Drawings
For

Part 1:
Thornton Water Treatment Plant Clearwell and Pumping Improvements

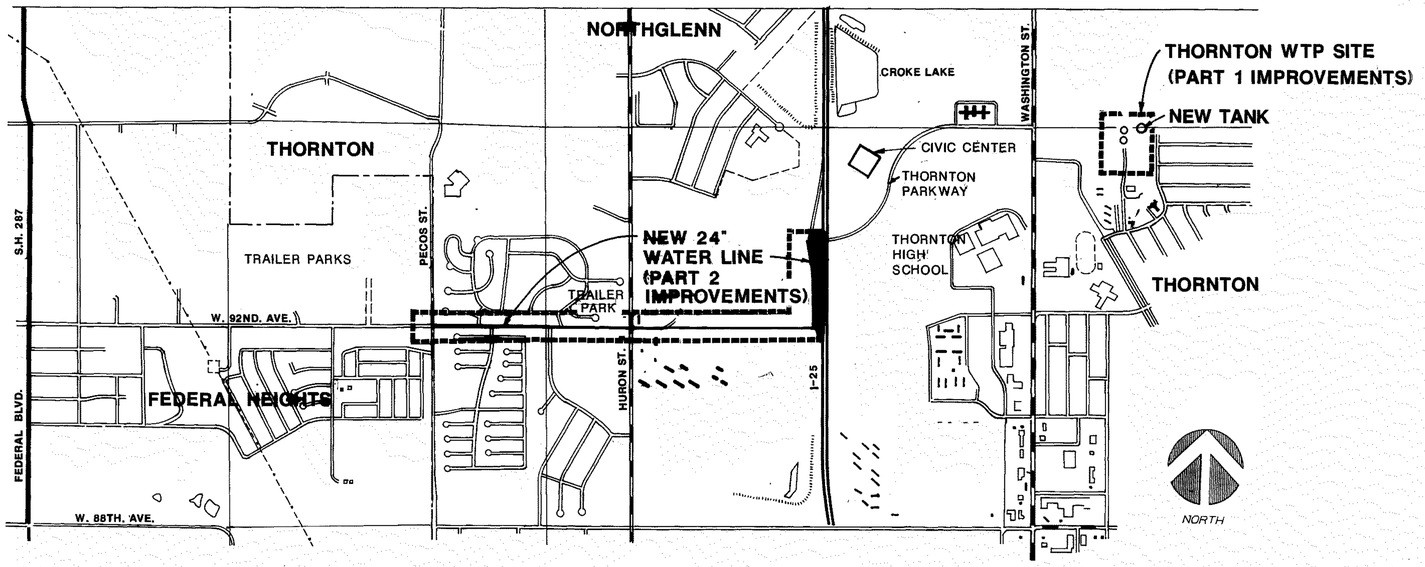
Part 2: (NOT INCLUDED IN THIS SET)
Thornton Parkway 24" Water Main

1987

Job No's. 148-42-50 / 148-43-50

HDR Infrastructure, Inc.
A Centerra Company

THORNTON WATER TREATMENT PLANT
Folder 1

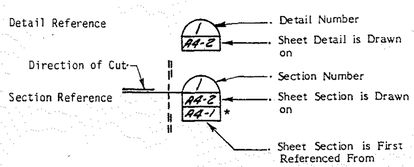


VICINITY MAP

SCALE: 1"=1000'

GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY BY EXCAVATION ALL UTILITIES AND EXISTING PIPING AT LOCATIONS WHERE NEW PIPE CROSSES THE EXISTING UTILITY OR EXISTING PIPING. THE FIELD VERIFIED LOCATIONS AND ELEVATIONS SHALL BE REPORTED TO THE CITY AND THE ENGINEER.
2. ALL DUCTILE IRON PIPE JOINTS SHALL BE ELECTRICALLY CONNECTED USING #2 HMWPE TYPE VH CADWELD CONNECTION OR PROVIDE DIP CAPABLE OF ACCEPTING BOLTED LUG CONNECTIONS. ALL CONNECTIONS OF DISSIMILAR MATERIALS SHALL BE INSTALLED WITH INSULATION GASKETS.
3. CONTRACTOR SHALL CONFINE ALL CONSTRUCTION ACTIVITIES TO THE AREAS DELINEATED ON THE DRAWINGS. CONTRACTOR SHALL COORDINATE ACCESS AT WTP SITE WITH OTHER CONTRACTOR.
4. ABANDON EXISTING 16" and 12" PIPING IN ALLEYWAY AT WTP AS NECESSARY TO INSTALL THE NEW 42" PIPE. ABANDONED PIPE NOT REMOVED FROM GROUND SHALL BE PLUGGED WITH CONCRETE. THE 12" LINE SHALL BE RECONNECTED TO THE RELOCATED 24" LINE AS SHOWN ON PLANS.
5. BURIED DUCTILE IRON PIPE SHALL BE RESTRAINED AS SHOWN ON DRAWING USING RESTRAINED JOINT PIPE. BURIED STEEL PIPE SHALL HAVE HARNESSED COUPLINGS EVERY 40 FEET MAXIMUM.
6. DUCTILE IRON PIPE SHALL BE CLASS 51 IN AREAS UNDER PAVEMEMT AND CLASS 52 IN AREAS OF OPEN FIELD AS SHOWN ON THE PLANS. ALL DUCTILE IRON PIPE SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE ENCASEMENT AS PER AWWA C105.
7. CONTRACTOR SHALL REMOVE AND REPLACE EXISTING ASPHALT TO THE EXTENT SHOWN ON THE PLANS. ASPHALT SHALL BE HOT MIX USING TYPE E AGGREGATE GRADIATION. THE AGGREGATE BASE SHALL BE CLASS 6. BOTH THE HOT BITUMINOUS PAVEMENT AND THE AGGREGATE BASE COURSE SHALL CONFORM TO COLORADO DEPARTMENT OF HIGHWAY SPECIFICATIONS.
8. ALL DISTURBED AREAS SHALL BE REGRADED AND SEEDED TO REESTABLISH VEGETATIVE COVER.



* Orientation Should be as Shown

DRAWING INDEX

1. COVER SHEET
2. VICINITY MAP/DRAWING INDEX

PART 1- THORNTON W.T.P. CLEARWELL & PUMPING IMPROVEMENTS

3. THORNTON W.T.P. - OVERALL SITE PLAN
4. 3.0 MG CLEARWELL - SITE PLAN
5. 3.0 MG CLEARWELL - PLAN , ELEVATIONS & DETAILS
6. 3.0 MG CLEARWELL - DETAILS
7. YARD PIPING - PROFILES
8. YARD PIPING - PROFILES & SECTIONS
9. YARD PIPING ALLEY - PROFILES
10. YARD PIPING - MISCELLANEOUS DETAILS
11. YARD PIPING - MISCELLANEOUS DETAILS
12. ZONE 4/3 PUMP STATION - PROCESS PLANS & SECTIONS
13. ZONE 4/3 PUMP STATION - PROCESS DETAILS
14. ZONE 4/3 PUMP STATION - INSTRUMENTATION
15. ZONE 4/3 PUMP STATION - HVAC
16. ZONE 4/3 PUMP STATION - HVAC DETAILS
17. ZONE 4/3 PUMP STATION - ELECTRICAL ONE-LINE DIAGRAM
18. ZONE 4/3 PUMP STATION - ELECTRICAL PLAN
19. ZONE 4/3 PUMP STATION - ELECTRICAL DETAILS
20. ZONE 4/3 PUMP STATION - ELECTRICAL DETAILS
21. THORNTON W.T.P. - ELECTRICAL SITE PLAN

PART 2 - THORNTON PARKWAY 24" WATER MAIN

(NOT INCLUDED IN THIS SET)

22. PLAN & PROFILE - STA. 0+00 TO STA. 13+25
23. PLAN & PROFILE - STA. 13+25 TO STA. 27+84
24. PLAN & PROFILE - STA. 27+84 TO STA. 42+00
25. PLAN & PROFILE - STA. 42+00 TO STA. 56+15
26. PLAN & PROFILE - STA. 56+15 TO STA. 66+37
27. MISCELLANEOUS DETAILS
28. MISCELLANEOUS DETAILS

6A. RAW WATER LINE & VALVE VAULT

"AS RECORDED" FROM INFORMATION PROVIDED BY THE CONTRACTORS DATE: OCT-14-88

HDR Infrastructure, Inc.
A Centerra Company

Thornton WTP Clearwell & Pumping Improvements

Thornton Parkway 24" Water Main

Vicinity Map / Drawing Index

Project Number 148-42-50

Date November, 1986

Project Manager G. Fuller

Design J. Chwirka

Architectural

Structural C. Nyman

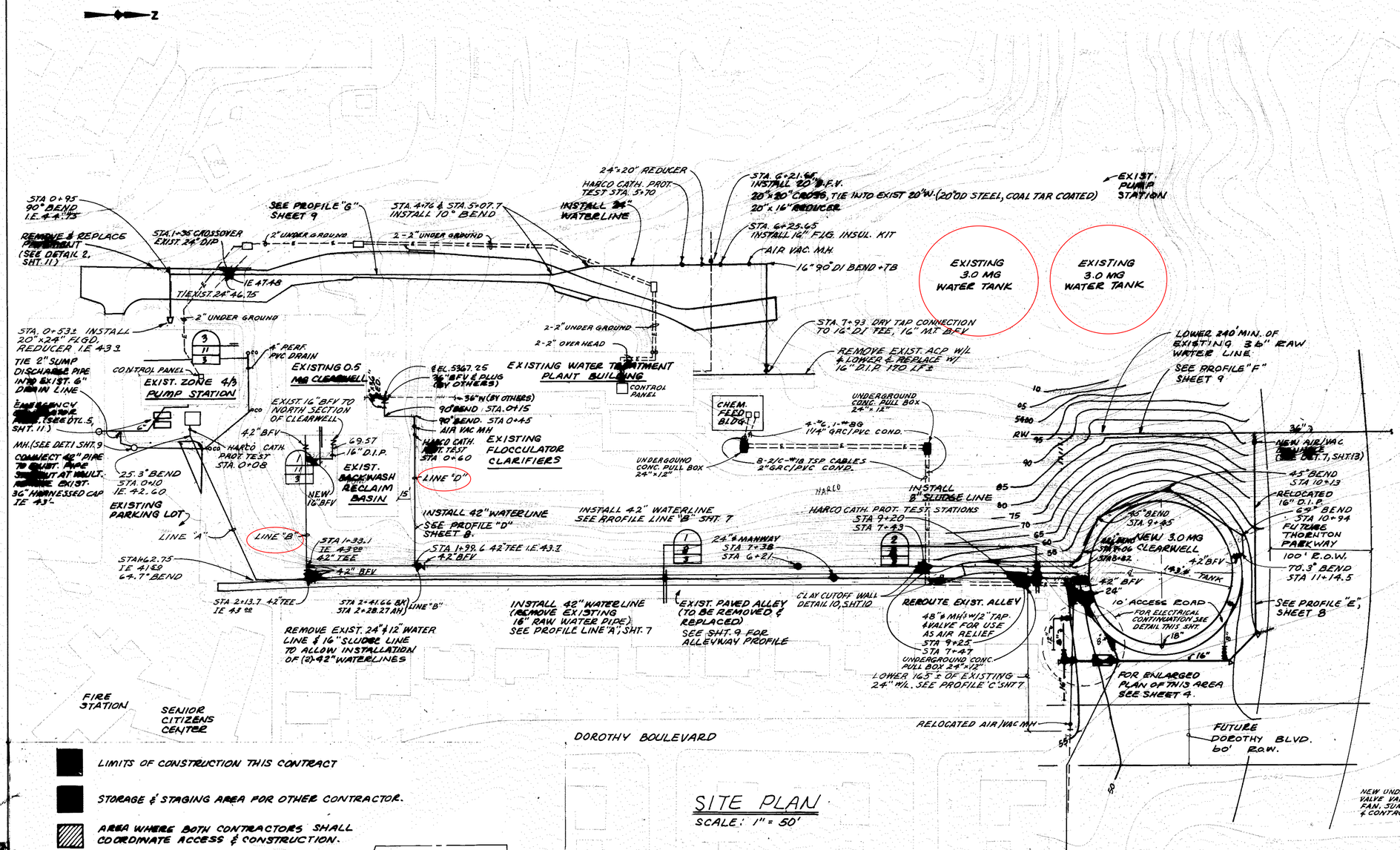
Mechanical P. O'Brien

Electrical M. Elzway

Drawn Sy R. Bredsnajder

Revisions 10/14/88 AS BUILT REVISION

Sheet Number 2

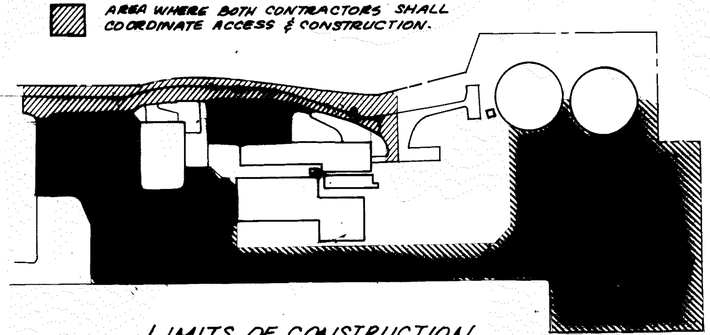


SITE PLAN
SCALE: 1" = 50'

LIMITS OF CONSTRUCTION THIS CONTRACT

STORAGE & STAGING AREA FOR OTHER CONTRACTOR.

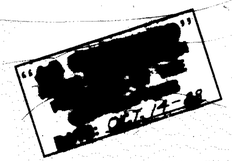
AREA WHERE BOTH CONTRACTORS SHALL COORDINATE ACCESS & CONSTRUCTION.



LIMITS OF CONSTRUCTION
SCALE: NONE

LEGEND

	EXISTING	PROPOSED
WATERLINE		W
STORM DRAIN		SD
SANITARY SEWER		
RAW WATER		RW
GAS		
ASPHALT ROAD		



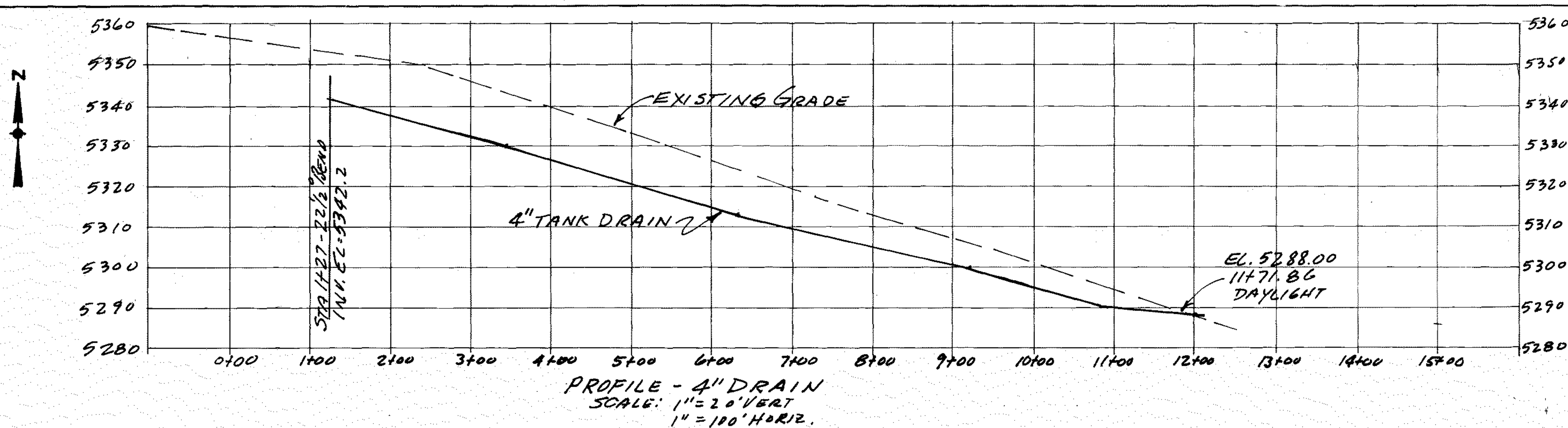
Harding Lawson Associates
A Centerra Company

Part 1 : Thornton Water Treatment Plant Clearwell & Pumping Improvements

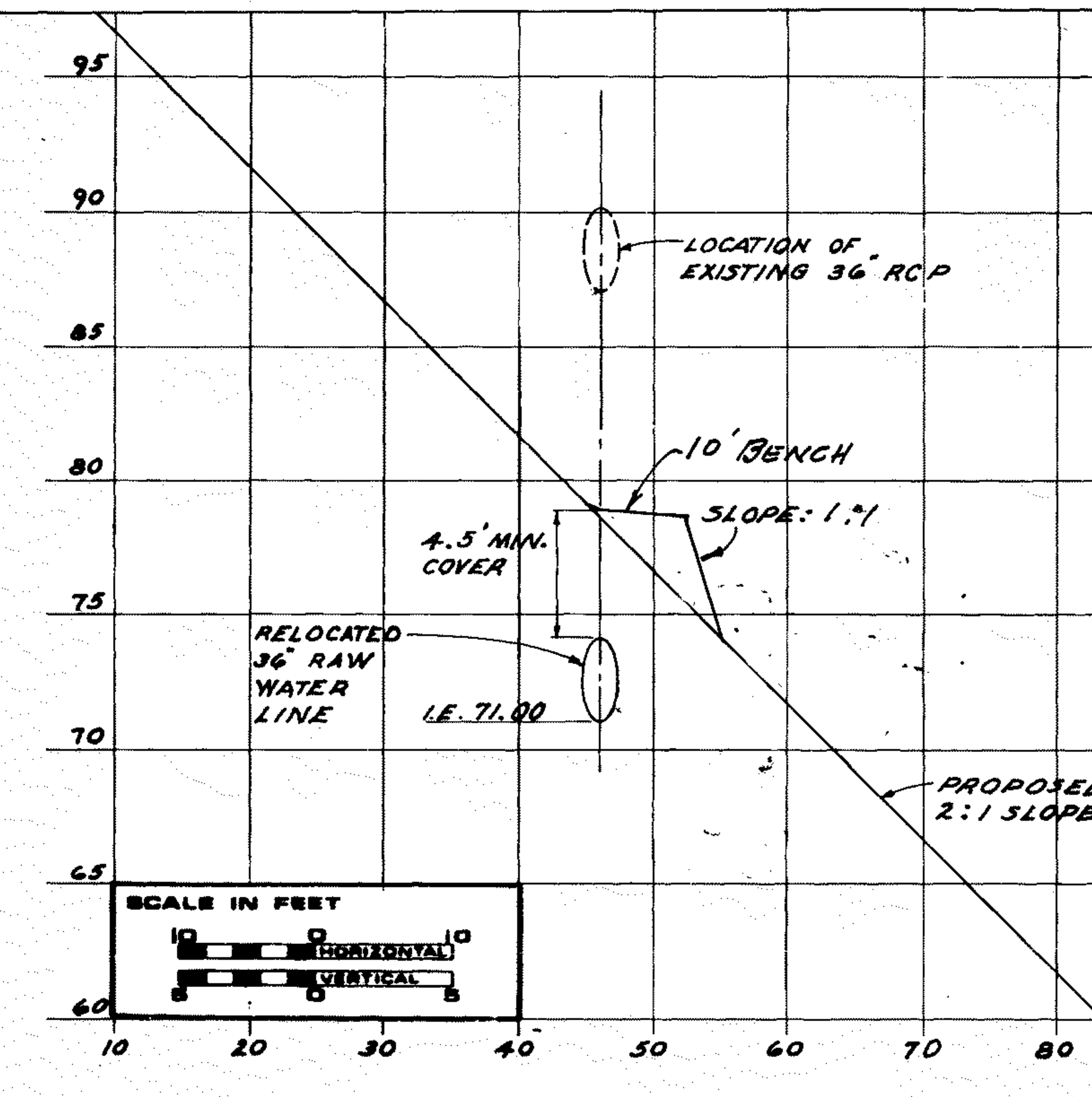
Site Plan

Project Number: 148-42-50
Date: November, 1986
Project Manager: G. Fuller
Design: J. Chwirka
Architectural:
Structural: C. Nyman
Mechanical: P. O'Brien
Electrical: M. Elway
Drawn By: R. Bredsnajder
Revisions: 10/14/88 AS BUILT REVISIONS

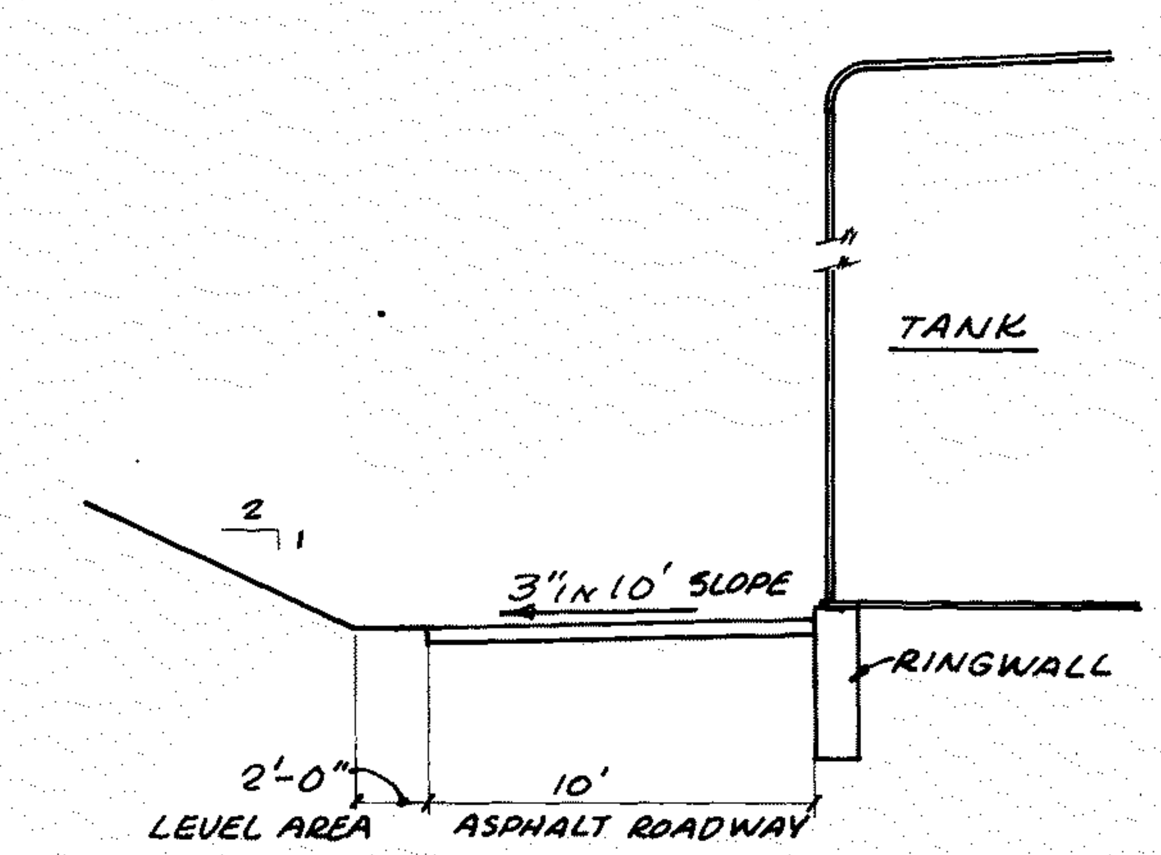
Sheet Number: 3



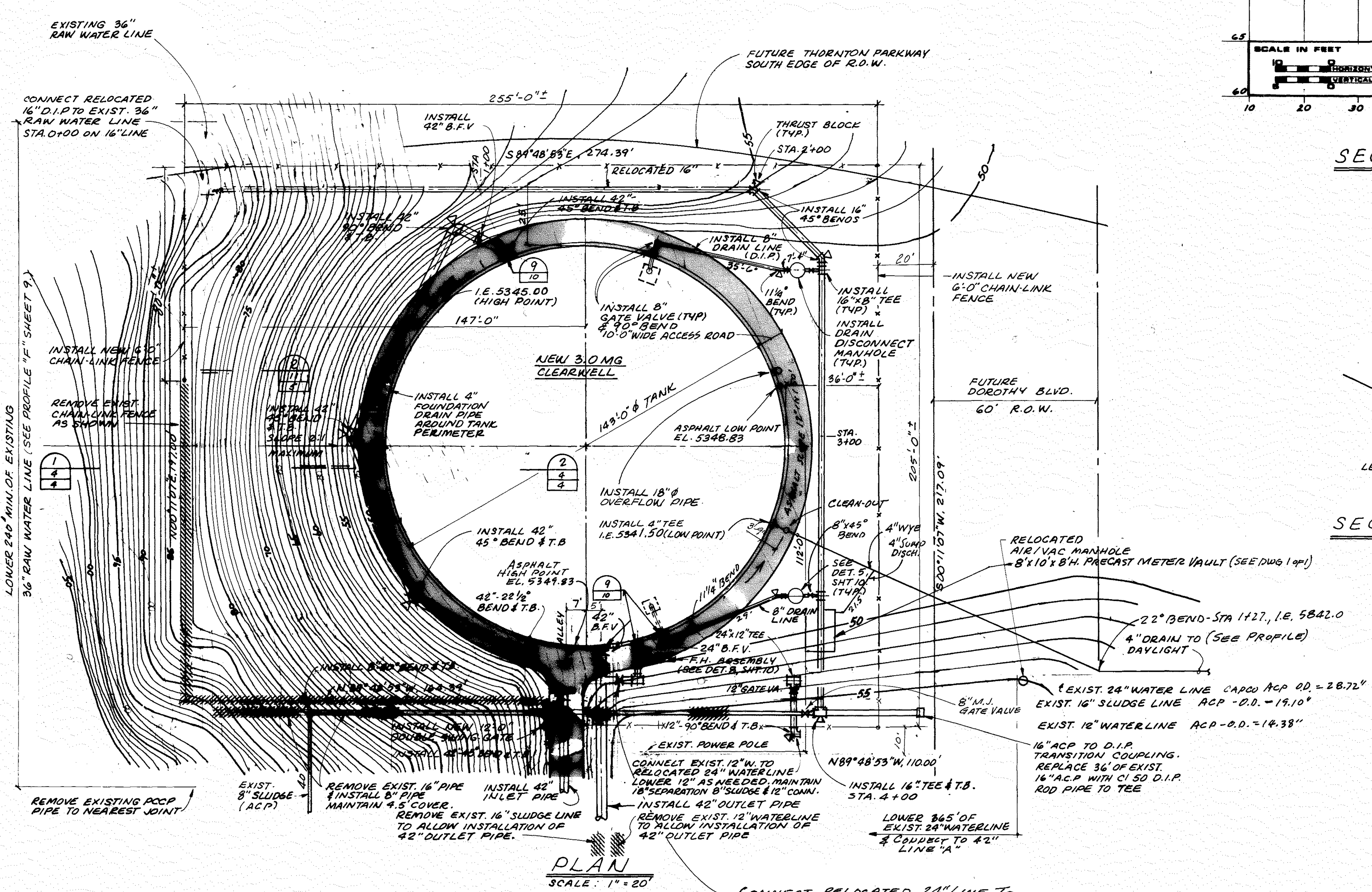
PROFILE - 4" DRAIN
SCALE: 1" = 20' VERT
1" = 100' HORIZ.



SECTION 1/4/4



SECTION 2/4/4



PLAN
SCALE: 1" = 20'

CONNECT RELOCATED 24" LINE TO 42" LINE "A", AFTER 42" LINE "B" IS IN SERVICE (SEE DETAILS SHEET 7)

"AS RECORDED" FROM INFORMATION PROVIDED BY THE CONTRACTORS DATE: OCT-14-88

HDR Infrastructure, Inc.
A Centerra Company

Part 1: Thornton Water Treatment Plant Clearwell & Pumping Improvements

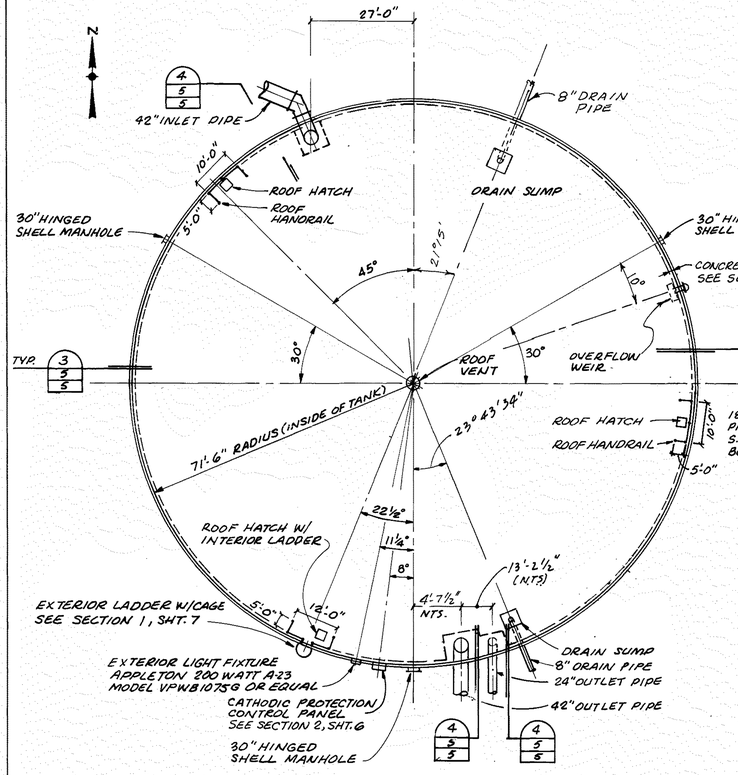
Clearwell Site Plan

Project Number	148-42-50
Date	November, 1986
Project Manager	G. Fuller
Design	J. Chwirka
Architectural	
Structural	C. Nyman
Mechanical	P. O'Brien
Electrical	M. Elzway
Drawn By	R. Bredsnajder
Revisions	10/14/88 As Built Revisions

KARL D. HENNINGSEN, PROFESSIONAL ENGINEER, STATE OF COLORADO

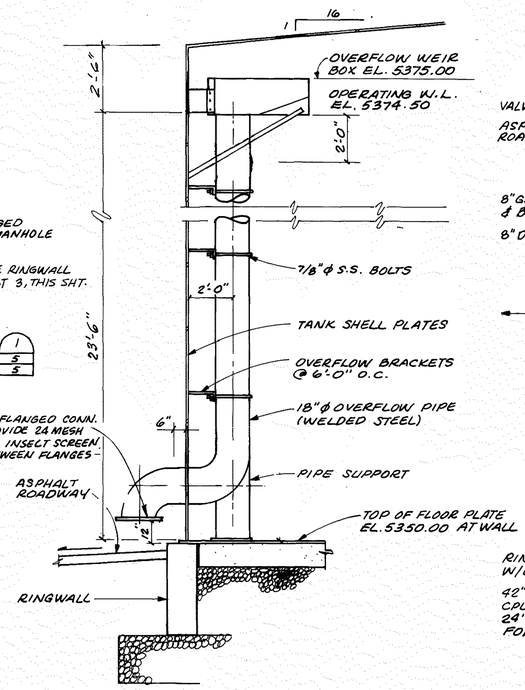
Sheet Number 4

AUDIT	004	005	006	007
OVERLAY	004	005	006	007



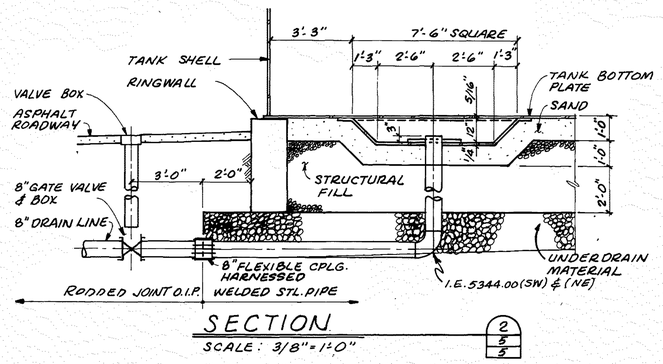
TANK PLAN

SCALE : 1/16" = 1'-0"



SECTION

SCALE : 3/8" = 1'-0"



SECTION

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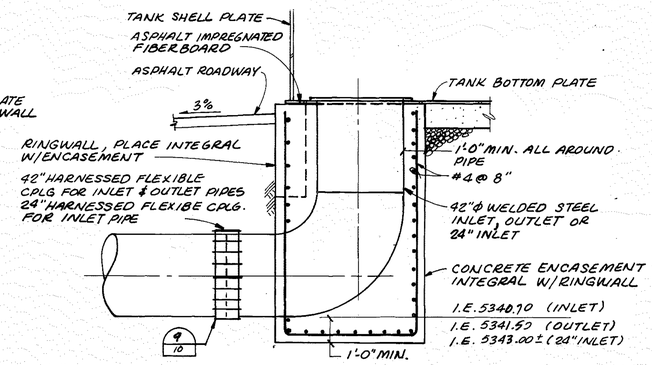
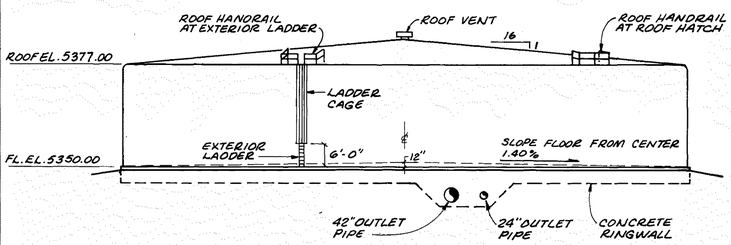


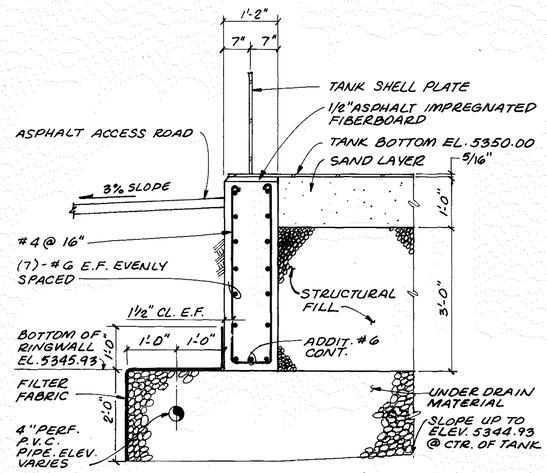
SECTION

SCALE : 3/8" = 1'-0"



SOUTH ELEVATION

SCALE : 1/16" = 1'-0"



SECTION

SCALE : 3/4" = 1'-0"

NOTES:

1. PROVIDE STD. 90° HK E.E. ON ALL WALL HORIZ. REINFORCING. EXTEND BOTH INSIDE FACE & OUTSIDE FACE REBARS TO OUTSIDE FACE OF INTERSECTING WALLS.
2. VERIFY NUMBER, SIZE, AND LOCATION OF ALL WALL & SLAB OPNGS. PROVIDE ADDITIONAL REINFORCING AS SHOWN AND CUT INTERFERING REINF. AS REQUIRED.
3. RING WALL HORIZONTAL SPLICING SHALL BE SPLICED SO LAPS OF ADJACENT REBAR ARE STAGGERED, PROVIDE MINIMUM OF 3'-6" BETWEEN LAP LOCATIONS OF REBAR ADJACENT TO REBAR BEING SPLICED. IN ALL CASES, PROVIDE MINIMUM OF 1 1/2" CLEAR BETWEEN REBAR.
4. CONCRETE STRENGTH : 4000 PSI
5. REINFORCING STEEL : ASTM A615 GRADE 60
6. FILL AND BACKFILL MATERIALS
   a) SAND: CLASS C FILTER MATERIAL PER C.D.O.H. SPECIFICATIONS.
   b) STRUCTURAL FILL: NON EXPANSIVE GRANULAR MATERIAL WITH A MINIMUM OF 20% PASSING A NO. 200 SIEVE AND WITH A LIQUID LIMIT OF 30% (MAX) COMPACT TO 100% STANDARD PROCTOR DENSITY.
   c) UNDERDRAIN MATERIAL: GRANULAR MATERIAL WITH LESS THAN 5% PASSING A NO. 200 SIEVE AND LESS THAN 50% PASSING A NO. 4 SIEVE. MAXIMUM SIZE TO BE 2".

"AS RECORDED" FROM INFORMATION PROVIDED BY THE CONTRACTORS DATE: OCT-14-88

HDR Infrastructure, Inc.
A Centerra Company

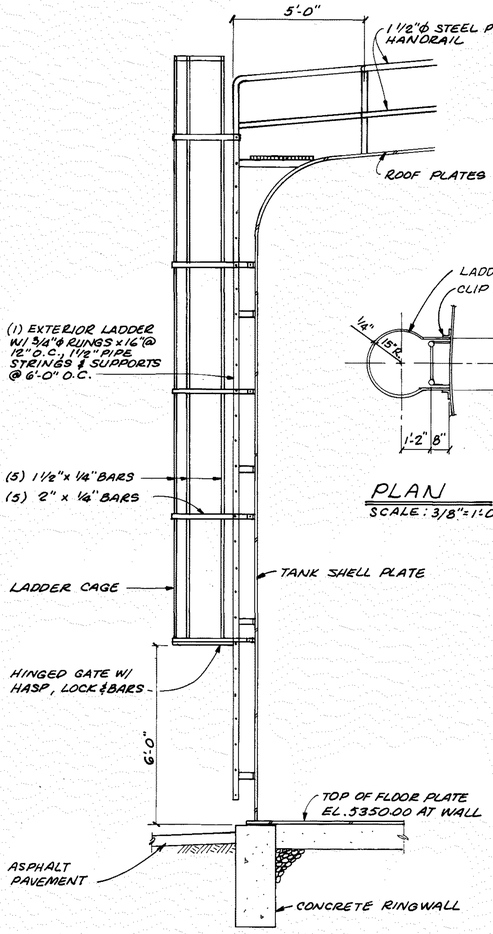
Part 1 : Thornton Water Treatment Plant Clearwell & Pumping Improvements

3.0 MG Clearwell

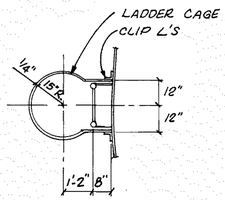
Project Number	148-42-50
Date	November, 1986
Project Manager	G. Fuller
Design	J. Chwirka
Architectural	
Structural	C. Nyman
Mechanical	P. O'Brien
Electrical	M. Elzway
Drawn By	R. Bredsnajder
Revisions	10/14/88 As Built Revisions

Sheet Number 5

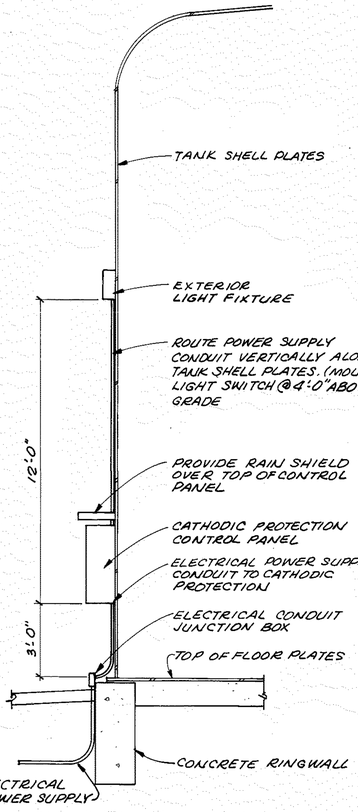
BRUNING



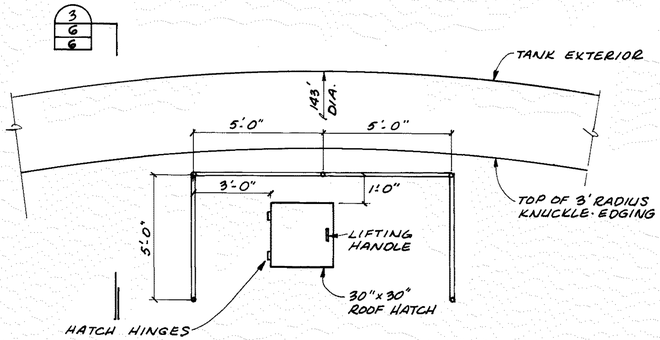
SECTION
SCALE: 3/8" = 1'-0"
1 6 5



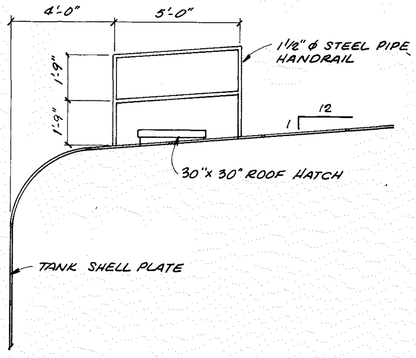
PLAN
SCALE: 3/8" = 1'-0"



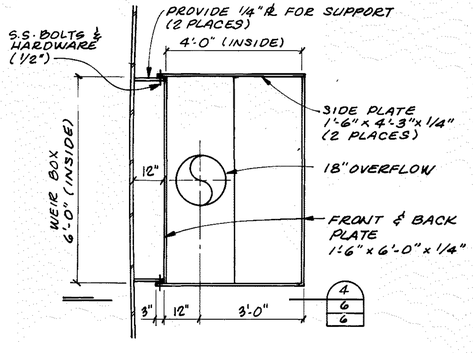
SECTION
SCALE: 3/8" = 1'-0"
2 6 5



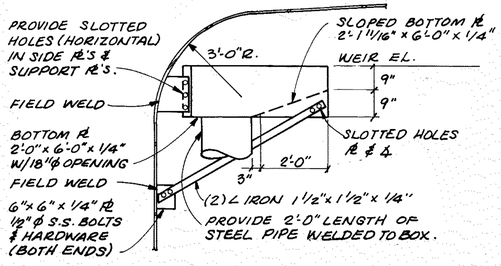
ROOF HATCH PLAN
SCALE: 3/8" = 1'-0"



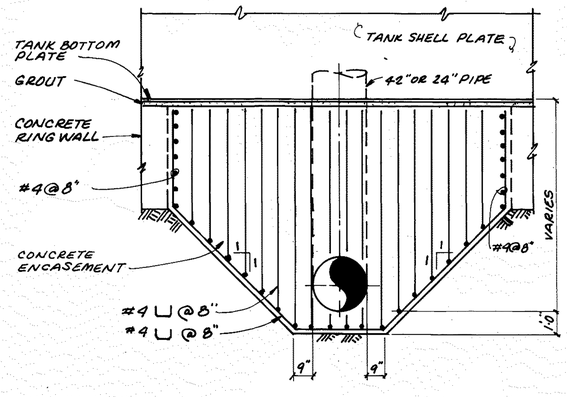
SECTION
SCALE: 3/8" = 1'-0"
3 6 6



OVERFLOW WEIR BOX PLAN
SCALE: 1/2" = 1'-0"
4 6 6



SECTION
SCALE: 1/2" = 1'-0"
4 6 6



DETAIL
SCALE: 3/8" = 1'-0"
1 6

"AS RECORDED"
FROM INFORMATION PROVIDED BY THE CONTRACTORS
DATE: OCT-14-88

HDR Infrastructure, Inc.
A Centerra Company

Part 1:
Thornton Water Treatment Plant Clearwell & Pumping Improvements

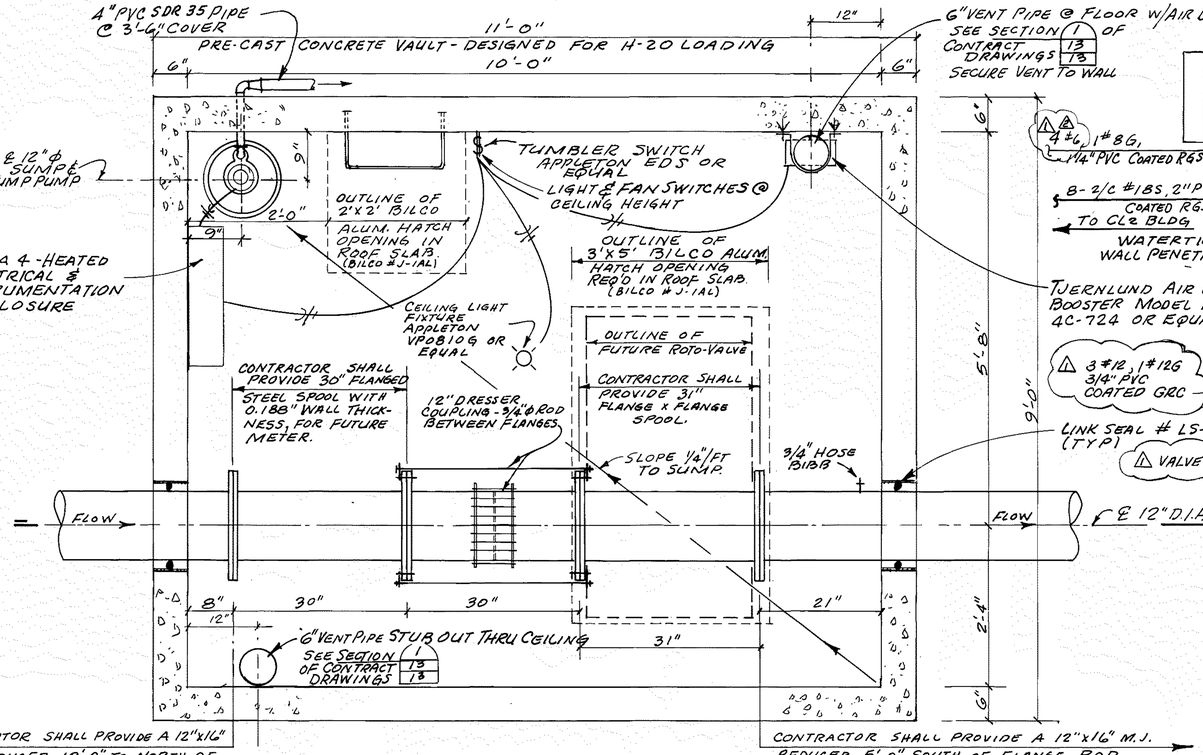
3.0 MG Clearwell

Project Number: 148-42-50
Date: November, 1986
Project Manager: G. Fuller
Design: J. Chwirka
Architectural:
Structural: C. Nyman
Mechanical: P. O'Brien
Electrical: M. Elzway
Drawn By: R. Bredsnajder
Revisions: 10/14/88 As Built Revisions

L. O. HENRICHFELD REGISTERED PROFESSIONAL ENGINEER STATE OF COLORADO

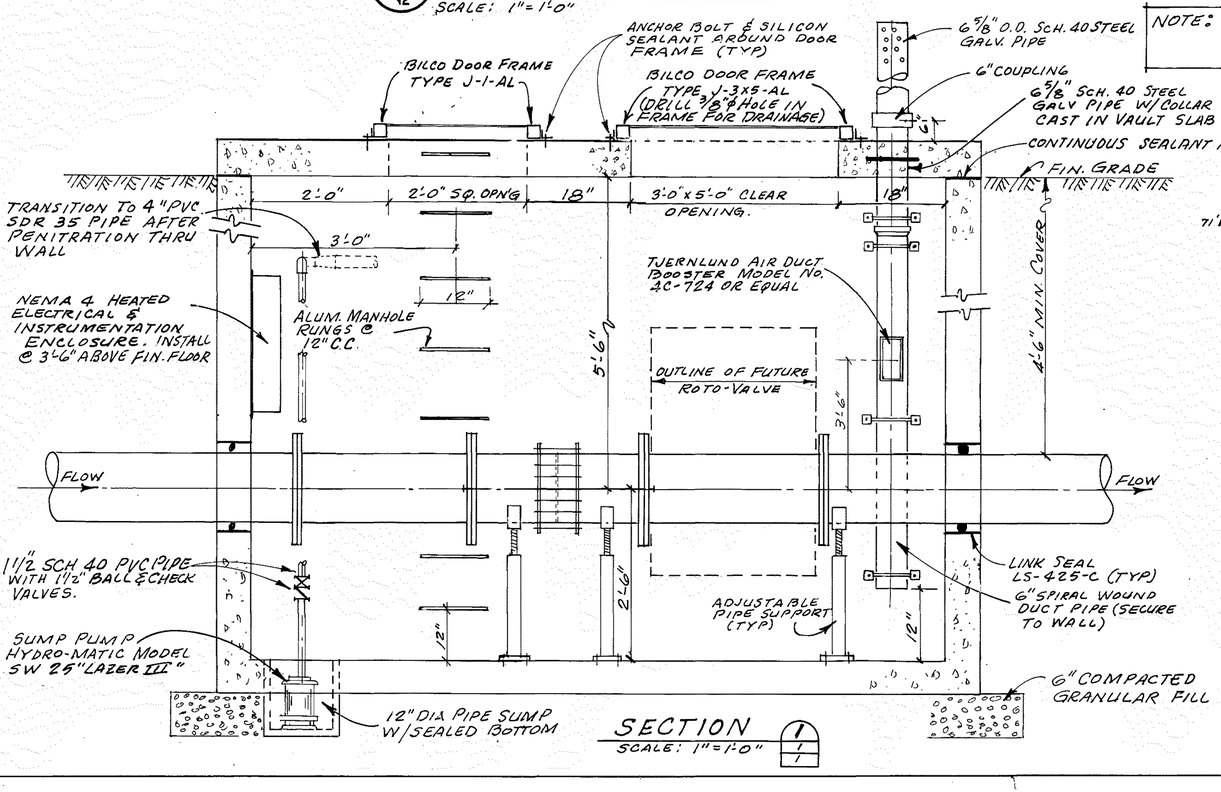
Sheet Number: 6

BRUNING



PLAN - VALVE VAULT

SCALE: 1"=1'-0"

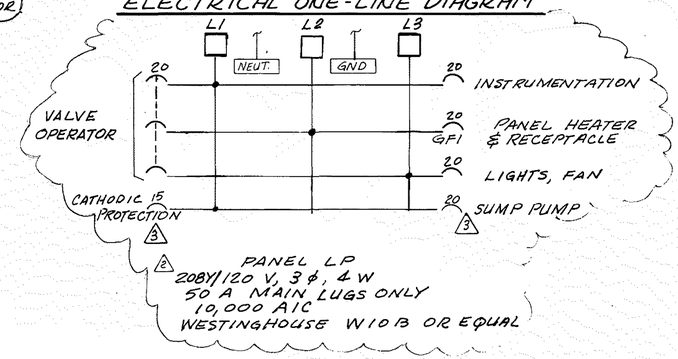


SECTION

SCALE: 1"=1'-0"

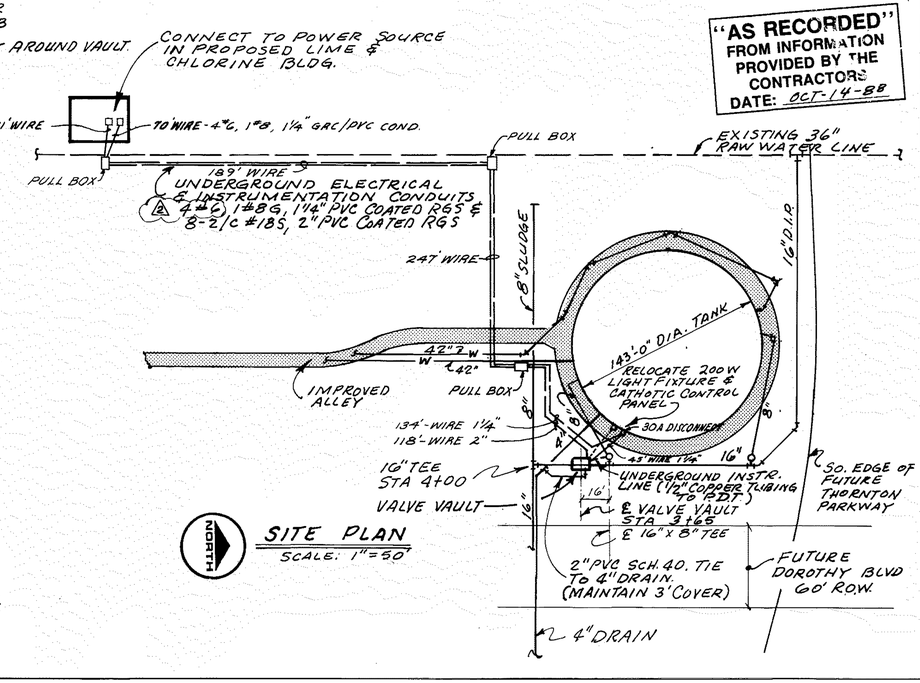
NOTE: INTERIOR PIPING & PIPE SUPPORTS SHALL BE PAINTED WITH PAINT FURNISHED BY CITY.

ELECTRICAL ONE-LINE DIAGRAM



SITE PLAN

SCALE: 1"=50



"AS RECORDED" FROM INFORMATION PROVIDED BY THE CONTRACTOR. DATE: OCT-14-88

HDR Infrastructure, Inc.
A Centerra Company

Part 1 : Thornton Water Treatment Plant Clearwell & Pumping Improvements

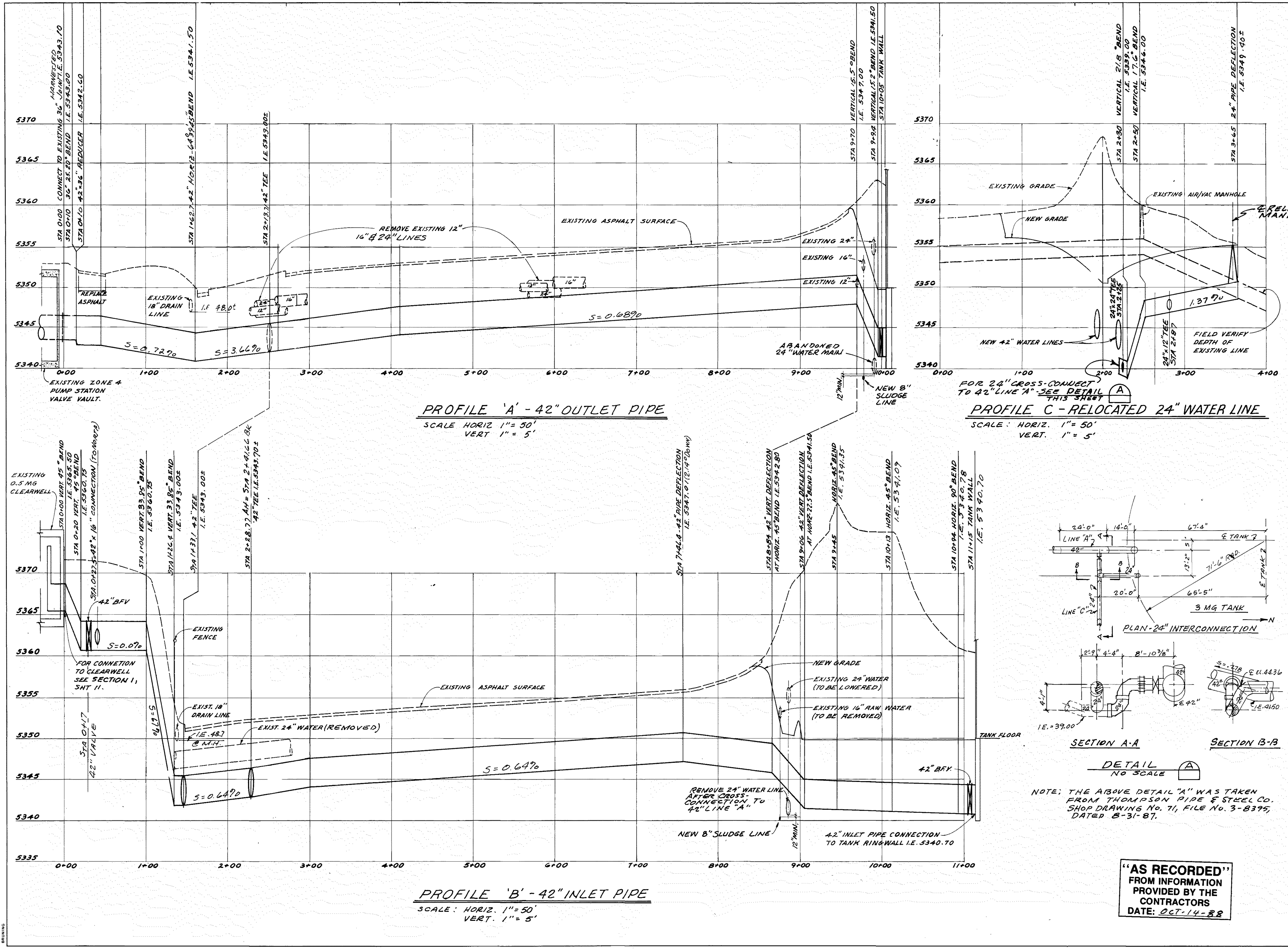
RAW WATER LINE VALVE VAULT

Project Number	148-42-50
Date	April, 1987
Project Manager	G. Fuller
Design	J. Chwirka
Architectural	
Structural	C. Nyman
Mechanical	P.O'Brian
Electrical	R. SASAKURA
Drawn By	A. Tacito

Revisions
4-21-87-REVISED PER CITY COMMENTS.
1 7-30-87 REVISED PER CITY REQUEST
2 8-10-87 REVISED PER CITY REQUEST.
3 8-31-87 ADDED SUMP PUMP & CATHODIC PROT. TO ONE-LINE DIAGRAM.
10/14/88 AS BUILT REVISIONS.

Sheet Number **6A**

BRUNO


PROFILE 'A' - 42" OUTLET PIPE
SCALE HORIZ 1" = 50'
VERT 1" = 5'
EXISTING ZONE 4 PUMP STATION VALVE VAULT.
STA 0+00 CONNECT TO EXISTING 36" JOINT I.E. 5343.10
STA 0+10 36" 25.20° BEND I.E. 5343.00
STA 0+10 42"x36" REDUCER I.E. 5342.60
STA 1+60.7 42" HORIZ. 64.95° BEND I.E. 5341.50
STA 2+13.1 42" TEE I.E. 5343.00±
STA 9+70 VERTICAL 15.5° BEND I.E. 5347.00
STA 9+94 VERTICAL 15.2° BEND I.E. 5341.50
STA 10+05 TANK WALL
REPLACE ASPHALT
EXISTING 18" DRAIN LINE
I.E. 48.0±
REMOVE EXISTING 12" 16" & 24" LINES
EXISTING ASPHALT SURFACE
EXISTING 24"
EXISTING 16"
EXISTING 12"
ABANDONED 24" WATER MAIN
NEW 8" SLUDGE LINE
12" MIN.
S = 0.72%
S = 3.66%
S = 0.68%
PROFILE C - RELOCATED 24" WATER LINE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'
STA 2+30 VERTICAL 21.8° BEND I.E. 5339.00
STA 2+50 VERTICAL 17.6° BEND I.E. 5346.00
STA 3+65 24" PIPE DEFLECTION I.E. 5349.90±
EXISTING GRADE
NEW GRADE
EXISTING AIR/VAC MANHOLE
℄ RELOCATED AIR/VAC MANHOLE
NEW 42" WATER LINES
24"x24" TEE STA 2+25
24"x12" TEE STA 2+87
1.37%
FIELD VERIFY DEPTH OF EXISTING LINE
FOR 24" CROSS-CONNECT TO 42" LINE "A" - SEE DETAIL A THIS SHEET
PROFILE 'B' - 42" INLET PIPE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'
EXISTING 0.5 MG CLEARWELL
STA 0+00 VERT. 45° BEND I.E. 5365.50
STA 0+20 VERT. 45° BEND I.E. 5360.75
STA 0+27.5 42" x 16" CONNECTION (TO NORTH)
STA 0+17 42" VALVE
42" BFV
S = 0.0%
FOR CONNECTION TO CLEARWELL SEE SECTION 1, SHT 11.
STA 1+00 VERT 33.95° BEND I.E. 5360.75
STA 1+26.4 VERT 33.95° BEND I.E. 5343.00±
STA 1+31 42" TEE I.E. 5343.00±
STA 2+28.77 AH = STA 2+41.66 BK 42" TEE I.E. 5343.70±
STA 7+61.4 42" PIPE DEFLECTION I.E. 5347.01 (2.14° DOWN)
STA 8+84 42" VERT DEFLECTION AT HORIZ. 45° BEND I.E. 5342.80
STA 9+06 42" VERT DEFLECTION AT HORIZ. 22.5° BEND I.E. 5341.50
STA 9+45 HORIZ. 45° BEND I.E. 5341.35
STA 10+13 HORIZ. 45° BEND I.E. 5341.09
STA 10+94 HORIZ. 90° BEND I.E. 5340.78
STA 11+15 TANK WALL I.E. 5340.70
EXISTING FENCE
EXISTING ASPHALT SURFACE
EXIST. 18" DRAIN LINE
I.E. 48.7
@ M.H.
EXIST. 24" WATER (REMOVED)
S = 6.19%
S = 0.64%
NEW GRADE
EXISTING 24" WATER (TO BE LOWERED)
EXISTING 16" RAW WATER (TO BE REMOVED)
TANK FLOOR
42" BFV
REMOVE 24" WATER LINE AFTER CROSS-CONNECTION TO 42" LINE "A"
NEW 8" SLUDGE LINE
12" MIN.
42" INLET PIPE CONNECTION TO TANK RINGWALL I.E. 5340.70
PLAN - 24" INTERCONNECTION
LINE "A"
LINE "C"
3 MG TANK
℄ TANK
SECTION A-A
SECTION B-B
DETAIL A
NO SCALE
NOTE: THE ABOVE DETAIL "A" WAS TAKEN FROM THOMPSON PIPE & STEEL CO. SHOP DRAWING No. 71, FILE No. 3-8395, DATED 8-31-87.
"AS RECORDED" FROM INFORMATION PROVIDED BY THE CONTRACTORS DATE: OCT-14-88

HDR Infrastructure, Inc.
A Centerra Company

Part 1: Thornton Water Treatment Plant Clearwell & Pumping Improvements

Yard Piping

Project Number: 148-42-50

Date: November, 1986

Project Manager: G. Fuller

Design: J. Chwirka

Architectural:

Structural: C. Nyman

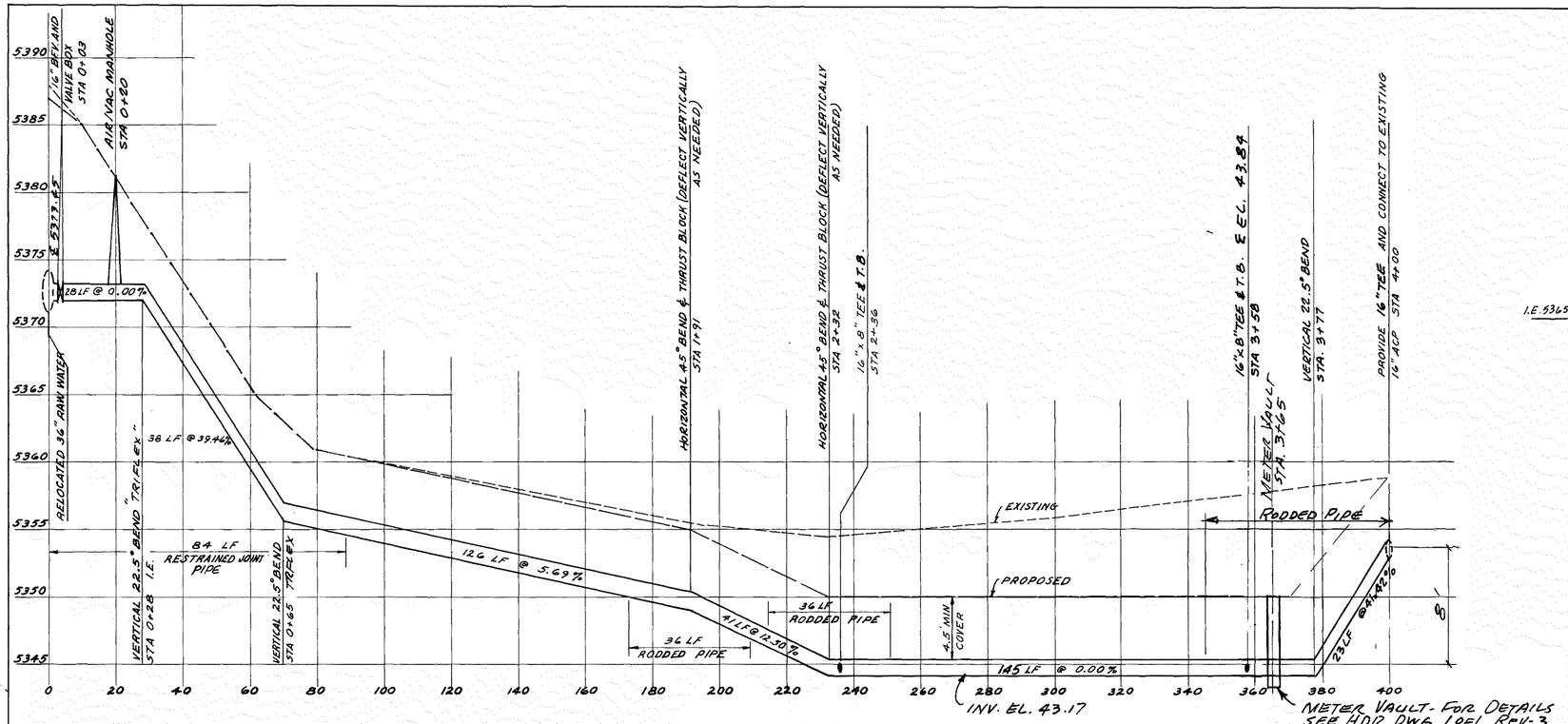
Mechanical: P. O'Brien

Electrical: M. Eizway

Drawn By: R. Bredsnajder

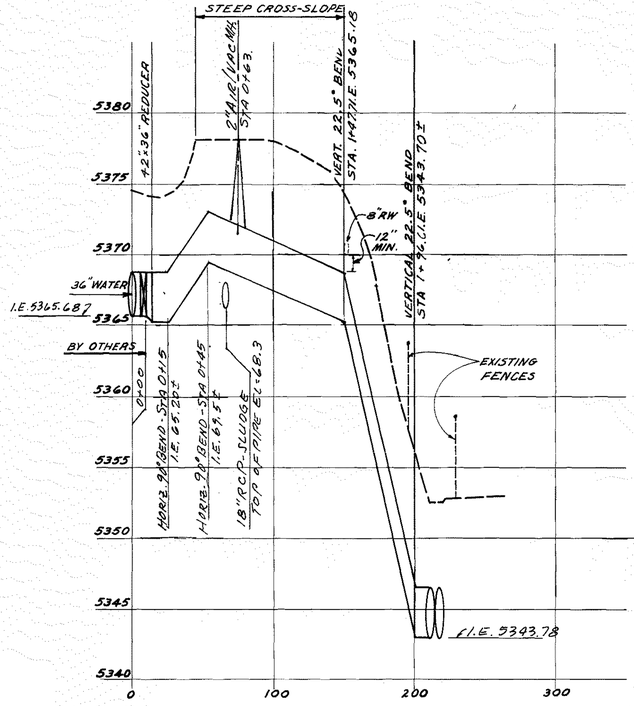
Revisions: 10/14/88 As Built Revisions

Sheet Number: 7



PROFILE "E" - RELOCATED 16" RAW WATER LINE

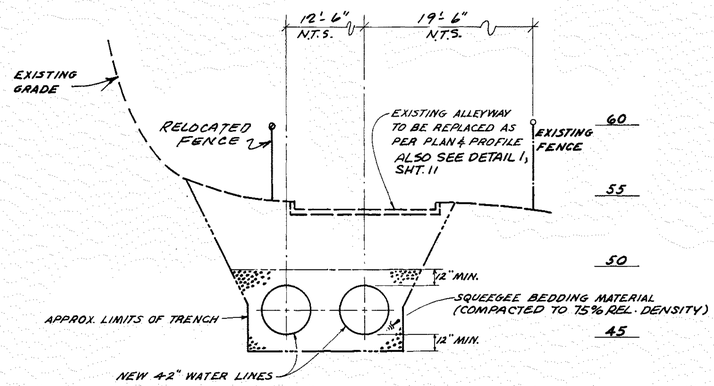
SCALE: HORIZ. 1" = 20'
VERT 1" = 5'



REFER TO THOMPSON PIPE CO. DWG # 7-1114-5 REV-1.

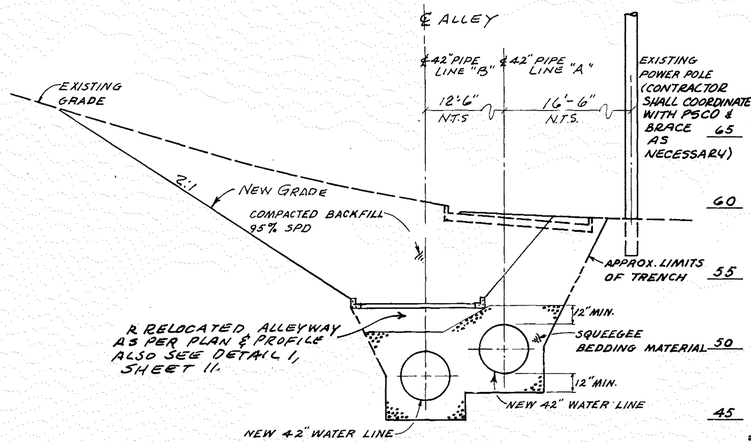
PROFILE "D" - 42" PIPE

SCALE: HORIZ 1" = 50'
VERT 1" = 5'



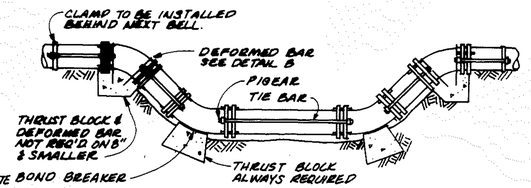
SECTION 1/8 3

SCALE: 1" = 5'-0"

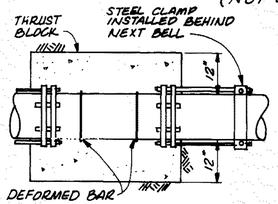


SECTION 2/8/3

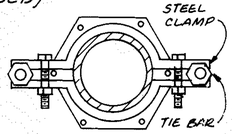
SCALE: 1" = 5'-0"



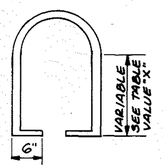
WATERLINE LOWERING DETAIL (NOT USED)



PLAN VIEW



SECTION A-A



DETAIL B

LINE SIZE	DEFORMED BAR DIAM.	DEFORMED BAR "X"	TIE BAR DIAM.	TIE BAR AMOUNT
8"	–	–	.375	2
12"	.500	18"	.500	2
16"	.750	20"	.750	2
24"	1.000	24"	1.000	2

NOTES:

1. ALL PIPE USED IN LOWERING SHALL BE DUCTILE IRON PIPE WITH 8 MIL. POLY WRAP.
2. ALL FITTINGS, PIPES & TIE BARS TO BE WRAPPED SEPARATELY IN POLYETHYLENE.
3. 45° FITTINGS SHALL BE USED.
4. FITTINGS SHALL BE RODDED TO THE NEXT BELL & NO JOINTS ARE ALLOWED BETWEEN FITTINGS.
5. PIGEARS SHALL BE USED ON RODDING FOR FITTINGS.

DETAIL 1/8

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EARL D. HENRICKS REGISTERED PROFESSIONAL ENGINEER STATE OF COLORADO

Sheet Number: 8