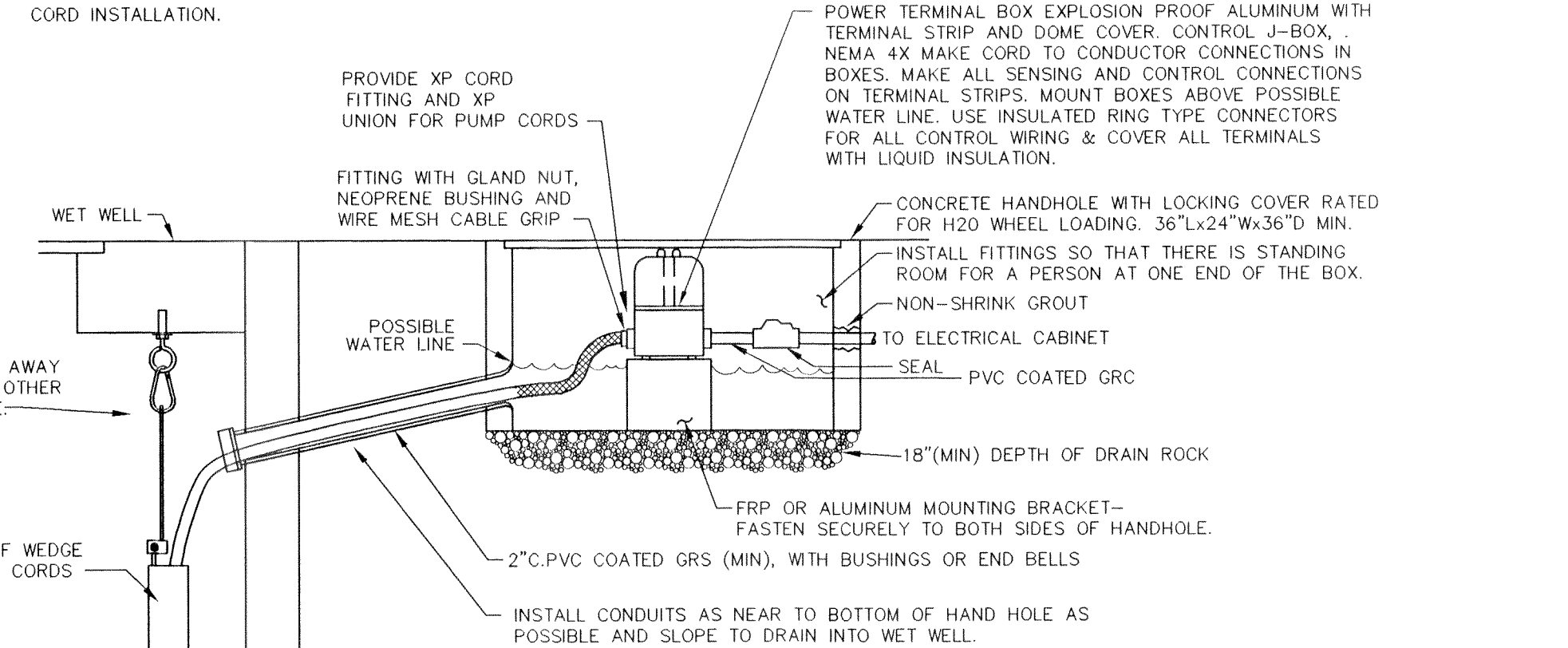


00201.008 2-2-08 JR

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FLUORESCENT LIGHTING FIXTURE, SURFACE. "F1" INDICATES TYPE AS PER LIGHTING SCHEDULE. "2" INDICATES CIRCUITING, "0" INDICATES SWITCHING.		HANDHOLE WITH DESIGNATION. C = CONTROL HANDHOLE (FOR C/S CONDUITS) P = POWER HANDHOLE (FOR P/V CONDUITS) PULL BOX.		GROUND ROD IN GROUND ROD BOX		DOOR SECURITY SWITCH
	FLUORESCENT LIGHTING FIXTURE, RECESSED.		PHOTO ELECTRIC CELL.		BATTERY.		VIBRATION SENSOR
	FLUORESCENT STRIP, SURFACE OR PENDANT AS INDICATED IN FIXTURE SCHEDULE.		FUSE		TRANSFORMER		RESISTANCE TEMPERATURE DEVICE
	FLUORESCENT LIGHTING FIXTURE WITH EMERGENCY BATTERY PACK.		GROUND		120V MOTOR, NUMBER INDICATES HORSEPOWER		OVER TEMPERATURE CUTOUT
	INCANDESCENT OR H.I.D. LIGHTING FIXTURE, SURFACE.		POWER MONITOR & DISPLAY UNIT.		480V MOTOR, NUMBER INDICATES HORSEPOWER		LOCAL EQUIPMENT CONTROL PANEL
	INCANDESCENT OR H.I.D. LIGHTING FIXTURE, RECESSED.		AMMETER.		EXHAUST OR SUPPLY FAN, NUMBER INDICATES HORSEPOWER		INTERCOM STATION
	INCANDESCENT OR H.I.D. LIGHTING FIXTURE, WALL MOUNT.		VOLTMETER.		VSD (VARIABLE SPEED DRIVE)		
	TRACK LIGHT FIXTURE.		METER & SWITCH: A=AMP V=VOLT		ELECTRIC HEATER WINDING		
	EXIT LIGHT.		CONTROL RELAY		GENERATOR		
	EMERGENCY WALL PACK.		PHASE FAIL RELAY & FUSE		SOLENOID VALVE.		
	H.I.D. LIGHTING FIXTURE POLE MOUNTED.		POTENTIOMETER		DISCONNECT SWITCH NON FUSED. NF. (60) INDICATES AMPERAGE RATING.		
	TERMINAL BOX		RUNNING TIME METER		DISCONNECT SWITCH FUSED 200=SWITCH RATING, 100=FUSE RATING.		
	JUNCTION BOX WITH BLANK COVER.		SMOKE DETECTOR		FULL VOLTAGE STARTER / NEMA SIZE MS=MOTOR STARTER CONTACT		
	SURFACE METAL RACEWAY WITH RECEPTACLE AT (X) O.C.		DATA OUTLET		BP=BYPASS CONTACTOR		
	DUPLEX RECEPTACLE "2" INDICATES CIRCUITING		TELEPHONE OUTLET		IC=ISOLATION CONTACTOR		
	DUPLEX RECEPTACLE WITH GROUND FAULT PROTECTION.		SOLENOID VALVE				
	SINGLE RECEPTACLE.		CONDUIT HOME RUN 3/4" C, 2#12 & 1#12 GND. TO PANEL L, CKT. 7 UNLESS SHOWN OTHERWISE.				
	480V, 3ø, RECEPTACLE		CONDUCTORS NOT CONNECTED.				
	208V, 1ø, RECEPTACLE		CONDUCTORS CONNECTED.				
	SINGLE POLE SWITCH.		PULL OUT SWITCH/PLUG-RECEPTACLE CONNECTION				
	THREE WAY SWITCH.		BLOWN FUSE INDICATOR				
	FOUR WAY SWITCH.		TERMINAL IN MCC				
	KEY OPERATED SWITCH.		NORMALLY OPEN CONTACT.				
	SWITCH WITH TIMER.		NORMALLY CLOSED CONTACT.				
	WEATHERPROOF SWITCH.		THERMAL OVERLOAD RELAY				
	PANELBOARD		CKT BKR, RATING, NO. OF POLES.				
	CONDUIT CONCEALED IN WALL OR CEILING. CONDUIT EXPOSED.		THERMAL MAGNETIC CKT BKR TRIP.				
	CONDUIT UNDER FLOOR OR IN FLOOR SLAB. CONDUIT ROUTED UNDERGROUND.		AUTOMATIC TRANSFER SWITCH.				
	SURFACE METAL RACEWAY.		POWER CAPACITOR.				
	SEWER LINE		EXISTING				
	CONDUIT FLEXIBLE.		EXISTING TO BE REMOVED				
	CONDUIT UP.		MOTOR MONITORING UNIT				
	CONDUIT DOWN.						
	CONDUIT CAPPED.						
	CONDUIT SEALS, CLASS 1, DIV.1 EXPLOSION PROOF.						



**WET WELL POWER AND CONTROL**



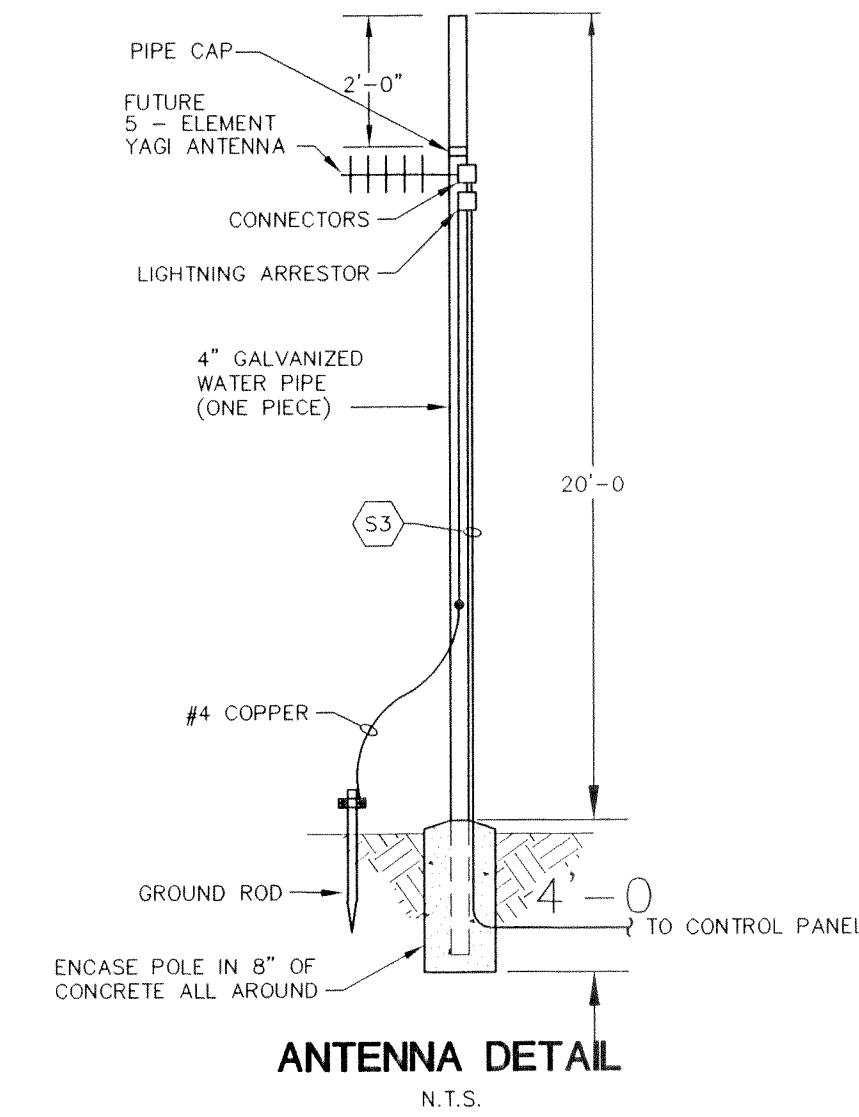
**CITY OF FERNDAL**  
**BARRETT ROAD PUMP STATION**

ENGINEER: - JONES ENGINEERS INC.  
ELECT. ENGINEER: - CASNE ENGINEERING, INC.  
ELECT. CONTRACTOR: -  
INTEGRATOR: -

**PROJECT NAMEPLATE**  
N.T.S.

**NAMEPLATES**

1. (PROJECT NAMEPLATE)
- 2A. UTILITY POWER NORMAL
- 2B. STATION POWER NORMAL
3. HI WET WELL LEVEL
4. LOW WET WELL LEVEL
5. PUMP #1
6. PUMP #2
7. RUN
8. OVERLOAD
9. FAIL TO PUMP
10. MOTOR OVER TEMP
11. TCAM (PLC INTERFACE)
12. MOISTURE SEAL FAILURE



F:\Projects\96106\VTN-DWG-EE-DETS Thu Feb 13 12:48:10 1997 B. JONES