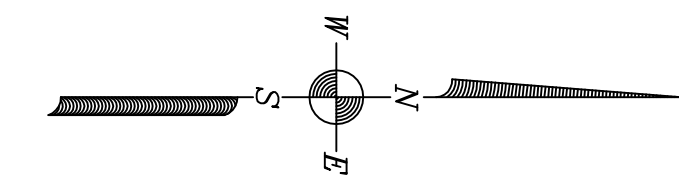


1. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
2. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF THE WET WELL HATCHES PER SELECTED PUMP MANUFACTURER'S REQUIREMENTS.
3. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL VERIFY.
4. INSTALL PLUG VALVES TO OPEN UPWARD AND TO CLOSE TO A SEATING POSITION.
5. 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.



DESIGN ENGINEER SHALL ORIENT NORTH
ARROW ACCORDING TO SPECIFIC SITE PLAN



CADD DWG. FILE NO. :
C1C01.DWG

COHSTD.BDR

ORIGINAL SCALE IN INCHES
FOR REDUCED PLANS

CONSULTANT TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE OF THE DRAWINGS

[illegible]

- 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: 500 – 999 GPM PER PUMP).
- C. THIS DESIGN IS BASED UPON 8"–10" NOMINAL DISCHARGE PIPING, VALVES, AND HEADER AS THE LARGEST SIZES RECOMMENDED FOR THIS STANDARD STATION.
- 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. 6" Ø PIPE MIN. SIZE OF VENT NOT TO EXCEED 600 FPM.
- F. REPLACE THE 90° ELBOW WITH A FLANGED TEE FOR CONNECTION TO SURGE RELIEF VALVE, IF REQUIRED. SEE DETAILS, SHEET 2006C.
- G. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY.
- H. BASE SLAB AND WALL THICKNESSES ARE DEPENDANT UPON THE STRUCTURAL DESIGN AND THE BUOYANCY REQUIREMENTS, AS DETERMINED BY THE DESIGN ENGINEER.
- J. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- K. 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.
- L. 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.
- M. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXTRANEOUS INFORMATION FROM THE DESIGN GUIDELINE DRAWING. DESIGN ENGINEER SHALL PROVIDE ANY NOTES OR OTHER APPROPRIATE INFORMATION NECESSARY TO COMPLETE THE LIFT STATION DESIGN.

PLAN VIEW @ GRADE & BASE SECTION
2 PUMPS @ 500 - 999 GPM PER PUMP
ALTERNATE HIGH PROFILE CONFIGURATION

PROJECT NO.	R-000267-000X-X
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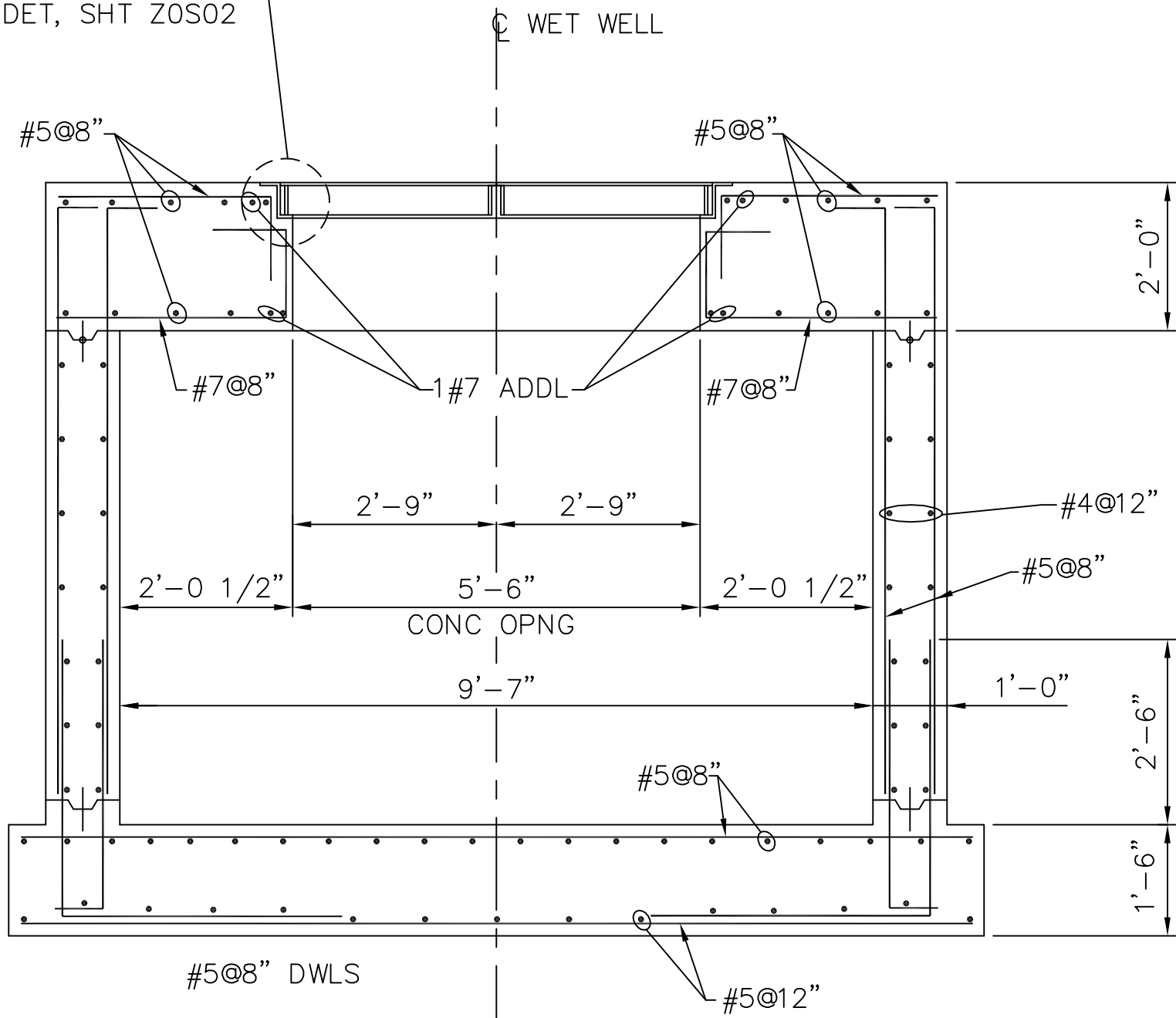
TITLE	CITY OF HOUSTON DESIGN GUIDELINE DRAWINGS FOR SUBMERSIBLE LIFT STATIONS
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CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING AND CONSTRUCTION

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

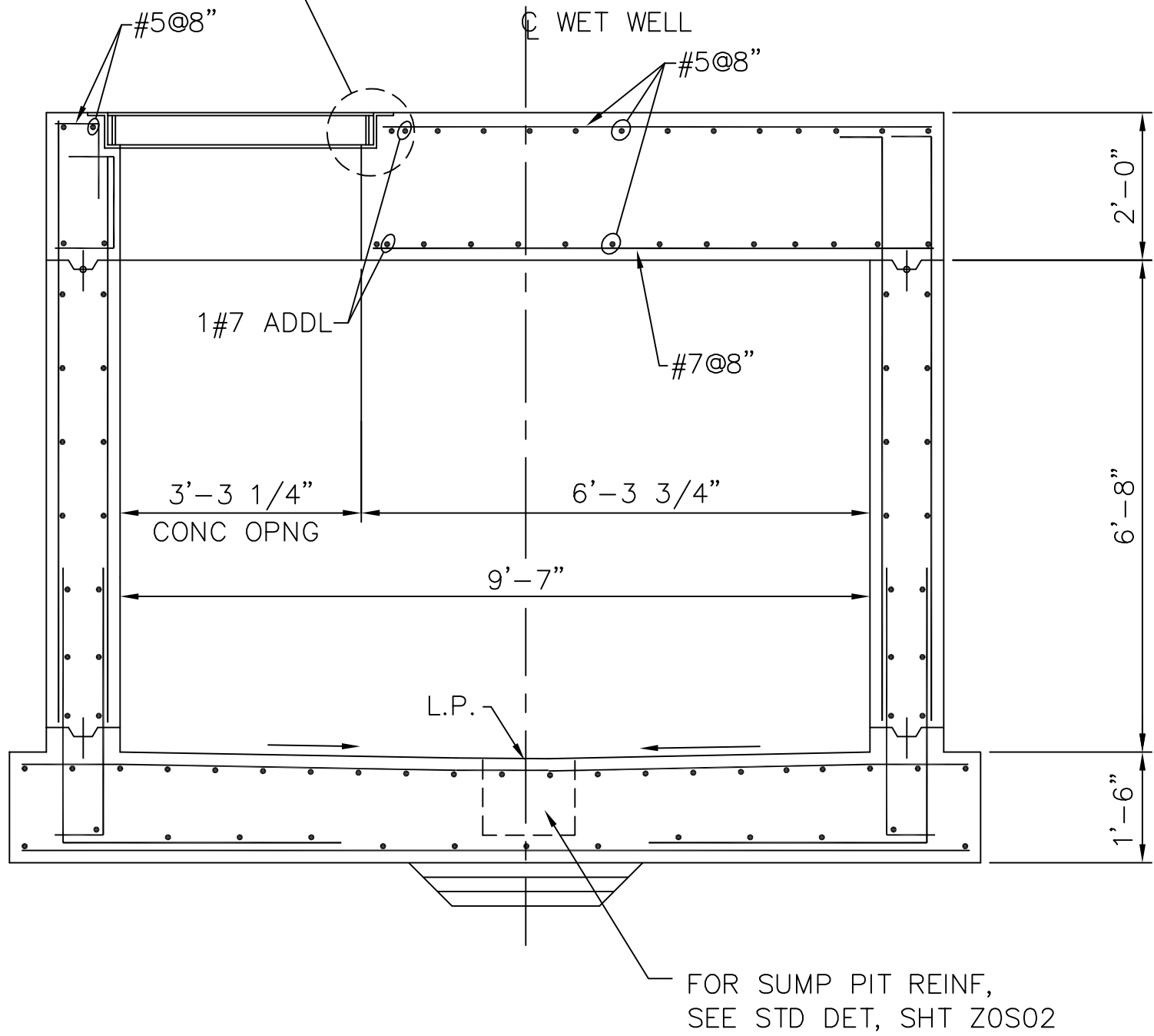
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SUBMITTED:	DRAWN BY:
DATE:	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO.
FIELD BOOK NO.	C1C01

HATCH OPNG FRAME, TYP
SEE STD DET, SHT ZOS02



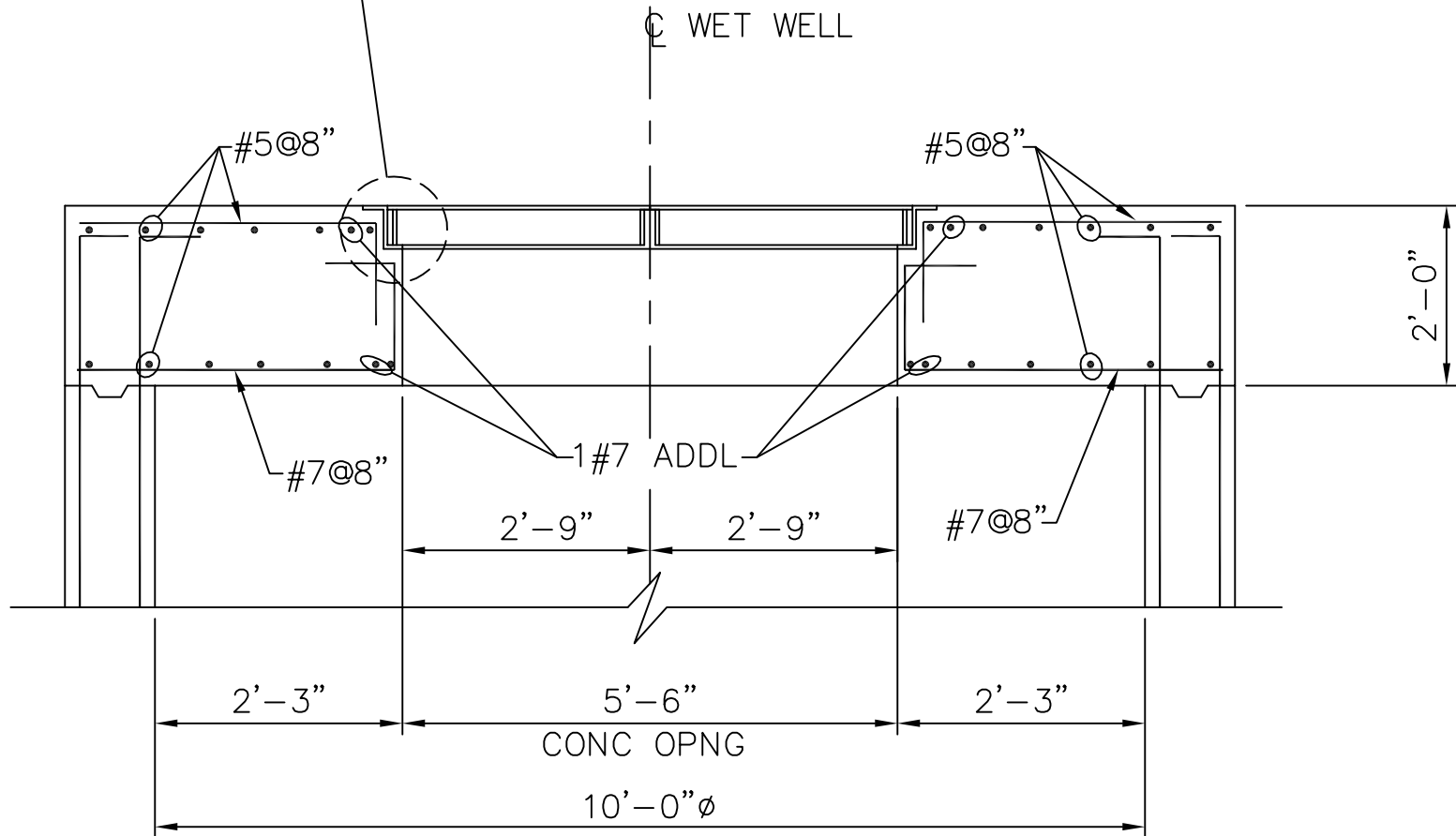
SECTION B
C3S01

HATCH OPNG FRAME, TYP
SEE STD DET, SHT ZOS02



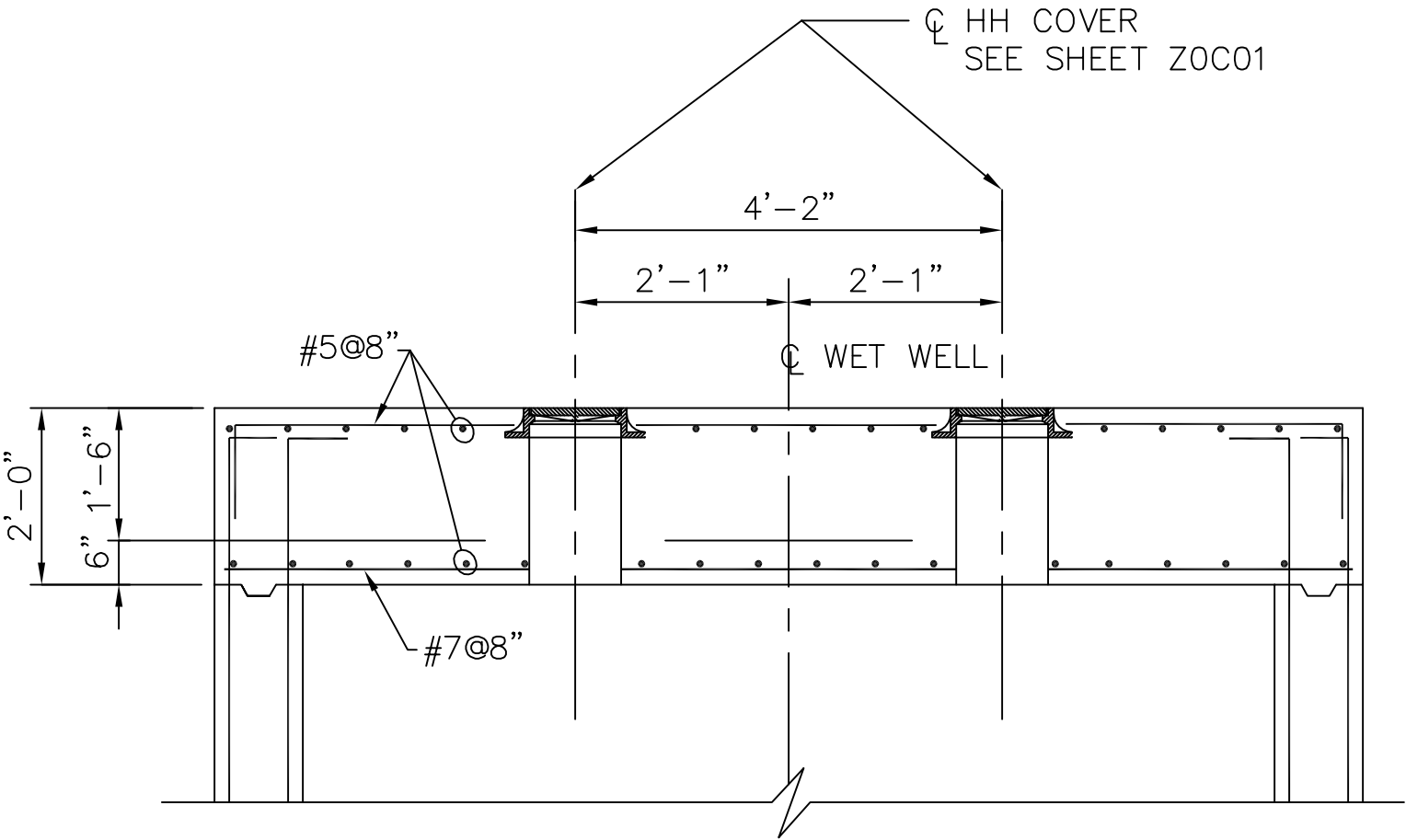
SECTION C
C3S01

HATCH OPNG FRAME, TYP
SEE STD DET, SHT ZOS02



SECTION D
C3S01

HH COVER
SEE SHEET ZOC01



SECTION E
C3S01

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 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. 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
2-PUMPS @ 500 - 999 GPM PER PUMP ALTERNATE LOW PROFILE CONFIGURATION
PROJECT NO. R-000267-000X-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. :
C3S03.DWG

COHSTD.BDR

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2

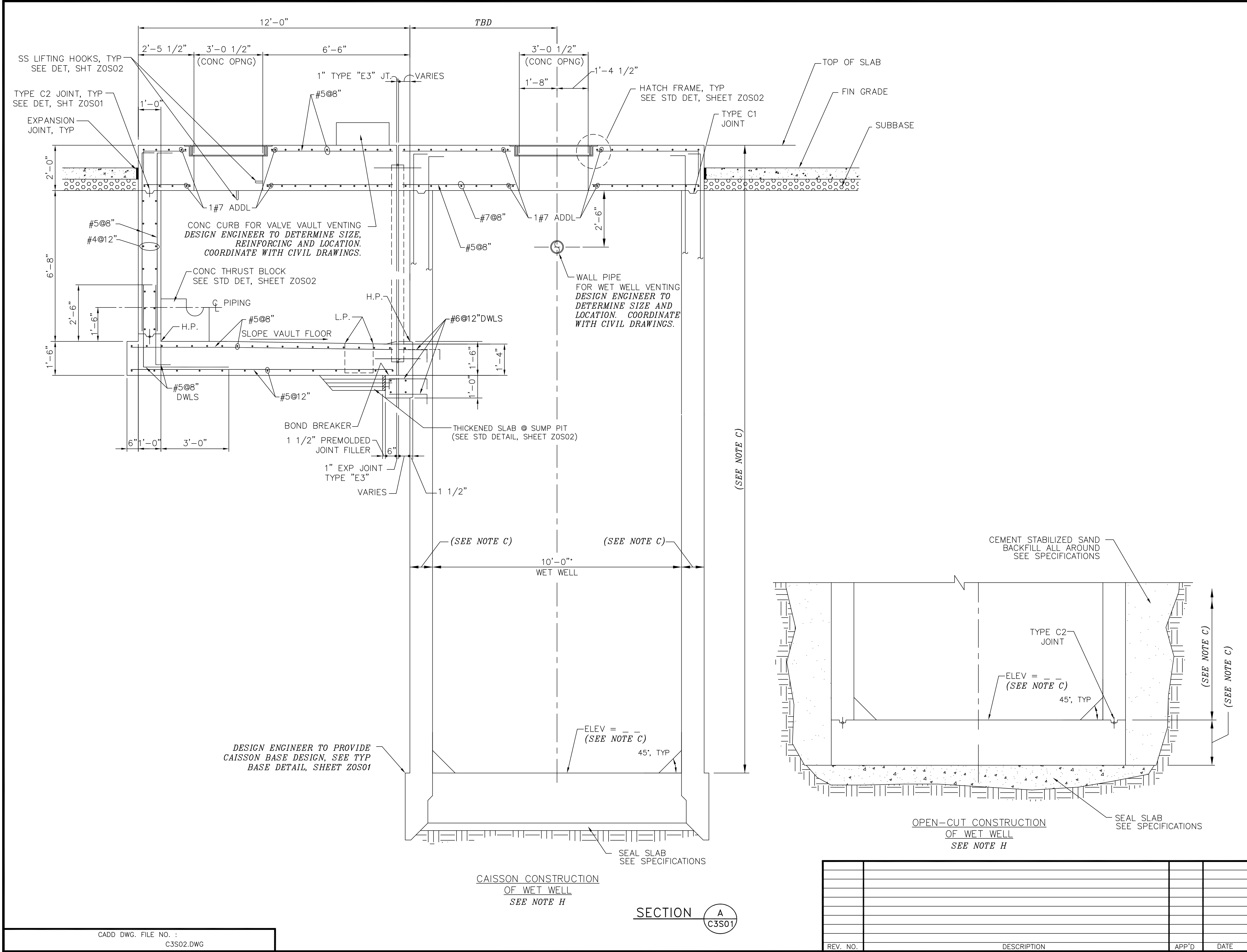
3

ORIGINAL SCALE IN INCHES
FOR REDUCED PLANS

CONSULTANT TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE OF THE DRAWINGS

REV. NO.	DESCRIPTION	APP'D	DATE

SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE:	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. C3S03
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 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, ELEVATIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE PROJECT SPECIFIC REQUIREMENTS.

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

E. 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.

F. 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.

G. 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.

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

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

2-PUMPS @ 500 - 999 GPM PER PUMP
ALTERNATE LOW PROFILE CONFIGURATION

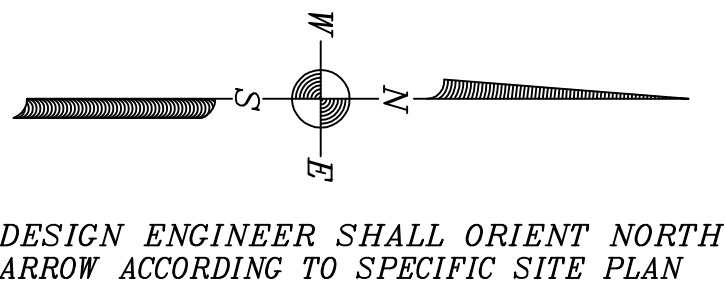
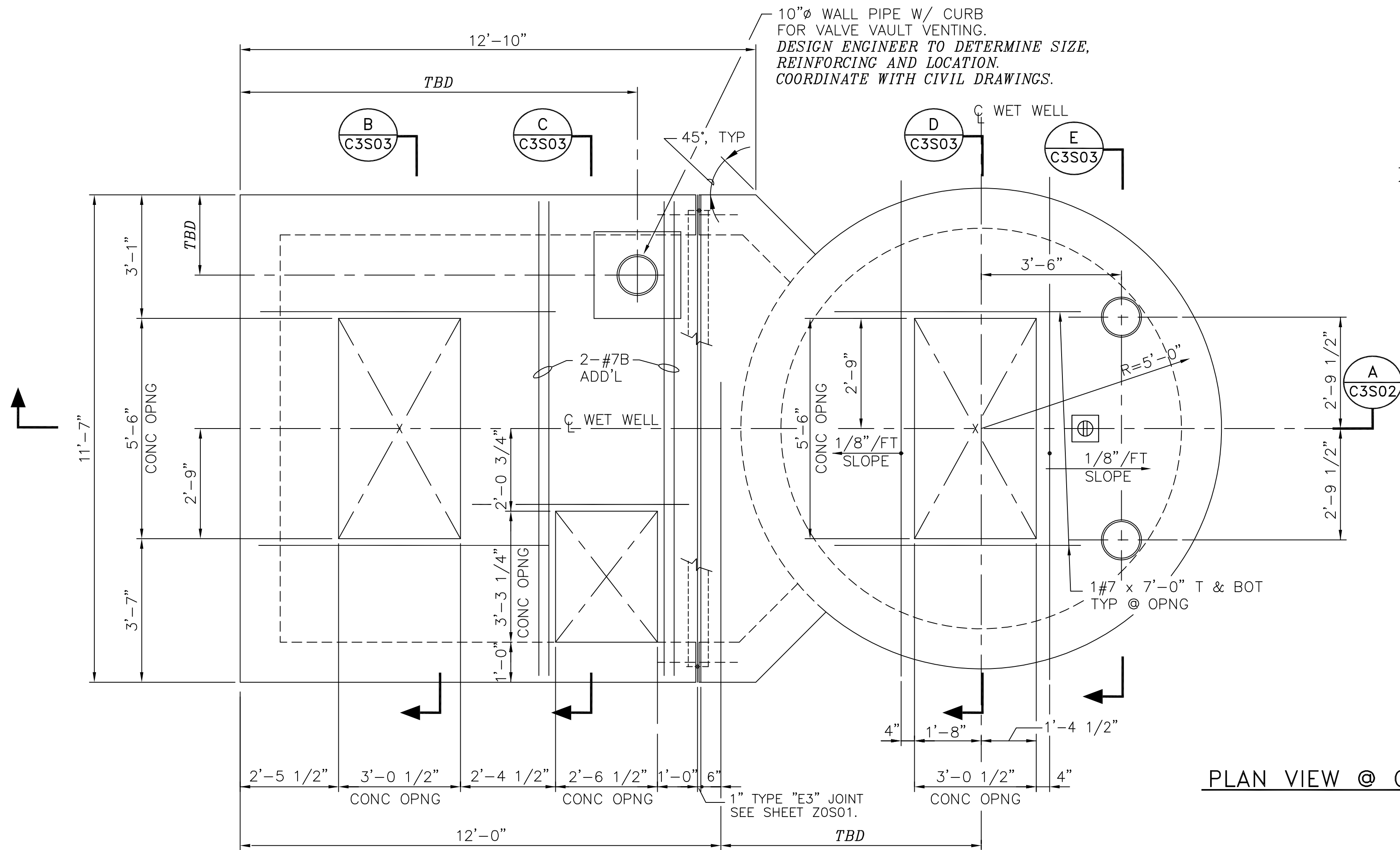
PROJECT NO. R-000267-000X-X

TITLE CITY OF HOUSTON
DESIGN GUIDELINE DRAWINGS
FOR SUBMERSIBLE LIFT STATION

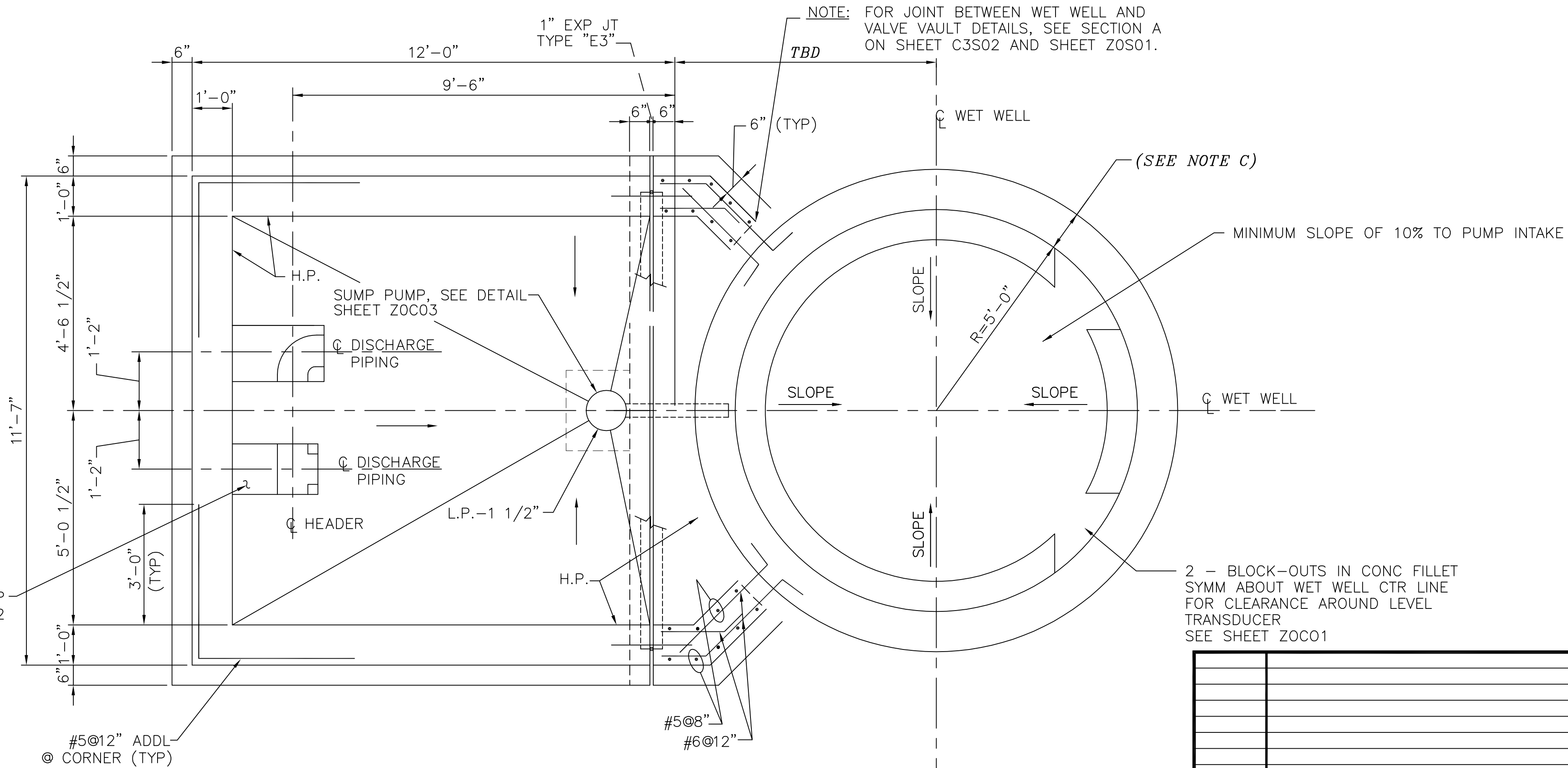
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING AND CONSTRUCTION

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:	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. C3S02
FIELD BOOK NO.	



PLAN VIEW @ GRADE



PLAN @ VAULT FLOOR

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 SPECIFIC SITE REQUIREMENTS.
- B. DESIGN ENGINEER TO VERIFY SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
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- D. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- E. 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.
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- G. 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.
- H. THE DESIGN ENGINEER SHALL ENSURE GUARDRAIL AND CATWALK MEET THE REQUIREMENTS FOR "AREAS NOT OPEN TO PUBLIC" AS PROVIDED FOR BY THE U.S. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) AND LATEST COH CODE ENFORCEMENT APPROVED VERSION OF THE INTERNATIONAL BUILDING CODE (IBC).
- I. THE DESIGN ENGINEER SHALL PROVIDE GUARDRAILS FOR ANY WALKING SURFACES WITH A POTENTIAL FALL DISTANCE EQUAL TO OR GREATER THAN 30 INCHES.

NOTES:

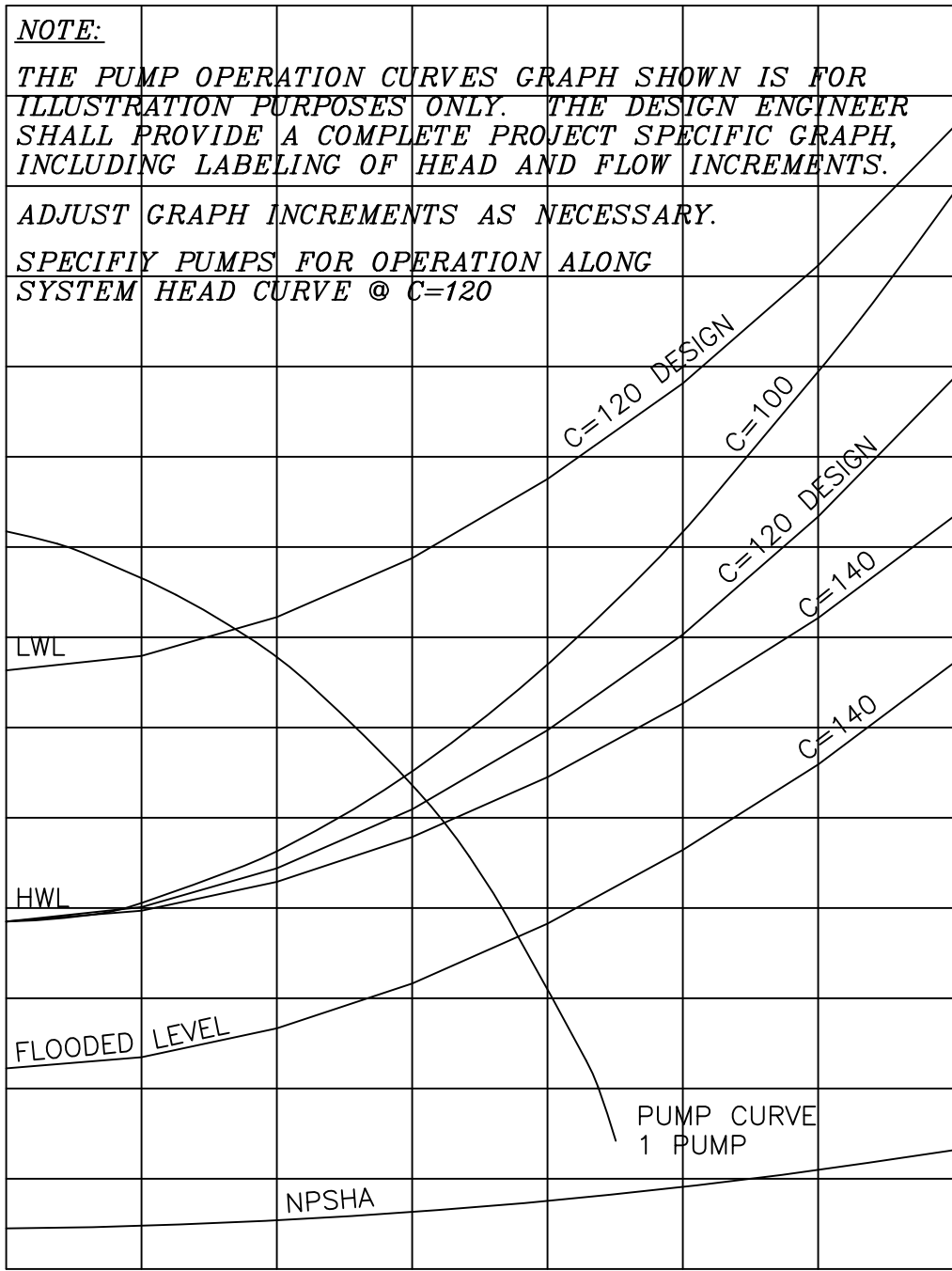
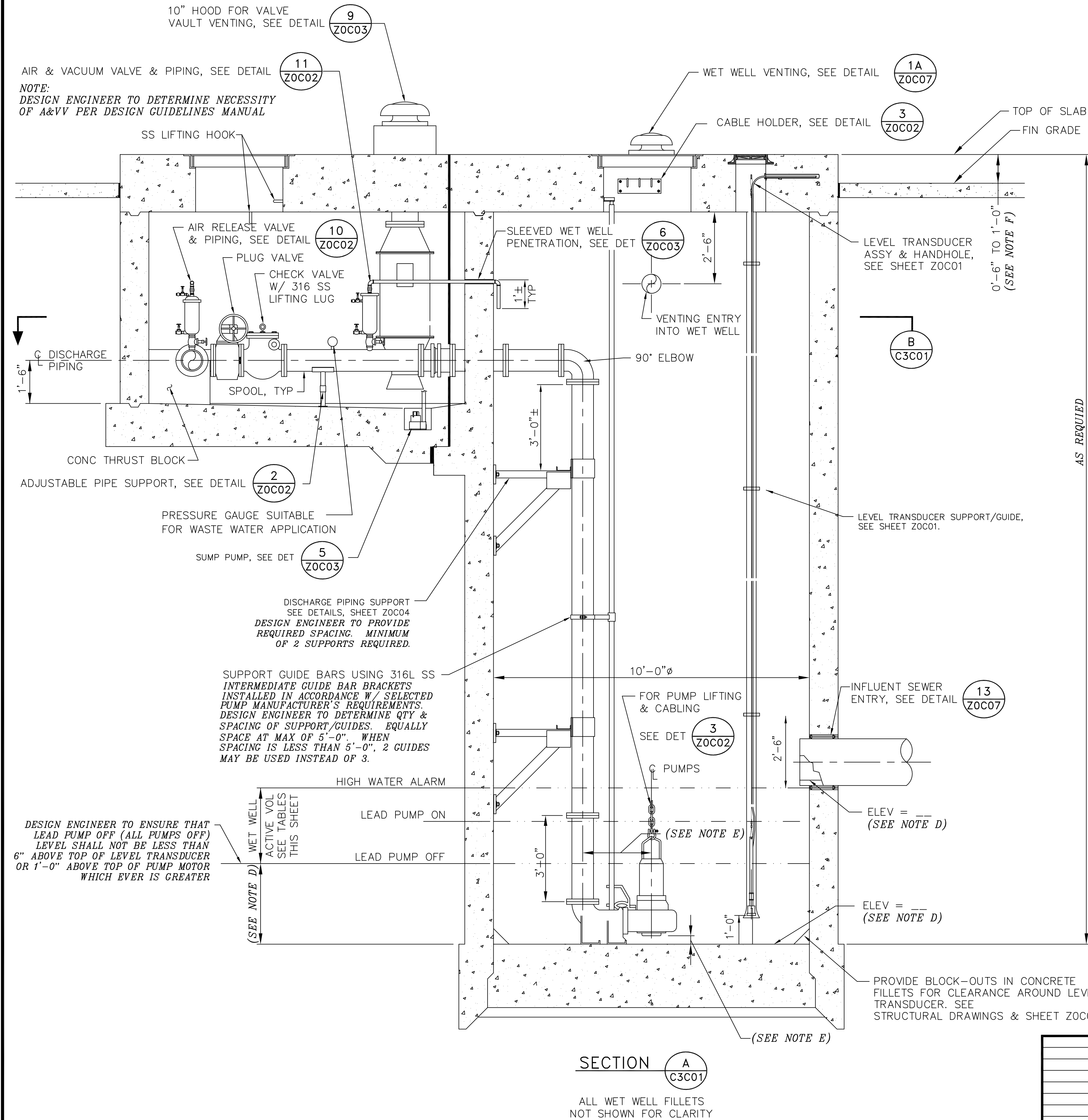
- FOR ADDITIONAL REINFORCEMENT AT OPENINGS NOT SHOWN, SEE SHEET ZOS01.
- CONTRACTOR TO CONFIRM THE SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- WET WELL 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	
2 PUMPS @ 500 - 999 GPM PER PUMP ALTERNATE LOW PROFILE CONFIGURATION	
PROJECT NO.	R-000267-000X-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:	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO.
FIELD BOOK NO.	C3S01

CADD DWG. FILE NO. :
C3S01.DWG



- 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 AVAILABLE (NPSHA) 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
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		
NPSHA (FT)		
DESIGN RUNOUT		
PUMP CYCLE TIME		

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
	HIGH WATER ALARM ON	HIGH WATER ALARM SOUND
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
	HIGH WATER LEVEL ALARM OFF	LEAD PUMP ON
	LEAD PUMP TURNS OFF	ALL PUMPS STOPPED - STANDBY PUMP SWITCHES TO LEAD PUMP

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: 500 - 999 GPM PER PUMP).
- C. THIS DESIGN IS BASED UPON 8"-10" NOMINAL DISCHARGE PIPING, VALVES, AND HEADER AS THE LARGEST SIZES RECOMMENDED FOR THIS STANDARD STATION.
- 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. WHERE FLOOD PLAIN CONDITIONS REQUIRE THE TOP SLAB TO BE GREATER THAN 1'-0" ABOVE FINISHED GRADE, DESIGN ENGINEER SHALL PROVIDE CONCRETE STAIRS.
- G. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- H. 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.
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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 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

2 PUMPS @ 500 - 999 GPM PER PUMP
ALTERNATE LOW PROFILE CONFIGURATION

PROJECT NO.

R-000267-000X-X

TITLE

CITY OF HOUSTON
DESIGN GUIDELINE DRAWINGS
FOR SUBMERSIBLE LIFT STATIONS

CITY OF HOUSTON

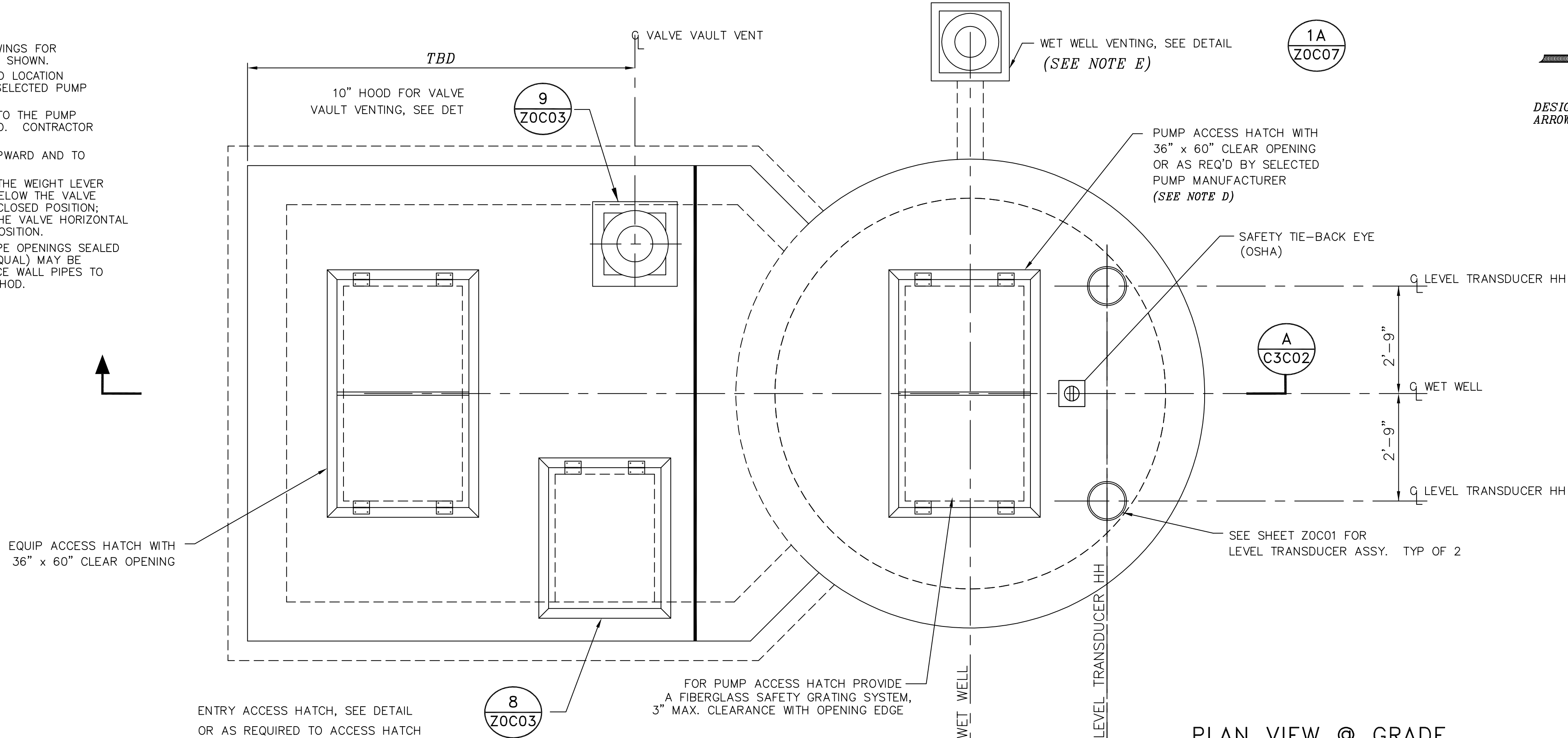
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ENGINEERING AND CONSTRUCTION

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: SHEET NO. OF SHEETS
SURVEY BY: DWG. NO. C3C02
FIELD BOOK NO.

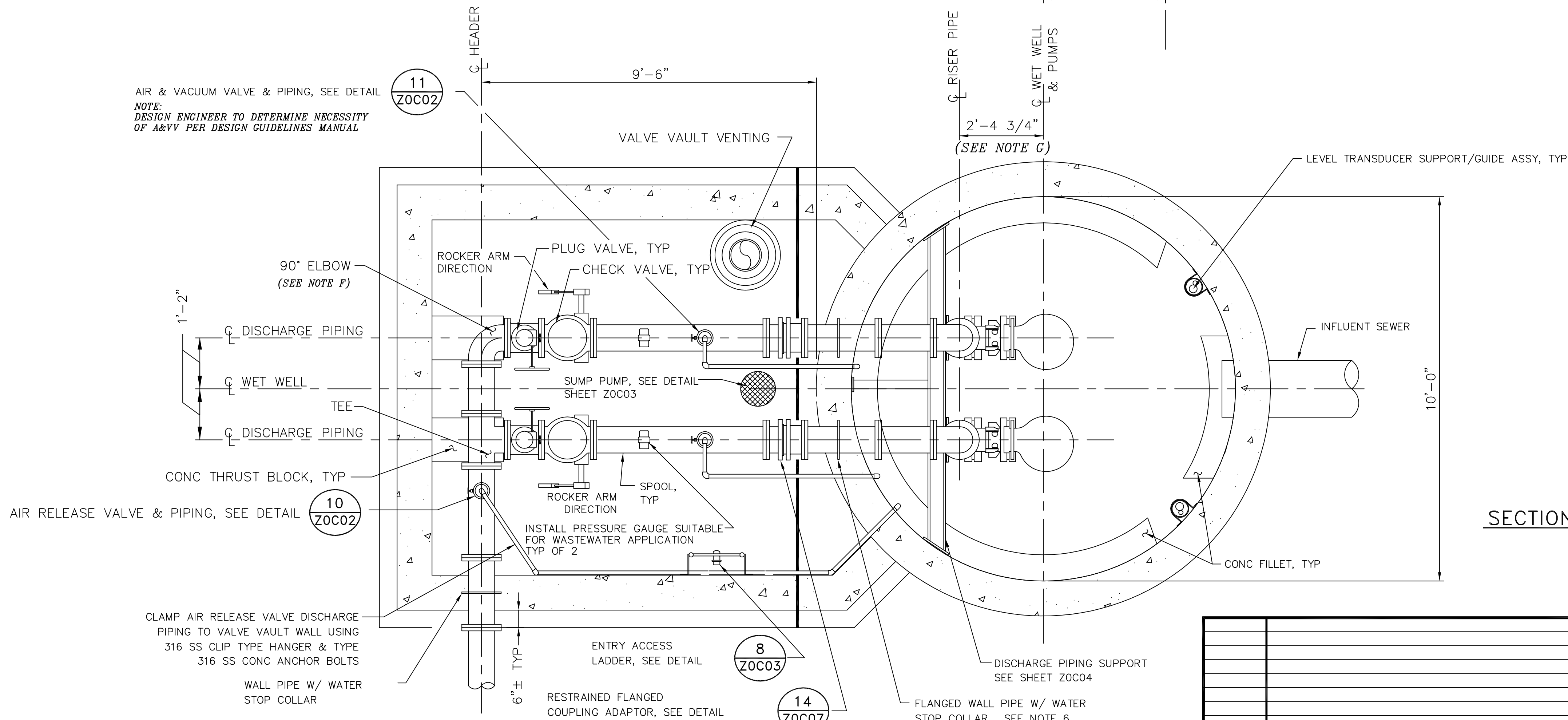
NOTES:

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 PUMP MANUFACTURER'S REQUIREMENTS.
3. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL VERIFY.
4. INSTALL PLUG VALVES TO OPEN UPWARD AND TO CLOSE TO A SEATING POSITION.
5. 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.
6. 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.

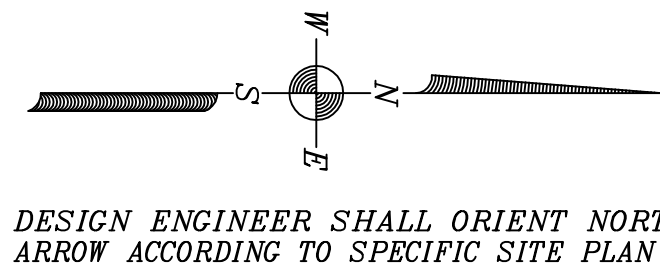


PLAN VIEW @ GRADE

AIR & VACUUM VALVE & PIPING, SEE DETAIL
NOTE:
DESIGN ENGINEER TO DETERMINE NECESSITY
OF A&VV PER DESIGN GUIDELINES MANUAL



SECTION B
C3C02



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 STANDARAD (RANGE: 500 - 999 GPM PER PUMP).
- C. THIS DESIGN IS BASED UPON 8"-10" NOMINAL DISCHARGE PIPING, VALVES, AND HEADER AS THE LARGEST SIZES RECOMMENDED FOR THIS STANDARD STATION.
- 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. 6" Ø PIPE MIN. SIZE OF VENT NOT TO EXCEED 600 FPM.
- F. REPLACE THE 90° ELBOW WITH A FLANGED TEE FOR CONNECTION TO SURGE RELIEF VALVE, IF REQUIRED. SEE DETAILS, SHEET ZOC06.
- G. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY.
- 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.

PLAN VIEW @ GRADE & BASE SECTION
2 PUMPS @ 500 - 999 GPM PER PUMP
ALTERNATE LOW PROFILE CONFIGURATION

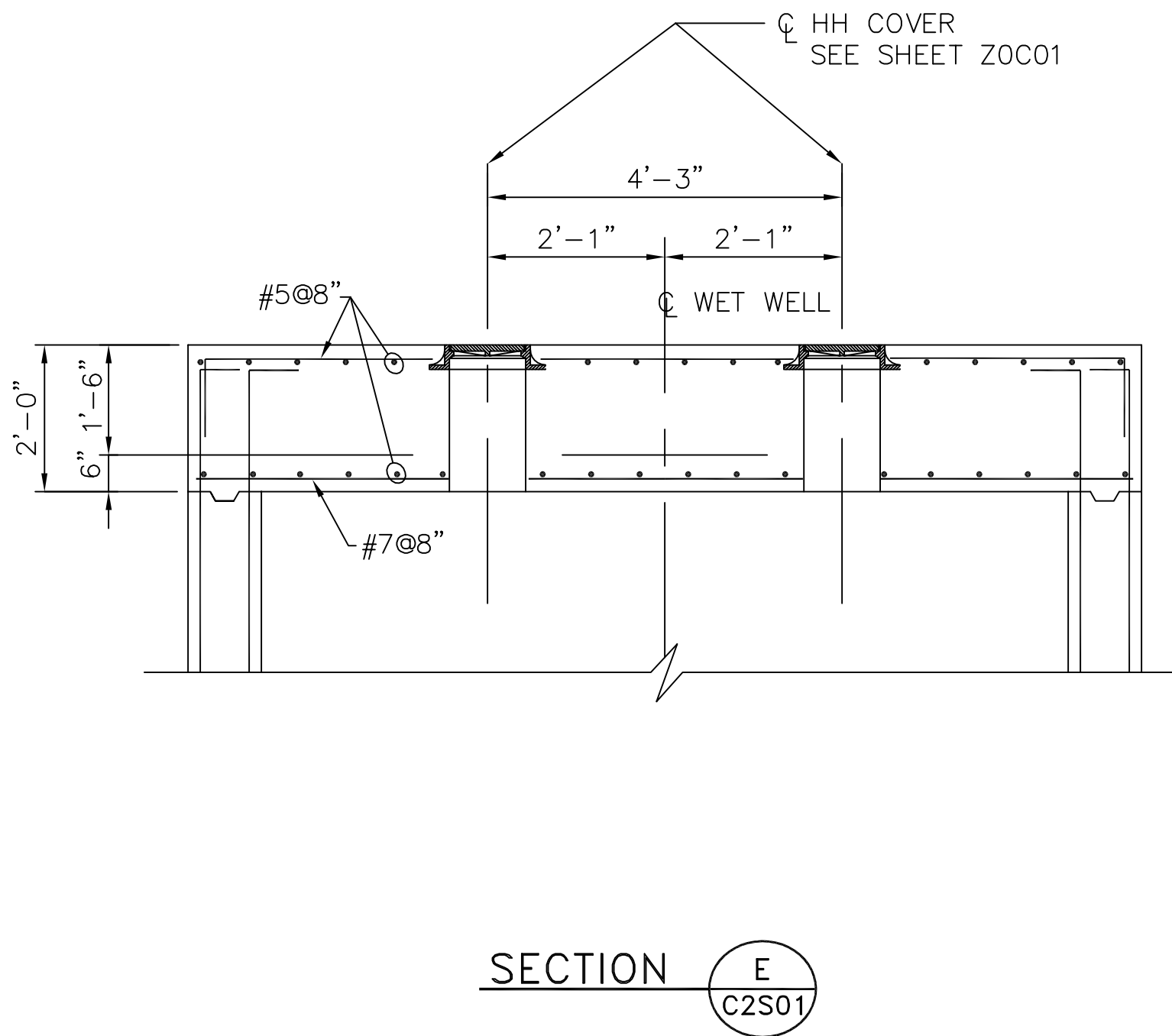
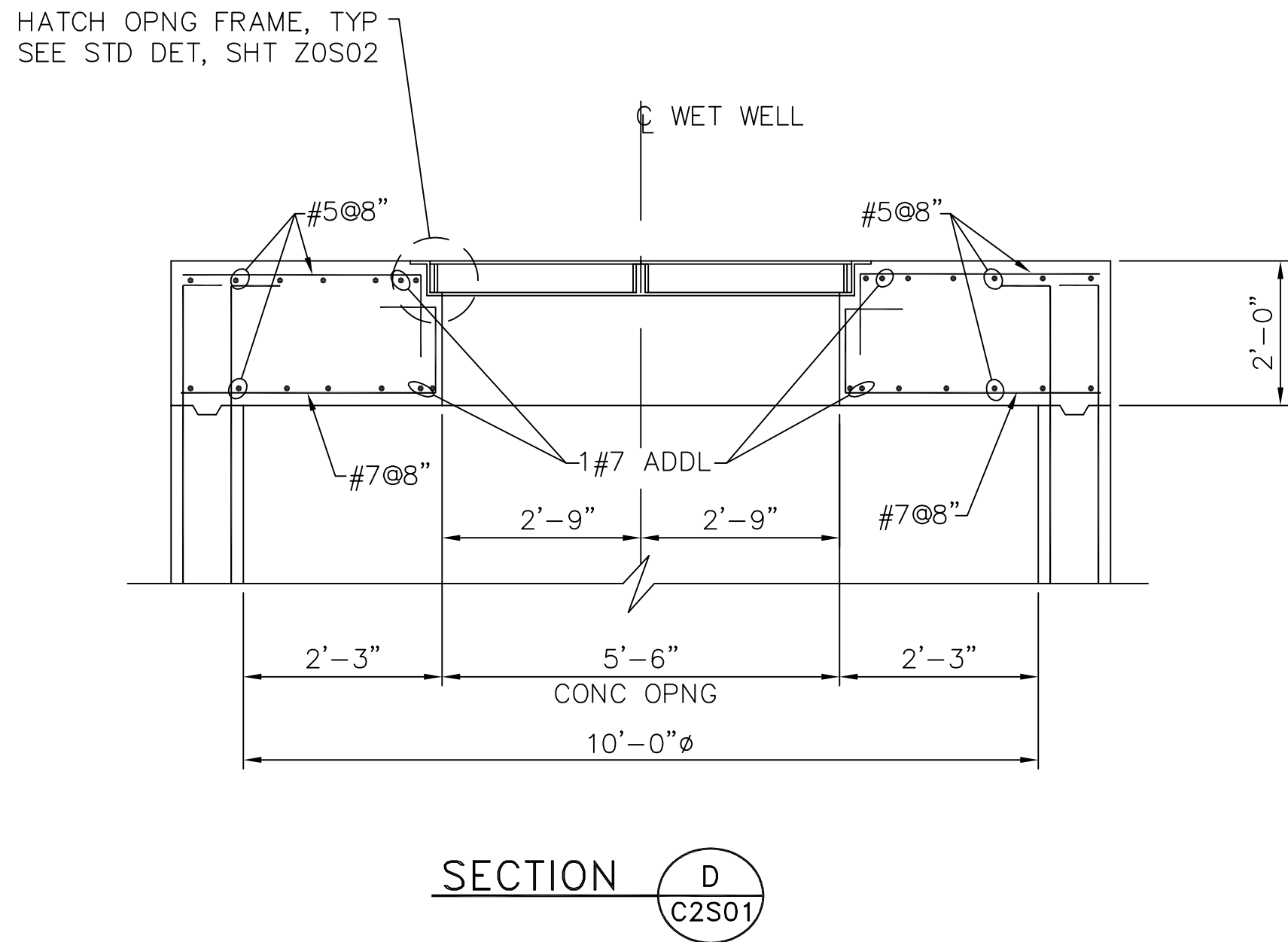
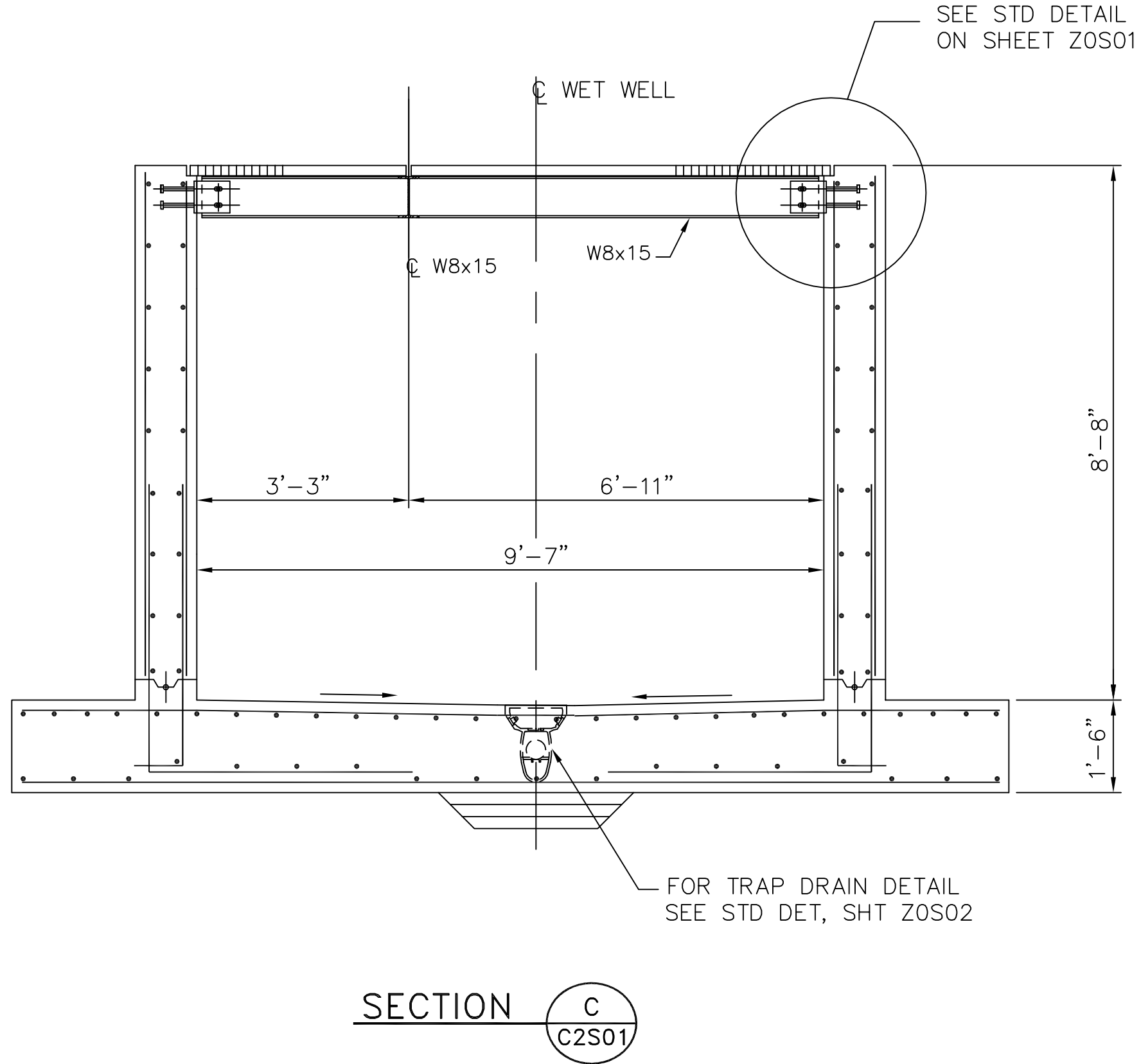
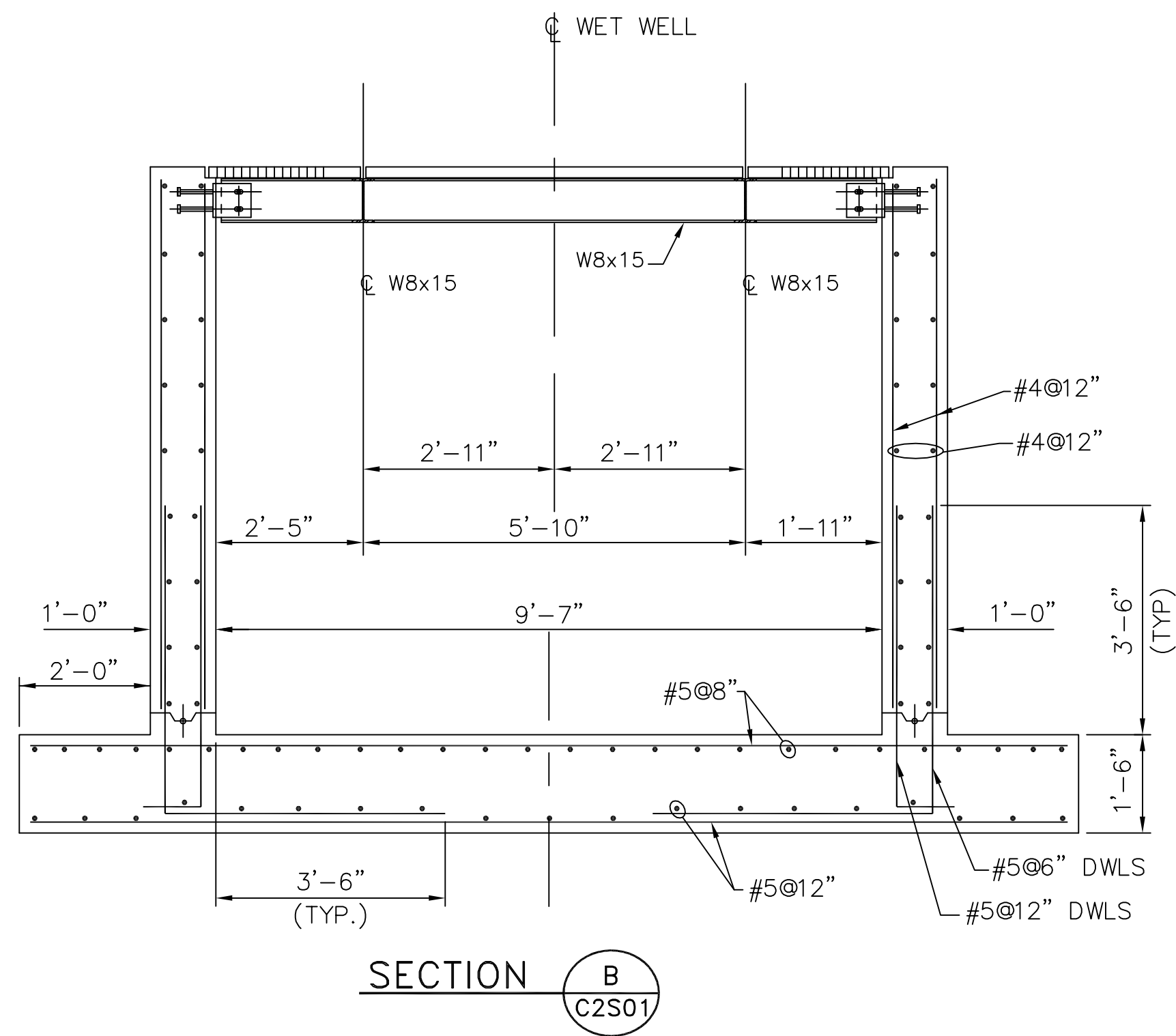
PROJECT NO. R-000267-000X-X

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:	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. C3C01
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 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:**
- 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
2-PUMPS @ 500 - 999 GPM PER PUMP
PREFERRED CONFIGURATION

PROJECT NO. R-000267-000X-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

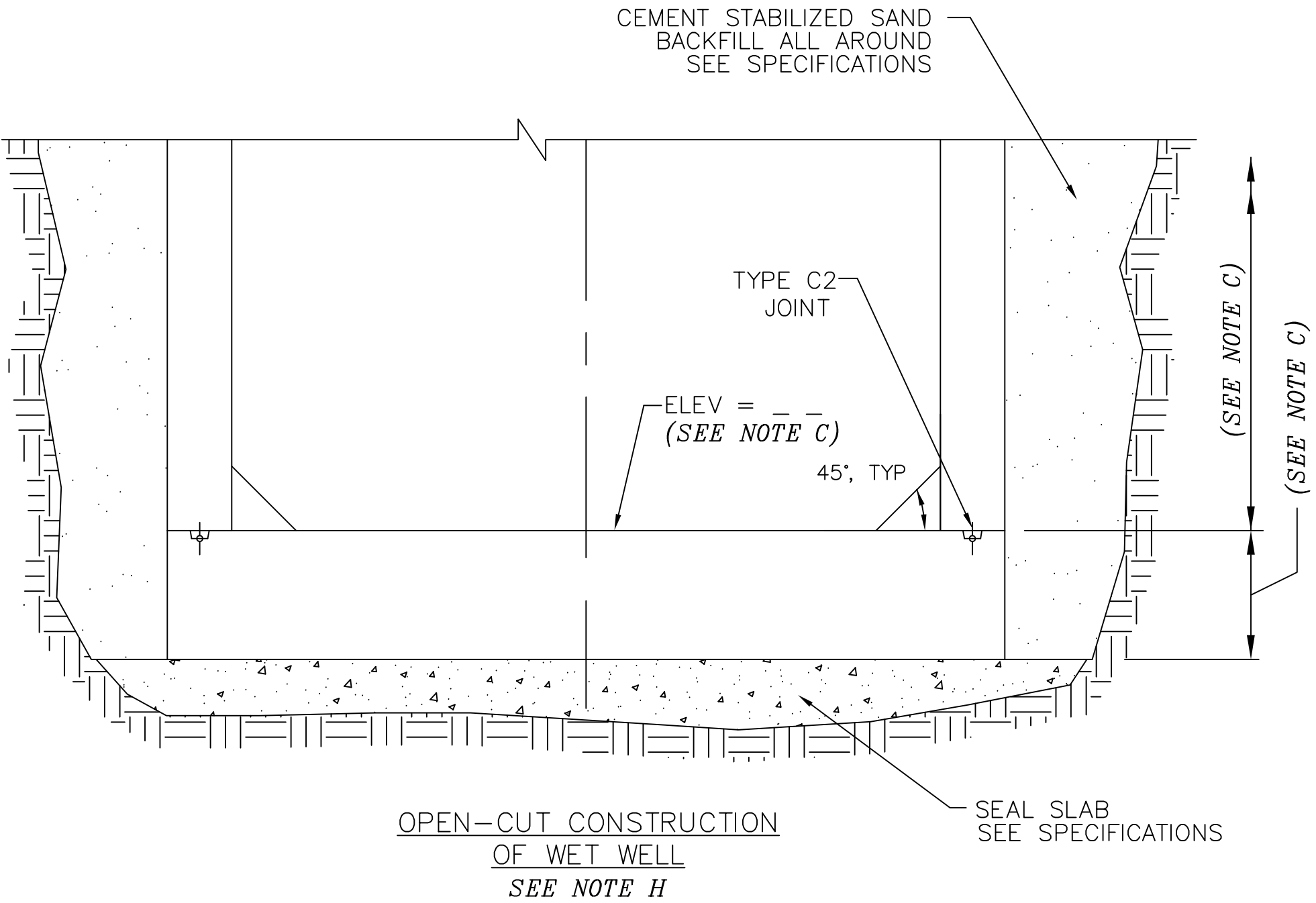
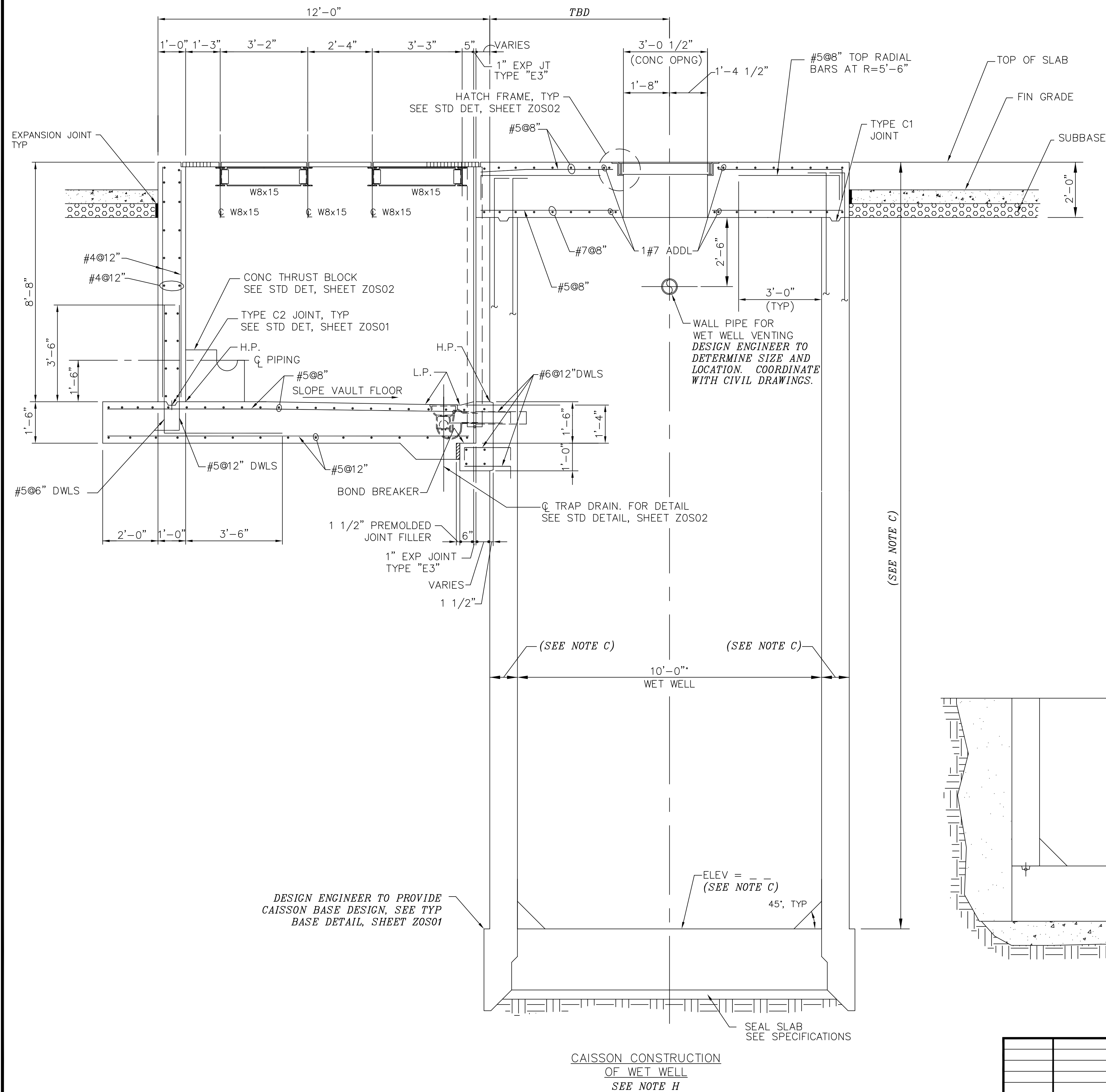
CADD DWG. FILE NO. :
C2S03.DWG

COHSTD.BDR 0 1 2 3

ORIGINAL SCALE IN INCHES
FOR REDUCED PLANS
CONSULTANT TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE OF THE DRAWINGS

REV. NO.	DESCRIPTION	APP'D	DATE

SCALE: XX" = 1'-0" DESIGNED BY:
SUBMITTED: DRAWN BY:
DATE: SHEET NO. OF SHEETS
SURVEY BY: DWG. NO.
FIELD BOOK NO. C2S03



- NOTES TO DESIGN ENGINEER:**
- A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER 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 SITE REQUIREMENTS.
- B. DESIGN ENGINEER TO VERIFY SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
- C. DIMENSIONS, ELEVATIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER PROJECT SPECIFIC REQUIREMENTS.
- D. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- E. 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.
- F. 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.
- G. 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.
- H. DESIGN ENGINEER TO PROVIDE WET WELL DESIGN FOR EITHER OPEN-CUT OR CAISSON CONSTRUCTION.
- I. THE DESIGN ENGINEER SHALL ENSURE GUARDRAIL AND CATWALK MEET THE REQUIREMENTS FOR "AREAS NOT OPEN TO PUBLIC" AS PROVIDED FOR 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 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
2-PUMPS @ 500 - 999 GPM PER PUMP
PREFERRED CONFIGURATION

PROJECT NO. R-000267-000X-X

TITLE CITY OF HOUSTON
DESIGN GUIDELINE DRAWINGS
FOR SUBMERSIBLE LIFT STATION

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: SHEET NO. OF SHEETS
SURVEY BY: DWG. NO.
FIELD BOOK NO. C2S02

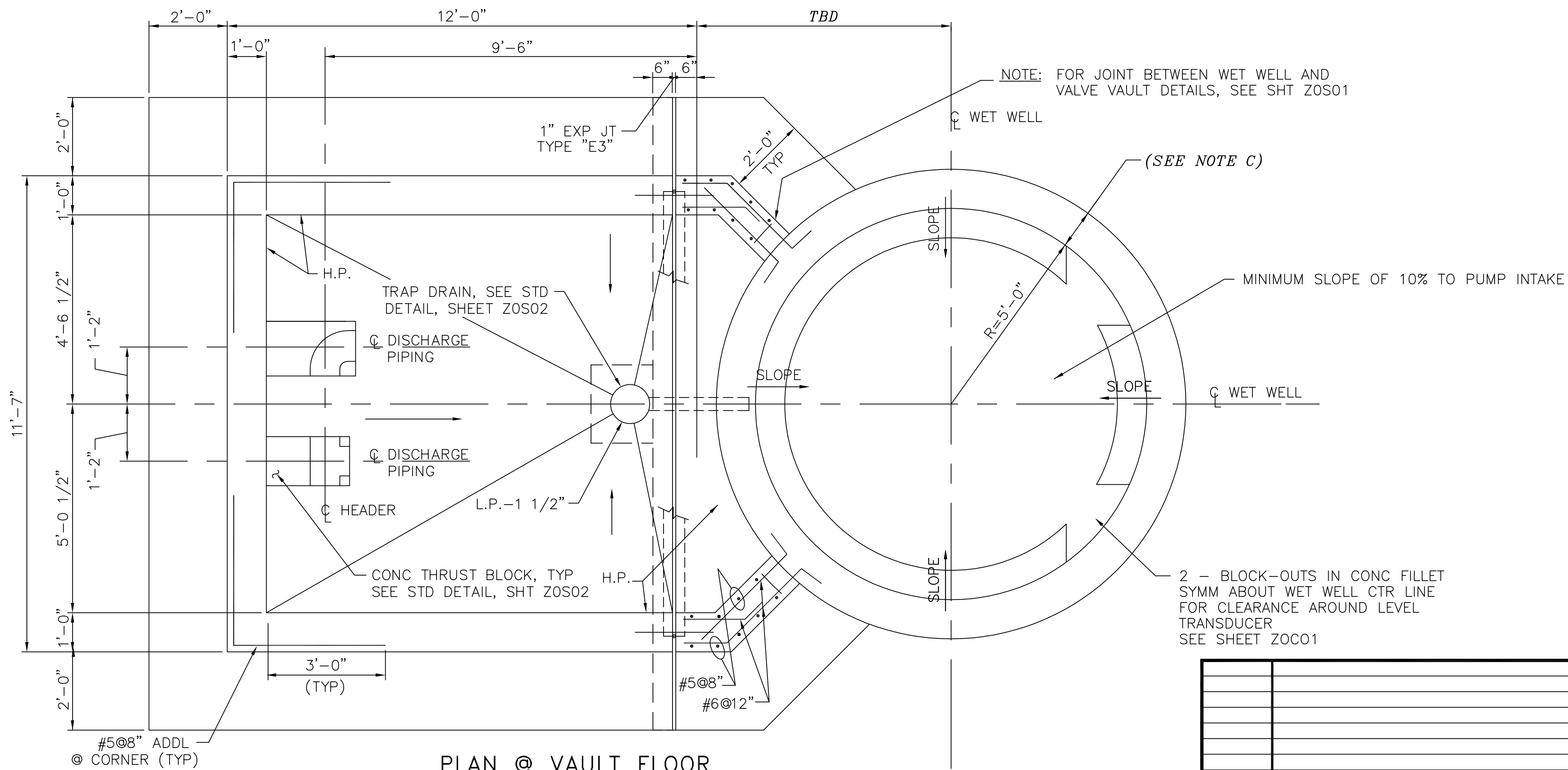
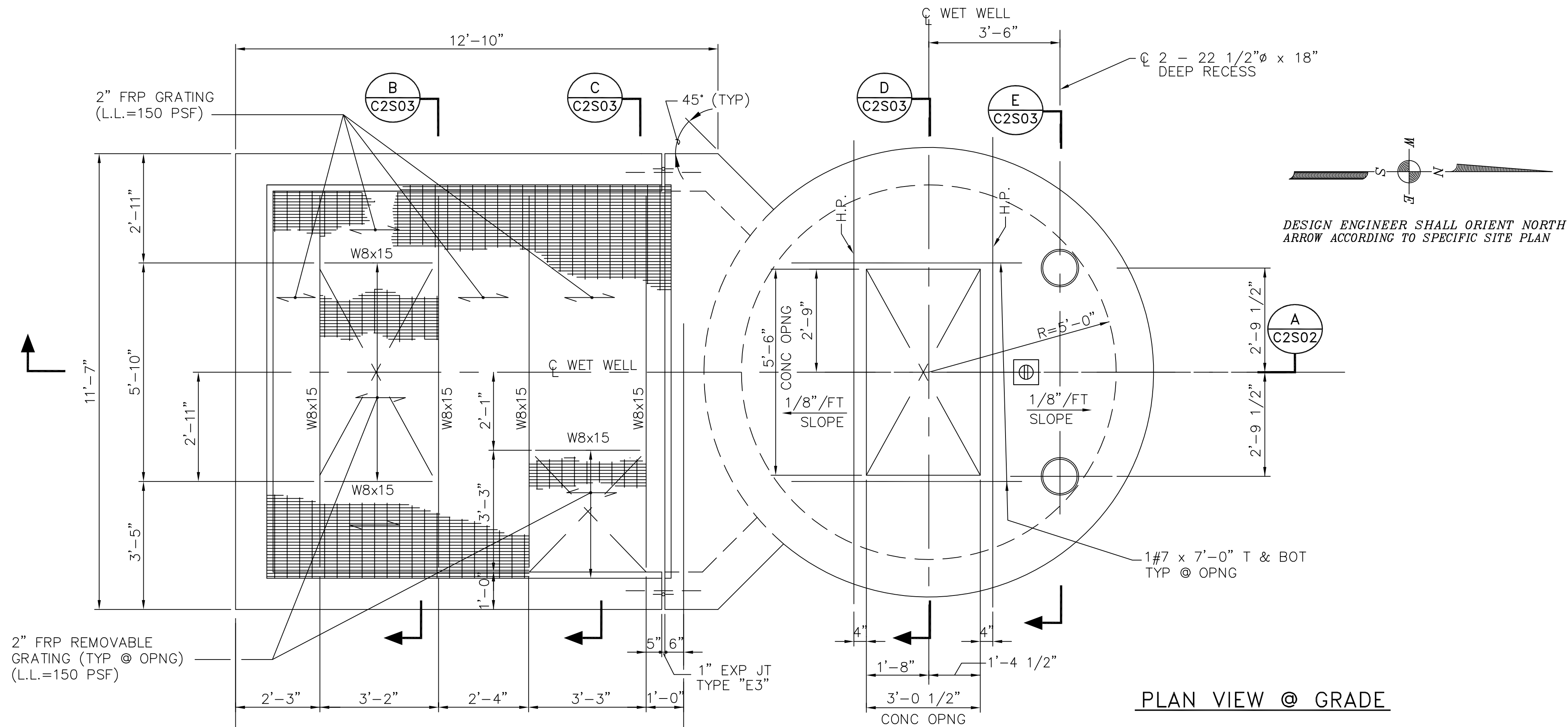
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C2S02.DWG

COHSTD.BDR 0 1 2 3

ORIGINAL SCALE IN INCHES
FOR REDUCED PLANS

CONSULTANT TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE OF THE DRAWINGS

SECTION A
C2S01



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 AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE PROJECT SPECIFIC REQUIREMENTS.
- D. SEE DETAIL AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
- E. 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.
- F. 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.
- G. 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.
- H. THE DESIGN ENGINEER SHALL ENSURE GUARDRAIL AND CATWALK MEET THE REQUIREMENTS FOR "AREAS NOT OPEN TO PUBLIC" AS PROVIDED FOR BY THE U.S. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION (OSHA) AND LATEST COH CODE ENFORCEMENT APPROVED VERSION OF THE INTERNATIONAL BUILDING CODE (IBC).
- I. 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 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
2 PUMPS @ 500 - 999 GPM PER PUMP PREFERRED CONFIGURATION
PROJECT NO. R-000267-000X-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:	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. C2S01
FIELD BOOK NO.	

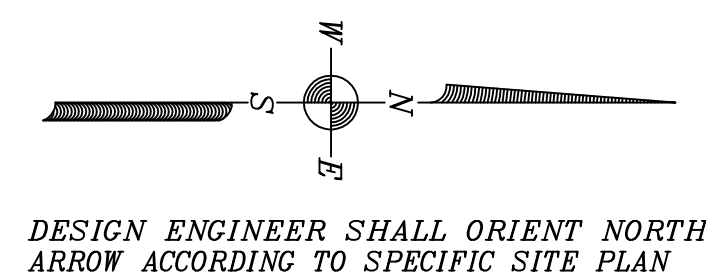
CADD DWG. FILE NO. : C2S01.DWG

CHSTD.BDR

ORIGINAL SCALE IN INCHES
FOR REDUCED PLANS

CONSULTANT TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE OF THE DRAWINGS

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 PUMP MANUFACTURER'S REQUIREMENTS.
3. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL VERIFY.
4. INSTALL PLUG VALVES TO OPEN UPWARD AND TO CLOSE TO A SEATING POSITION.
5. 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.
6. 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.

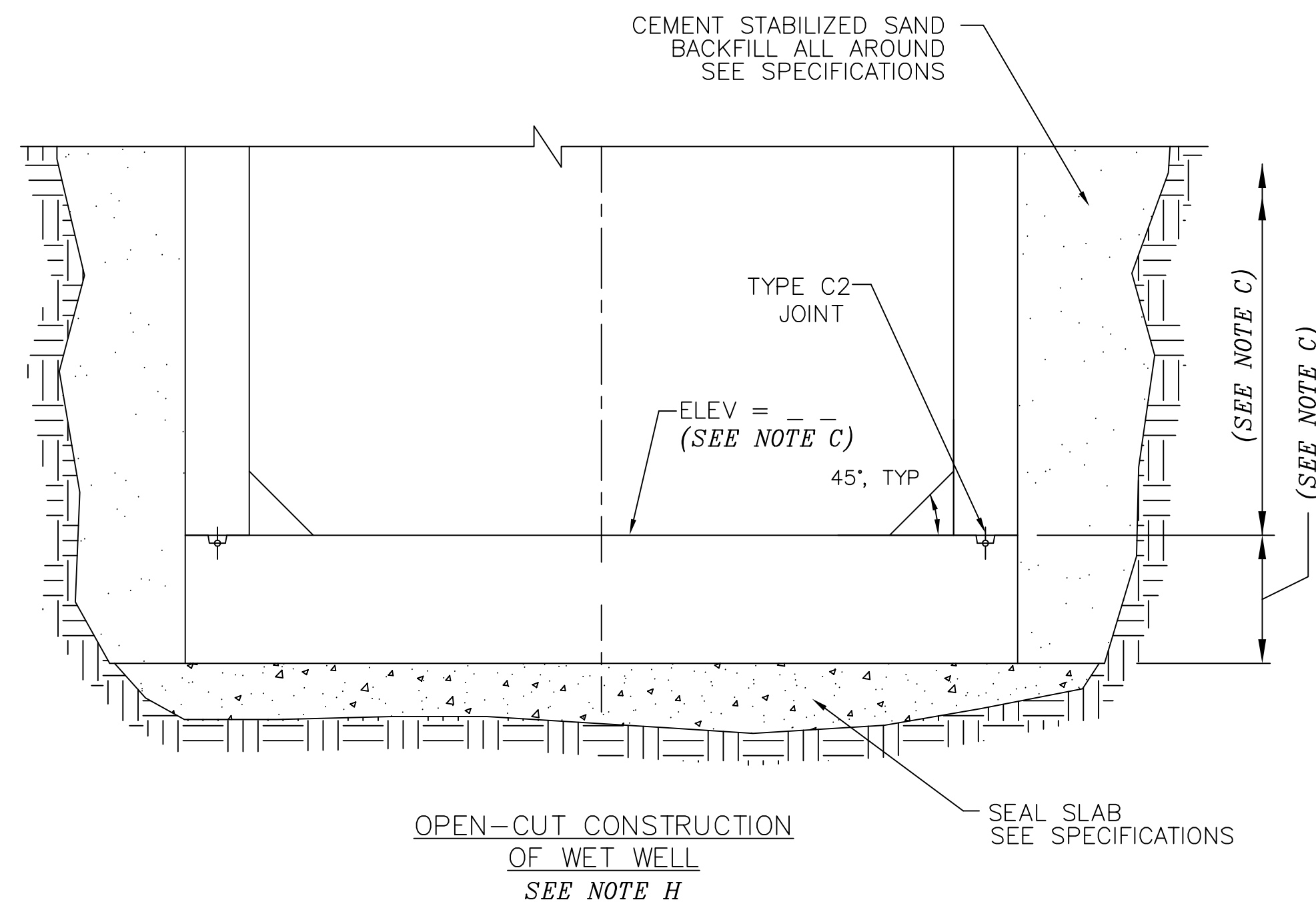
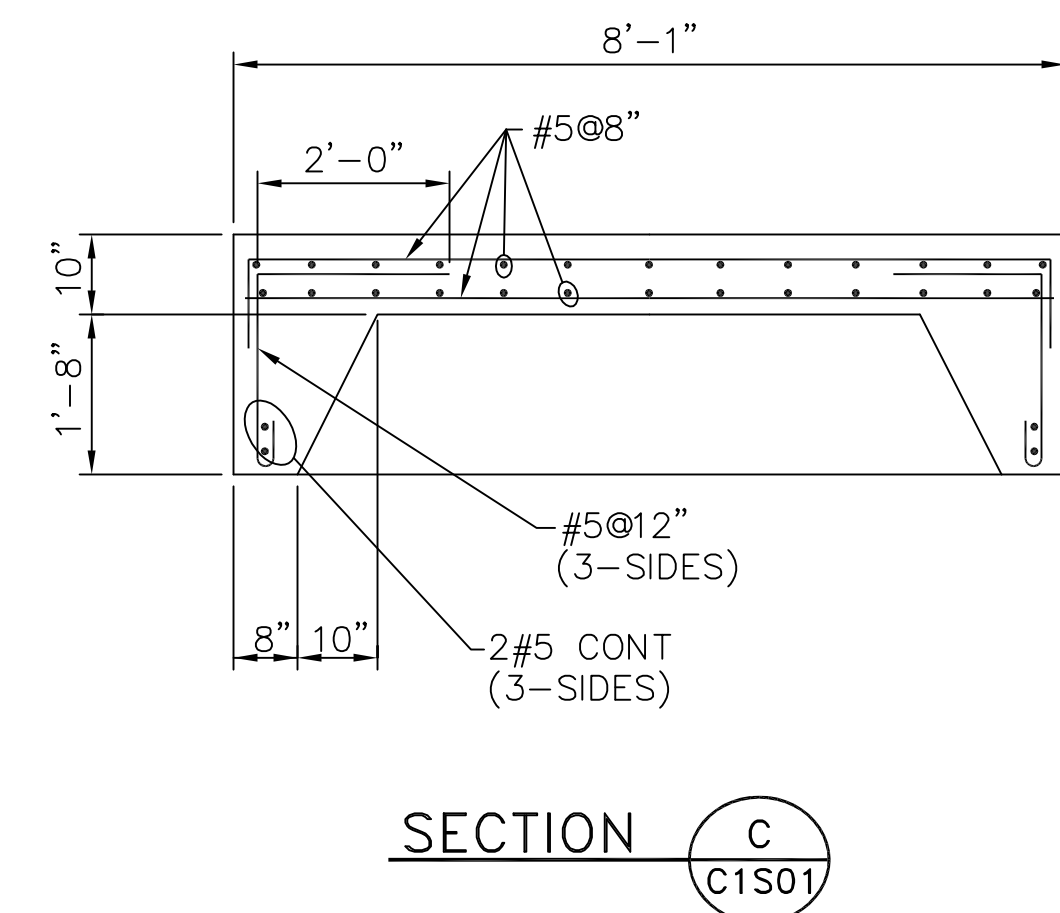
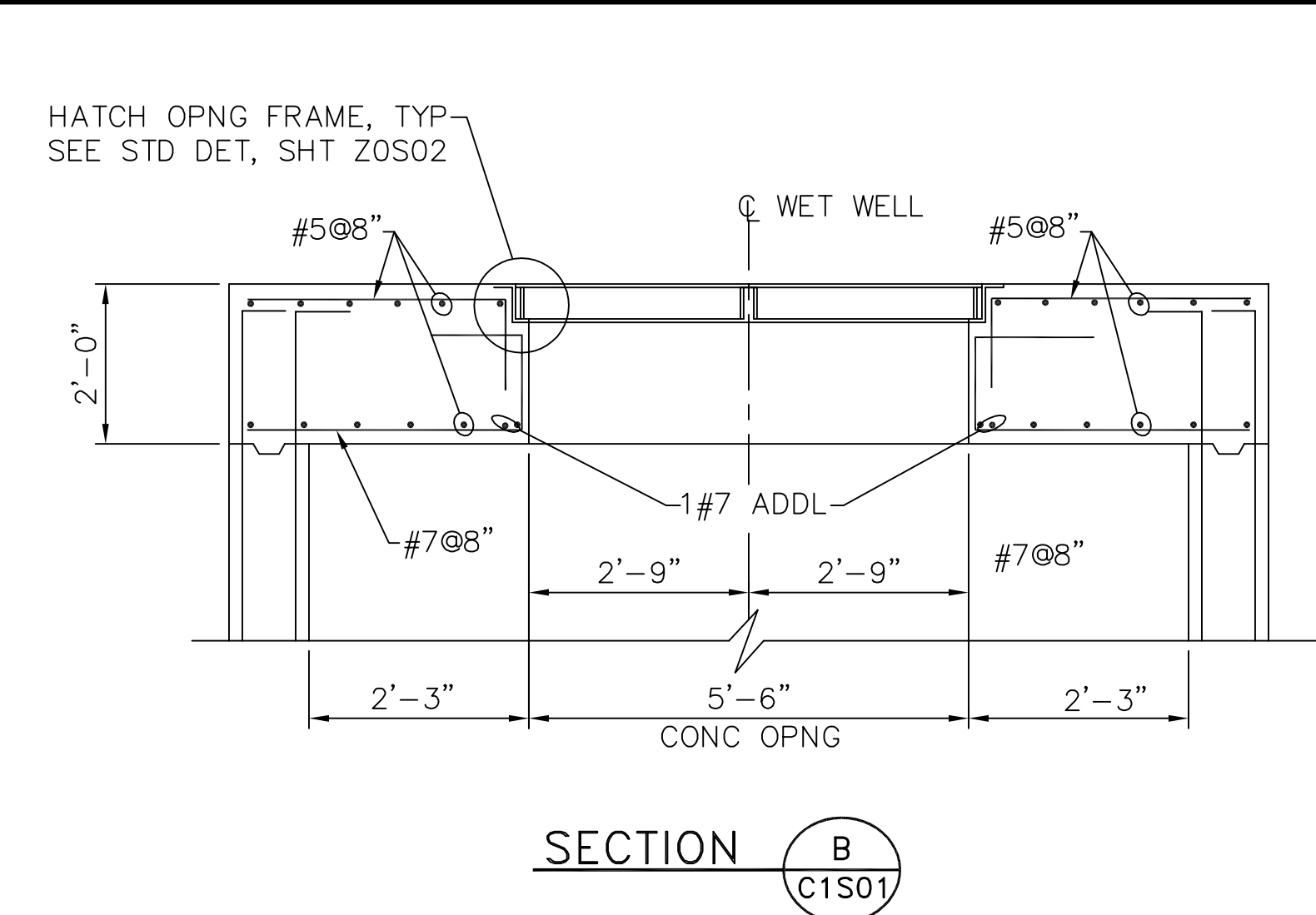
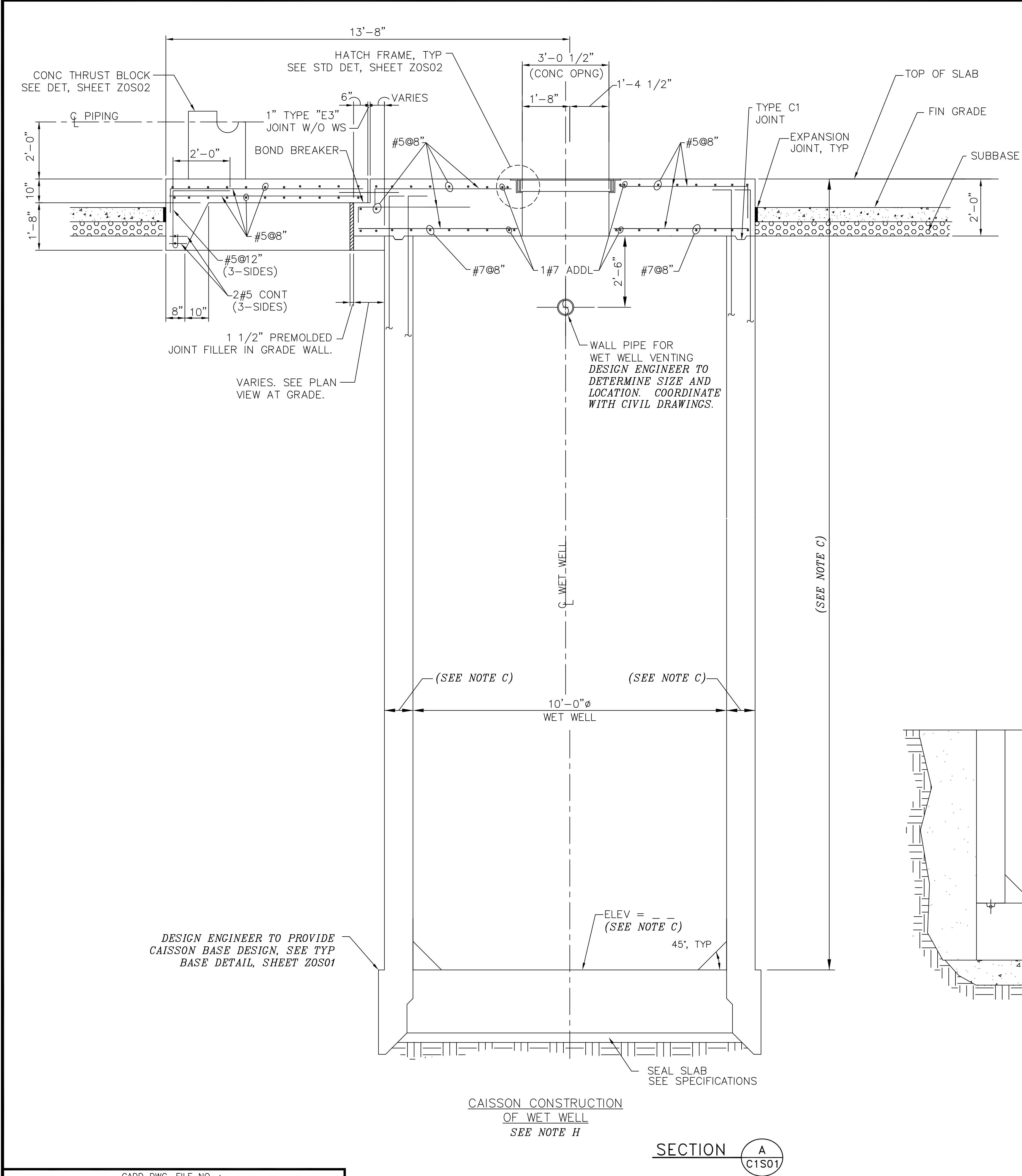


- A. THESE LIFT STATION DRAWINGS ARE CONSIDERED TO BE DESIGN GUIDELINES FOR THE CONSTRUCTION OF CITY OF HOUSTON WASTEWATER SUBMERSIBLE LIFT STATIONS. THEIR INTENDED USE IS AS A FRAMEWORK FOR THE CONTRACTED DESIGN ENGINEER IN DEVELOPING SPECIFIC LIFT STATION DESIGNS. IT IS THE RESPONSIBILITY OF THE CONTRACTED 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: 500 - 999 GPM PER PUMP).
- C. THIS DESIGN IS BASED UPON 8"-10" NOMINAL DISCHARGE PIPING, VALVES, AND HEADER AS THE LARGEST SIZES RECOMMENDED FOR THIS STANDARD STATION.
- 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. 6" x PIPE MIN. SIZE OF VENT NOT TO EXCEED 600 FPM.
- F. REPLACE THE 90° ELBOW WITH A FLANGED TEE FOR CONNECTION TO SURGE RELIEF VALVE, IF REQUIRED. SEE DETAILS, SHEET 20006.
- G. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. DESIGN ENGINEER SHALL VERIFY.
- 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 NOTIFICATION 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.



REV. NO.	DESCRIPTION	APP'D	DATE

SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE:	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO.
FIELD BOOK NO.	C2C01



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, ELEVATIONS AND REINFORCING NOT PROVIDED ARE TO BE DETERMINED BY THE DESIGN ENGINEER PER APPLICABLE PROJECT SPECIFIC REQUIREMENTS.

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

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

- NOTES:**
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 - CONTRACTOR TO CONFIRM THE SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS ACCORDING TO THE SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
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STRUCTURAL
2 PUMPS @ 500 - 999 GPM PER PUMP
ALTERNATE LOW PROFILE CONFIGURATION

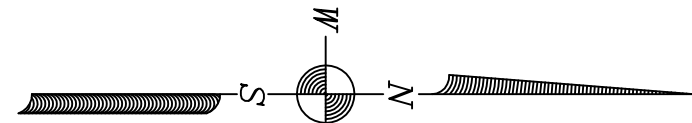
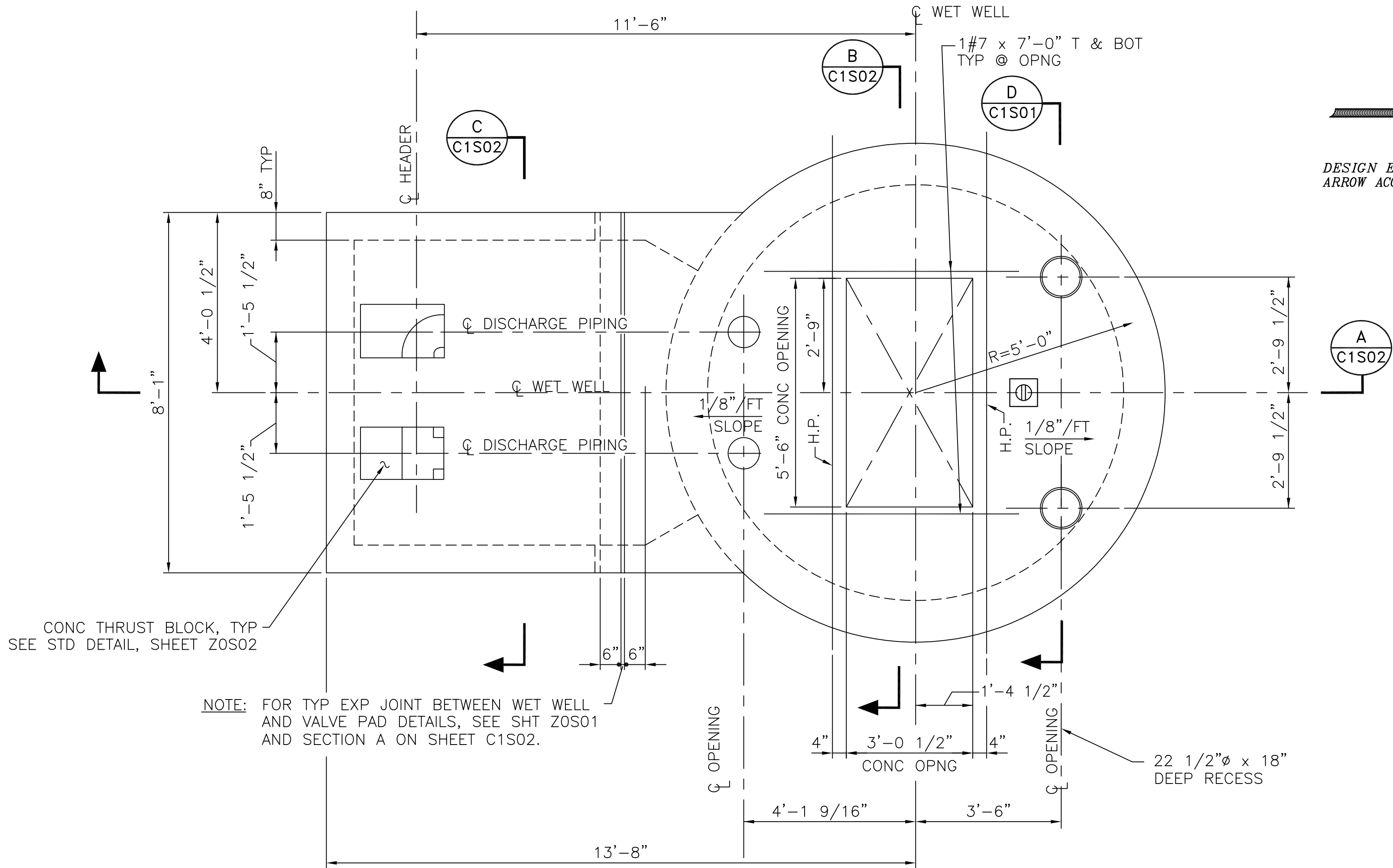
PROJECT NO. R-000267-000X-X

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: SHEET NO. OF SHEETS
SURVEY BY: DWG. NO. C1S02
FIELD BOOK NO.

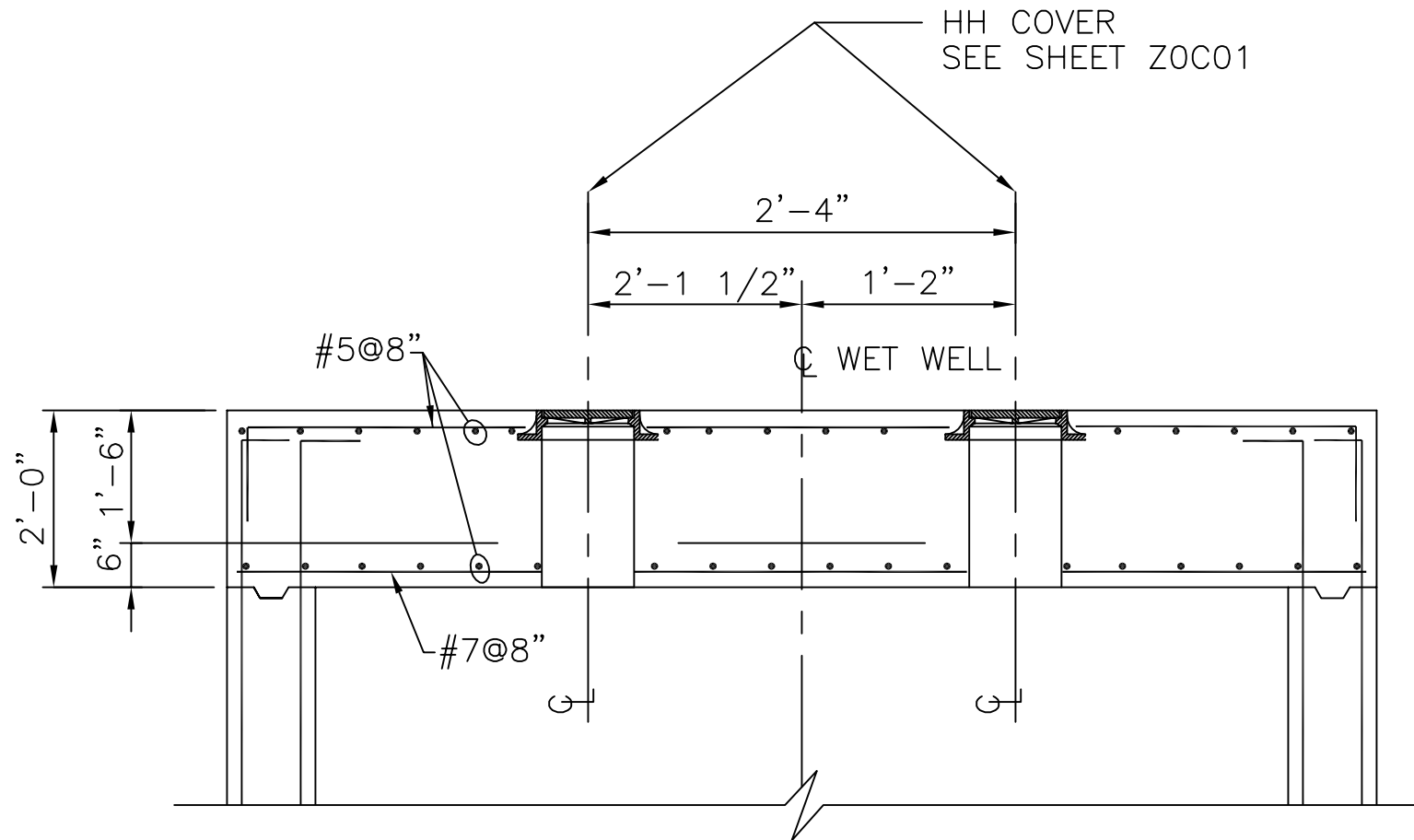


DESIGN ENGINEER SHALL ORIENT NORTH
ARROW ACCORDING TO SPECIFIC SITE PLAN

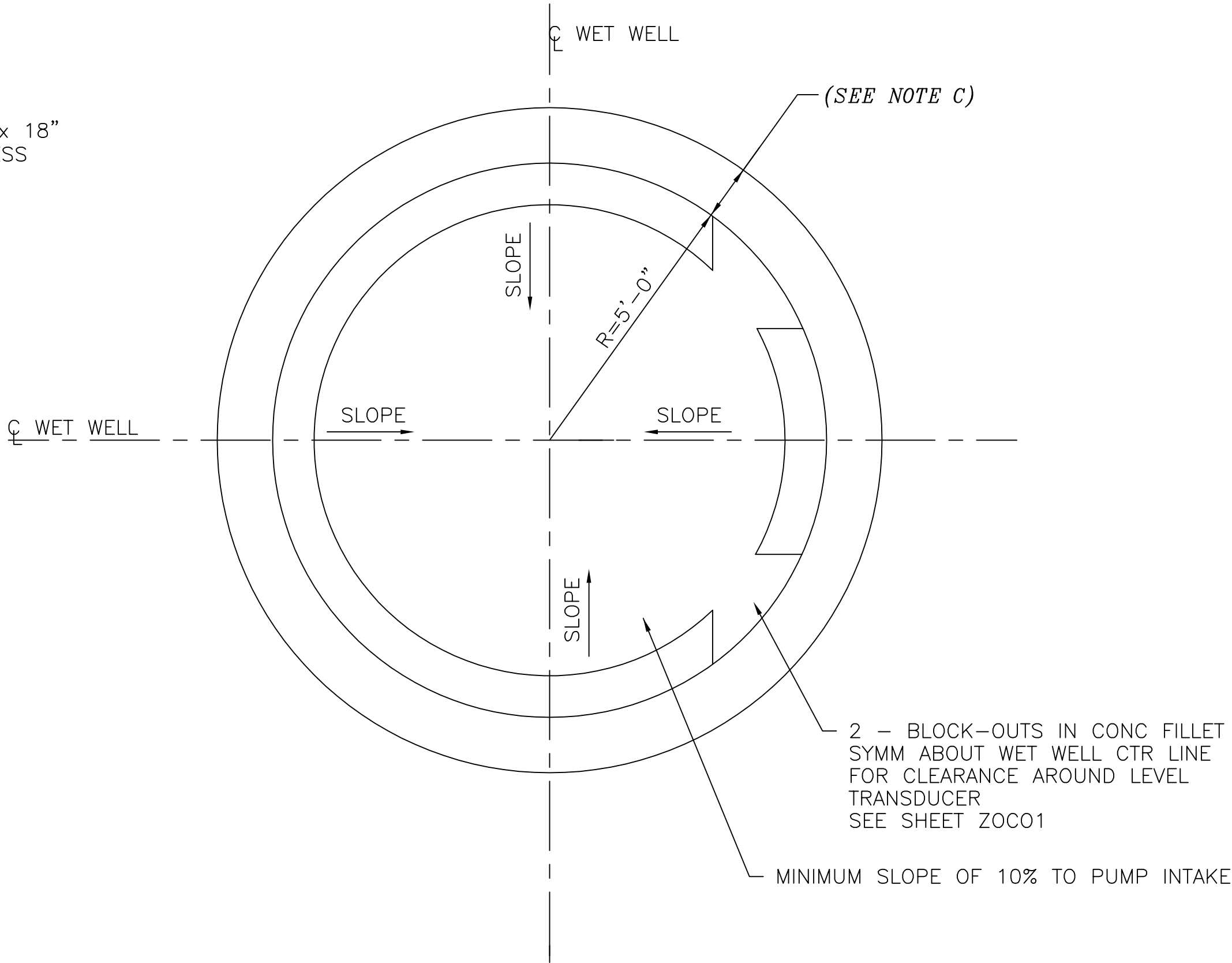
CONC THRUST BLOCK, TYP
SEE STD DETAIL, SHEET Z0S02

NOTE: FOR TYP EXP JOINT BETWEEN WET WELL
AND VALVE PAD DETAILS, SEE SHT Z0S01
AND SECTION A ON SHEET C1S02.

PLAN VIEW @ GRADE



SECTION D
C1S01



BASE SLAB PLAN

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

NOTES:

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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
2 PUMPS @ 500 - 999 GPM PER PUMP ALTERNATE HIGH PROFILE CONFIGURATION
PROJECT NO.
R-000267-000X-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 Z0COX

CADD DWG. FILE NO. :
C1S01.DWG

COHSTD.BDR

0 1 2 3

ORIGINAL SCALE IN INCHES
FOR REDUCED PLANS

CONSULTANT TO UPDATE BAR SCALE TO REFLECT ACTUAL SCALE OF THE DRAWINGS

REV. NO.	DESCRIPTION	APP'D	DATE

SCALE: XX" = 1'-0"	DESIGNED BY:
SUBMITTED:	DRAWN BY:
DATE:	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO. C1S01
FIELD BOOK NO.	



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 AVAILABLE (NPSHA) BASED ON NORMAL OPERATING WATER LEVELS
7. PUMP CURVES ARE MODIFIED FOR STATION LOSSES.

PUMP CHARACTERISTICS	PUMP NO. 1	PUMP NO. 2
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		
NPSHA (FT) DESIGN RUNOUT		
PUMP CYCLE TIME		

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
	HIGH WATER ALARM ON	HIGH WATER ALARM SOUND
FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
	HIGH WATER LEVEL ALARM OFF	LEAD PUMP ON
	LEAD 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.

B. THIS DESIGN IS BASED UPON THE LARGEST CAPACITY PUMP FOR THIS STANDARD (RANGE: 500 – 999 CPM PER PUMP).

C. THIS DESIGN IS BASED UPON 8"–10" NOMINAL DISCHARGE PIPING, VALVES, AND HEADER AS THE LARGEST SIZES RECOMMENDED FOR THIS STANDARD STATION.

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. WHERE FLOOD PLAIN CONDITIONS REQUIRE THE TOP SLAB TO BE GREATER THAN 1'-0" ABOVE FINISHED GRADE, DESIGN ENGINEER SHALL PROVIDE CONCRETE STAIRS.

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

H. 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.

I. 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 PERTAINING TO THESE STANDARD DESIGN GUIDELINE DRAWINGS.

J. THE DESIGN ENGINEER SHALL REMOVE THESE NOTES, ALL REFERENCES TO THESE NOTES, AND ANY OTHER EXCESSIVE 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. 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 VITACULIC STYLE COUPLINGS SHALL BE PERMITTED INSIDE THE WET WELL.

ELEVATION SECTION

2 PUMPS @ 500 - 999 GPM PER PUMP
ALTERNATE HIGH PROFILE CONFIGURATION

PROJECT NO.

R-000267-000X-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:
SUBMITTED:	DRAWN BY:
DATE:	SHEET NO. OF SHEETS
SURVEY BY:	DWG. NO.
FIELD BOOK NO.	C1C02