

NOTES TO DESIGN ENGINEER:

A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS.

IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED, AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.

B. THIS DESIGN IS BASED UPON THE LARGEST CAPACITY PUMP FOR THIS STANDARD (RANGE: 2000 - 3499 GPM PER PUMP).

C. LIFT STATION DESIGN IS BASED UPON 16" - 24" NOMINAL PUMP VALVES AND PIPING AS THE SIZES RECOMMENDED FOR THIS STANDARD STATION. THE DESIGN WILL ACCOMMODATE VALVES AND PIPING IF SPECIFIC PROJECT CONDITIONS REQUIRE.

D. DESIGN ENGINEER TO VERIFY THE SIZE AND LOCATION OF THE WET WELL HATCHES ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.

E. THE ACTUAL LOCATION OF THE WET WELL VENTING MAY VARY ACCORDING TO SITE REQUIREMENTS. WHERE POSSIBLE, LOCATE ON THE NORTHWEST SIDE OF THE WET WELL.

F. REPLACE THE 90° ELBOW WITH A FLANGED TEE FOR CONNECTION TO SUBMERGIBLE RELIEF VALVE, OR ALTERNATIVE BYPASS IF REQUIRED. SEE DETAILS, SHEET 2006G AND \_\_\_\_\_.

G. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.

H. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD DESIGN GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.

J. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.

K. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY OTHER OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

NOTES:

1. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
2. CONTRACTOR TO CONFIRM THE SIZE AND LOCATION OF THE WET WELL HATCHES PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
3. INSTALL PLUG VALVES TO OPEN UPWARD AND TO CLOSE TO A SEATING POSITION.
4. INSTALL CHECK VALVES SO THAT THE WEIGHT LEVER POSITION IS APPROXIMATELY 45° BELOW THE VALVE HORIZONTAL CENTER LINE IN THE CLOSED POSITION; AND APPROXIMATELY 45° ABOVE THE VALVE HORIZONTAL CENTER LINE IN THE FULL OPEN POSITION.

PLAN VIEW @ GRADE  
3 PUMPS @ 2000 - 3499 GPM PER PUMP  
ALTERNATE HIGH PROFILE CONFIGURATION

PROJECT NO. R-0267-XX-X

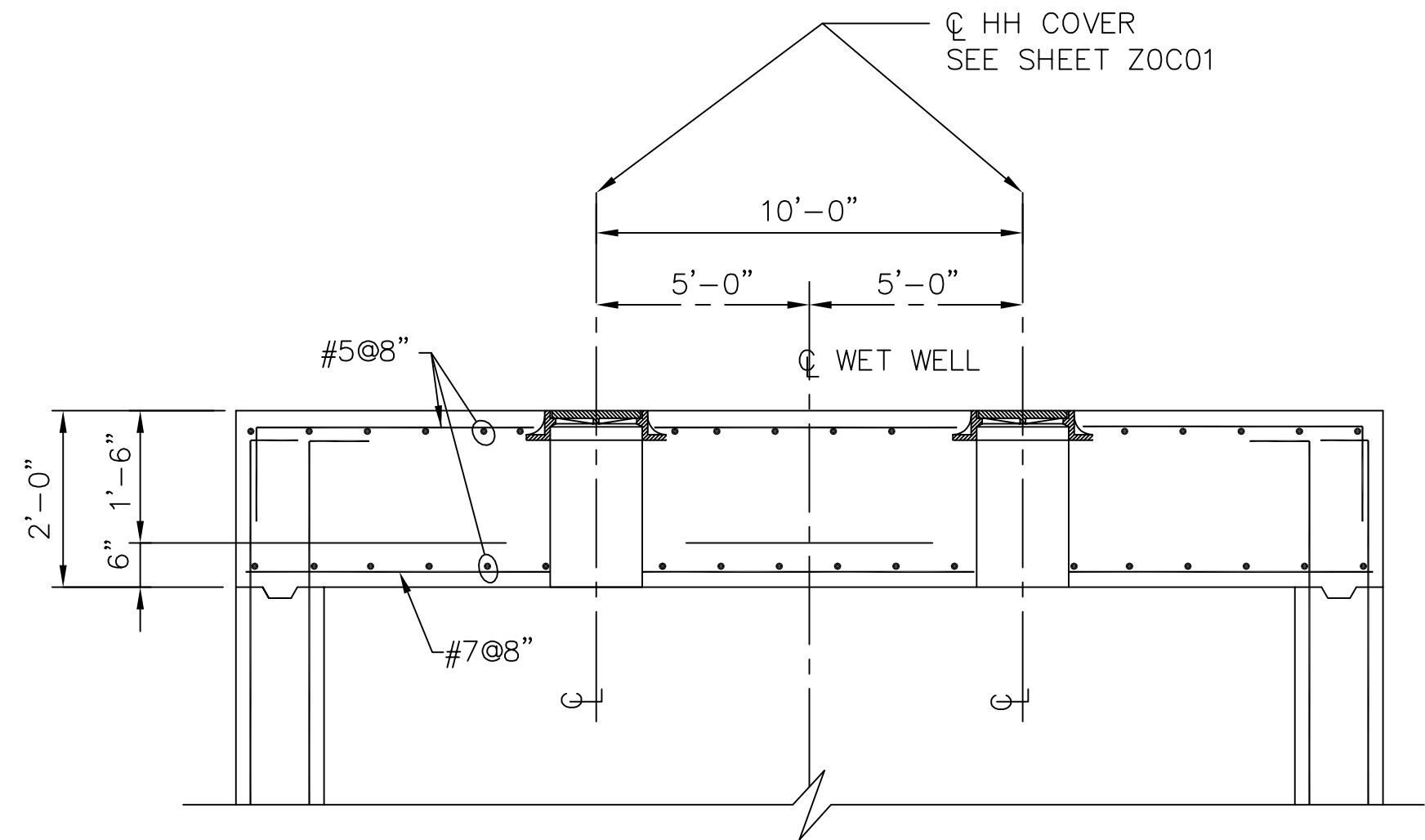
TITLE CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

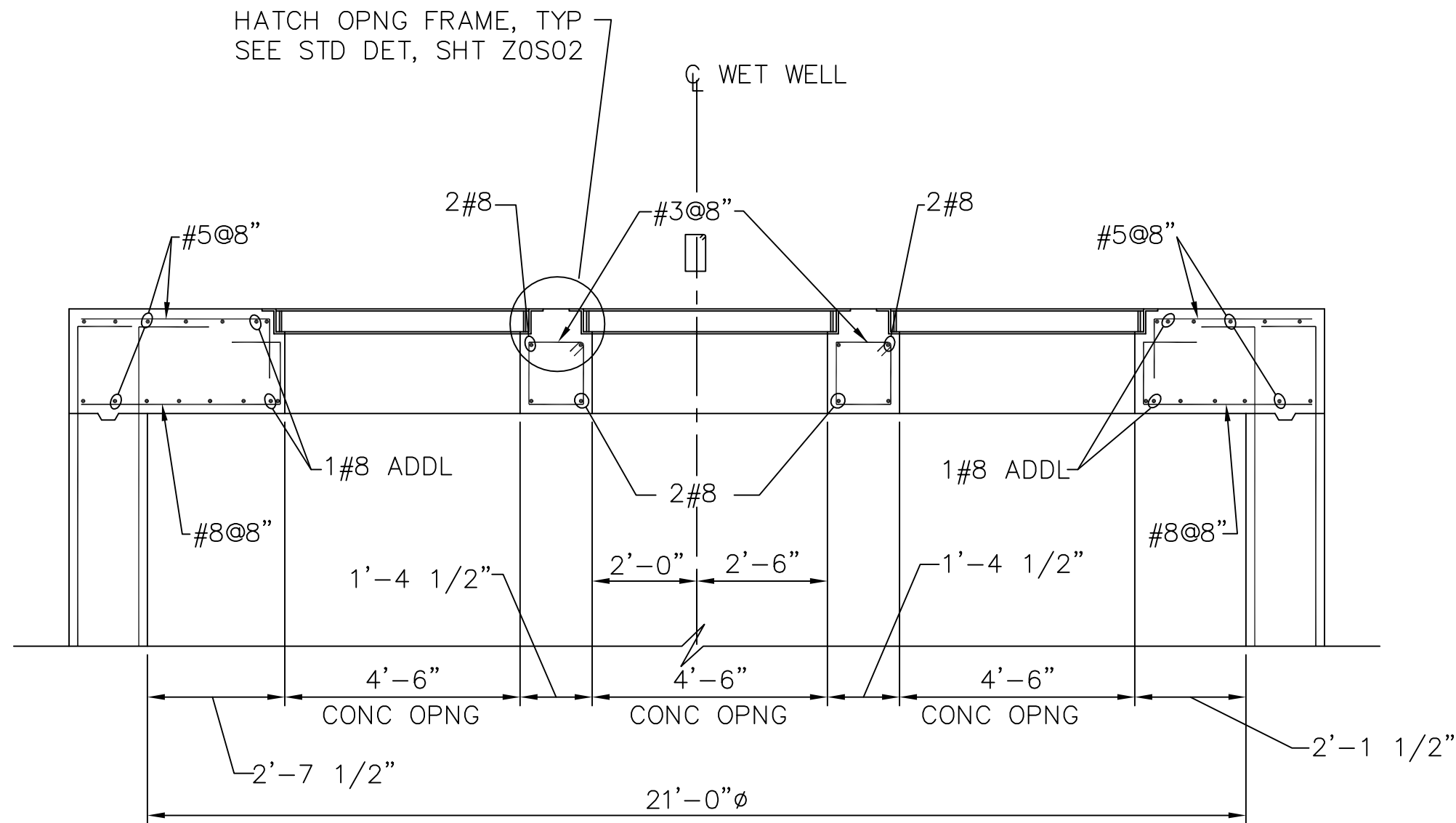
DESIGN ENGINEER TO INCLUDE COMPANY  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

REV. NO.	DESCRIPTION	APP'D	DATE

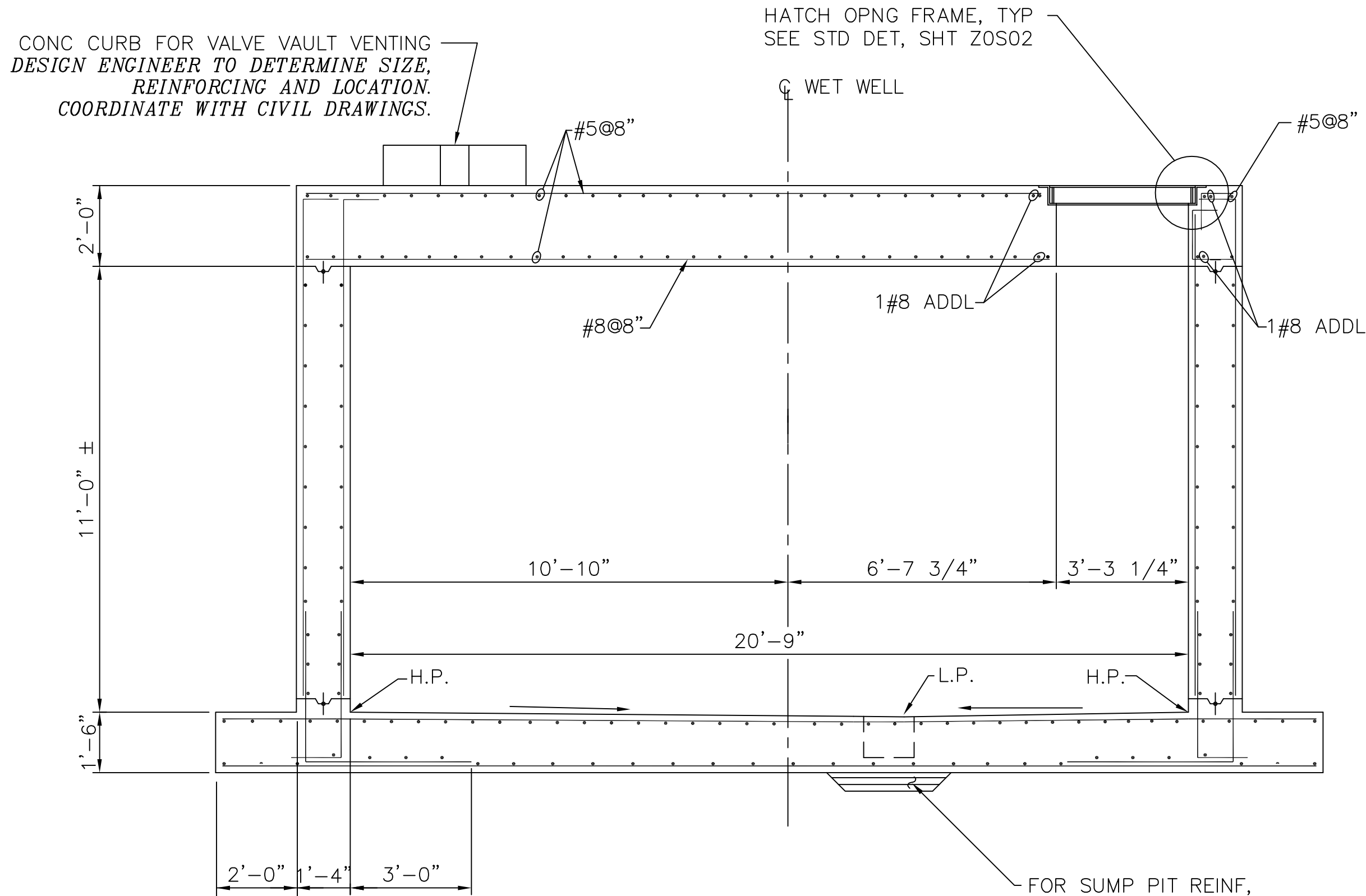
SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE: DECEMBER, 1996	SHEET NO. OF SHEET
SURVEY BY:	DWG. NO. H1C01
FIELD BOOK NO.	



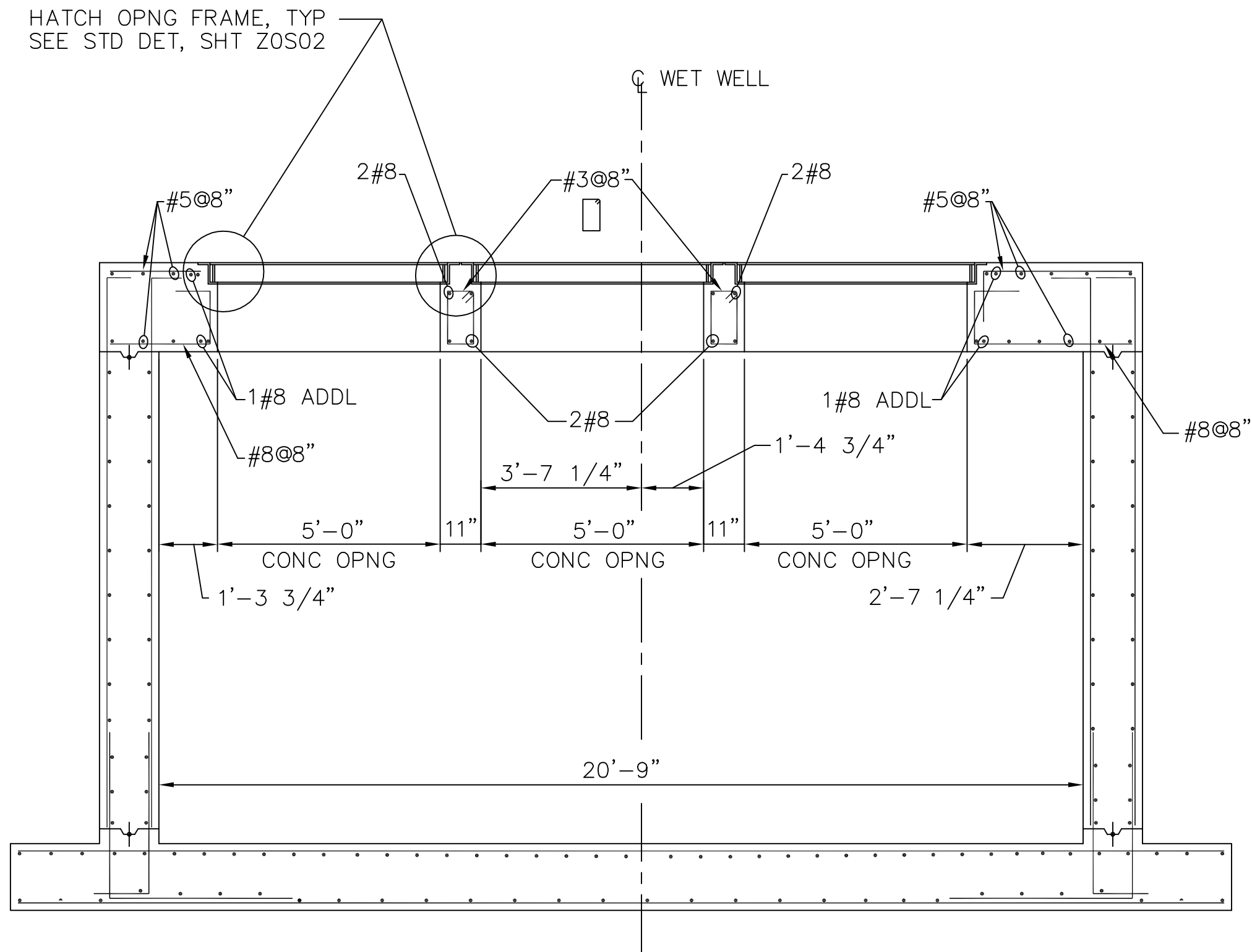
SECTION B  
H3S01



SECTION C  
H3S01



SECTION D  
H3S01



SECTION E  
H3S01

NOTES TO DESIGN ENGINEER:

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- B. DESIGN ENGINEER TO VERIFY THE SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- C. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- D. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- E. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- F. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

NOTES:

1. FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET ZOS01.
2. DESIGN ENGINEER TO VERIFY THE SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
3. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.

STRUCTURAL
3 PUMPS @ 2000 - 3499 GPM PER PUMP ALTERNATE LOW PROFILE CONFIGURATION
PROJECT NO. R-0267-XX-X
TITLE CITY OF HOUSTON DESIGN GUIDELINE DRAWINGS FOR SUBMERSIBLE LIFT STATIONS
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

CADD DWG. FILE NO. :  
H3S04.DWG

COHSTD.BDR

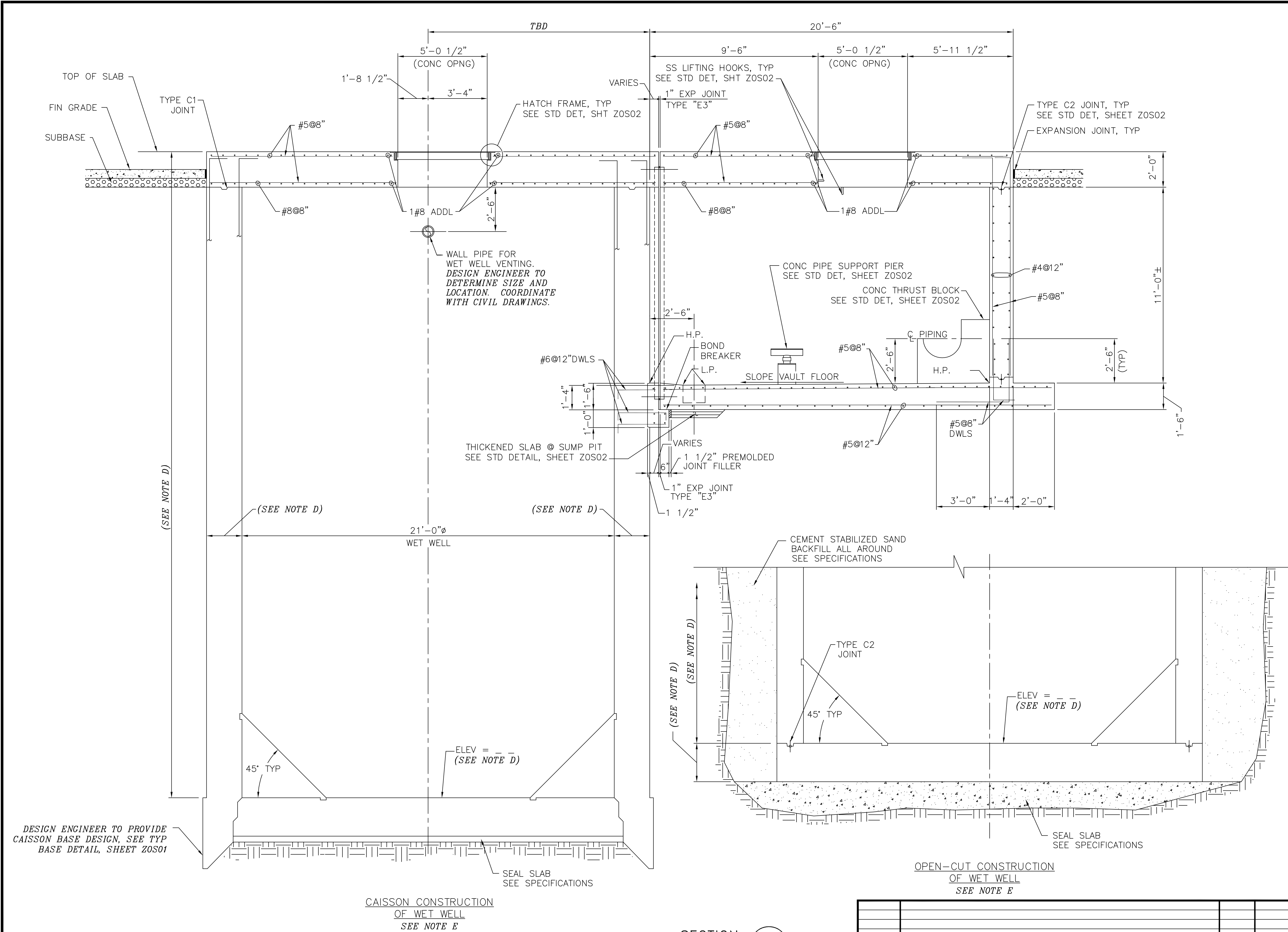
0 1 2 3

ORIGINAL SCALE IN INCHES  
FOR REDUCED PLANS

DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.

REV. NO.	DESCRIPTION	APP'D	DATE

SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE: NOVEMBER, 1996	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. H3S04
FIELD BOOK NO.	



NOTES TO DESIGN ENGINEER:

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- B. DESIGN ENGINEER TO VERIFY SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- C. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- D. DIMENSIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE SITE REQUIREMENTS.
- E. DESIGN ENGINEER TO PROVIDE WET WELL DESIGN FOR EITHER OPEN CUT OR CAISSON CONSTRUCTION.
- F. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- G. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- H. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

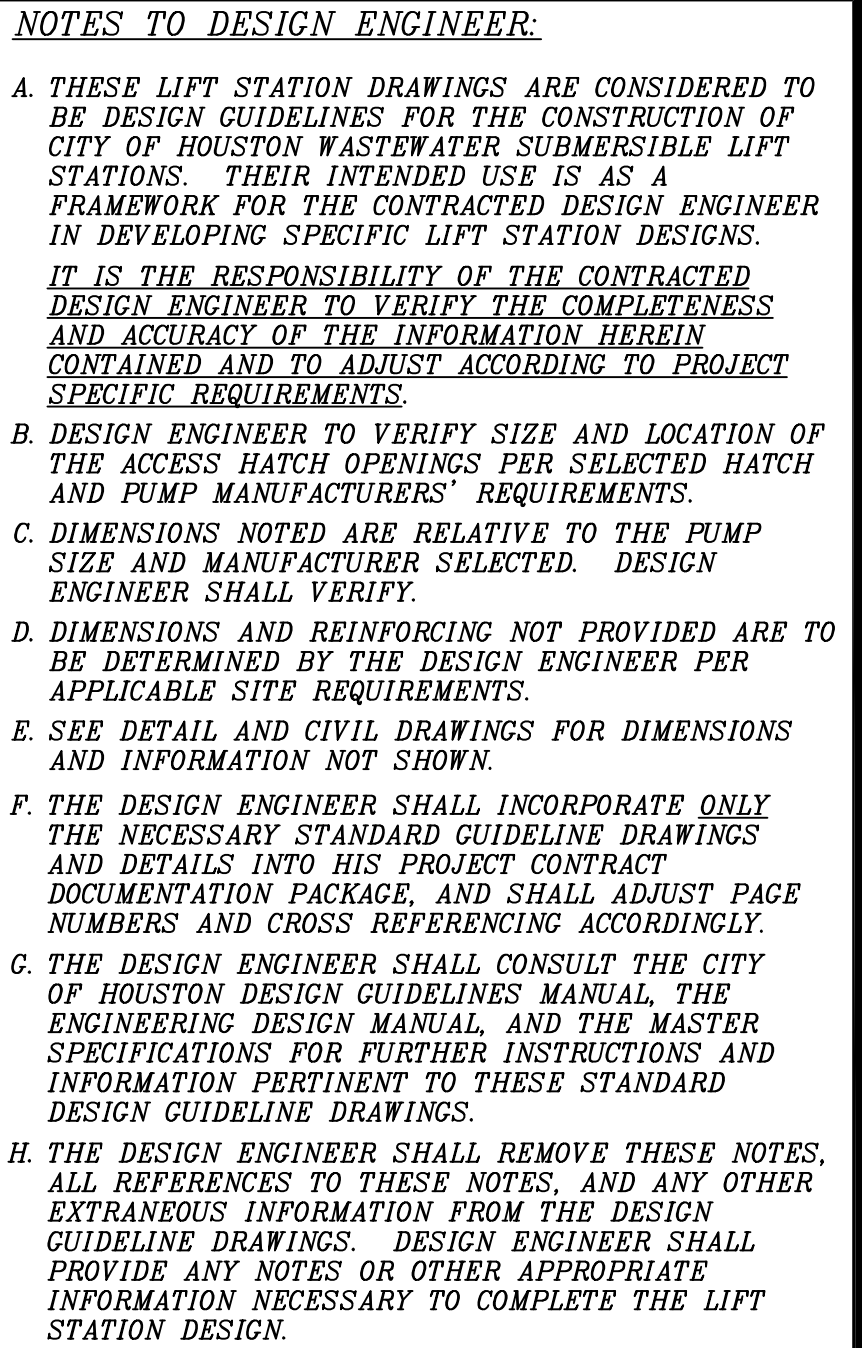
NOTES:

1. FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET ZOS01.
2. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
3. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL CONFIRM.
4. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
5. WET WELL TO BE LINED WITH CONCRETE PROTECTIVE LINER PER PROJECT SPECIFICATIONS, CONSULT WITH COH PROJECT MANAGER FOR APPROVED PRODUCTS. LINER SHALL COVER ALL CONCRETE SURFACES, AND SHALL EXTEND TO A MINIMUM OF 12" BELOW THE LOW WATER ELEVATION.

STRUCTURAL
3 PUMPS @ 2000 - 3499 GPM PER PUMP ALTERNATE LOW PROFILE CONFIGURATION
PROJECT NO. R-0267-XX-X
TITLE CITY OF HOUSTON DESIGN GUIDELINE DRAWINGS FOR SUBMERSIBLE LIFT STATIONS
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH STANDARD TITLE BLOCK ON ALL DRAWINGS, SEE STANDARD TITLE BLOCK DETAIL ON SHEET ZOC0X

SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE: NOVEMBER, 1996	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. H3S03
FIELD BOOK NO.	



**NOTES:**

1. FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET S001.
2. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
3. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL CONFIRM.
4. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
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STRUCTURAL
3 PUMPS @ 2000 - 3499 GPM PER PUMP
ALTERNATE LOW PROFILE CONFIGURATION

PROJECT NO. R-0267-XX-X

TITLE	CITY OF HOUSTON DESIGN GUIDELINE DRAWINGS FOR SUBMERSIBLE LIFT STATIONS
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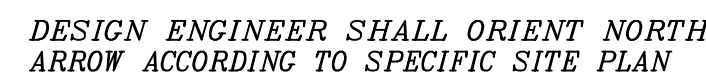
CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

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SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE: NOVEMBER, 1996	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO.
FIELD BOOK NO.	H3S02





CADD DWG. FILE NO. :  
H3S01.DWG

COHSTD.BDR

ORIGINAL SCALE IN INCHES  
FOR REDUCED PLANS

DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.

REV. NO.	DESCRIPTION	APP'D	DATE

**NOTES TO DESIGN ENGINEER:**

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AND ACCURACY OF THE INFORMATION HEREIN  
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SPECIFIC REQUIREMENTS.

**B. DESIGN ENGINEER TO VERIFY SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.**

C. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY.

D. DIMENSIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE SITE REQUIREMENTS.

E. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.

F. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.

G. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.

H. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

1. THE DESIGN ENGINEER SHALL ENSURE GUARDRAIL AND CATWALK MEET THE REQUIREMENTS FOR "AREAS NOT OPEN TO PUBLIC" AS PROVIDED BY THE U.S. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) AND LATEST COH CODE ENFORCEMENT APPROVED VERSION OF THE INTERNATIONAL BUILDING CODE (IBC).

J. THE DESIGN ENGINEER SHALL PROVIDE GUARDRAILS FOR ANY WALKING SURFACES WITH A POTENTIAL FALL DISTANCE EQUAL TO OR GREATER THAN 30 INCHES.

NOTES:

1. FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET ZOS01.
2. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
3. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL CONFIRM.
4. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
5. WEIR WELL TO BE LINED WITH CONCRETE PROTECTIVE LINER PER PROJECT SPECIFICATIONS, CONSULT WITH COH PROJECT MANAGER FOR APPROVED PRODUCTS. LINER SHALL COVER ALL CONCRETE SURFACES, AND SHALL EXTEND TO A MINIMUM OF 12" BELOW THE LOW WATER ELEVATION.

## STRUCTURAL

3 PUMPS @ 2000 - 3499 GPM PER PUMP  
ALTERNATE LOW PROFILE CONFIGURATION

PROJECT NO.

R-0267-XX-X

TITLE	CITY OF HOUSTON DESIGN GUIDELINE DRAWINGS FOR SUBMERSIBLE LIFT STATIONS
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CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

SCALE: XX" = 1'-0"

DESIGNED BY:	
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SUBMITTED:

DRAWN BY:

DATE \_\_\_\_\_

NOVEMBER, 1996

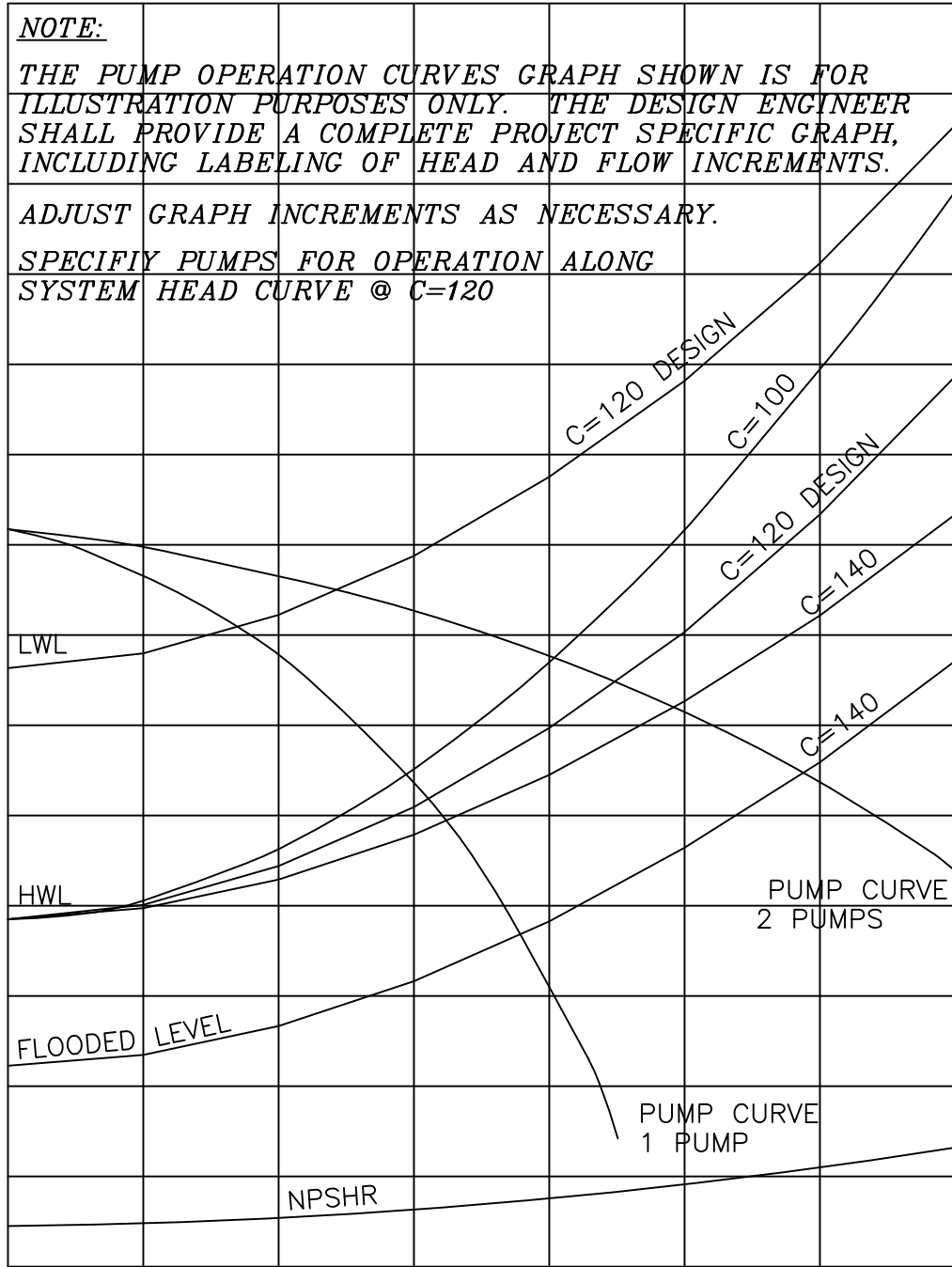
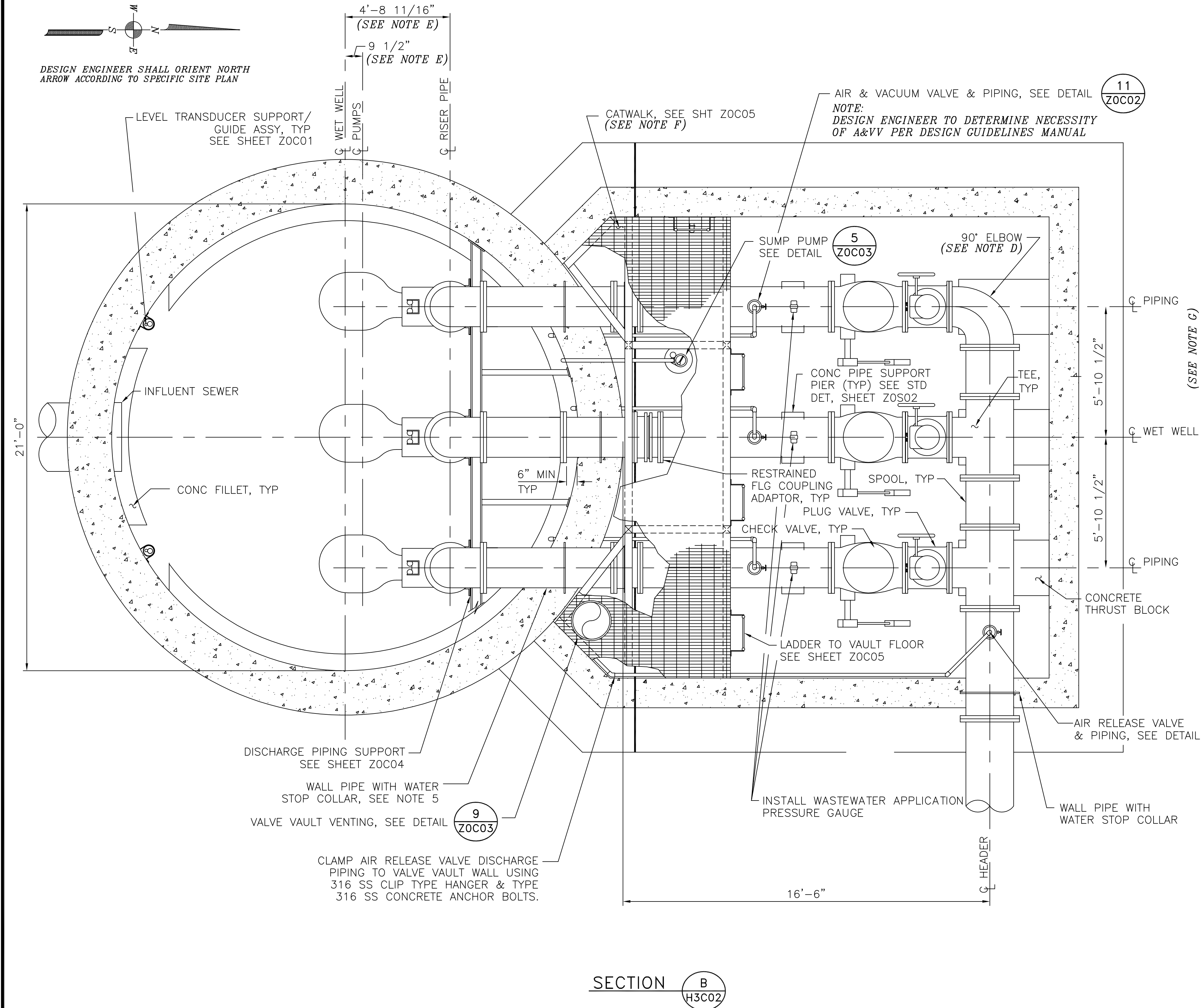
6 SHEET NO. OF SHEETS

SURVEY BY:

DWG. NO.

FIELD BOOK NO.

H3S01



- PUMP CURVE NOTES:
1. LOW NORMAL OPERATING LEVEL C=120 - DESIGN.
  2. HIGH NORMAL OPERATING LEVEL C=100 - INFORMATION ONLY (TCEQ)
  3. HIGH NORMAL OPERATING LEVEL C=120 - DESIGN
  4. HIGH NORMAL OPERATING LEVEL C=140 - INFORMATION ONLY
  5. EMERGENCY FLOODED OPERATING LEVEL C=140 - MAXIMUM DISCHARGE
  6. NET POSITIVE SUCTION HEAD REQUIRED (NPSHR) BASED ON NORMAL OPERATING WATER LEVELS
  7. PUMP CURVES ARE MODIFIED FOR STATION LOSSES.

PUMP DATA TABLE			
PUMP CHARACTERISTICS	PUMP NO. 1	PUMP NO. 2	PUMP NO. 3
MOTOR DATA			
NOMINAL SIZE (HP)			
MAX SPEED (RPM)			
SOLIDS PASSAGE			
MIN SPHERE (IN)			
CAPACITY (GPM)			
DESIGN RUNOUT			
DISCHARGE HEAD (FT)			
DESIGN RUNOUT			
SHUT OFF			
EFFICIENCY (%)			
DESIGN			
NPSHR (FT)			
DESIGN RUNOUT			
PUMP CYCLE TIME			

NOTES TO DESIGN ENGINEER:

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- B. THIS DESIGN IS BASED UPON THE LARGEST CAPACITY PUMP FOR THIS STANADARD (RANGE: 2000 - 3499 GPM PER PUMP).
- C. LIFT STATION DESIGN IS BASED UPON 16"-24" NOMINAL PUMP, VALVES AND PIPING AS THE SIZES RECOMMENDED FOR THIS STANDARD STATION. THE DESIGN WILL ACCOMMODATE VALVES AND PIPING IF PROJECT SPECIFIC CONDITIONS REQUIRE.
- D. REPLACE THE 90° ELBOW WITH A FLANGED TEE FOR CONNECTION TO SURGE RELIEF VALVE, OR ALTERNATIVE BYPASS IF REQUIRED. SEE DETAILS, SHEET ZOC06 AND \_\_\_\_\_
- E. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY.
- F. WHEN TOP OF DISCHAGE PIPING IS NO GREATER THAN 30 INCHES ABOVE THE VALVE VAULT FLOOR, THE CATWALK MAY BE ELIMINATED.
- G. INFORMATION OMITTED IS DETERMINED BY DESIGN ENGINEER FOR SPECIFIC SITE REQUIREMENTS.
- H. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
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2. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL VERIFY.
3. INSTALL PLUG VALVES TO OPEN UPWARD AND TO CLOSE TO A SEATING POSITION.
4. INSTALL CHECK VALVES SO THAT THE WEIGHT LEVER POSITION IS APPROXIMATELY 45° BELOW THE VALVE HORIZONTAL CENTER LINE IN THE CLOSED POSITION; AND APPROXIMATELY 45° ABOVE THE VALVE HORIZONTAL CENTER LINE IN THE FULL OPEN POSITION.
5. SLEEVED OR CORED DISCHARGE PIPE OPENINGS SEALED WITH LINK-SEAL (OR APPROVED EQUAL) MAY BE SUBSTITUTED FOR POURED IN PLACE WALL PIPES TO ACCOMMODATE CONSTRUCTION METHOD.

BASE SECTION	
3 PUMPS @ 2000 - 3499 GPM PER PUMP ALTERNATE LOW PROFILE CONFIGURATION	
PROJECT NO.	R-0267-XX-X
TITLE	CITY OF HOUSTON DESIGN GUIDELINE DRAWINGS FOR SUBMERSIBLE LIFT STATIONS
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING AND CONSTRUCTION	

DESIGN ENGINEER TO INCLUDE COH  
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DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

CADD DWG. FILE NO. :  
H3C03.DWG

COHSTD.BDR

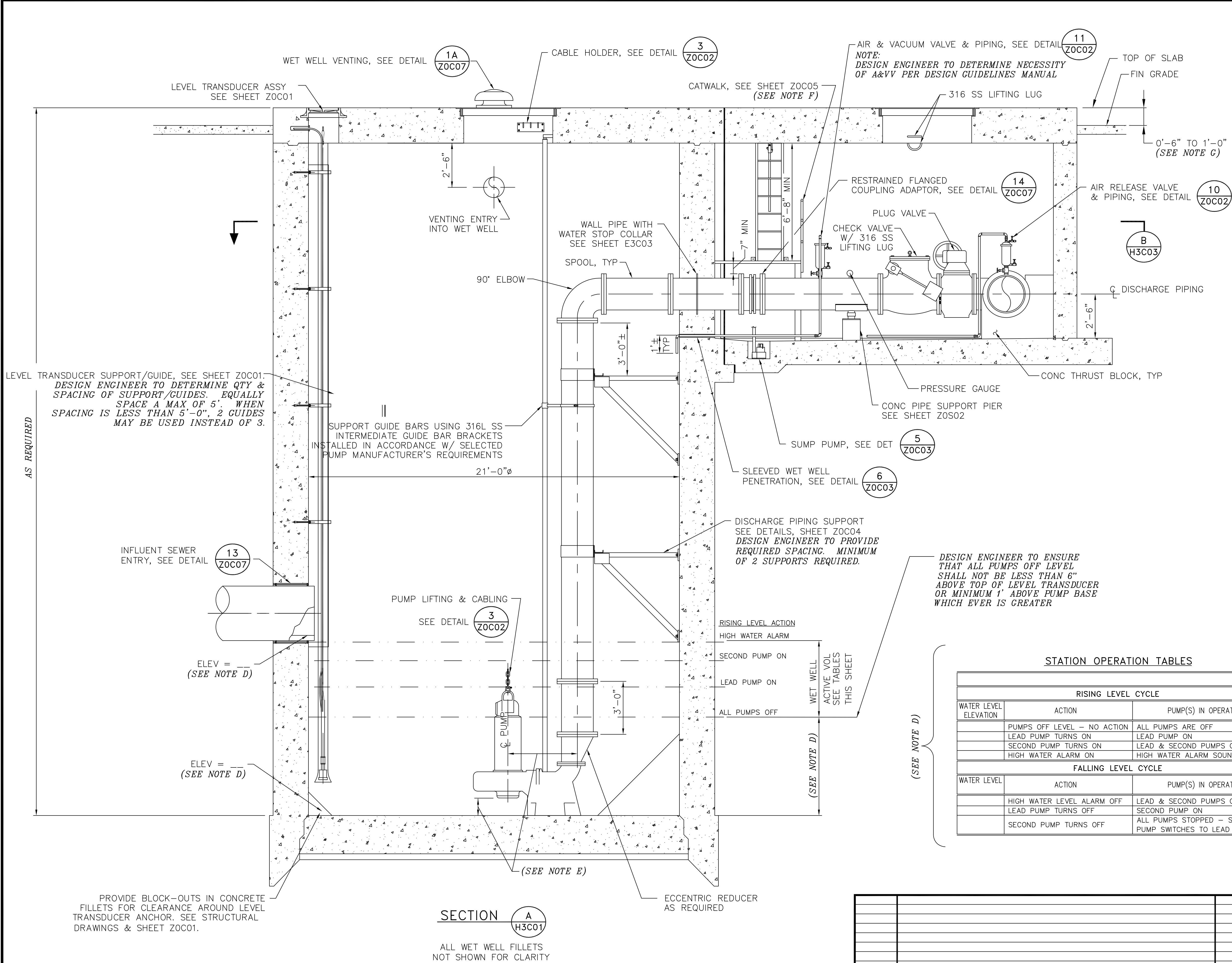
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ORIGINAL SCALE IN INCHES  
FOR REDUCED PLANS

DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.

REV. NO.	DESCRIPTION	APP'D	DATE

SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE: DECEMBER, 1996	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. H3C03
FIELD BOOK NO.	



- NOTES TO DESIGN ENGINEER:**
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- B. THIS DESIGN IS BASED UPON THE LARGEST CAPACITY PUMP FOR THIS STANDARAD (RANGE: 2000 - 3499 GPM PER PUMP).
- C. LIFT STATION DESIGN IS BASED UPON 16"-24" NOMINAL PUMP VALVES AND PIPING AS THE SIZES RECOMMENDED FOR THIS STANDARD STATION. THE DESIGN WILL ACCOMMODATE VALVES AND PIPING IF PROJECT SPECIFIC CONDITIONS REQUIRE.
- D. ELEVATIONS AND INFORMATION OMITTED ARE DETERMINED BY DESIGN ENGINEER FOR PROJECT SPECIFIC REQUIREMENTS.
- E. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY. DESIGN ENGINEER SHALL PROVIDE RAISED PUMP BASE IF REQUIRED.
- F. WHEN TOP OF DISCHAGE PIPING IS NO GREATER THAN 30 INCHES ABOVE THE VALVE VAULT FLOOR, THE CATWALK MAY BE ELIMINATED.
- G. WHERE FLOOD PLAIN CONDITIONS REQUIRE THE TOP SLAB TO BE GREATER THAN 1'-0" ABOVE FINISHED GRADE, DESIGN ENGINEER SHALL PROVIDE CONCRETE STAIRS.
- H. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- I. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- J. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
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- NOTES:**
1. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL VERIFY.
2. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
3. PUMP ANCHOR BOLTS ARE TO BE ADHESIVE TYPE, AND EMBEDDED IN CONCRETE. CONTRACTOR TO SUBMIT DESIGN OF PUMP ANCHOR BOLTS AND PATTERN, INCLUDING CALCULATIONS, DURING SHOP DRAWING SUBMISSION.
4. CONTRACTOR TO PROVIDE ADHESIVE ANCHORS IN LIEU OF WEDGE ANCHORS FOR ALL SUBMERGED CONDITIONS. AND SUBMIT DESIGN OF ANCHOR BOLTS DURING SHOP DRAWING SUBMISSION.
5. ALL PIPING IN THE WET WELL SHALL BE FLANGED. NO FLANGED COUPLING ADAPTORS, OR VICTAULIC STYLE COUPLINGS SHALL BE PERMITTED INSIDE THE WET WELL.

ELEVATION SECTION  
3 PUMPS @ 2000 - 3499 GPM PER PUMP  
ALTERNATE LOW PROFILE CONFIGURATION

PROJECT NO. R-0267-XX-X

TITLE CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

APPROVALS

WATER DESIGN TRAFFIC AND SIGNAL DESIGN

STORM SEWER DESIGN STREET, BRIDGE & R.O.W.

WASTEWATER DESIGN CONSTRUCTION

OTHER REVIEWS

PLANNING AND DEVELOPMENT

CITY ENGINEER DATE

SCALE: XX" = 1'-0" DESIGNED BY:

SUBMITTED: DRAWN BY:

DATE: DECEMBER, 1996 SHEET NO. OF SHEETS

SURVEY BY: DWG. NO. H3C02

FIELD BOOK NO.

STATION OPERATION TABLES

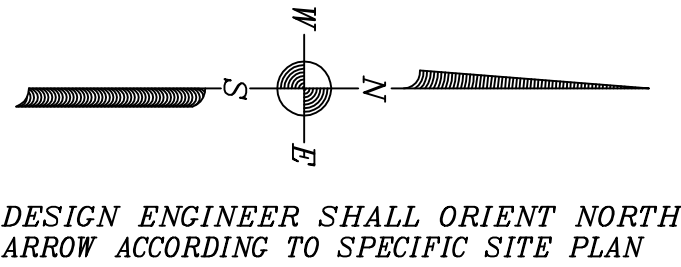
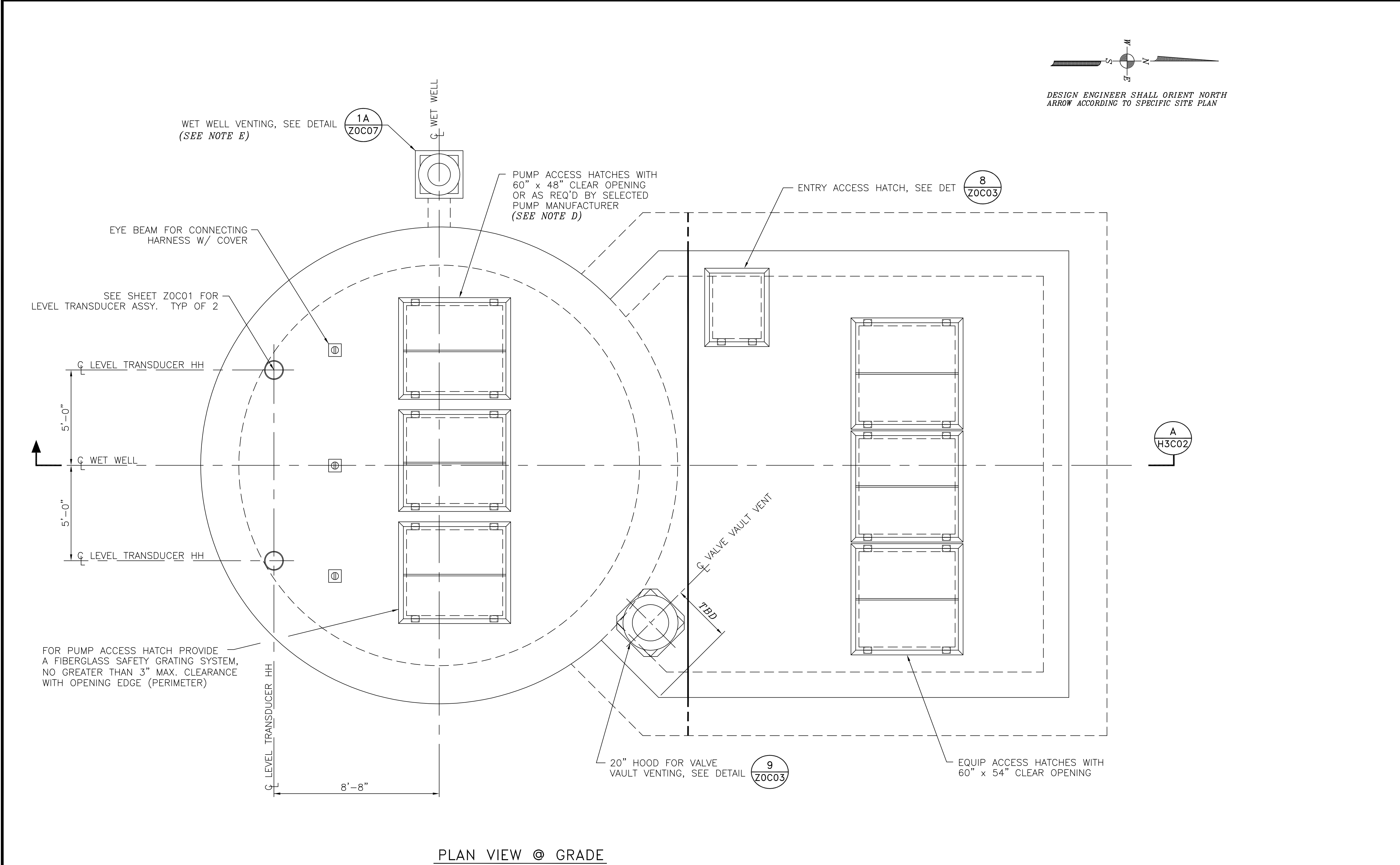
RIISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
	PUMPS OFF LEVEL - NO ACTION	ALL PUMPS ARE OFF
	LEAD PUMP TURNS ON	LEAD PUMP ON
	SECOND PUMP TURNS ON	LEAD & SECOND PUMPS ON
	HIGH WATER ALARM ON	HIGH WATER ALARM SOUND
FALLING LEVEL CYCLE		
WATER LEVEL	ACTION	PUMP(S) IN OPERATION
	HIGH WATER LEVEL ALARM OFF	LEAD & SECOND PUMPS ON
	LEAD PUMP TURNS OFF	SECOND PUMP ON
	SECOND PUMP TURNS OFF	ALL PUMPS STOPPED - STANDBY PUMP SWITCHES TO LEAD PUMP

CADD DWG. FILE NO. : H3C02.DWG

CHSTD.BDR

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS





- NOTES TO DESIGN ENGINEER:**
- A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- B. THIS DESIGN IS BASED UPON THE LARGEST CAPACITY PUMP FOR THIS STANADARD (RANGE: 2000 – 3499 GPM PER PUMP).
- C. LIFT STATION DESIGN IS BASED UPON 16”–24”NOMINAL PUMP, VALVES AND PIPING AS THE SIZES RECOMMENDED FOR THIS STANDARD STATION. THE DESIGN WILL ACCOMMODATE VALVES AND PIPING IF PROJECT SPECIFIC CONDITIONS REQUIRE.
- D. DESIGN ENGINEER TO VERIFY THE SIZE AND LOCATION OF THE WET WELL HATCHES ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS’ REQUIREMENTS.
- E. THE ACTUAL LOCATION OF THE WET WELL VENTING MAY VARY ACCORDING TO SITE REQUIREMENTS. WHERE POSSIBLE, LOCATE ON THE NORTHWEST SIDE OF THE WET WELL.
- F. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- G. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- H. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- I. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEIOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

- NOTES:**
1. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
2. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF THE WET WELL HATCHES, PER SELECTED HATCH AND PUMP MANUFACTURERS’ REQUIREMENTS.

PLAN VIEW @ GRADE  
3 PUMPS @ 2000 – 3499 GPM PER PUMP  
ALTERNATE LOW PROFILE CONFIGURATION

PROJECT NO. R-0267-XX-X

TITLE CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

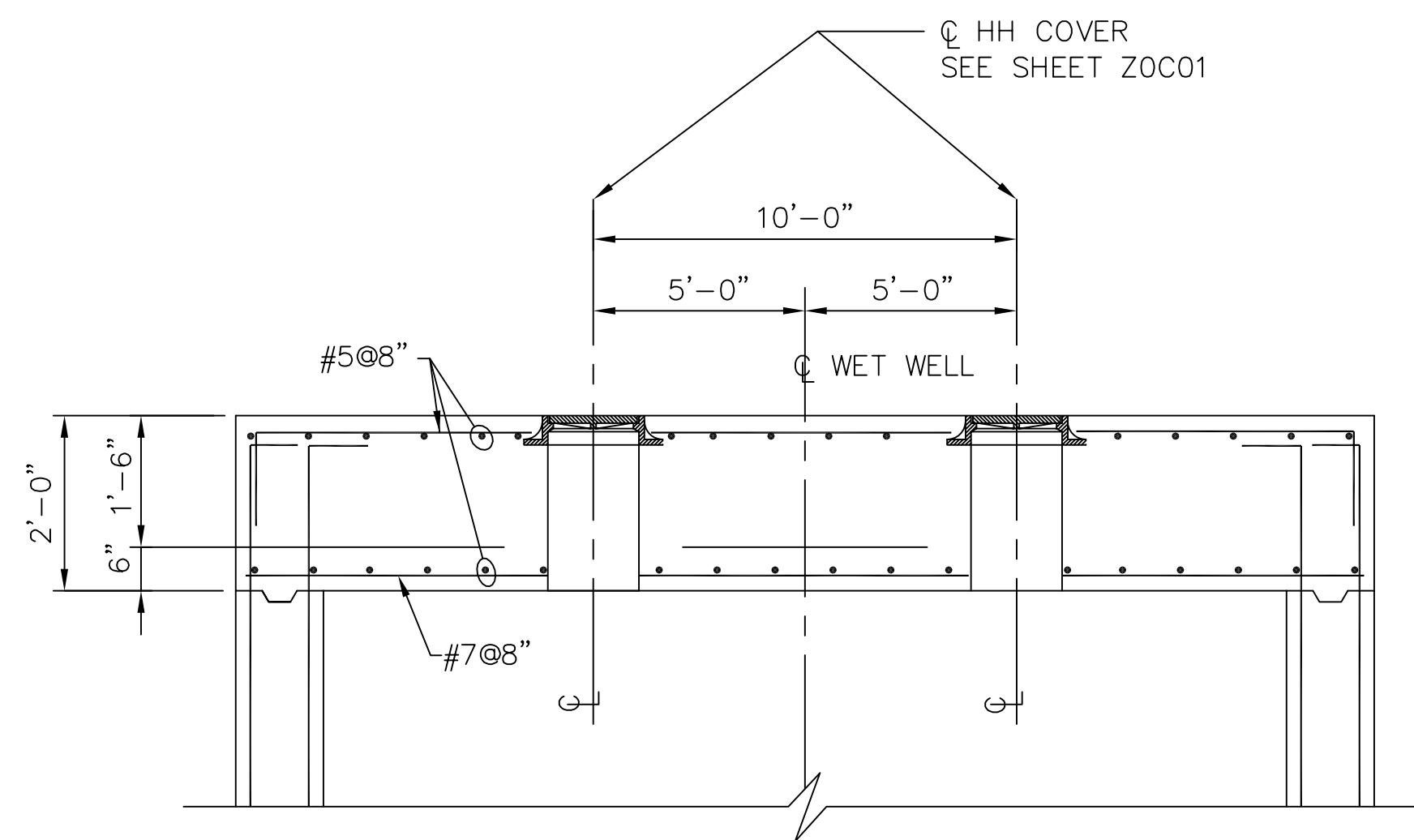
DESIGN ENGINEER TO INCLUDE COH STANDARD TITLE BLOCK ON ALL DRAWINGS, SEE STANDARD TITLE BLOCK DETAIL ON SHEET ZOC0X

CADD DWG. FILE NO. : H3C01.DWG

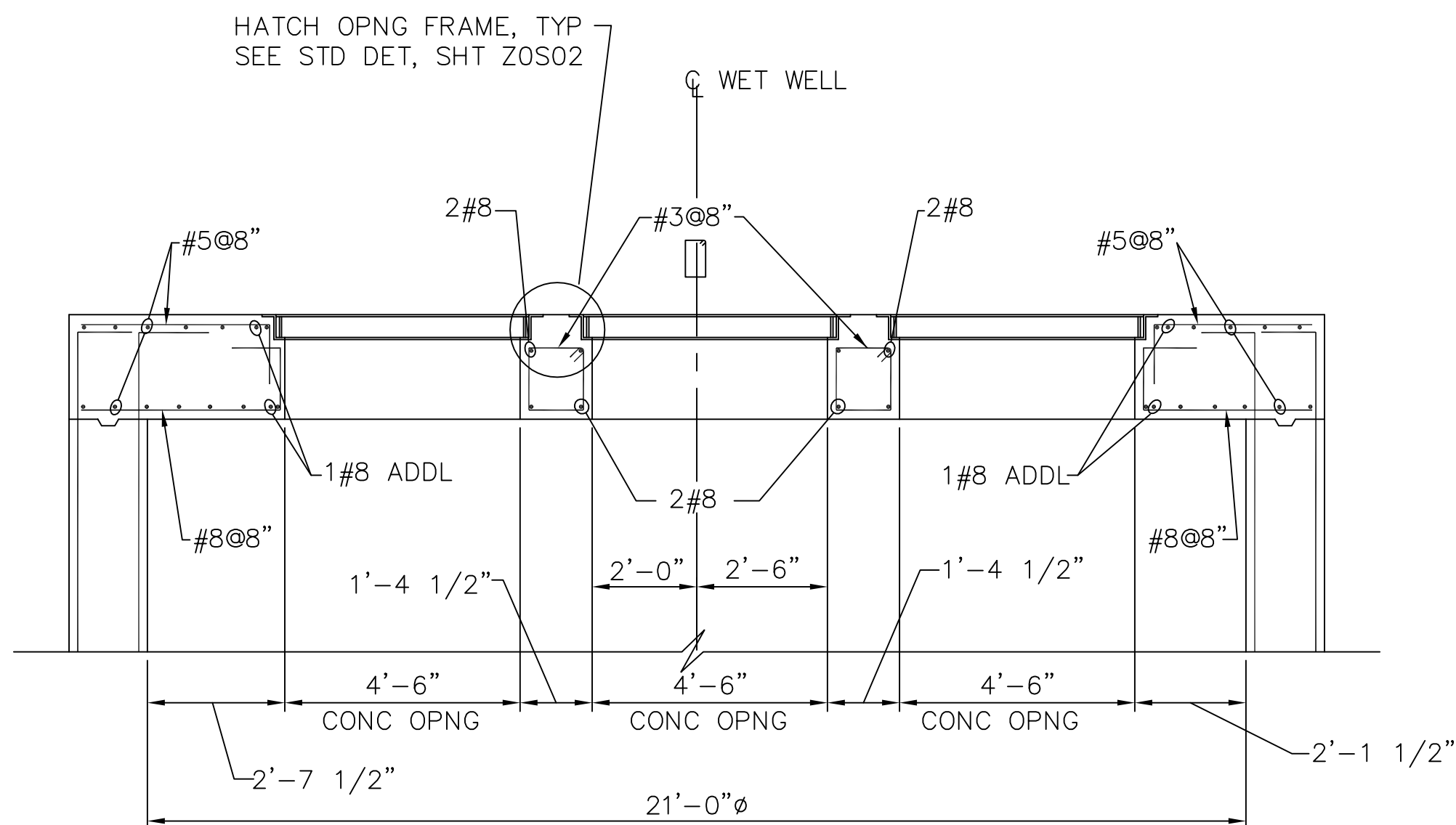
REV. NO.	DESCRIPTION	APP'D	DATE

SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE: NOVEMBER, 1996	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. H3C01
FIELD BOOK NO.	

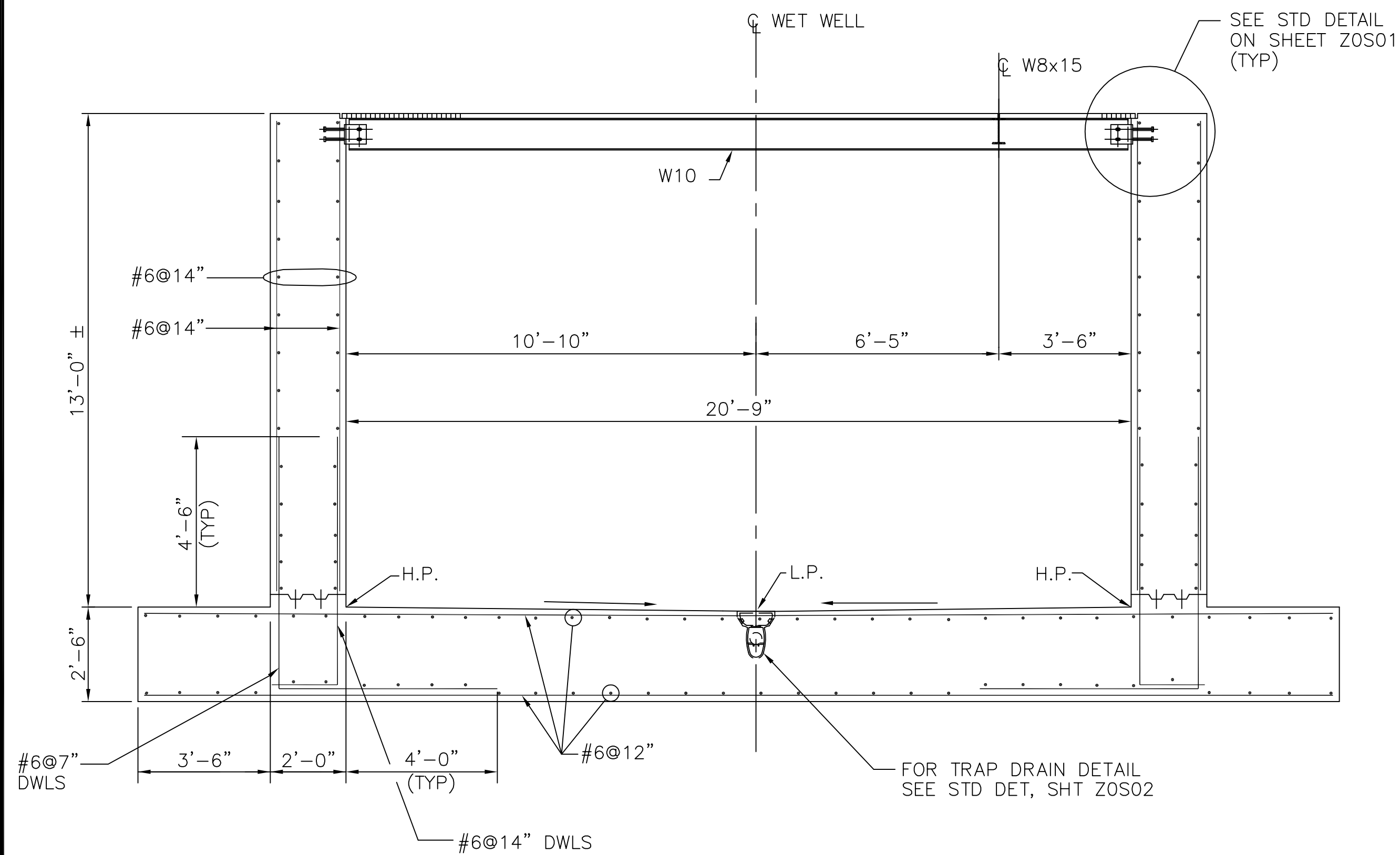




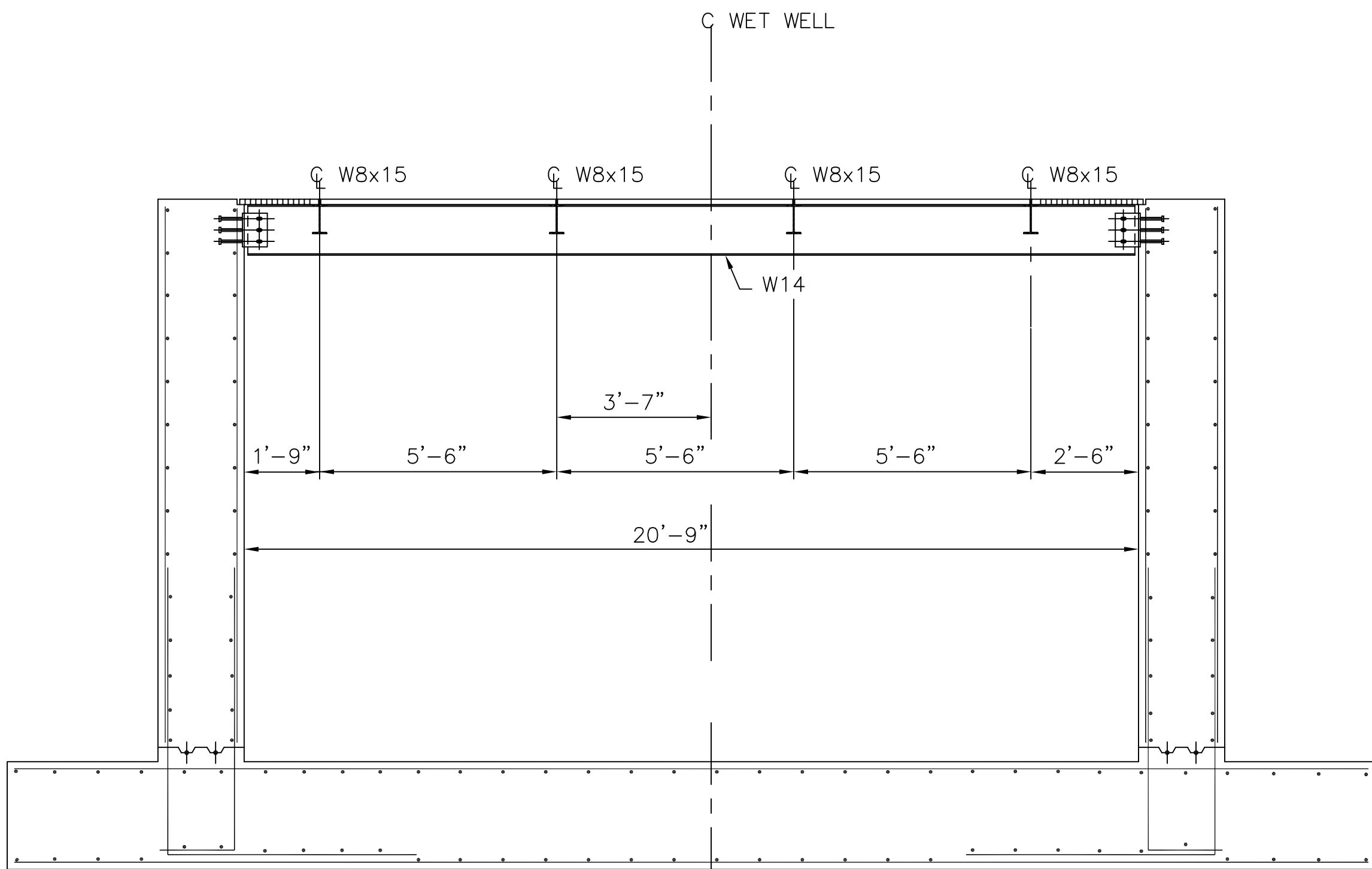
SECTION B  
E2S01



SECTION C  
E2S01



SECTION D  
E2S01



SECTION E  
E2S01

NOTES TO DESIGN ENGINEER:

- A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS.
- IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- B. DESIGN ENGINEER TO VERIFY THE SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- C. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- D. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- E. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- F. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

NOTES:

1. FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET ZOS01.
2. DESIGN ENGINEER TO VERIFY THE SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
3. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.

STRUCTURAL	
3 PUMPS @ 2000 - 3499 GPM PER PUMP PREFERRED CONFIGURATION	
PROJECT NO.	R-0267-XX-X
TITLE	CITY OF HOUSTON DESIGN GUIDELINE DRAWINGS FOR SUBMERSIBLE LIFT STATIONS
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING AND CONSTRUCTION	

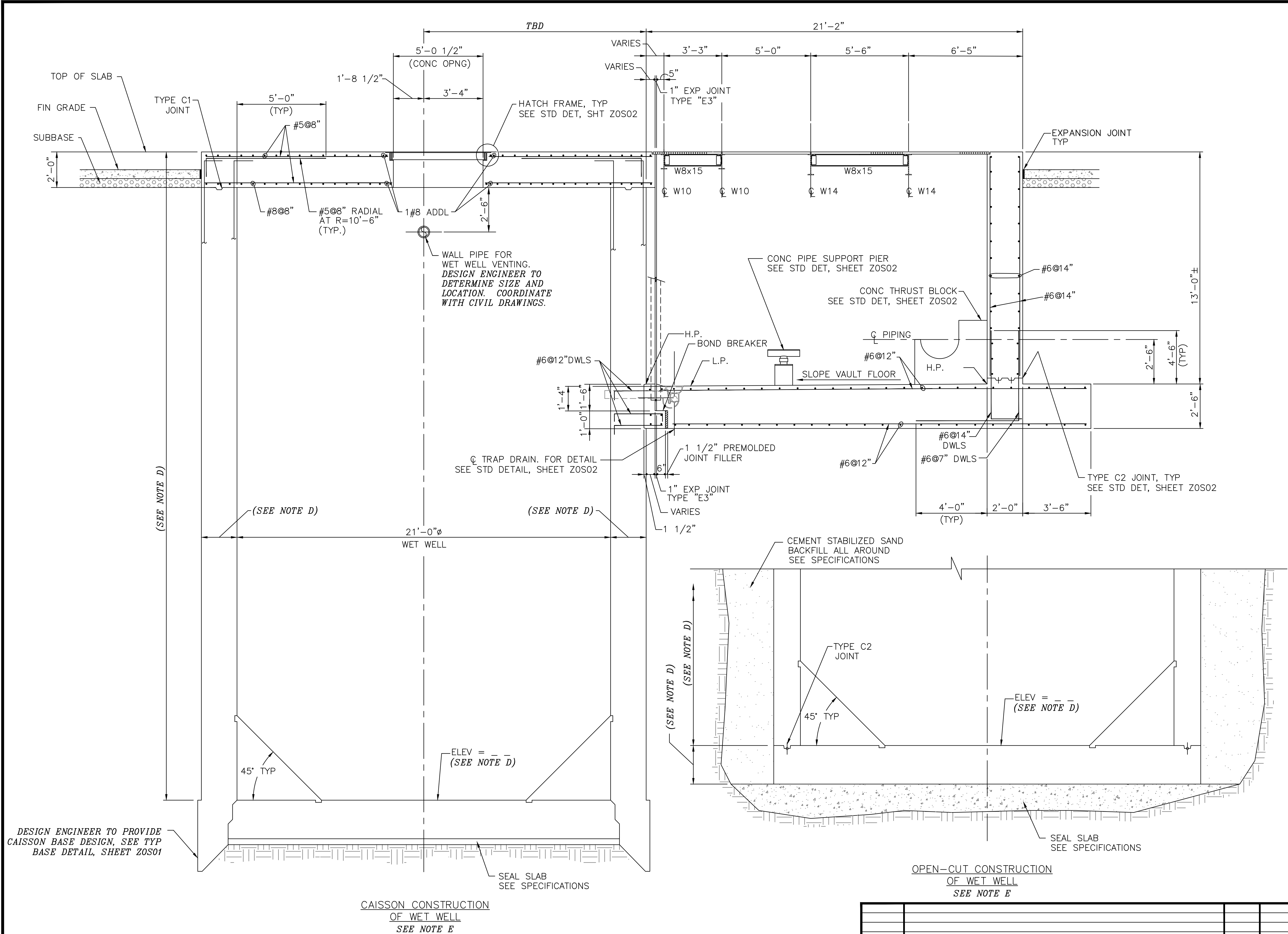
DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

CADD DWG. FILE NO. :  
H2S04.DWG

COHSTD.BDR  
0 1 2 3  
ORIGINAL SCALE IN INCHES  
FOR REDUCED PLANS  
DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.

REV. NO.	DESCRIPTION	APP'D	DATE

SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE: NOVEMBER, 1996	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. H2S04
FIELD BOOK NO.	



NOTES TO DESIGN ENGINEER:

- A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- B. DESIGN ENGINEER TO VERIFY SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- C. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- D. DIMENSIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE SITE REQUIREMENTS.
- E. DESIGN ENGINEER TO PROVIDE WET WELL DESIGN FOR EITHER OPEN-CUT OR CAISSON CONSTRUCTION.
- F. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- G. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- H. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEIOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

NOTES:

- FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET ZOS01.
- CONTRACTOR TO CONFIRM SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL CONFIRM.
- SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- WET WELL TO BE LINED WITH CONCRETE PROTECTIVE LINER PER PROJECT SPECIFICATIONS, CONSULT WITH COH PROJECT MANAGER FOR APPROVED PRODUCTS. LINER SHALL COVER ALL CONCRETE SURFACES, AND SHALL EXTEND TO A MINIMUM OF 12" BELOW THE LOW WATER ELEVATION.

STRUCTURAL  
3 PUMPS @ 2000 - 3499 GPM PER PUMP  
PREFERRED CONFIGURATION

PROJECT NO. R-0267-XX-X

TITLE CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

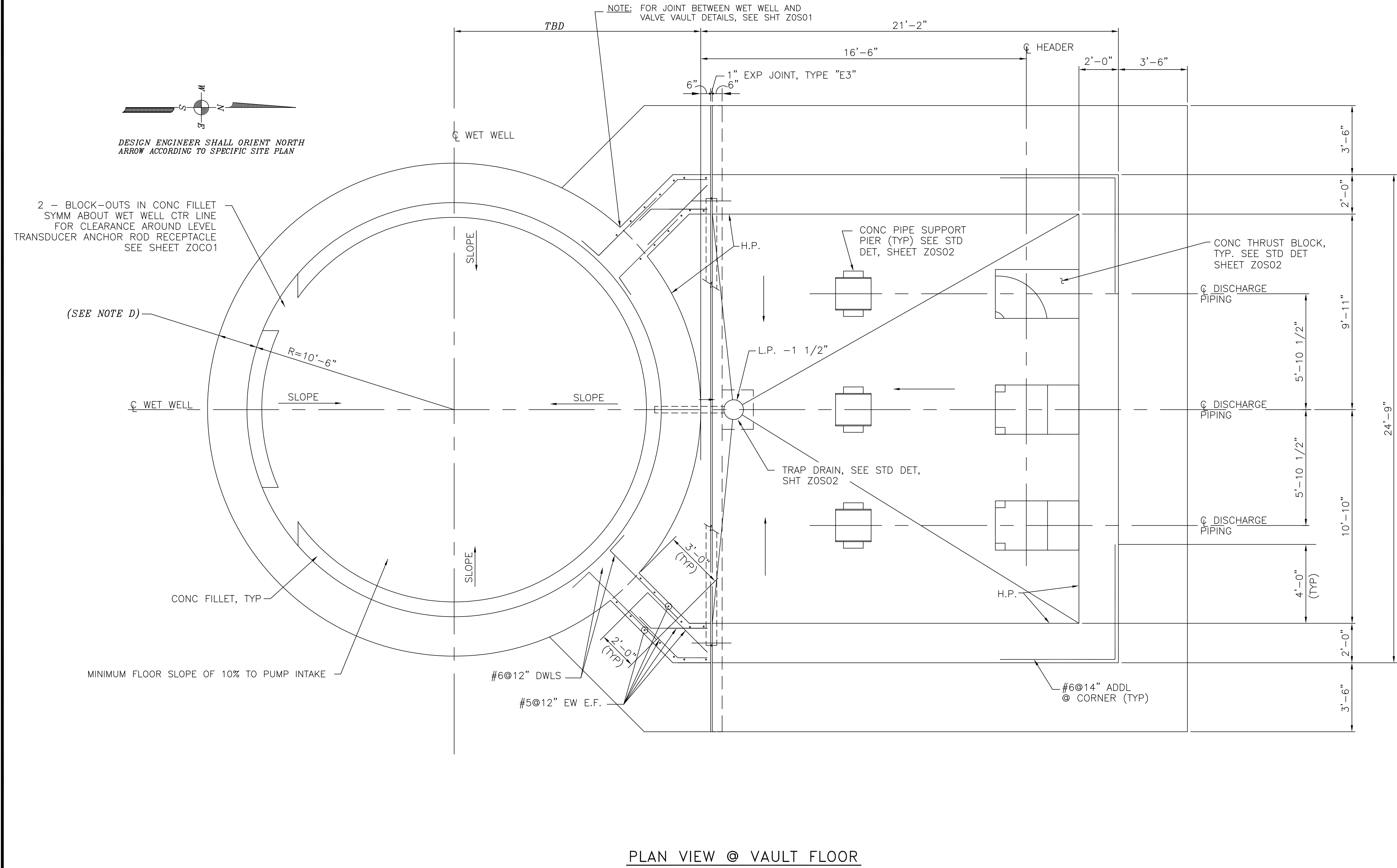
CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

SCALE: XX" = 1'-0"  
SUBMITTED: NOVEMBER, 1996  
DATE: NOVEMBER, 1996  
SURVEY BY:  
FIELD BOOK NO.

DESIGNED BY:  
DRAWN BY:  
SHEET NO. OF SHEETS  
DWG. NO. H2S03

CADD DWG. FILE NO. : H2S03.DWG



- NOTES TO DESIGN ENGINEER:**
- A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- B. DESIGN ENGINEER TO VERIFY SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- C. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY.
- D. DIMENSIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE SITE REQUIREMENTS.
- E. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- F. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- G. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- H. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

- NOTES:**
1. FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET ZOS01.
2. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
3. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL CONFIRM.
4. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
5. WET WELL TO BE LINED WITH CONCRETE PROTECTIVE LINER PER PROJECT SPECIFICATIONS, CONSULT WITH COH PROJECT MANAGER FOR APPROVED PRODUCTS. LINER SHALL COVER ALL CONCRETE SURFACES, AND SHALL EXTEND TO A MINIMUM OF 12" BELOW THE LOW WATER ELEVATION.

STRUCTURAL  
3 PUMPS @ 2000 - 3499 GPM PER PUMP  
PREFERRED CONFIGURATION

PROJECT NO. R-0267-XX-X

TITLE CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

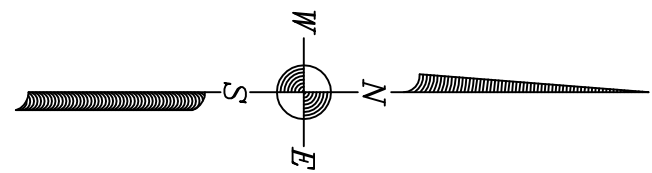
CADD DWG. FILE NO. :  
H2S02.DWG

COHSTD.BDR 0 1 2 3 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.

REV. NO.	DESCRIPTION	APP'D	DATE

SCALE: XX" = 1'-0" DESIGNED BY:  
SUBMITTED: DRAWN BY:  
DATE: NOVEMBER, 1996 SHEET NO. OF SHEETS  
SURVEY BY: DWG. NO. H2S02  
FIELD BOOK NO.





DESIGN ENGINEER SHALL ORIENT NORTH  
ARROW ACCORDING TO SPECIFIC SITE PLAN

Q 2 - 22 1/2"Ø x 18"  
DEEP RECESS

B  
H2S04

EYE BEAM FOR CONNECTING  
HARNES W/ COVER

R=10'-6"

1/8"/FT  
SLOPE

2#8 x 9'-0" T & BOT W/  
#3 1/2"Ø STIRRUPS, TYP,  
BETWEEN ACCESS OPNGS

4"

1'-8 1/2"

5'-0 1/2"

CONC OPNG

WET WELL

C  
H2S04

1#8 x 9'-0" T & BOT  
TYP @ OPNG

D  
H2S04

1" EXP JOINT  
TYPE "E3"

E  
H2S04

2" FRP REMOVABLE  
GRATING, TYP 4 PLACES.  
(L.L. = 150 PSF)

W10x33

W10x33

W14x38

W14x38

W8x15

W8x15

W8x15

W8x15

2" FRP GRATING  
TYPICAL U.O.N.  
(L.L. = 150 PSF)

A  
H2S03

PLAN VIEW @ GRADE

NOTES TO DESIGN ENGINEER:

- A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- B. DESIGN ENGINEER TO VERIFY SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- C. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY.
- D. DIMENSIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE SITE REQUIREMENTS.
- E. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- F. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- G. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- H. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.
- I. THE DESIGN ENGINEER SHALL ENSURE GUARDRAIL AND CATWALK MEET THE REQUIREMENTS FOR "AREAS NOT OPEN TO PUBLIC" AS PROVIDED BY THE U.S. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) AND LATEST COH CODE ENFORCEMENT APPROVED VERSION OF THE INTERNATIONAL BUILDING CODE (IBC).
- J. THE DESIGN ENGINEER SHALL PROVIDE GUARDRAILS FOR ANY WALKING SURFACES WITH A POTENTIAL FALL DISTANCE EQUAL TO OR GREATER THAN 30 INCHES.

NOTES:

- FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET Z0S01.
- CONTRACTOR TO CONFIRM SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL CONFIRM.
- SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- WET WELL TO BE LINED WITH CONCRETE PROTECTIVE LINER PER PROJECT SPECIFICATIONS, CONSULT WITH COH PROJECT MANAGER FOR APPROVED PRODUCTS. LINER SHALL COVER ALL CONCRETE SURFACES, AND SHALL EXTEND TO A MINIMUM OF 12" BELOW THE LOW WATER ELEVATION.

STRUCTURAL

3 PUMPS @ 2000 - 3499 GPM PER PUMP  
PREFERRED CONFIGURATION

PROJECT NO.

R-0267-XX-X

TITLE

CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET Z0C0X

CADD DWG. FILE NO. :

H2S01.DWG

COHSTD.BDR

0

1

2

3

ORIGINAL SCALE IN INCHES  
FOR REDUCED PLANS

DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.

REV. NO.

DESCRIPTION

APP'D

DATE

SCALE:

XX" = 1'-0"

DESIGNED BY:

SUBMITTED:

DRAWN BY:

DATE:

NOVEMBER, 1996

SHEET NO.E2S010F

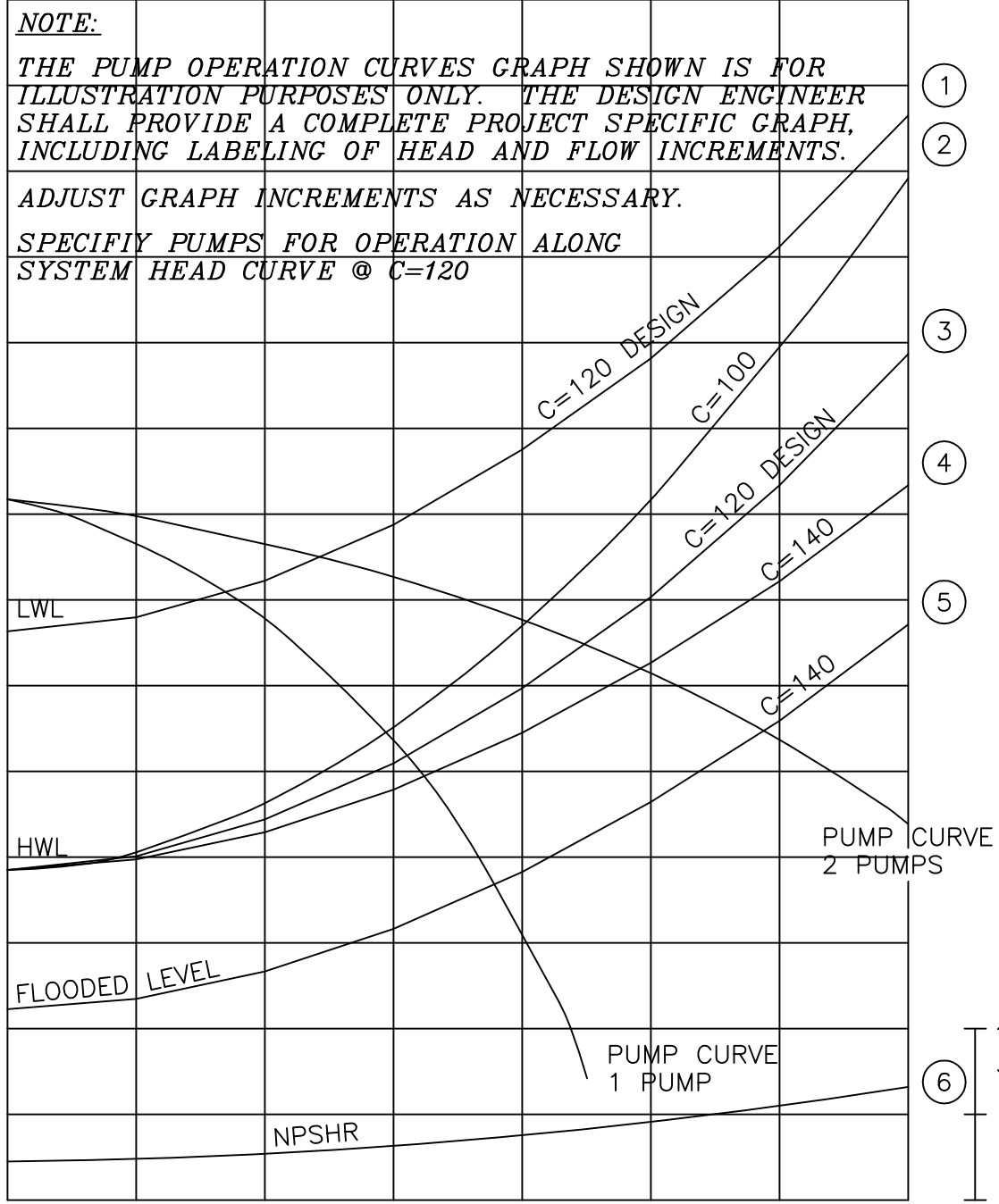
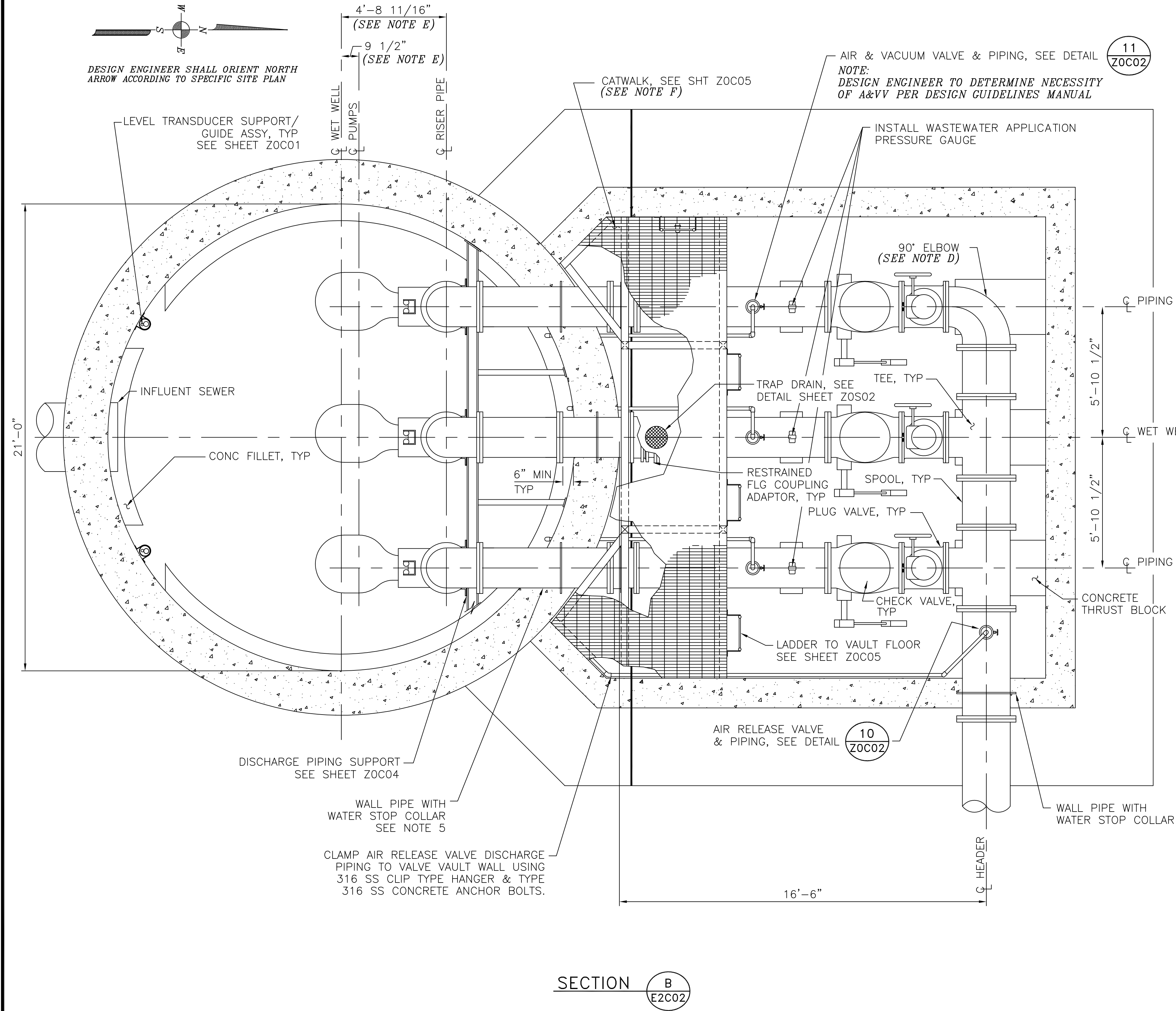
SHEETS

SURVEY BY:

DWG. NO.

H2S01

FIELD BOOK NO.



NOTES TO DESIGN ENGINEER:

- A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS.
- IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- B. THIS DESIGN IS BASED UPON THE LARGEST CAPACITY PUMP FOR THIS STANDARD (RANGE: 2000 - 3499 GPM PER PUMP).
- C. LIFT STATION DESIGN IS BASED UPON 16"-24" NOMINAL PUMP, VALVES AND PIPING AS THE SIZES RECOMMENDED FOR THIS STANDARD STATION. THE DESIGN WILL ACCOMMODATE VALVES AND PIPING IF PROJECT SPECIFIC CONDITIONS REQUIRE.
- D. REPLACE THE 90° ELBOW WITH A FLANGED TEE FOR CONNECTION TO SURGE RELIEF VALVE, OR ALTERNATIVE BYPASS IF REQUIRED. SEE DETAILS, SHEET ZOC06 AND \_\_\_\_\_.
- E. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY.
- F. WHEN TOP OF DISCHARGE PIPING IS NO GREATER THAN 30 INCHES ABOVE THE VALVE VAULT FLOOR, THE CATWALK MAY BE ELIMINATED.
- G. INFORMATION OMITTED IS DETERMINED BY DESIGN ENGINEER FOR SPECIFIC SITE REQUIREMENTS.
- H. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- I. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- J. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- K. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

NOTES:

1. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
2. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL VERIFY.
3. INSTALL PLUG VALVES TO OPEN UPWARD AND TO CLOSE TO A SEATING POSITION.
4. INSTALL CHECK VALVES SO THAT THE WEIGHT LEVER POSITION IS APPROXIMATELY 45° BELOW THE VALVE HORIZONTAL CENTER LINE IN THE CLOSED POSITION; AND APPROXIMATELY 45° ABOVE THE VALVE HORIZONTAL CENTER LINE IN THE FULL OPEN POSITION.
5. SLEEVED OR CORED DISCHARGE PIPE OPENINGS SEALED WITH LINK-SEAL (OR APPROVED EQUAL) MAY BE SUBSTITUTED FOR POURED IN PLACE WALL PIPES TO ACCOMMODATE CONSTRUCTION METHOD.

BASE SECTION  
3 PUMPS @ 2000 - 3499 GPM PER PUMP  
PREFERRED CONFIGURATION

PROJECT NO. R-0267-XX-X

TITLE CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

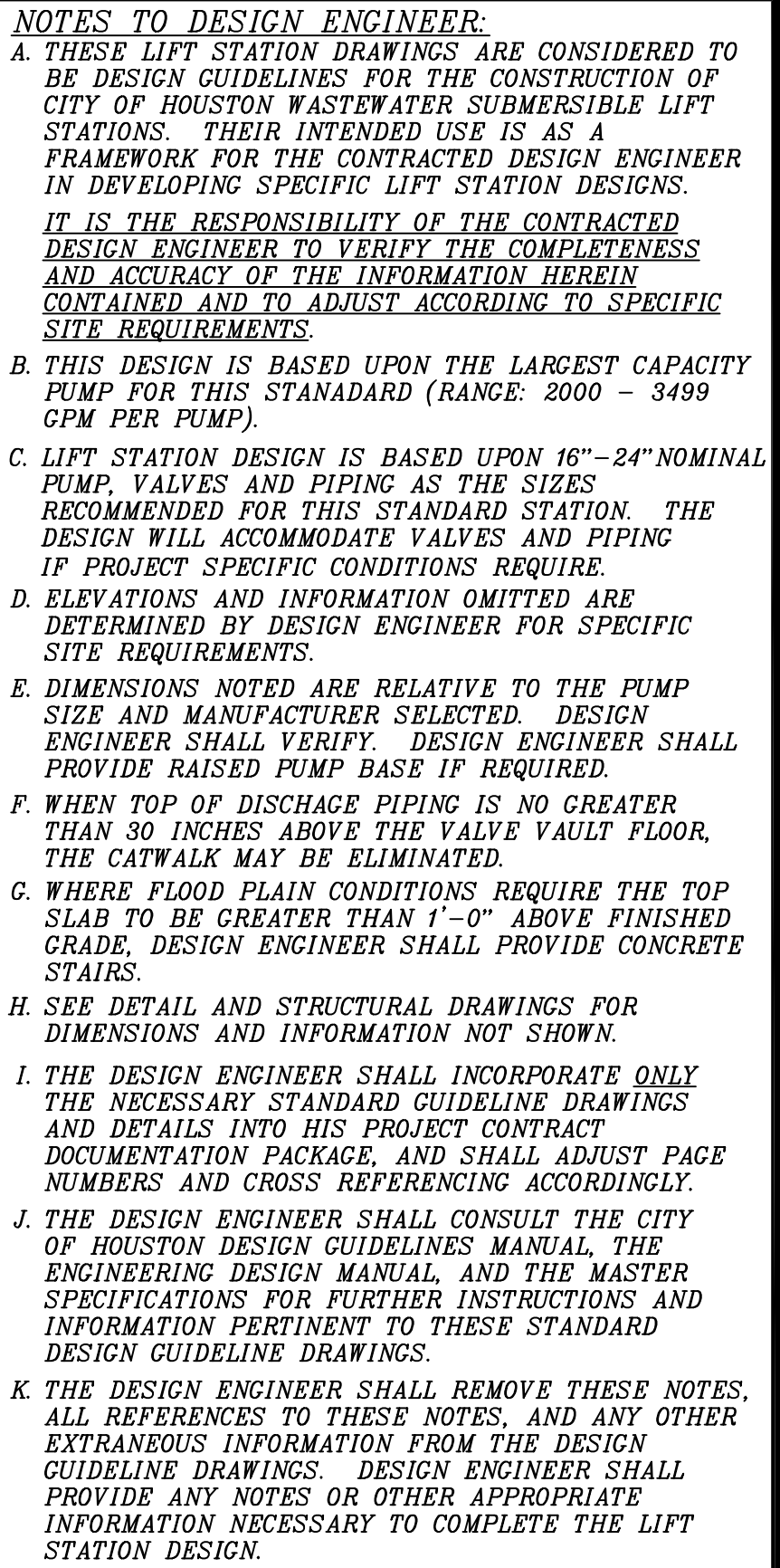
CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

SCALE: XX" = 1'-0" DESIGNED BY:  
SUBMITTED: DRAWN BY:  
DATE: DECEMBER, 1996 SHEET NO. OF SHEETS  
SURVEY BY: DWG. NO.  
FIELD BOOK NO. H2C03

CADD DWG. FILE NO. :  
H2C03.DWG

COHSTD.BDR ORIGINAL SCALE IN INCHES FOR REDUCED PLANS DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.



**NOTES:**

1. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL VERIFY.
2. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
3. PUMP ANCHOR BOLTS ARE TO BE ADHESIVE TYPE, AND EMBEDDED IN CONCRETE SLAB. CONTRACTOR TO SUBMIT DESIGN OF PUMP ANCHOR BOLTS AND PATTERN, INCLUDING CALCULATIONS, DURING SHOP DRAWING SUBMISSION.
4. CONTRACTOR TO PROVIDE ADHESIVE ANCHORS IN LIEU OF WEDGE ANCHORS FOR ALL SUBMERGED CONDITIONS. AND SUBMIT DESIGN OF ANCHOR BOLTS DURING SHOP DRAWING SUBMISSION.
5. ALL PIPING IN THE WET WELL SHALL BE FLANGED. NO FLANGED COUPLING ADAPTORS, OR VICTAULIC STYLE COUPLINGS SHALL BE PERMITTED INSIDE THE WET WELL.

ELEVATION SECTION  
3 PUMPS @ 2000 - 3499 GPM PER PUMP  
PREFERRED CONFIGURATION

PROJECT NO. R-0267-XX-X

TITLE	CITY OF HOUSTON DESIGN GUIDELINE DRAWINGS FOR SUBMERSIBLE LIFT STATIONS
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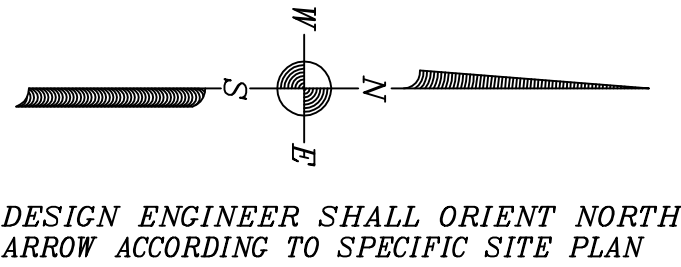
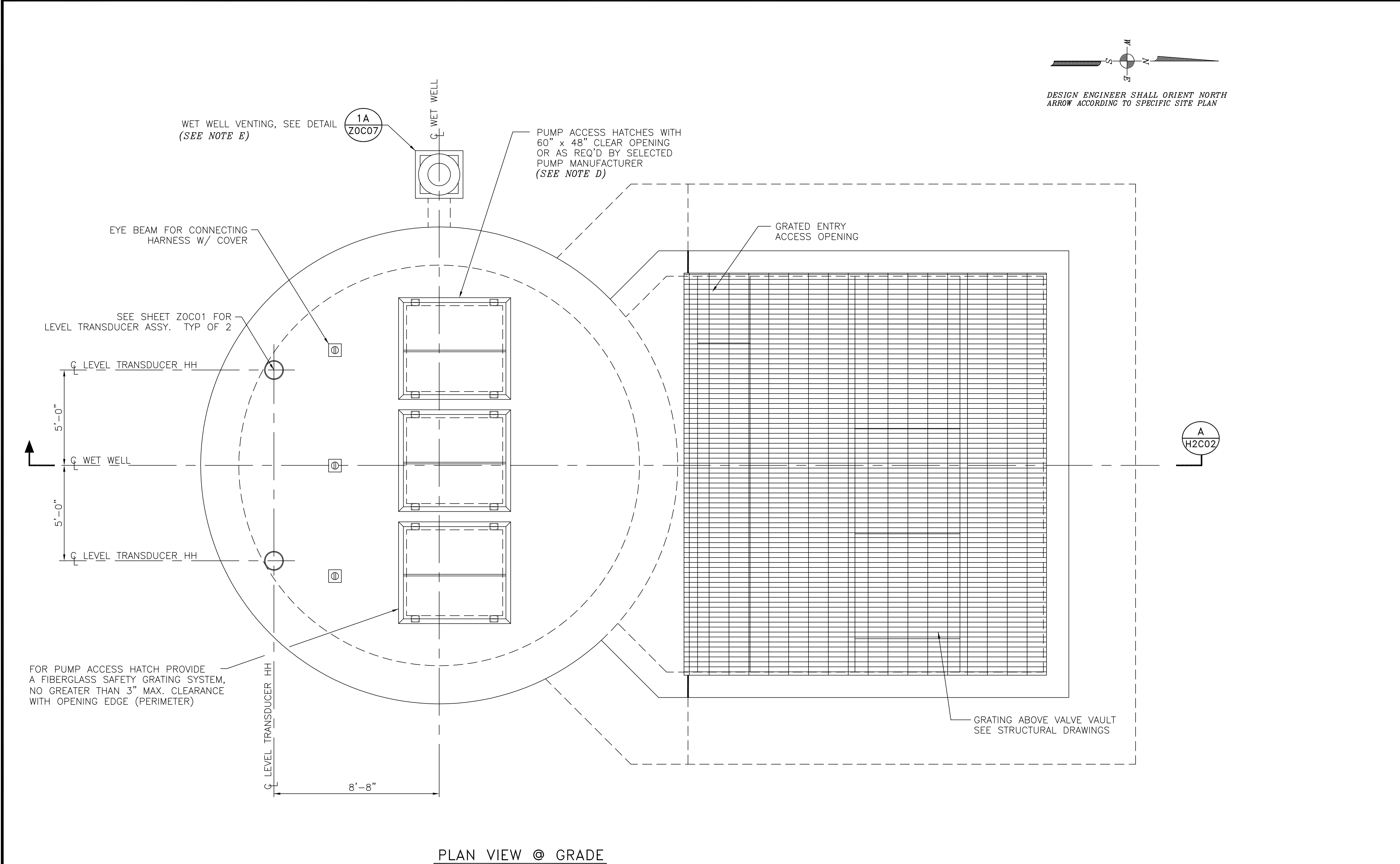
CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

STATION OPERATION TABLES		
RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
	PUMPS OFF LEVEL – NO ACTION	ALL PUMPS ARE OFF
	LEAD PUMP TURNS ON	LEAD PUMP ON
	SECOND PUMP TURNS ON	LEAD & SECOND PUMPS ON
	HIGH WATER ALARM ON	HIGH WATER ALARM SOUND
FALLING LEVEL CYCLE		
WATER LEVEL	ACTION	PUMP(S) IN OPERATION
	HIGH WATER LEVEL ALARM OFF	LEAD & SECOND PUMPS ON
	LEAD PUMP TURNS OFF	SECOND PUMP ON
	SECOND PUMP TURNS OFF	ALL PUMPS STOPPED – STANDBY PUMP SWITCHES TO LEAD PUMP

SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE: DECEMBER, 1996	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO.
FIELD BOOK NO.	H2C02





- NOTES TO DESIGN ENGINEER:**
- A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- B. THIS DESIGN IS BASED UPON THE LARGEST CAPACITY PUMP FOR THIS STANADARD (RANGE: 2000 – 5300 GPM PER PUMP).
- C. LIFT STATION DESIGN IS BASED UPON 16”–24” NOMINAL PUMP, VALVES AND PIPING AS THE SIZES RECOMMENDED FOR THIS STANDARD STATION. THE DESIGN WILL ACCOMMODATE VALVES AND PIPING IF PROJECT SPECIFIC CONDITIONS REQUIRE.
- D. DESIGN ENGINEER TO VERIFY THE SIZE AND LOCATION OF THE WET WELL HATCHES ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS’ REQUIREMENTS.
- E. THE ACTUAL LOCATION OF THE WET WELL VENTING MAY VARY ACCORDING TO SITE REQUIREMENTS. WHERE POSSIBLE, LOCATE ON THE NORTHWEST SIDE OF THE WET WELL.
- F. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- G. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- H. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- I. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEIOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

- NOTES:**
1. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
2. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF THE WET WELL HATCHES PER SELECTED HATCH AND PUMP MANUFACTURERS’ REQUIREMENTS.

PLAN VIEW @ GRADE  
3 PUMPS @ 2000 – 3499 GPM PER PUMP  
PREFERRED CONFIGURATION

PROJECT NO. R-0267-XX-X

TITLE CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

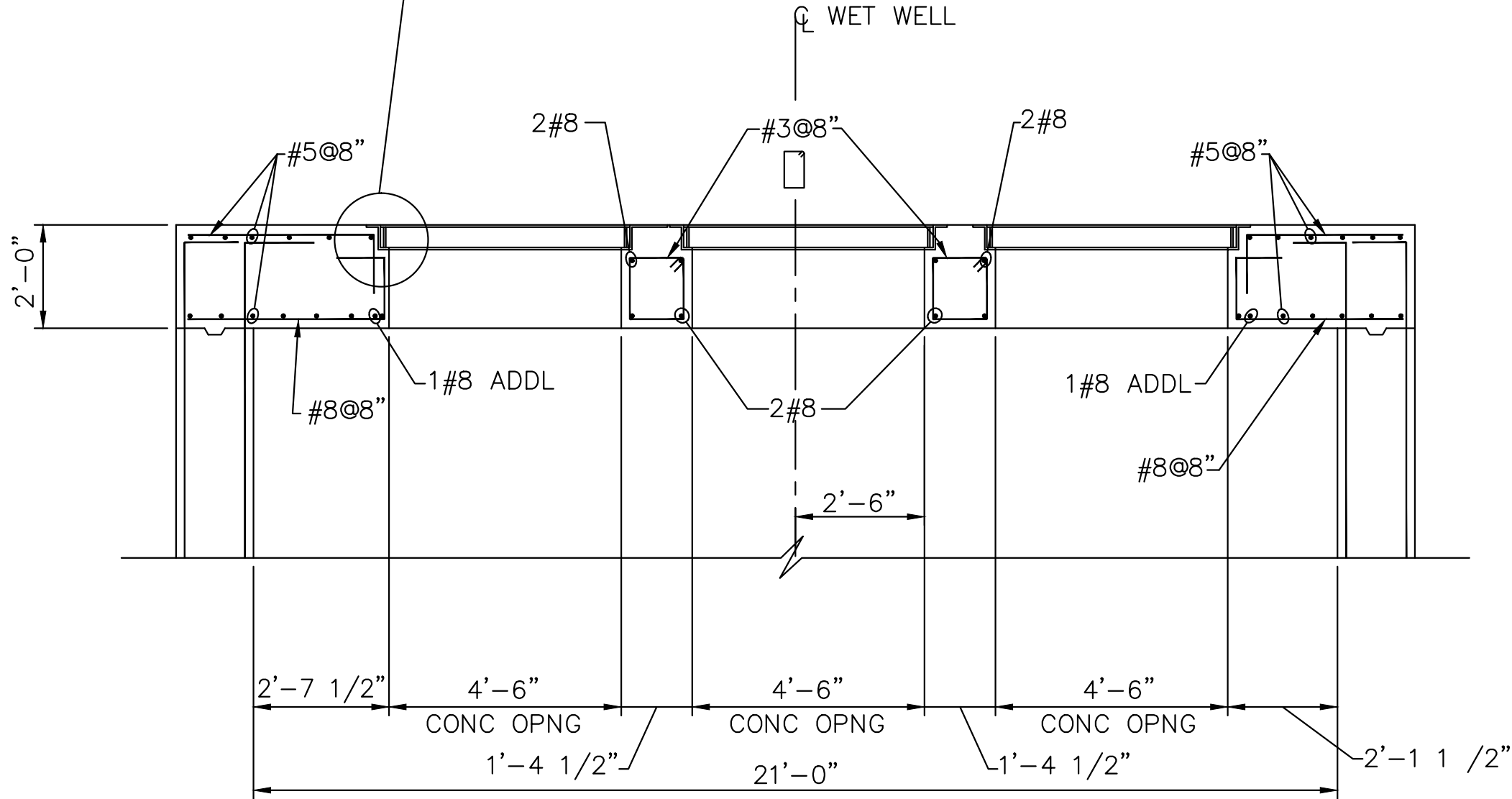
CADD DWG. FILE NO. :  
H2C01.DWG

COHSTD.BDR 0 1 2 3 ORIGINAL SCALE IN INCHES FOR REDUCED PLANS DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.

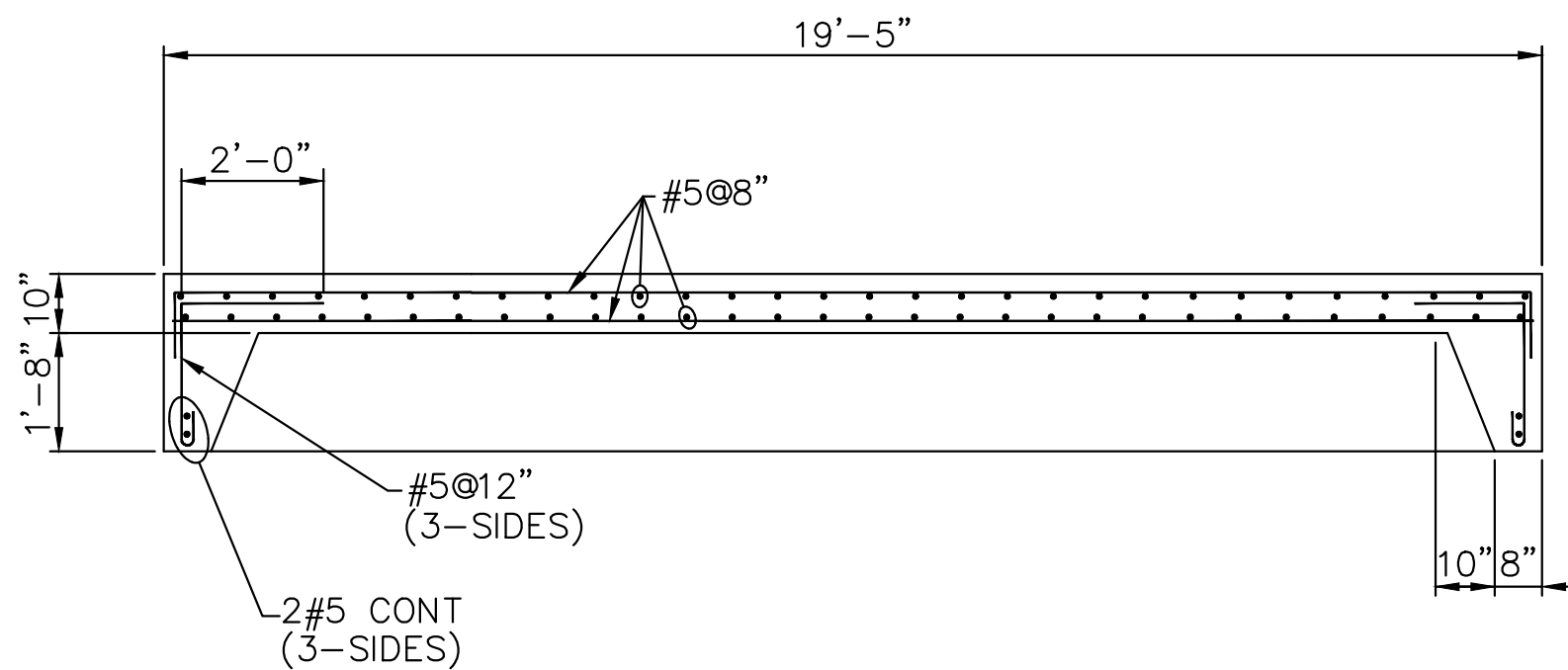
REV. NO.	DESCRIPTION	APP'D	DATE

SCALE: XX" = 1'-0" DESIGNED BY:  
SUBMITTED: DRAWN BY:  
DATE: NOVEMBER, 1996 SHEET NO. OF SHEETS  
SURVEY BY: DWG. NO.  
FIELD BOOK NO. H2C01

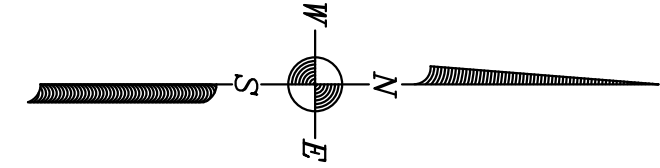
HATCH OPNG FRAME, TYP  
SEE STD DET, SHT ZOS02



SECTION C  
E1S01



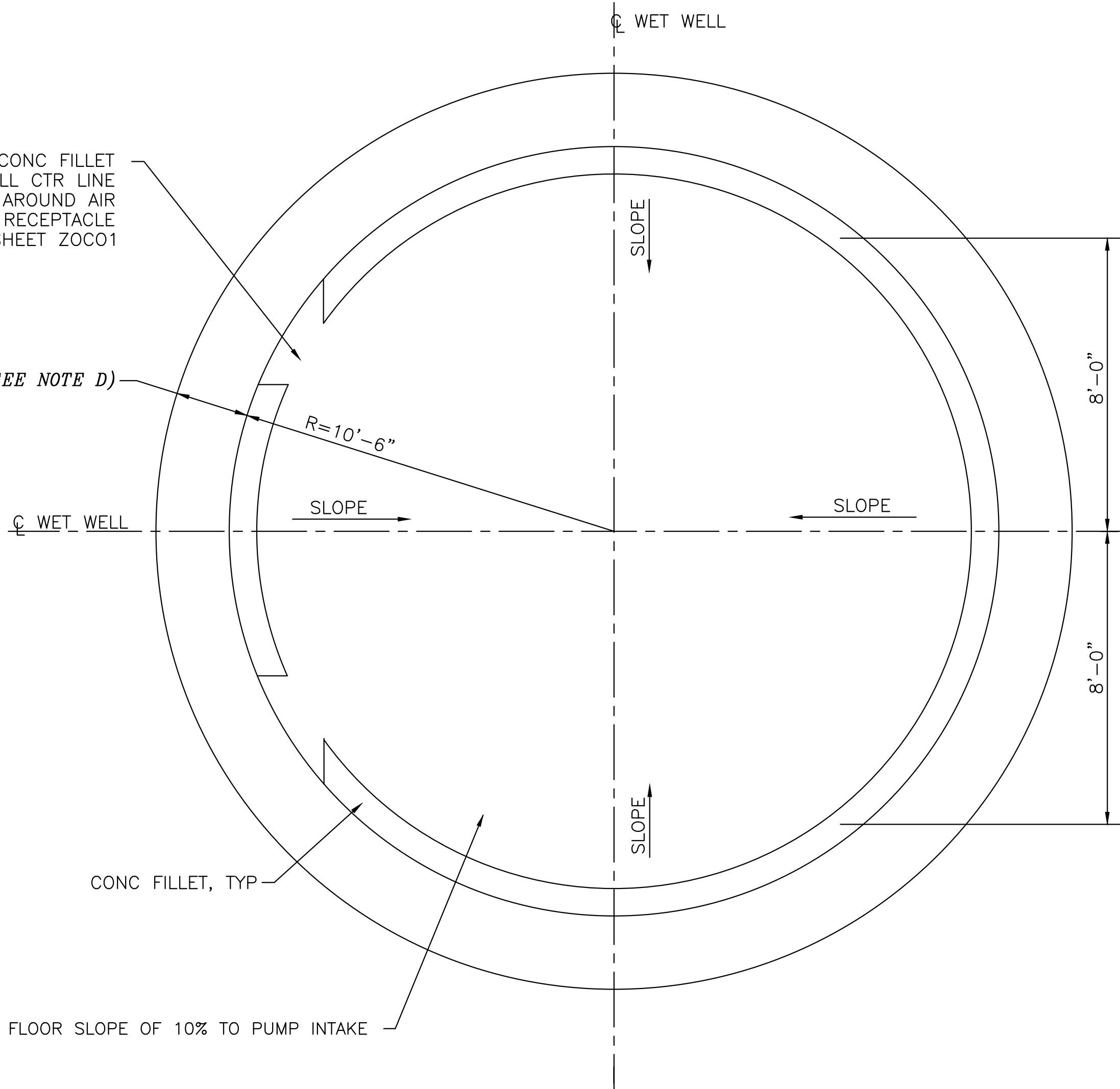
SECTION D  
E1S01



DESIGN ENGINEER SHALL ORIENT NORTH  
ARROW ACCORDING TO SPECIFIC SITE PLAN

2 - BLOCK-OUTS IN CONC FILLET  
SYMM ABOUT WET WELL CTR LINE  
FOR CLEARANCE AROUND AIR  
CELL ANCHOR ROD RECEPTACLE  
SEE SHEET ZOC01

(SEE NOTE D)



BASE SLAB PLAN

NOTES TO DESIGN ENGINEER:

- THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- DESIGN ENGINEER TO VERIFY THE SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- DIMENSIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE SITE REQUIREMENTS.
- THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

NOTES:

- FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET ZOS01.
- CONTRACTOR TO CONFIRM THE SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.

STRUCTURAL  
3 PUMPS @ 2000 - 3499 GPM PER PUMP  
ALTERNATE HIGH PROFILE CONFIGURATION

PROJECT NO.  
R-0267-XX-X

TITLE  
CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

SCALE: XX" = 1'-0"  
DESIGNED BY:  
SUBMITTED: DRAWN BY:  
DATE: NOVEMBER, 1996 SHEET NO. OF SHEETS  
SURVEY BY: DWG. NO.  
FIELD BOOK NO. H1S03

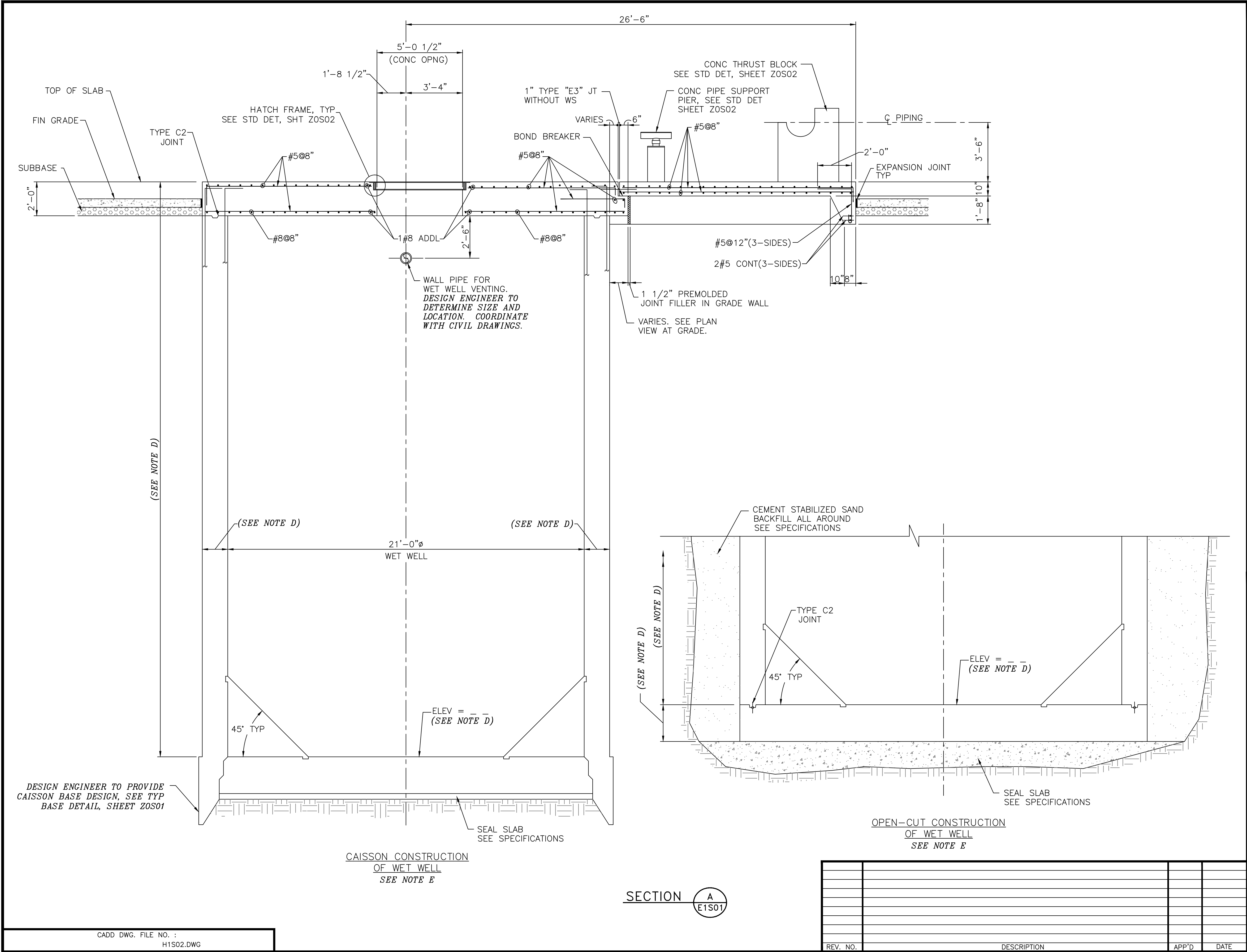
CADD DWG. FILE NO. :  
H1S03.DWG

COHSTD.BDR

0 1 2 3

ORIGINAL SCALE IN INCHES  
FOR REDUCED PLANS

DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.



**NOTES TO DESIGN ENGINEER:**

A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.

B. DESIGN ENGINEER TO VERIFY SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.

C. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.

D. DIMENSIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE SITE REQUIREMENTS.

E. DESIGN ENGINEER TO PROVIDE WET WELL DESIGN FOR EITHER OPEN-CUT OR CAISSON CONSTRUCTION.

F. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.

G. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.

H. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

**NOTES:**

1. FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET ZOS01.

2. CONTRACTOR TO CONFIRM THE SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.

3. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.

4. WET WELL TO BE LINED WITH CONCRETE PROTECTIVE LINER PER PROJECT SPECIFICATIONS, CONSULT WITH COH PROJECT MANAGER FOR APPROVED PRODUCTS. LINER SHALL COVER ALL CONCRETE SURFACES, AND SHALL EXTEND TO A MINIMUM OF 12" BELOW THE LOW WATER ELEVATION.

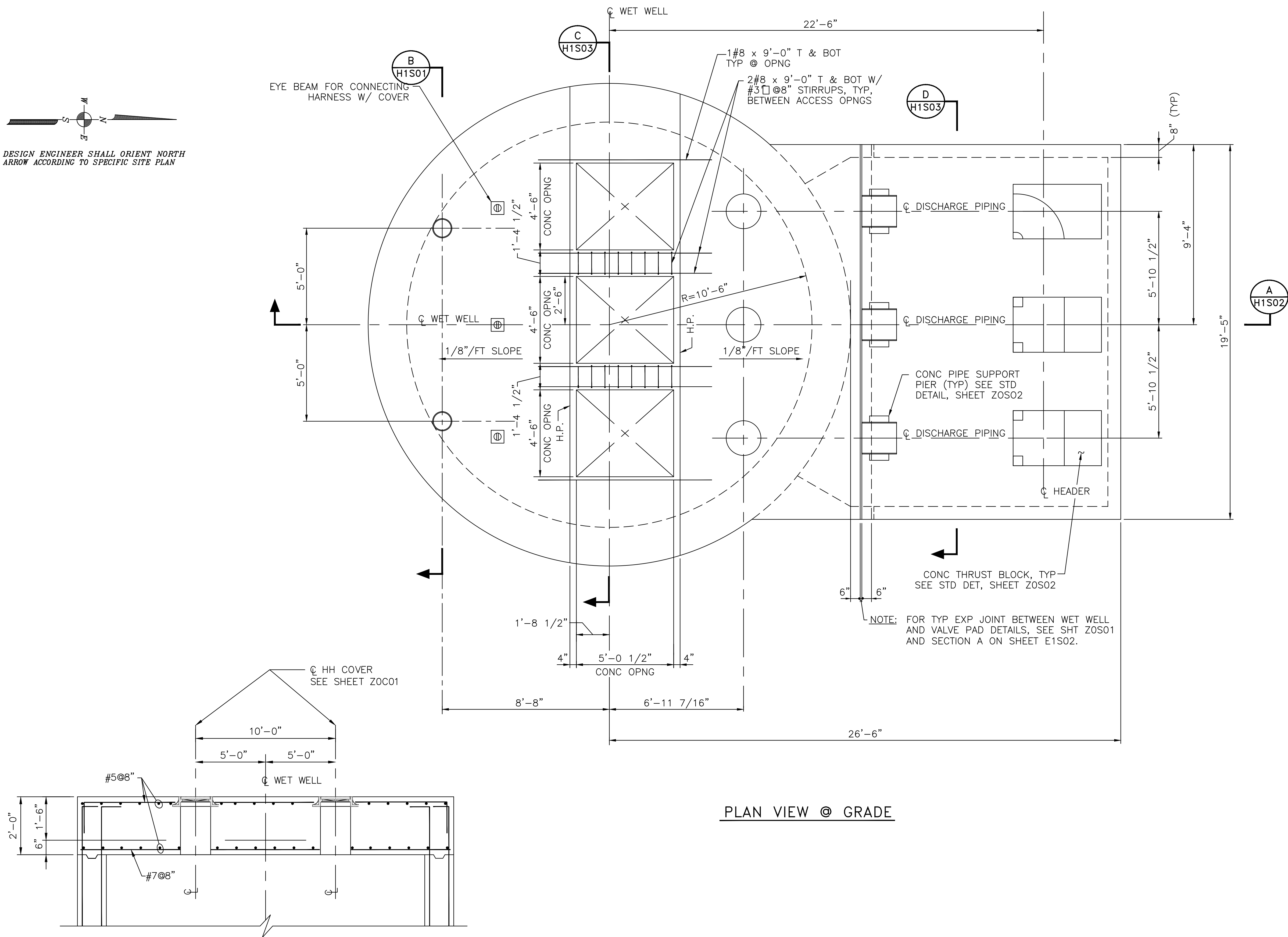
STRUCTURAL	
3 PUMPS @ 2000 - 3499 GPM PER PUMP ALTERNATE HIGH PROFILE CONFIGURATION	
PROJECT NO.	R-0267-XX-X
TITLE	CITY OF HOUSTON DESIGN GUIDELINE DRAWINGS FOR SUBMERSIBLE LIFT STATIONS
CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING ENGINEERING AND CONSTRUCTION	

SCALE:	XX" = 1'-0"	DESIGNED BY:
SUBMITTED:		DRAWN BY:
DATE:	JANUARY, 1996	SHEET NO. OF SHEETS
SURVEY BY:		DWG. NO.
FIELD BOOK NO.		H1S02

REV. NO.	DESCRIPTION	APP'D	DATE



DESIGN ENGINEER SHALL ORIENT NORTH  
ARROW ACCORDING TO SPECIFIC SITE PLAN



SECTION B  
H1S01

PLAN VIEW @ GRADE

NOTES TO DESIGN ENGINEER:

- THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- DESIGN ENGINEER TO VERIFY SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- DIMENSIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE SITE REQUIREMENTS.
- SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.
- THE DESIGN ENGINEER SHALL ENSURE GUARDRAIL AND CATWALK MEET THE REQUIREMENTS FOR "AREAS NOT OPEN TO PUBLIC" AS PROVIDED BY THE U.S. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) AND LATEST COH CODE ENFORCEMENT APPROVED VERSION OF THE INTERNATIONAL BUILDING CODE (IBC).
- THE DESIGN ENGINEER SHALL PROVIDE GUARDRAILS FOR ANY WALKING SURFACES WITH A POTENTIAL FALL DISTANCE EQUAL TO OR GREATER THAN 30 INCHES.

NOTES:

- FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET ZOS01.
- CONTRACTOR TO CONFIRM THE SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- WET WELL TO BE LINED WITH CONCRETE PROTECTIVE LINER PER PROJECT SPECIFICATIONS. CONSULT WITH COH PROJECT MANAGER FOR APPROVED PRODUCTS. LINER SHALL COVER ALL CONCRETE SURFACES, AND SHALL EXTEND TO A MINIMUM OF 12" BELOW THE LOW WATER ELEVATION.

STRUCTURAL

3 PUMPS @ 2000 - 3499 GPM PER PUMP  
ALTERNATE HIGH PROFILE CONFIGURATION

PROJECT NO.

R-0267-XX-X

TITLE

CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

CITY ENGINEER

SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE: NOVEMBER, 1996	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. H1S01
FIELD BOOK NO.	

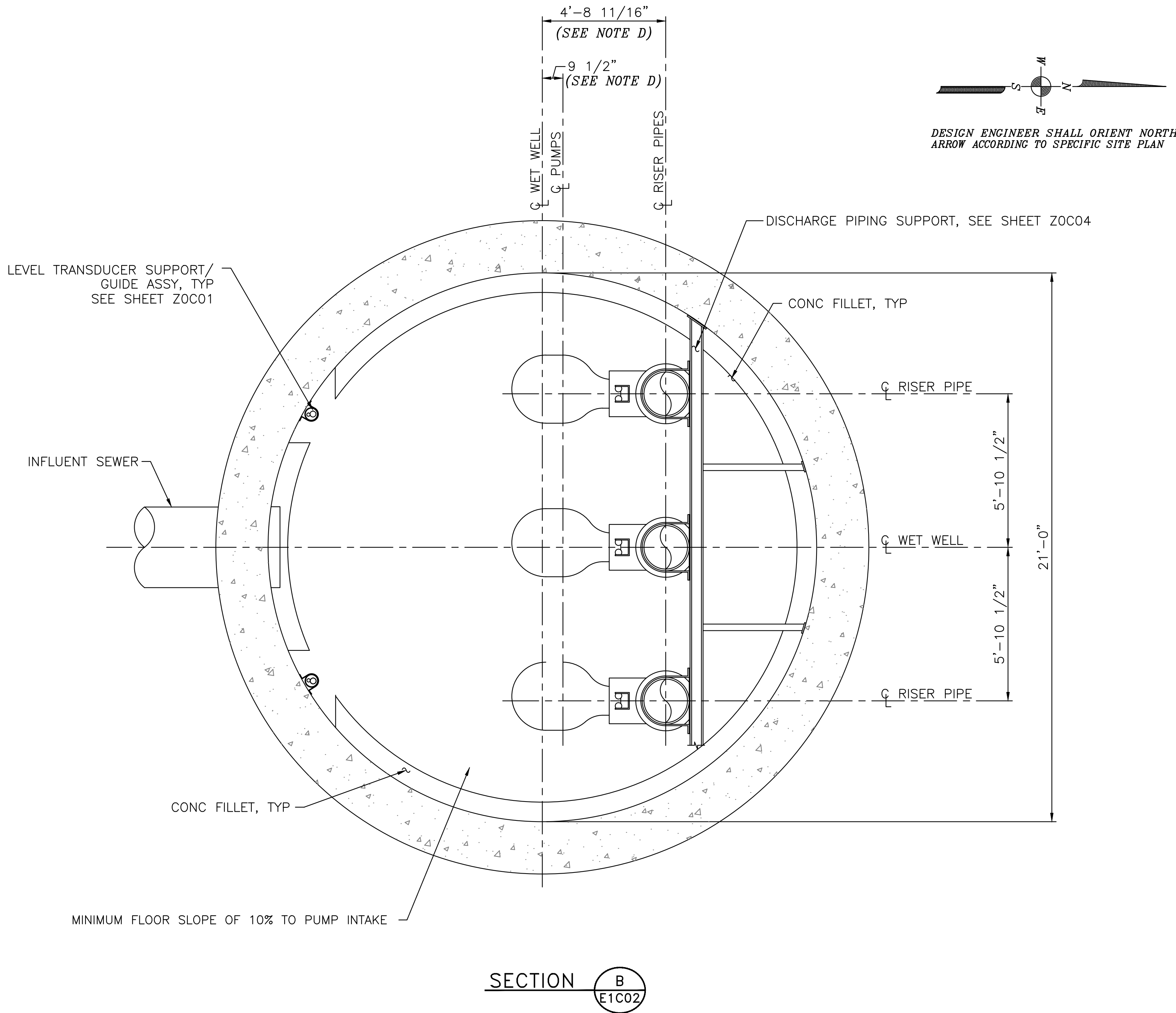
CADD DWG. FILE NO. :  
H1S01.DWG

COHSTD.BDR

0 1 2 3

ORIGINAL SCALE IN INCHES  
FOR REDUCED PLANS

DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.



NOTES TO DESIGN ENGINEER:

- A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- B. THIS DESIGN IS BASED UPON THE LARGEST CAPACITY PUMP FOR THIS STANDARD (RANGE: 2000 - 3499 GPM PER PUMP).
- C. LIFT STATION DESIGN IS BASED UPON 16"-24" NOMINAL PUMP, VALVES AND PIPING AS THE SIZES RECOMMENDED FOR THIS STANDARD STATION. THE DESIGN WILL ACCOMMODATE VALVES AND PIPING IF PROJECT SPECIFIC CONDITIONS REQUIRE.
- D. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY.
- E. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- F. THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- G. THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- H. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

NOTES:

1. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
2. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL VERIFY.

PLAN VIEW @ GRADE  
3 PUMPS @ 2000 - 3499 GPM PER PUMP  
BASE SECTION

PROJECT NO. R-0267-XX-X

TITLE CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON  
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH  
STANDARD TITLE BLOCK ON ALL  
DRAWINGS, SEE STANDARD TITLE  
BLOCK DETAIL ON SHEET ZOC0X

CITY ENGINEER

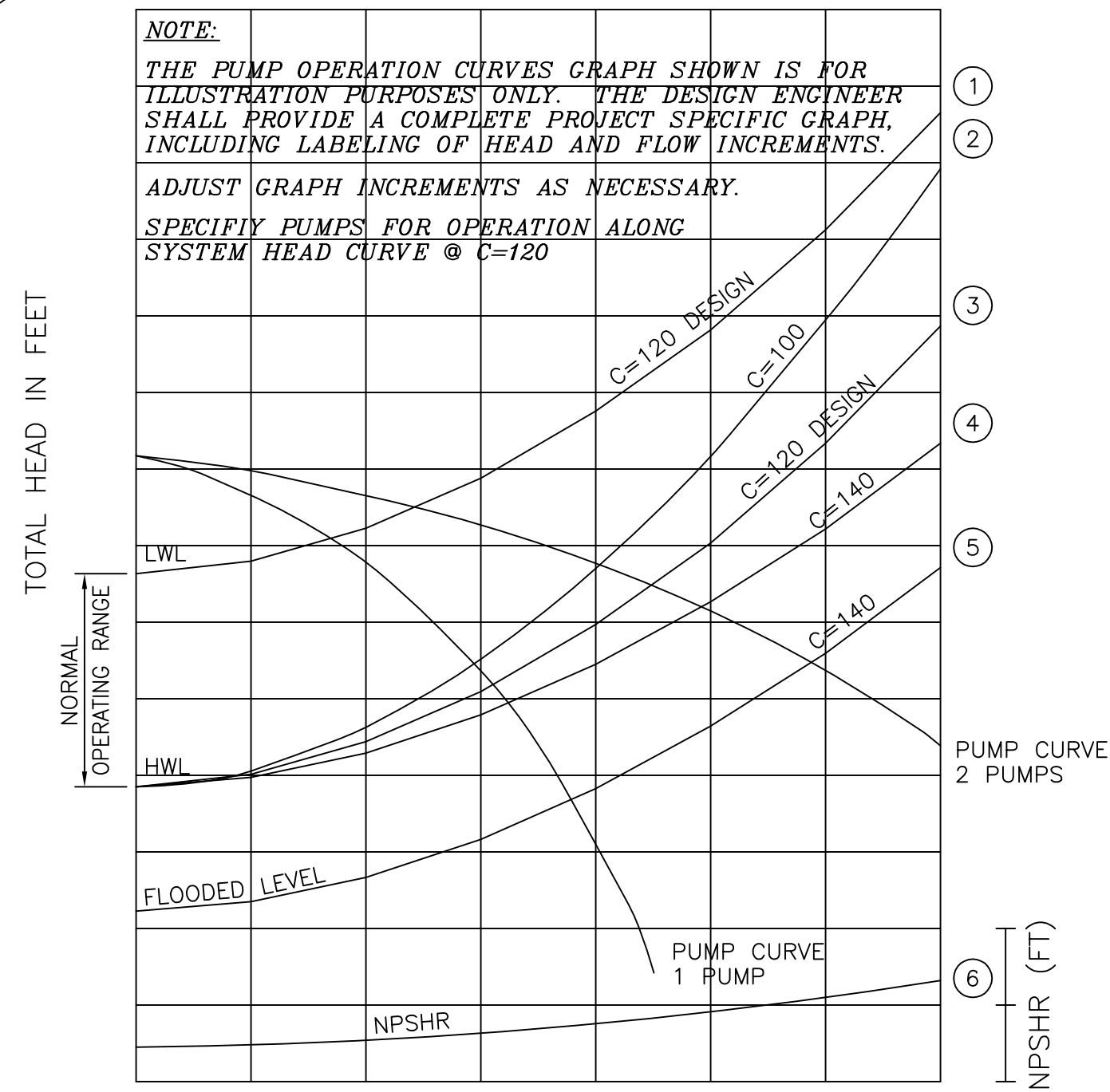
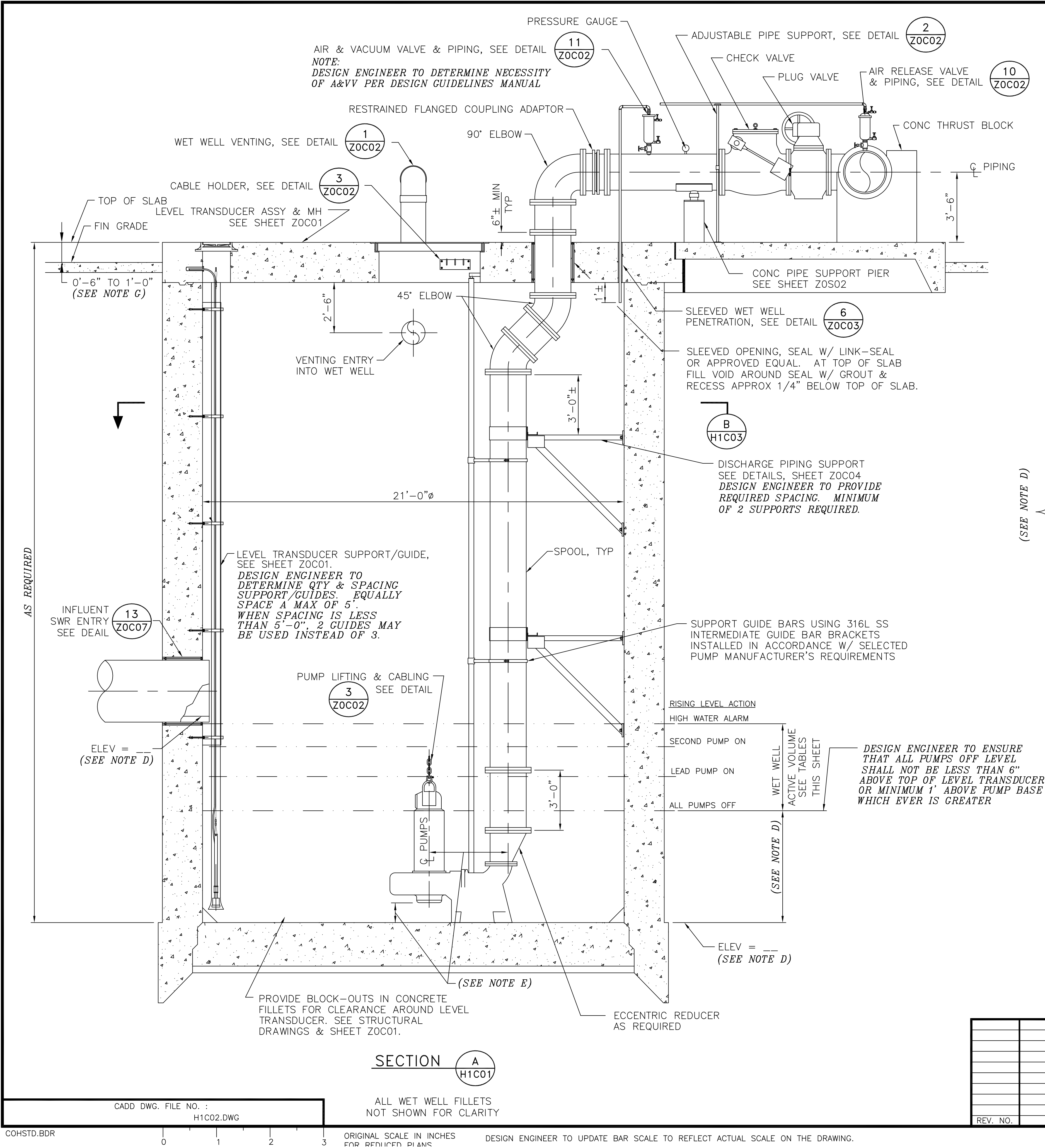
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DESIGNED BY:  
DRAWN BY:  
DATE: DECEMBER, 1996  
SHEET NO. OF SHEETS  
SURVEY BY:  
DWG. NO. H1C03  
FIELD BOOK NO.

CADD DWG. FILE NO. :  
H1C03.DWG

COHSTD.BDR

0 1 2 3

ORIGINAL SCALE IN INCHES  
FOR REDUCED PLANS  
DESIGN ENGINEER TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE ON THE DRAWING.



- PUMP CURVE NOTES:
1. LOW NORMAL OPERATING LEVEL C=120 - DESIGN.
  2. HIGH NORMAL OPERATING LEVEL C=100 - INFORMATION ONLY (TCEQ)
  3. HIGH NORMAL OPERATING LEVEL C=120 - DESIGN
  4. HIGH NORMAL OPERATING LEVEL C=140 - INFORMATION ONLY
  5. EMERGENCY FLOODED OPERATING LEVEL C=140 - MAXIMUM DISCHARGE
  6. NET POSITIVE SUCTION HEAD REQUIRED (NPSHR) BASED ON NORMAL OPERATING WATER LEVELS
  7. PUMP CURVES ARE MODIFIED FOR STATION LOSSES.

PUMP DATA TABLE			
PUMP CHARACTERISTICS	PUMP NO. 1	PUMP NO. 2	PUMP NO. 3
MOTOR DATA			
NOMINAL SIZE (HP)			
MAX SPEED (RPM)			
SOLIDS PASSAGE			
MIN SPHERE (IN)			
CAPACITY (GPM)			
DESIGN RUNOUT			
DISCHARGE HEAD (FT)			
DESIGN RUNOUT			
SHUT OFF			
EFFICIENCY (%)			
DESIGN			
NPSHR (FT)			
DESIGN RUNOUT			
PUMP CYCLE TIME			

STATION OPERATION TABLES

RIISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
	PUMPS OFF LEVEL - NO ACTION	ALL PUMPS ARE OFF
	LEAD PUMP TURNS ON	LEAD PUMP ON
	SECOND PUMP TURNS ON	LEAD & SECOND PUMPS ON
	HIGH WATER ALARM ON	HIGH WATER ALARM SOUND
FALLING LEVEL CYCLE		
WATER LEVEL	ACTION	PUMP(S) IN OPERATION
	HIGH WATER LEVEL ALARM OFF	LEAD & SECOND PUMPS ON
	LEAD PUMP TURNS OFF	SECOND PUMP ON
	SECOND PUMP TURNS OFF	ALL PUMPS STOPPED - STANDBY PUMP SWITCHES TO LEAD PUMP

NOTES TO DESIGN ENGINEER:

- THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED DESIGN ENGINEER TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION HEREIN CONTAINED AND TO ADJUST ACCORDING TO PROJECT SPECIFIC REQUIREMENTS.
- THIS DESIGN IS BASED UPON THE LARGEST CAPACITY PUMP FOR THIS STANADARD (RANGE: 2000 - 3499 GPM PER PUMP).
- LIFT STATION DESIGN IS BASED UPON 16"-24" NOMINAL PUMP, VALVES AND PIPING AS THE SIZES RECOMMENDED FOR THIS STANDARD STATION. THE DESIGN WILL ACCOMMODATE VALVES AND PIPING IF PROJECT SPECIFIC CONDITIONS REQUIRE.
- ELEVATIONS AND INFORMATION OMITTED ARE DETERMINED BY DESIGN ENGINEER FOR PROJECT SPECIFIC REQUIREMENTS.
- DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY. DESIGN ENGINEER SHALL PROVIDE RAISED PUMP BASE IF REQUIRED.
- WHERE FLOOD PLAIN CONDITIONS REQUIRE THE TOP SLAB TO BE GREATER THAN 1'-0" ABOVE FINISHED GRADE, DESIGN ENGINEER SHALL PROVIDE CONCRETE STAIRS.
- SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- THE DESIGN ENGINEER SHALL INCORPORATE ONLY THE NECESSARY STANDARD GUIDELINE DRAWINGS AND DETAILS INTO HIS PROJECT CONTRACT DOCUMENTATION PACKAGE, AND SHALL ADJUST PAGE NUMBERS AND CROSS REFERENCING ACCORDINGLY.
- THE DESIGN ENGINEER SHALL CONSULT THE CITY OF HOUSTON DESIGN GUIDELINES MANUAL, THE ENGINEERING DESIGN MANUAL, AND THE MASTER SPECIFICATIONS FOR FURTHER INSTRUCTIONS AND INFORMATION PERTINENT TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.
- THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWINGS. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

NOTES:

- DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL CONFIRM.
- SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- PUMP ANCHOR BOLTS ARE TO BE ADHESIVE TYPE, AND EMBEDDED IN CONCRETE SLAB. CONTRACTOR TO SUBMIT DESIGN OF PUMP ANCHOR BOLTS AND PATTERN, INCLUDING CALCULATIONS, DURING SHOP DRAWING SUBMISSION.
- CONTRACTOR TO PROVIDE ADHESIVE ANCHORS IN LIEU OF WEDGE ANCHORS FOR ALL SUBMERGED CONDITIONS. AND SUBMIT DESIGN OF ANCHOR BOLTS DURING SHOP DRAWING SUBMISSION.
- ALL PIPING IN THE WET WELL SHALL BE FLANGED. NO FLANGED COUPLING ADAPTORS, OR VICTAULIC STYLE COUPLINGS SHALL BE PERMITTED INSIDE THE WET WELL.

ELEVATION SECTION

3 PUMPS @ 2000 - 3499 GPM PER PUMP  
ALTERNATE HIGH PROFILE CONFIGURATION

PROJECT NO.

R-0267-XX-X

TITLE

CITY OF HOUSTON  
DESIGN GUIDELINE DRAWINGS  
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING  
ENGINEERING AND CONSTRUCTION

DESIGN ENGINEER TO INCLUDE COH STANDARD TITLE BLOCK ON ALL DRAWINGS, SEE STANDARD TITLE BLOCK DETAIL ON SHEET ZOC0X

SCALE: XX" = 1'-0" DESIGNED BY:  
SUBMITTED: DRAWN BY:  
DATE: DECEMBER, 1996 SHEET NO. OF SHEETS  
SURVEY BY: DWG. NO. H1C02  
FIELD BOOK NO.