KEY TO COUNTIES

CITY OF FLINT
DEPARTMENT OF PUBLIC WORKS
RESERVIOR REHABILITATION
CEDAR STREET

Project Location:

City of Flint
Section 32 of T8N, R6E,
Geographic Township of Genesee
Genesee County, Michigan 48505

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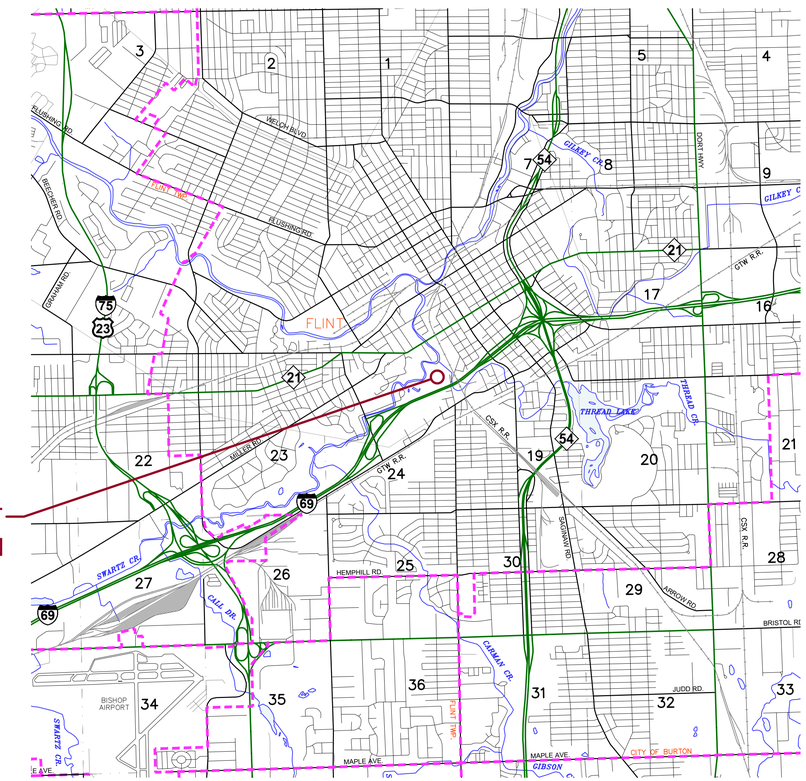

LOCATION MAP

SCALE : 1" = 3,000'

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DLZ

CITY OF FLINT OFFICIALS

SHELDON NEELEY	MAYOR
ERIC MAYS	CITY COUNCIL 1ST WARD
LADEL LEWIS	CITY COUNCIL 2ND WARD
QUENCY MURPHY	CITY COUNCIL 3RD WARD
JUDY PRIESTLY	CITY COUNCIL 4TH WARD
JERRI WINFREY-CARTER	CITY COUNCIL 5TH WARD
TONYA BURNS	CITY COUNCIL 6TH WARD
ALLIE HERKENRODER	CITY COUNCIL 7TH WARD
DENNIS PFEIFFER	CITY COUNCIL 8TH WARD
EVA WORTHING	CITY COUNCIL 9TH WARD
CLYDE D. EDWARDS	CITY OF FLINT ADMINISTRATOR

APPROVED BY THE CITY OF FLINT

CITY OF FLINT ADMINISTRATOR

PROJECT DESCRIPTION:
REHAB OF EXISTING RESERVIOR.

PREPARED UNDER THE SUPERVISION OF

GREG J. GUCWA
REGISTERED PROFESSIONAL ENGINEER

6201026553
REGISTRATION NO.

DLZ, INC.
ORGANIZATION

GENERAL NOTES

THE CONTRACTOR SHALL CALL "MISS DIG" (1-800-482-7171) THREE WORKING DAYS, EXCEPT SATURDAY, SUNDAY, AND HOLIDAYS PRIOR TO COMMENCEMENT OF ANY WORK.

ALL UTILITIES SHOWN ARE APPROXIMATE LOCATIONS DERIVED FROM ACTUAL MEASUREMENTS AND AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE THE EXACT LOCATION NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THE AREA.

THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE CITY OF FLINT CODE OF ORDINANCES.

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EXCEPTIONAL DESIGN
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DLZ PROJECT No.
1949-0188-00
SHEET 1 OF 16

STATE OF MICHIGAN
GREGORY J. GUCWA
Engineer No. 26533
REGISTERED PROFESSIONAL ENGINEER

DATE ISSUED: 7/5/23 ISSUED FOR BID

PLOT DATE: 6/29/2023 6:13:46 PM SAVE DATE: 6/28/2023 3:39:42 PM IAN BLAIR X:\Projects\2019\1949\0188800 Flint-Dort & Cedar\01_ConstDocs\CAD\Sheet Files\Cedar St\Reservior\1949018800 Cover-Reservior.dwg

GENERAL NOTES

A. CONTRACTOR IS RESPONSIBLE TO CONFORM WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS INCLUDING APPLICABLE ORDINANCES AND REFERENCED STANDARDS.

B. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO SUBMITTING A BID OR BEGINNING ANY WORK. CONDITIONS FOUND TO BE IN VARIANCE FROM THE INFORMATION IN THE DRAWINGS OR PROJECT MANUAL SHALL BE SUBMITTED TO THE ENGINEER IN WRITING FOR CLARIFICATION.

C. KEYNOTES ARE MEANT AS GENERAL GUIDE FOR TYPICAL LOCATIONS. CONTRACTORS PERFORM FULL EXTENT OF WORK REQUIRED TO ACCOMPLISH DESIGN INTENT. THE ABSENCE OF A KEYNOTE DOES NOT ABSOLVE THE CONTRACTOR FROM PROVIDING THE FEATURE GRAPHICALLY INDICATED ON THE DRAWINGS.

D. SPECIFIED WORK ITEMS SHALL BE COORDINATED AND INTERFACED WITH ALL OTHER TRADES TO ALLOW FOR NEW CONSTRUCTION AND COMPLETE INSTALLATION AS REQUIRED TO ACCOMPLISH DESIGN AND INTENT.

E. REFER TO DRAWINGS OF EACH TRADE OR DISCIPLINE FOR ADDITIONAL GENERAL MODES AND INFORMATION, INCLUDING, CIVIL/SITE DEVELOPMENT, ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION AND ELECTRICAL.

F. CONTRACTOR IS RESPONSIBLE FOR ALL WORK IDENTIFIED ON ALL DRAWINGS AND INFORMATION IN THE PROJECT MANUAL, AS A COMPLETE PROJECT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE SPECIFIC SCOPE OF WORK FOR ANY SUBCONTRACTORS FOR THIS PROJECT.

G. FIELD VERIFY ACTUAL LOCATIONS OF EXISTING UNDERGROUND UTILITIES, STRUCTURES, WATER LINES, STORM, SANITARY LINES, GAS LINES, ELECTRICAL CONDUIT AND OTHER UNDERGROUND UTILITIES PRIOR TO PERFORMING EARTHWORK EXCAVATION OR UTILITY WORK. ENGAGE THE SERVICES OF A PRIVATE UTILITY LOCATE COMPANY IF NECESSARY TO COMPLETE THE LOCATE EXISTING UNDERGROUND UTILITIES AND STRUCTURES.

H. LOCATION OF ALL TEMPORARY FACILITIES SHALL BE COORDINATED WITH OWNER AND ENGINEER PRIOR TO MOBILIZATION ON SITE, INCLUDING BUT NOT LIMITED TO TEMPORARY STAGING AREA, MATERIAL STORAGE, ACCESS DRIVE(S), PARKING AREA, TOP SOIL STOCKPILE AREA, WASTE DISPOSAL AREA, YIELD OFFICES AND TEMPORARY FACILITIES, JOB SIGN, AND TEMPORARY FENCING.

I. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MISCELLANEOUS BLOCKING REQUIRED FOR INSTALLATION OF ALL BUILDING COMPONENTS, INCLUDING BUT NOT LIMITED TO FURNISHINGS, FIXTURES, EQUIPMENT, HARDWARE, BRACKETS AND OWNER PROVIDED EQUIPMENT. CONTRACTOR SHALL COORDINATE SPECIFIC REQUIREMENTS ASSOCIATED WITH EACH TRADE AND WITH OWNER'S REPRESENTATIVE.

J. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MISCELLANEOUS WOOD AND METAL TRIM, FLASHING, CLIP ANGLES, ANCHOR SUPPORTS ENCLOSURE TRIM REQUIRED TO PROVIDE A COMPLETE UNIFORM AND WEATHER TIGHT ASSEMBLY AS REQUIRED TO ACCOMPLISH THE DESIGN INTENT.

K. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN RECOMMENDATIONS. CONTRACTOR SHALL PROVIDE AND INSTALL ALL ACCESSORY COMPONENTS AS REQUIRED TO FULLY COMPLETE WITH MANUFACTURER'S RECOMMENDATIONS.

L. CONTRACTOR SHALL PROVIDE ACCESS DOORS IN ALL WALLS AND CEILINGS WHERE SERVICE OR ADJUSTMENT TO MECHANICAL, PLUMBING, FIRE PROTECTION OR ELECTRICAL ITEMS MAY BE REQUIRED. ACCESS DOORS SHALL BE OF AN APPROPRIATE SIZE REQUIRED FOR EACH APPLICATION. WHERE APPLICABLE. ACCESS DOORS SHALL MATCH THE FIRE RATING OF THE WALL ASSEMBLY.

M. WHERE DISCREPANCIES EXIST IN THE CONTRACT DOCUMENTS INCLUDING, DISCREPANCIES BETWEEN THE DRAWINGS AND THE PROJECT MANUAL. CONTRACTOR SHALL REQUEST CLARIFICATION IN WRITING FROM THE ENGINEER. THE CONTRACTOR SHALL NOT ASSUME ANY ITEM TAKES PRECEDENCE OVER THE OTHER. ANY ACTION THE CONTRACTOR MAKES PRIOR TO NOTIFICATION IN WRITING SHALL BE SOLELY AT THE CONTRACTOR'S RISK.

N. COORDINATE WITH OTHER CONSTRUCTION ACTIVITIES AND CONSTRUCTION SEQUENCING WITH OTHER PROJECTS AND WORK BEING PERFORMED CURRENTLY ON SITE.

O. CONTRACTOR TO PROTECT ALL ITEMS WITHIN THE CONSTRUCTION LIMITS INCLUDING SITE ELEMENTS THAT ARE DESIGNATED TO REMAIN; ITEMS DAMAGE AS A RESULT OF WORK PERFORMED UNDER THIS CONTRACT SHALL BE REPAIRED OR REPLACED TO ORIGINAL CONDITION.

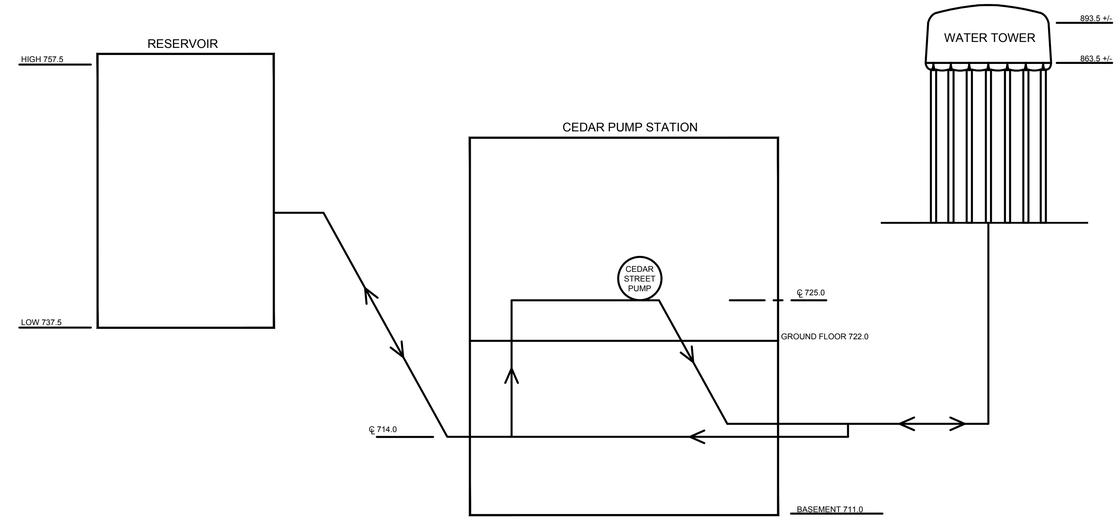
P. THESE DRAWINGS SHALL NOT BE SCALED TO OBTAIN DIMENSIONS. IF THE DIMENSIONS CANNOT BE DETERMINED BY THE INFORMATION GIVEN, CONTRACTOR SHALL REQUEST CLARIFICATION FROM THE ENGINEER. ALL DIMENSIONS ARE TO FACE OF STUD FACE OF CMU OR FACE OF CONCRETE UNLESS NOTED OTHERWISE. CEILING HEIGHT DIMENSIONS ARE FROM FINISHED FLOOR TO FACE OF FINISHED CEILING MATERIALS, UNLESS NOTED OTHERWISE.

Q. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL NECESSARY DEWATERING ACTIVITIES AS PART OF THE BASE BID AMOUNT.

R. CONTRACTOR SHALL FIELD MEASURE ALL ACCESS HATCHES PRIOR TO ORDERING MATERIALS. NEW HATCHES TO MATCH CLOSELY WITH EXISTING HATCH DIMENSIONS. ACCESS HATCH SUBMITTALS SHALL BE ACCOMPANIED WITH FIELD MEASUREMENTS FOR EACH LOCATION.

S. MAXIMUM WEIGHT OF EQUIPMENT ALLOWED ON TOP OF RESERVOIR IS 4000 LBS.

T. ALL ACCESS HATCHES SHALL BE BILCO TYPE D OR APPROVED EQUAL. HATCHES MUST MEET THE REQUIREMENTS OF SECTIONS 7.1.3 AND 7.1.8.2 OF THE TEN STATES STANDARDS.



SCHEMATIC STATIC HYDRAULIC PROFILE

NO SCALE

SOIL EROSION AND SEDIMENTATION CONTROL NOTES AND MAINTENANCE NOTES

1. This Project shall be constructed in compliance with Part 91 of Act 451 of 1994 as amended, the Soil Erosion and Sedimentation Control Act and the Genesee Drain Commissioner Soil Erosion and Sedimentation Control requirements

2. All erosion and sedimentation control work shall conform to the standards and specifications of Genesee County Drain Commissioner and the City of Flint..

3. Erosion and any sedimentations from work on this site shall be contained on the site and not allowed to collect on any off site areas or in Waterways. Waterways include both natural and man made open ditches, streams, storm drains, lakes and ponds.

4. Staging of the work will be done by the Contractor as directed in these plans and as required to ensure progressive stabilization and maintenance of disturbed earth change.

5. The Contractor shall be responsible for installation and maintenance of soil erosion and sedimentation control devices.

6. The Contractor shall implement and maintain the soil erosion control measures as shown on the plans before and at all times during construction of this project. Any modifications or additions to soil erosion control measures due to construction or changed conditions shall be complied with as required or directed by the Office of the Genesee County Drain Commissioner or the City of Flint.

7. If any of SESC measures on the site are deemed inadequate or ineffective, the Genesee County Drain Commissioner or the City of Flint has the right to require additional SESC measures at the expense of the Contractor.

8. The Soil Erosion and Sedimentation Control Measures shall be maintained weekly and after every storm event by the Contractor.

9. Install Inlet Filter on all permanent catch basins per detail.

   A Inlet filters shall be inspected weekly under normal conditions, within 24 hours of a rainfall and daily during a prolonged rain event.
   B Buildup of sediment and debris shall be removed promptly.
   C If fabric decomposes or becomes ineffective prior to the end of expected usable life and the barrier is still required, the silt fence shall be replaced promptly.

10. All stockpiled soils shall be maintained in such a way as to prevent erosion from leaving the site. If the stockpile will be on site for more than 30 days, then the stockpile must be seeded. Silt fence must be installed around the perimeter of the stockpile. Immediately after seeding, mulch all seeded areas with unweathered small grain straw, spread uniformly at the rate of 1 to 2 tons per acre or 100 pounds (2-3 bales) per 1000 square feet. This mulch should be anchored with disc type mulch anchoring tool or other means as approved by the Genesee County Drain Commissioner. Mulch matting may be used in lieu of loose mulch.

11. If any dewatering is needed, it shall be discharged through a filter bag over a well vegetated area. The pump must discharge at a non-erosive velocity. If necessary, an approved energy dissipater may be used.

12. All dirt tracked onto roadways shall be removed immediately.

13. Streets and or parking areas will be scraped on a daily basis and swept at a minimum of once per week by the Contractor.

14. During dry periods, all disturbed areas shall be watered for dust control.

15. Permanent soil erosion control measures for all slopes, channels, ditches, or any disturbed land area shall be completed within 5 calendar days after final grading or the final earth change has been completed. When it is not possible to permanently stabilize a disturbed area after earth change activity ceases, temporary soil erosion control measures shall be implemented immediately. All temporary soil erosion control shall be maintained until permanent soil erosion control measures are implemented. All permanent soil erosion control measures will be implemented and established before a certificate of compliance is issued.

16. Final grade, establish vegetation, and or landscape all disturbed areas not built or paved upon.

17. Remove all temporary soil erosion control devices after permanent stabilization is established.

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WARNING
UTILITY LOCATIONS ARE NOT CONFIRMED. THOSE SHOWN WERE OBTAINED FROM UTILITY OWNERS OR PLANS. THREE FULL WORKING DAYS PRIOR TO BEGINNING WORK THE CONTRACTOR SHALL NOTIFY UTILITY OWNERS TO MARK WORK AREA AS REQUIRED AND HE SHALL PROTECT OR HAVE RELOCATED, AS NOTED IN THE SPECIFICATIONS, ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

GENERAL NOTES
RESERVOIR REHABILITATION
Cedar Street
Flint, Michigan 48503

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	EGLE PERMIT	06-08-23

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SHEET NO.
G-001

PLOT DATE: 7/5/2023 1:54:29 PM SAVE DATE: 6/29/2023 8:41:49 AM IAN BLAIR X:\Projects\2019\1949\08800 Flint-Dort & Cedar\01_ConstDocs\CAD\Sheet Files\Cedar St\Reservoir\1949018800 General Notes-Reservoir.dwg
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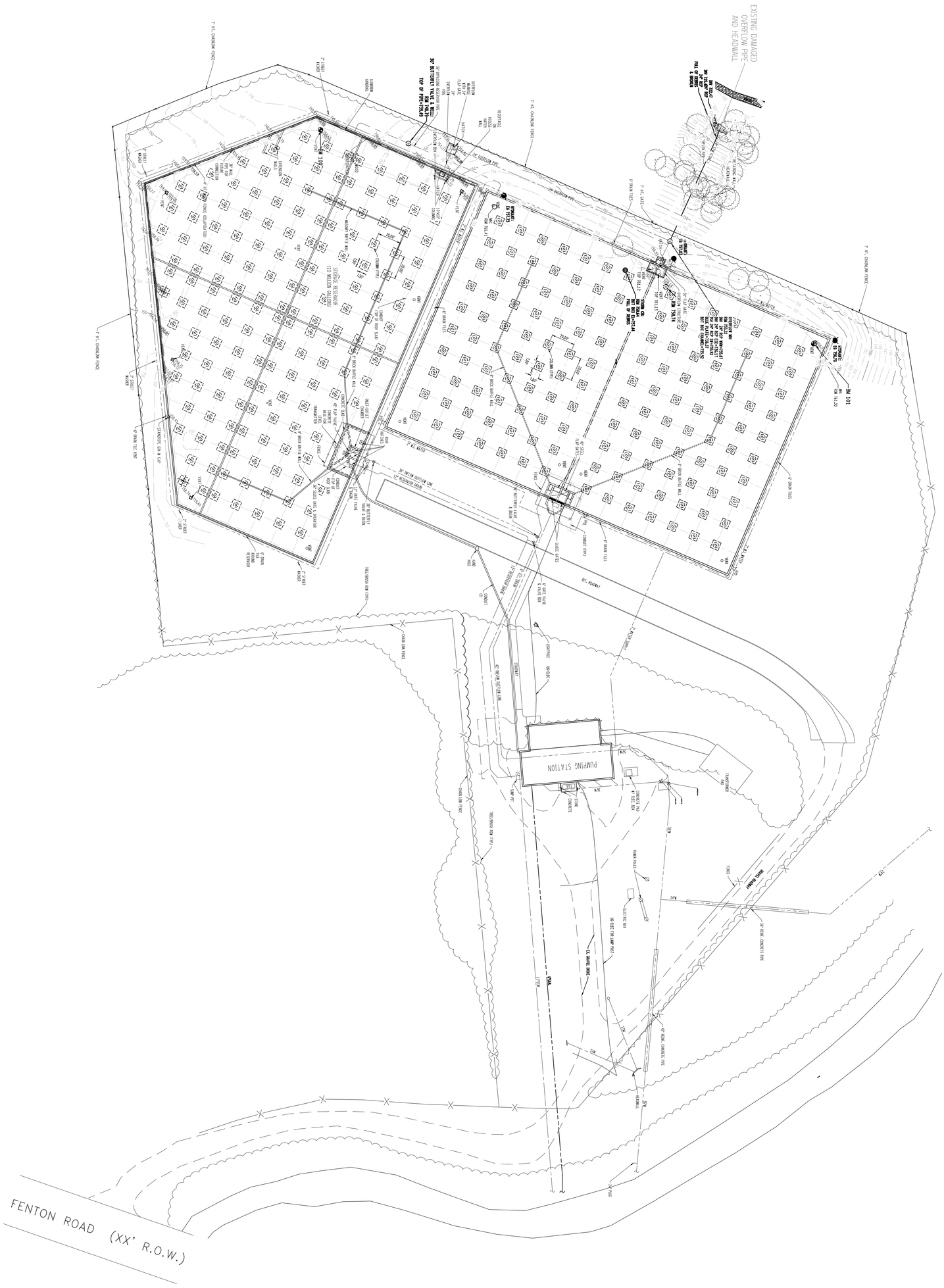

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SCALE = 1" = 40'

CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

OVERALL EXISTING CONDITIONS RESERVOIR REHABILITATION

Cedar Street
Flint, Michigan 48503

WARNING

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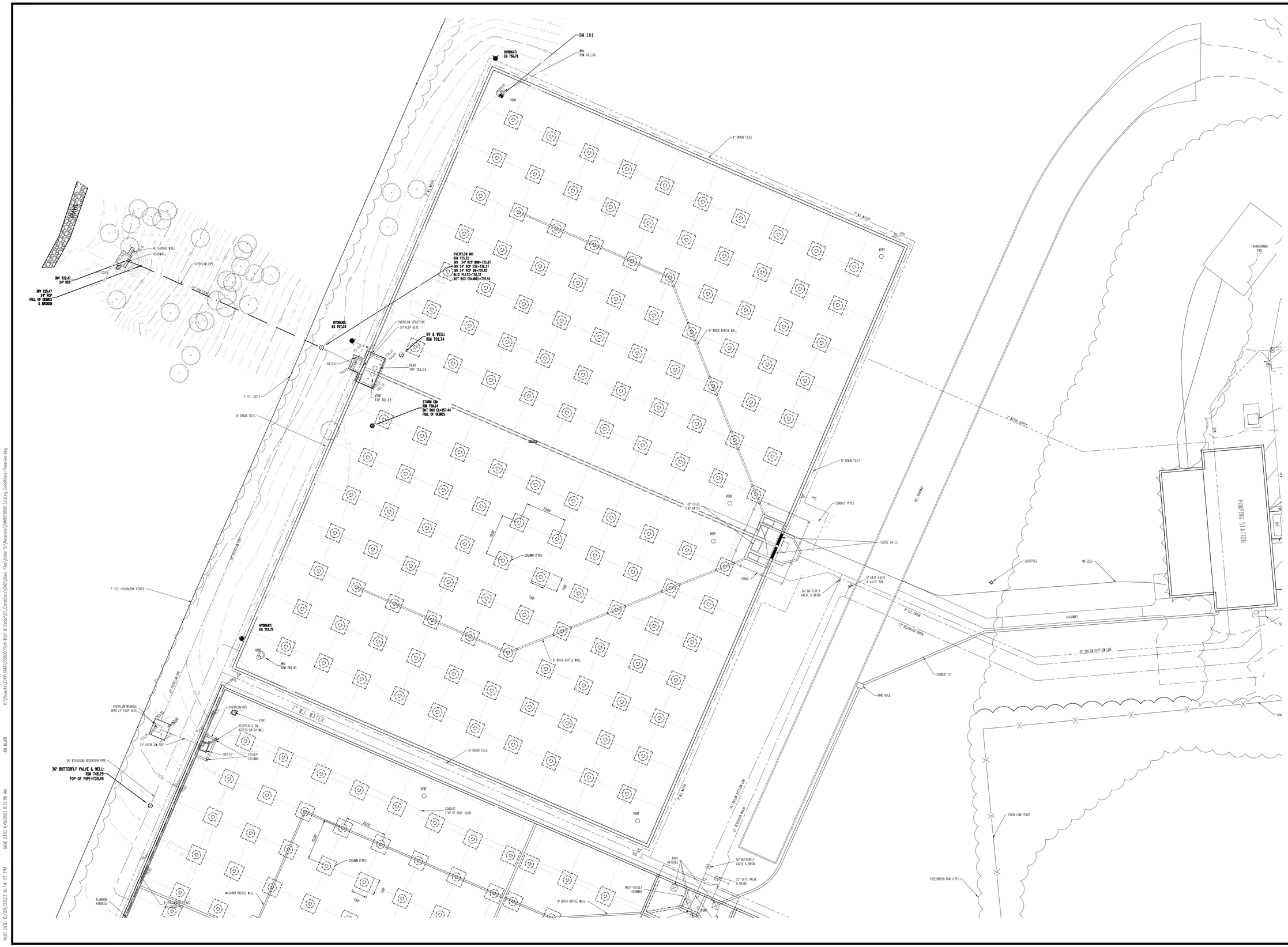

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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

EXISTING CONDITIONS (RESERVIOR 1) RESERVOIR REHABILITATION

Cedar Street
Flint, Michigan 48503

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SCALE = 1" = 20'

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SHEET NO.
V-101

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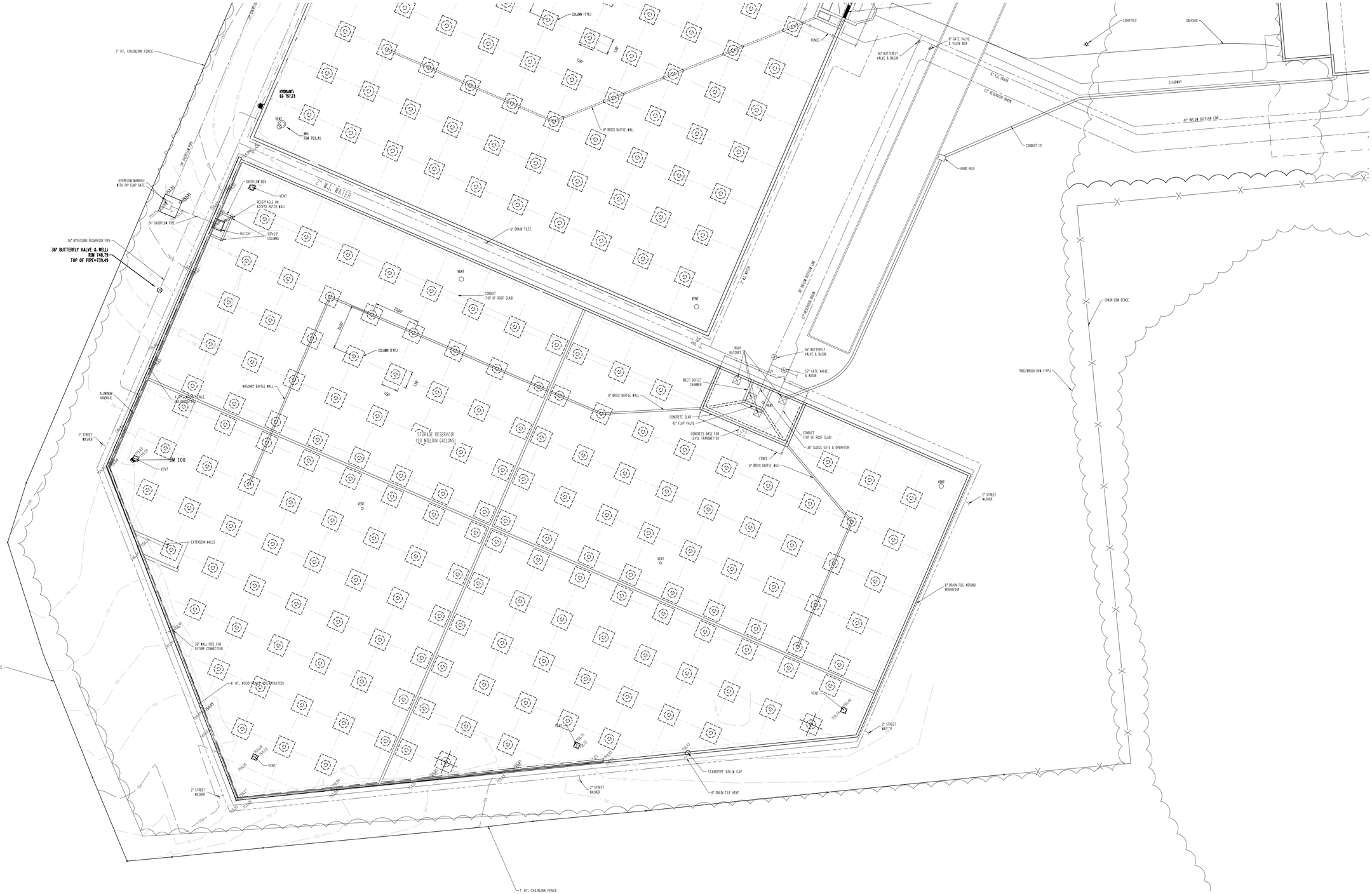

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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

EXISTING CONDITIONS (RESERVIOR 2)
REHABILITATION
Cedar Street
Flint, Michigan 48503

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SCALE = 1" = 20'

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V-102

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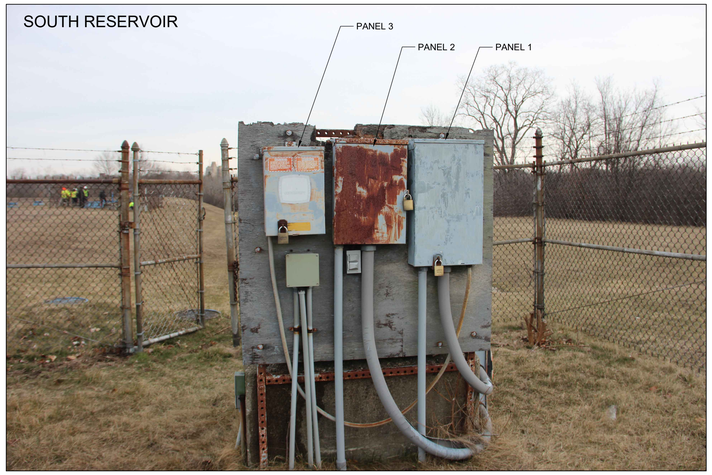


BACK SCALE LEVEL SENSOR PANEL

LEVEL SENSOR PANEL

PANEL 1

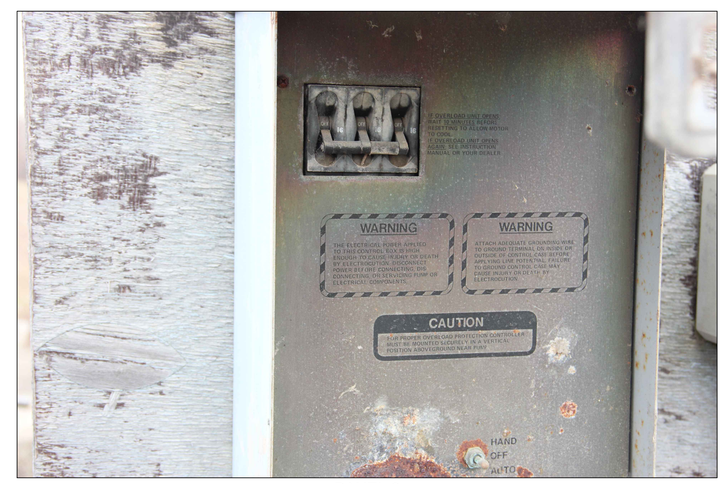
PANEL 1

PANEL 3

PANEL 2

PANEL 2

SITE AREA



PANEL 2

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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

Existing Conditions Photographs
RESERVOIR REHABILITATION
Cedar Street
Flint, Michigan 48503

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SHEET NO.
V-103

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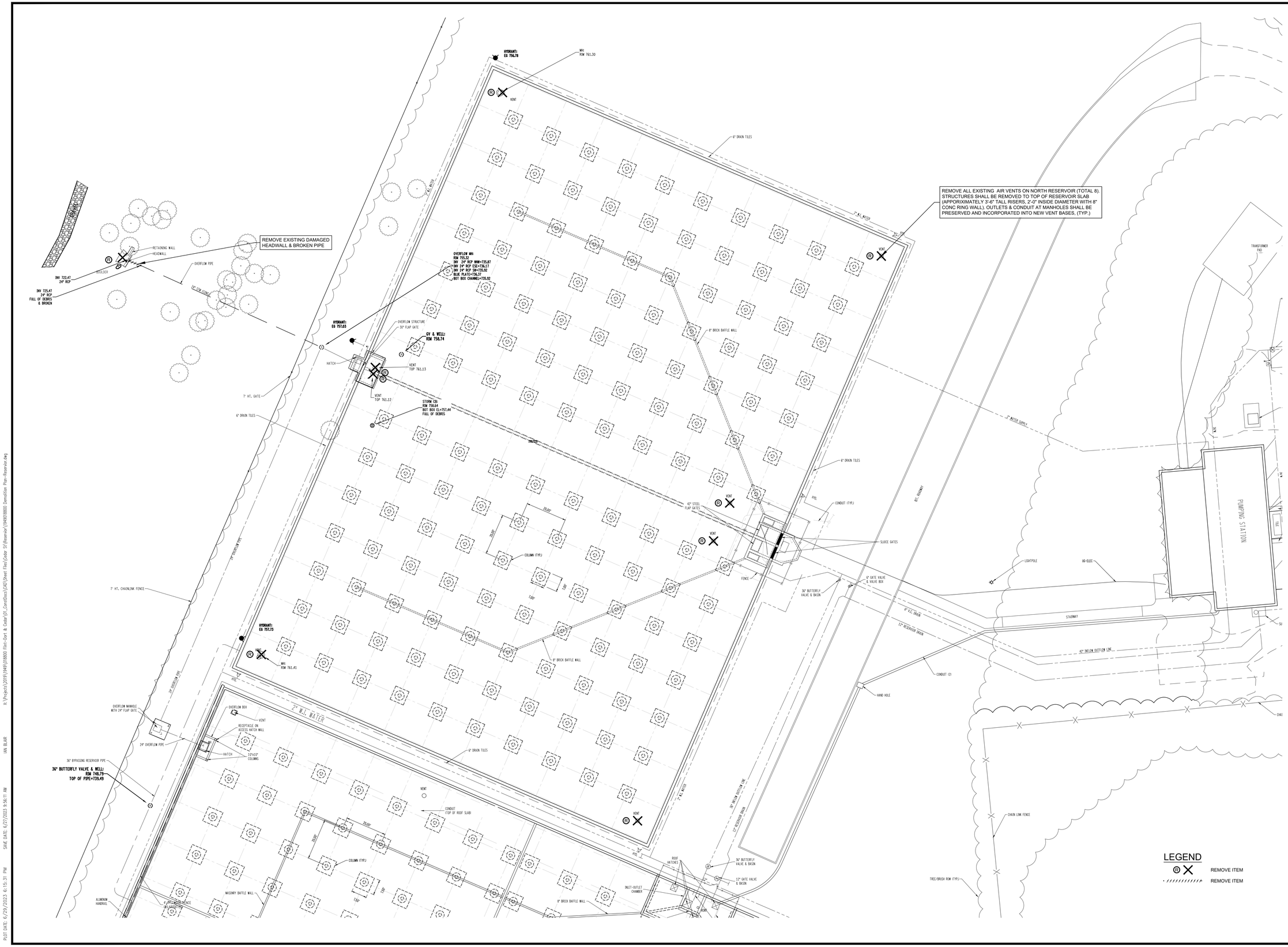

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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

DEMOLITION PLAN (RESERVIOR 1)
RESERVOIR REHABILITATION

Cedar Street
Flint, Michigan 48503

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SCALE = 1" = 20'

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DLZ JOB NUMBER: 1949-0188-00

SHEET NO.
CD-101

PLOT DATE: 6/29/2023 6:15:31 PM SAVE DATE: 6/27/2023 9:56:11 AM IAN BLAIR X:\Projects\2019\1949\0188800 Flint-Port & Cedar\01_ConstDocs\CAD\Sheet Files\Cedar St\Reservoir\1949018800 Demolition Plan-Reservoir.dwg

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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

DEMOLITION PLAN (RESERVIOR 2)
RESERVOIR REHABILITATION
Cedar Street
Flint, Michigan 48503

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SCALE = 1" = 20'

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	EGLE PERMIT	06-08-23

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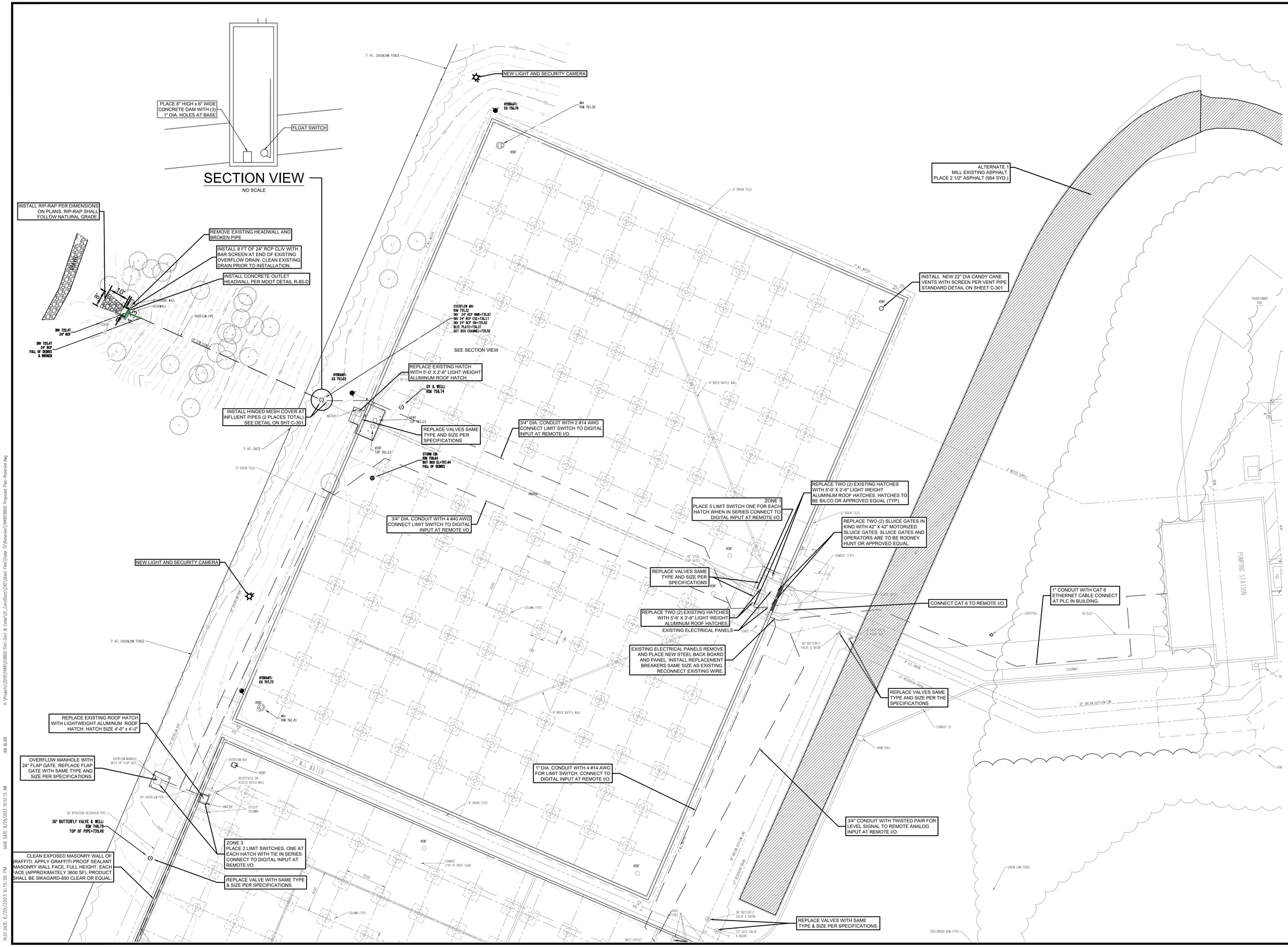
DLZ JOB NUMBER: 1949-0188-00

SHEET NO.
CD-102

PLOT DATE: 6/29/2023 6:15:36 PM SAVE DATE: 6/27/2023 9:56:11 AM IAN BLAIR X:\Projects\2019\1949\0188000 Flint-Dort & Cedar\01_ConstDocs\042\Sheet Files\Cedar 01\Reservior\1949001880D Demolition Plan-Reservior.dwg



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EXCEPTIONAL DESIGN
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WARNING
UTILITY LOCATIONS ARE NOT CONFIRMED. THOSE SHOWN WERE OBTAINED FROM AVAILABLE RECORDS. CALL THREE FULL WORKING DAYS PRIOR TO BEGINNING WORK. THE CONTRACTOR SHALL NOTIFY UTILITY OWNERS TO HAVE THEIR FACILITIES MOVED AND HE SHALL PROTECT OR HAVE RELOCATED, AS NOTED IN THE SPECIFICATIONS, ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

PROPOSED PLAN (RESERVIOR 1)
RESERVOIR REHABILITATION
Cedar Street
Flint, Michigan 48503

MARK	ISSUED FOR	DATE
	-	-
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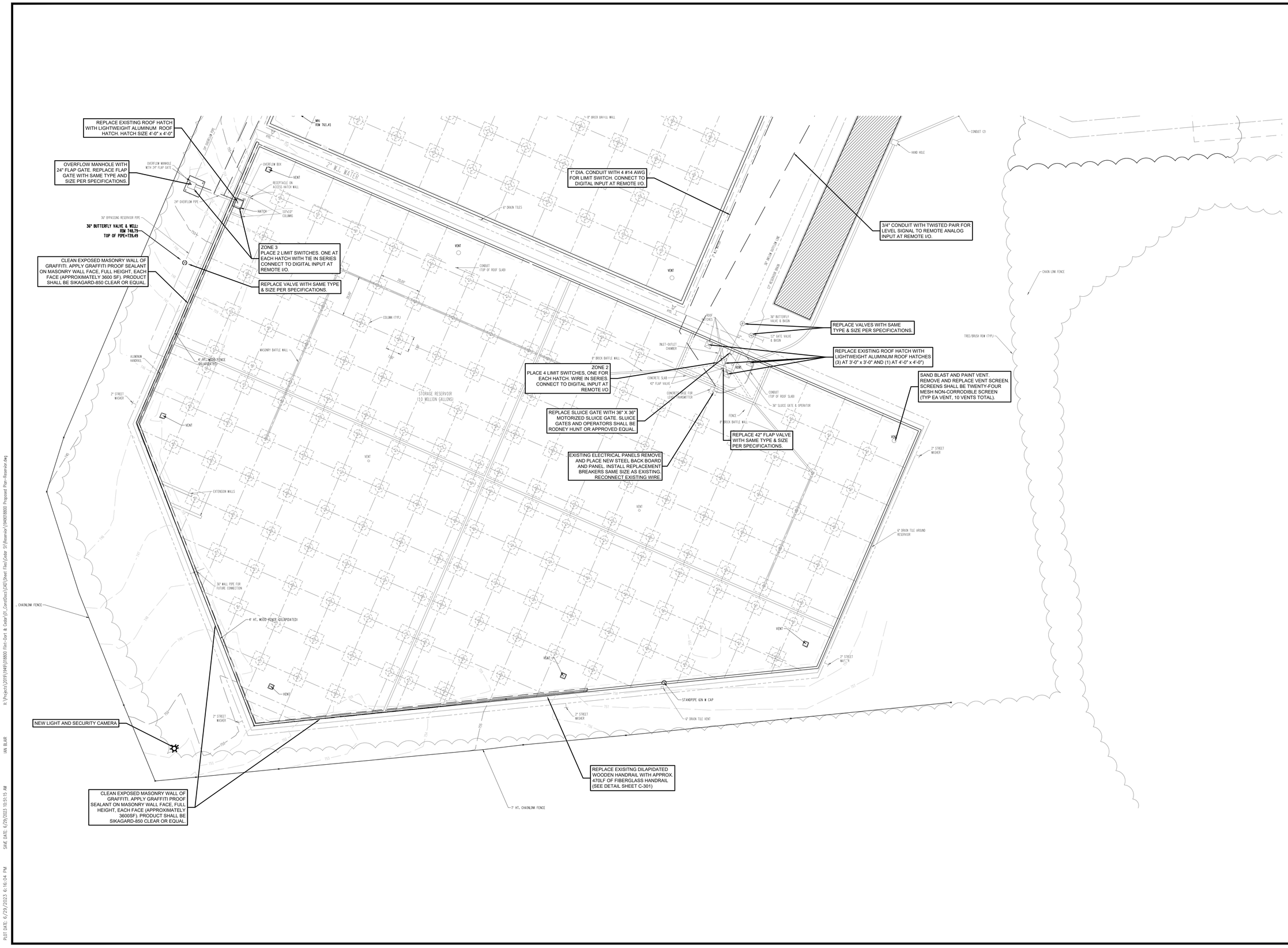
	-	-
	ISSUED FOR BID	07-05-23
	EGLE PERMIT	06-08-23

DRAWN BY: DLZ
DESIGN BY: -
CHECKED BY: -

DLZ JOB NUMBER: 1949-0188-00

SHEET NO.
C-201

X:\Projects\2019\1949\0188\0 Flint-Port & Cedar\01_CostDocs\CAD\Sheet Files\Cedar St\Reservior\1949018800 Proposed Plan-Reservior.dwg
PLOT DATE: 6/29/2023 6:15:56 PM SAVE DATE: 6/29/2023 10:35:15 AM IAN, BLAIR



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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

PROPOSED PLAN (RESERVIOR 2) RESERVOIR REHABILITATION

Cedar Street
Flint, Michigan 48503

N

SCALE = 1" = 20'

MARK	ISSUED FOR	DATE
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	ISSUED FOR BID	07-05-23
	EGLE PERMIT	06-08-23

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DLZ JOB NUMBER: 1949-0188-00

SHEET NO.
C-202

PLOT DATE: 6/29/2023 6:16:04 PM SAVE DATE: 6/29/2023 10:51:15 AM IAN BLAIR X:\Projects\2019\1949\0188000 Flint-Dort & Cedar\01_ConstDocs\040\Sheet Files\Cedar St\Reservior\1949018800 Proposed Plan-Reservior.dwg

ALTERNATE 1
MILL EXISTING ASPHALT
PLACE 2 1/2" ASPHALT (954 SYD.)
ALTERNATE 2
PLACE 6" 22AA CRUSHED LIMESTONE
& 4" OF ASPHALT (447 SYD)
ALTERNATE 3
PLACE 6" 22AA CRUSHED LIMESTONE
& 4" OF ASPHALT (945 SYD)
EXISTING
ELECTRICAL
PAANELS
EXISTING
ELECTRICAL
PAANELS
STORAGE RESERVOIR
(10 MILLION GALLONS)
PUMPING STATION
FENCE
TRANSFORMER PAD
CONCRETE PAD W/ ELEC. BOX
POWER POLES
ELECTRIC BOX
UG-ELEC FOR LAMP POST
EX. GRAVEL DRIVE
HEADWALL
42" REINF. CONCRETE PIPE
36" REINF. CONCRETE PIPE
24" PLUG
STAIRWAY
SUMP PIT
TREE/BRUSH ROW (TYP.)
CHAIN LINK FENCE
LIGHTPOLE
UG-ELEC
6" GATE VALVE IN EL BOX
HAND HOLE
CONDUIT (2)
FENTON ROAD (XX' R.O.W.)
7' HT. CHAINLINK FENCE
HYDRANT: EG 756.72
HYDRANT: EG 757.73
HYDRANT: EG 757.03
MH: RIM 761.30
MH: RIM 761.41
OVERFLOW MH: RIM 755.32
INV 24" RCP NW=735.87
INV 24" RCP ESE=736.17
INV 24" RCP SW=735.92
BLUE PLATE=736.37
BOT BOX CHANNEL=735.92
RIM 758.74
STORM CB: RIM 758.64
BOT BOX EL=757.44
FULL OF DEBRIS
INV 722.47
INV 725.49" RCP
24" RCP
FULL OF DEBRIS
& BROKEN
36" BUTTERFLY VALVE & WELL:
RIM 748.39
TOP OF PIPE=739.49
RETAINING WALL
HEADWALL
PLOW PIPE
6" DRAIN TILES
8" BRICK BAFFLE WALL
30" FLAP GATE
OVERFLOW STRUCTURE
42" STEEL FLAP GATES
COLUMN (TYP.)
CONDUIT (TYP.)
SLUICE GATE
36" BUTTERFLY VALVE & BASIN
12" GATE VALVE & BASIN
36" SLUICE GATE & OPERATOR
ROOF HATCHES
INLET-OUTLET CHAMBER
CONCRETE SLAB
42" FLAP VALVE
CONCRETE BASE FOR LEVEL TRANSMITTER
MASONRY BAFFLE WALL
6' HT. WOOD FENCE (DILAPIDATED)
EXTENSION WALLS
36" WALL PIPE FOR FUTURE CONNECTION
2" STREET WASHER
6" DRAIN TILE AROUND RESERVOIR
STANDPIPE 6IN W CAP
6" DRAIN TILE VENT
OVERFLOW MANHOLE WITH 24" FLAP GATE
OVERFLOW PIPE
36" BYPASSING RESERVOIR PIPE
OVERFLOW BOX
10"x10" COLUMNS
RECEPTACLE ON ACCESS HATCH WALL
ALUMINUM HANDRAIL
HATCH
VENT
TOP 761.13
TOP 761.12
TOP 761.11
TOP 761.10
TOP 761.09
TOP 761.08
TOP 761.07
TOP 761.06
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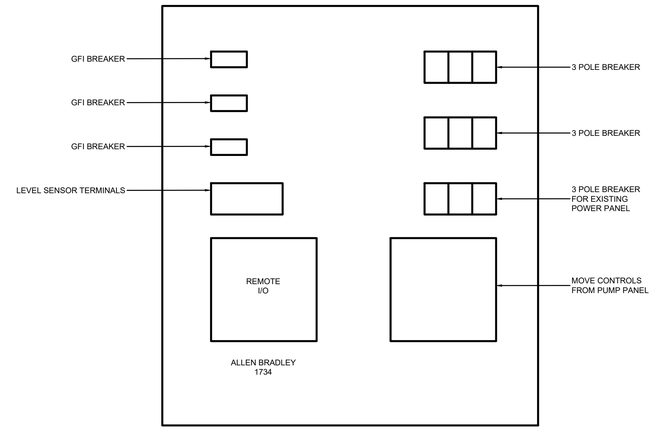
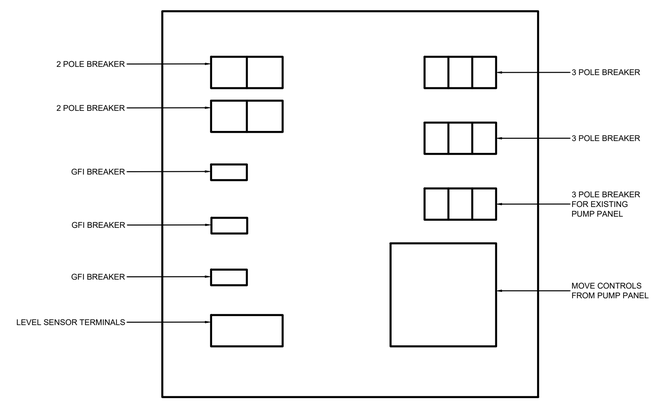


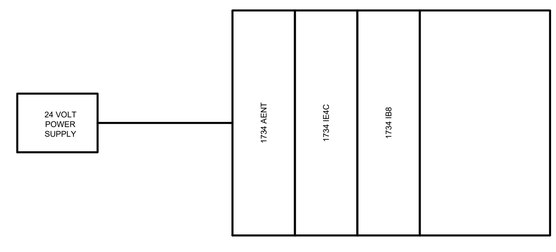
NORTH RESERVOIR

NO SCALE



SOUTH RESERVOIR

NO SCALE



1734 REMOTE I/O

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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

Instrumentation & Control Diagrams

RESERVOIR REHABILITATION
Cedar Street
Flint, Michigan 48503

N

0 1' 2'
SCALE

MARK	ISSUED FOR	DATE
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	-	-
	ISSUED FOR BID	07-05-23
	EGLE PERMIT	06-08-23

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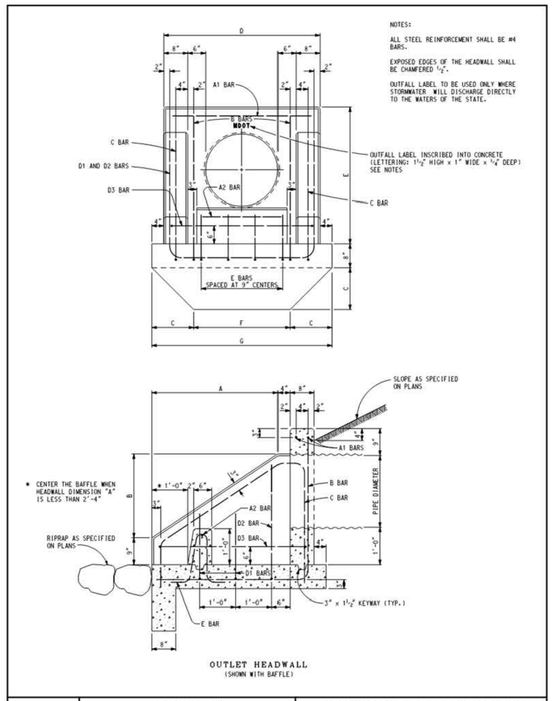
DESIGN BY: -
CHECKED BY: -

DLZ JOB NUMBER: 1949-0188-00

SHEET NO.
IC-001

PLOT DATE: 6/29/2023 6:16:45 PM SAVE DATE: 6/27/2023 9:17:06 AM IAN BLAIR X:\Projects\2019\1949\0188\00 Flint-Port & Cedar\01_Const\Docs\CAD\Sheet Files\Cedar St\Reservoir\1949\0188\00 Panels.dwg



OUTLET HEADWALL
(SHOWN WITH BAFFLE)

MDOT Michigan Department of Transportation

PREPARED BY DESIGN SUPPORT AREA

DRAWN BY: R.L.T.
CHECKED BY: W.S.P.

DEPARTMENT DIRECTOR
Gloria J. Jeff

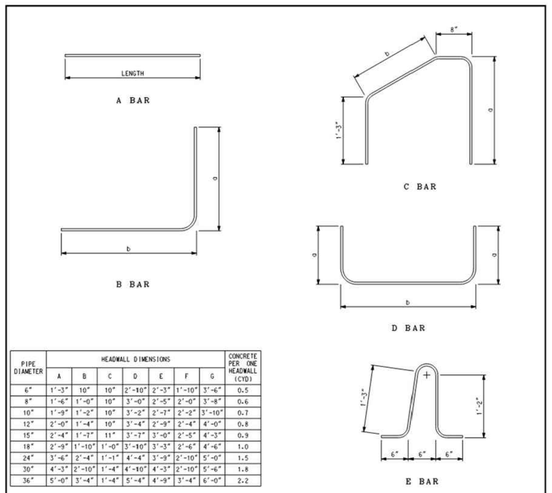
APPROVED BY: ENGINEER OF DELIVERY

APPROVED BY: ENGINEER OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

OUTLET HEADWALLS

11-17-2005	4-21-2005	R-85-D	SHEET
F.H.W.A. APPROVAL	PLAN DATE		1 OF 2



PIPE DIAMETER	HEADWALL DIMENSIONS							CONCRETE PER ONE HEADWALL (CYD)
	A	B	C	D	E	F	G	
6"	1'-3"	10"	10"	2'-10"	2'-3"	1'-10"	3'-6"	0.5
8"	1'-6"	1'-0"	10"	3'-0"	2'-5"	2'-0"	3'-8"	0.6
10"	1'-9"	1'-2"	10"	3'-2"	2'-7"	2'-2"	3'-10"	0.7
12"	2'-0"	1'-4"	10"	3'-4"	2'-9"	2'-4"	4'-0"	0.8
15"	2'-4"	1'-7"	11"	3'-7"	3'-0"	2'-5"	4'-3"	0.9
18"	2'-9"	1'-10"	1'-0"	3'-10"	3'-3"	2'-6"	4'-6"	1.0
24"	3'-6"	2'-4"	1'-1"	4'-4"	3'-9"	2'-10"	5'-0"	1.5
30"	4'-3"	2'-10"	1'-4"	4'-10"	4'-3"	2'-10"	5'-6"	1.8
36"	5'-0"	3'-4"	1'-4"	5'-4"	4'-9"	3'-4"	6'-0"	2.2

STEEL QUANTITIES FOR ONE OUTLET HEADWALL WITH BAFFLE

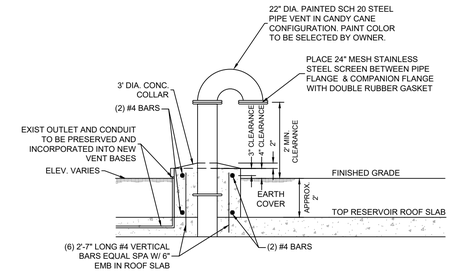
STEEL QUANTITIES FOR ONE OUTLET HEADWALL WITHOUT BAFFLE

PIPE DIA.	A1 BAR TOTAL LENGTH	NO.	B BAR DIMENSIONS a	B BAR DIMENSIONS b	B BAR TOTAL LENGTH	NO.	C BAR DIMENSIONS a	C BAR DIMENSIONS b	C BAR TOTAL LENGTH	NO.	D1 BAR DIMENSIONS a	D1 BAR DIMENSIONS b	D1 BAR TOTAL LENGTH	NO.	D2 BAR DIMENSIONS a	D2 BAR DIMENSIONS b	D2 BAR TOTAL LENGTH	NO.	D3 BAR DIMENSIONS a	D3 BAR DIMENSIONS b	D3 BAR TOTAL LENGTH	NO.	TOTAL WEIGHT OF BARS (LBS)	A2 BAR TOTAL LENGTH	NO.	E BAR TOTAL LENGTH	NO.	TOTAL WEIGHT OF BARS (LBS)
6"	2'-4"	2	1'-11"	2'-4"	4'-5"	2	1'-10"	1'-3"	5'-0"	2	1'-1"	2'-4"	4'-8"	1					1'-7"	2'-4"	5'-4"	1	23	8"	1	3'-8"	2	29
8"	2'-8"	2	2'-2"	2'-8"	4'-10"	2	2'-0"	1'-6"	5'-5"	2	1'-3"	2'-8"	5'-2"	1					1'-10"	2'-8"	6'-4"	1	26	10"	1	3'-8"	2	32
10"	2'-10"	2	2'-5"	2'-10"	5'-3"	2	2'-2"	1'-10"	5'-11"	2	1'-5"	2'-10"	5'-8"	1					2'-1"	2'-10"	7'-0"	1	28	1'-0"	1	3'-8"	2	34
12"	3'-0"	2	2'-8"	3'-0"	5'-8"	2	2'-4"	2'-1"	6'-4"	2	1'-7"	3'-0"	6'-2"	2					2'-4"	3'-0"	7'-8"	1	34	1'-2"	1	3'-8"	2	40
15"	3'-3"	2	3'-0"	3'-3"	6'-3"	2	2'-7"	2'-4"	7'-0"	2	1'-10"	3'-3"	6'-11"	2					2'-8"	3'-3"	8'-7"	1	38	1'-5"	1	3'-8"	3	46
18"	3'-6"	2	3'-5"	3'-6"	6'-11"	2	2'-10"	3'-0"	7'-9"	2	2'-1"	3'-6"	7'-8"	2					3'-1"	3'-6"	9'-8"	1	41	1'-8"	1	3'-8"	3	50
24"	4'-0"	2	4'-2"	4'-0"	8'-2"	2	3'-4"	3'-11"	9'-2"	2	2'-10"	4'-0"	7'-8"	2	3'-3"	4'-0"	10'-4"	1	3'-10"	4'-0"	11'-8"	1	54	2'-2"	1	3'-8"	4	65
30"	4'-6"	2	4'-11"	4'-6"	9'-5"	2	3'-10"	4'-10"	10'-7"	2	2'-4"	4'-6"	9'-2"	2	3'-8"	4'-6"	11'-10"	1	4'-7"	4'-6"	13'-8"	1	62	2'-8"	1	3'-8"	4	74
36"	5'-0"	2	5'-8"	5'-0"	10'-8"	2	4'-4"	5'-9"	12'-0"	2	2'-2"	5'-0"	9'-4"	2	3'-5"	5'-0"	11'-10"	2	5'-4"	5'-0"	15'-8"	1	76	3'-2"	1	3'-8"	5	90

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

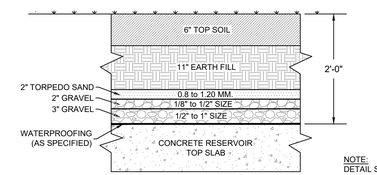
OUTLET HEADWALLS

11-17-2005	4-21-2005	R-85-D	SHEET
F.H.W.A. APPROVAL	PLAN DATE		2 OF 2



RESERVOIR VENT

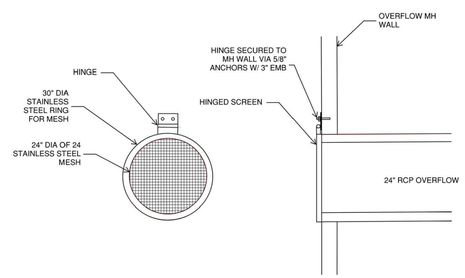
NO SCALE



NOTE:
DETAIL SHALL BE FOLLOWED FOR ALL REQUIRED BACKFILL LOCATIONS WHERE EXCAVATION ON TOP OF RESERVOIR IS PERFORMED.

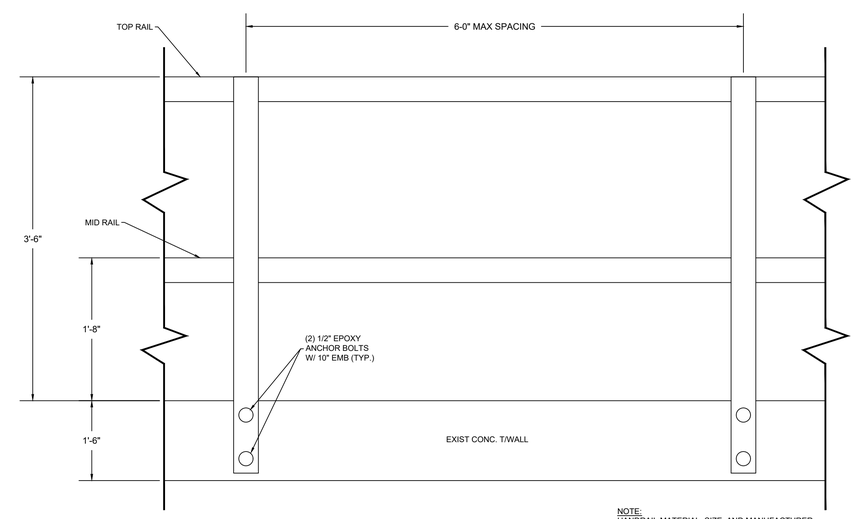
RESERVOIR TOP EARTH FILL DETAIL

NO SCALE



HINGED MESH PIPE COVER DETAIL

NO SCALE



NOTE:
HANDRAIL MATERIAL, SIZE, AND MANUFACTURER SHALL BE PER SPECIFICATION SECTION 06-60-01

TYPICAL HANDRAIL DETAIL

NO SCALE

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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

DETAIL SHEET
RESERVOIR REHABILITATION
Cedar Street
Flint, Michigan 48503

N
DLZ
0 40' 80'
SCALE

MARK	ISSUED FOR	DATE
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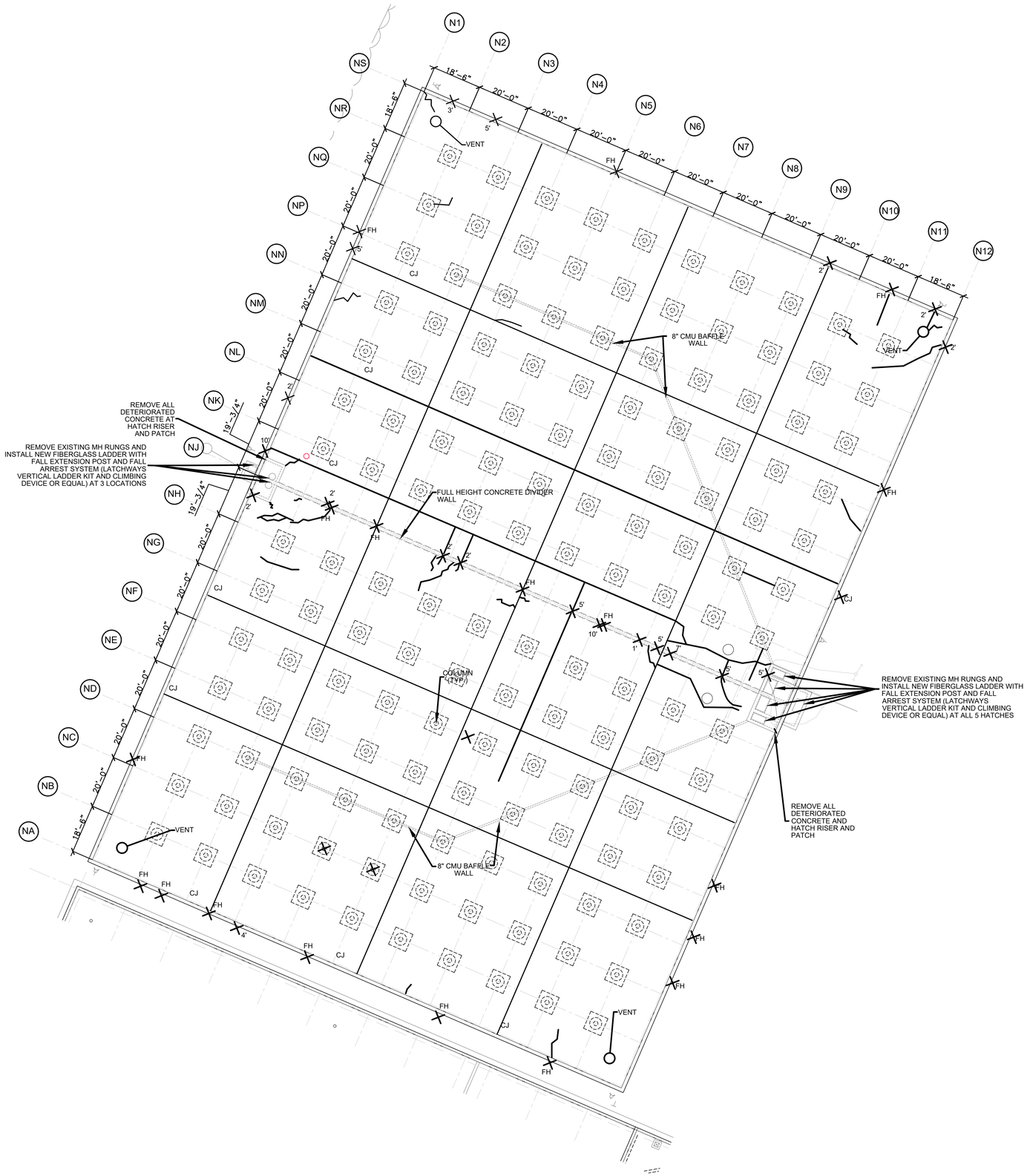
	ISSUED FOR BID	07-05-23
	EGLE PERMIT	06-08-23

DRAWN BY: DLZ
DESIGN BY: -
CHECKED BY: -

DLZ JOB NUMBER: 1949-0188-00

SHEET NO.
C-301

PLOT DATE: 6/29/2023 6:16:51 PM SAVE DATE: 6/29/2023 11:07:46 AM IAN BLAIR X:\Projects\2019\1949\018800 Flint-Port & Cedar\01_ConstDocs\CAD\Sheet Files\Cedar St\Reservoir\1949018800 Details-Reservoir.dwg



GENERAL NOTES:

1. WHERE SPECIFIC PRODUCTS ARE LISTED THEY SHALL BE CONSIDERED BASIS OF DESIGN. ALTERNATE PRODUCTS MAY BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER OF RECORD.
2. WHERE QUANTITIES ARE GIVEN THEY SHALL BE ASSUMED TO BE APPROXIMATE AND UNDISTRIBUTED AND SHALL BE THE BASIS FOR THE CONTRACTORS BID. CONTRACTOR SHALL BE PAID FOR ACTUAL WORK PERFORMED BASED ON UNIT PRICES SUBMITTED AT TIME OF BIDDING. UNIT PRICE SHALL INCLUDE ALL MATERIAL, LABOR AND INCIDENTALS REQUIRED FOR INSTALLATION.
3. COAT ALL INTERIOR CONCRETE SURFACES (ROOF, MAT, COLUMNS & WALLS) WITH SIKA FEROGUARD 903 (585,860 SFT).
4. BOTTOM SLAB OF RESEVOIR COULD NOT BE INSPECTED. CONTRACTOR TO CLEAN THE SLAB AND SOUND THE CONCRETE WITH A CHAIN TO LOCATE CONTRACTOR SHALL PROVIDE A SKETCH TO ENGINEER NOTING ANY DETERIORATION FOR REVIEW
5. REPAIR ALL CRACKS PER DETAIL 2/S-103
6. REPAIR ALL CONSTRUCTION JOINTS IN THE ROOF PER DETAIL 3/S-103

LEGEND

CJ	CONSTRUCTION JOINT
FH	FULL HEIGHT WALL CRACK
5'	APPROXIMATE LENGTH OF WALL CRACK
	APPROXIMATE LOCATION/EXTEND OF CRACK IN BOTTOM OF ROOF

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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

NORTH RESERVOIR REHABILATATION
RESERVOIR REHABILITATION
Cedar Street
Flint, Michigan 48503

N

0 20' 40'
SCALE

MARK	ISSUED FOR	DATE
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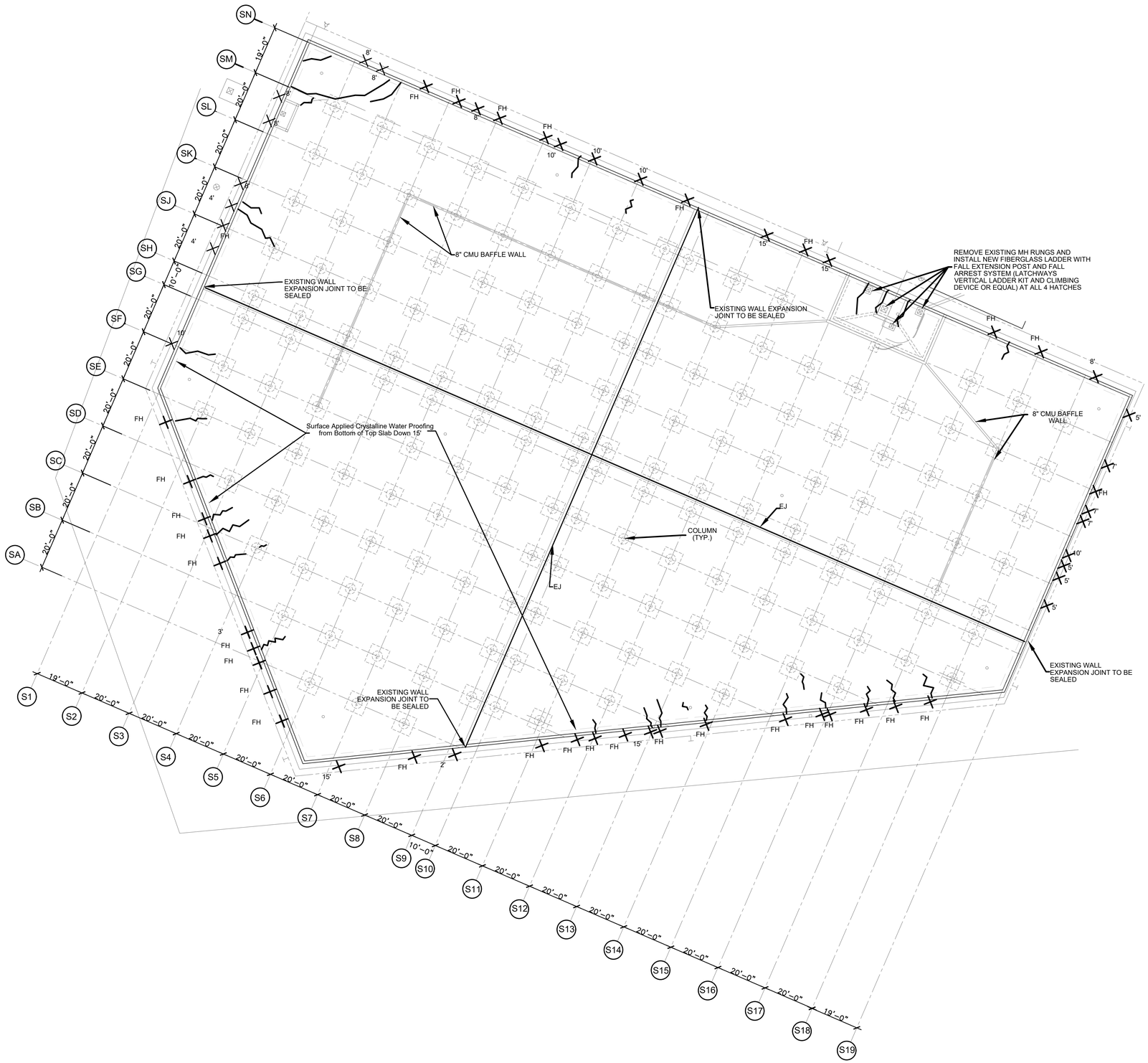
DRAWN BY: DLZ
DESIGN BY: -
CHECKED BY: -

DLZ JOB NUMBER: 1949-0188-00

SHEET NO.
S-101

PLOT DATE: 6/29/2023 6:17:02 PM SAVE DATE: 6/29/2023 11:33:10 AM IAN, BLAIR X:\Projects\2019\1949\0188800 Flint-Dort & Cedar\01_ConstDocs\CAD\Sheet Files\Cedar St\Reservoir\STRUCT\1949018800 S-101 - Structural Renovation North Plan.dwg



GENERAL NOTES:

1. WHERE SPECIFIC PRODUCTS ARE LISTED THEY SHALL BE CONSIDERED BASIS OF DESIGN. ALTERNATE PRODUCTS MAY BE SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER OF RECORD.
2. WHERE QUANTITIES ARE GIVEN THEY SHALL BE ASSUMED TO BE APPROXIMATE AND UNDISTRIBUTED AND SHALL BE THE BASIS FOR THE CONTRACTORS BID. CONTRACTOR SHALL BE PAID FOR ACTUAL WORK PERFORMED BASED ON UNIT PRICES SUBMITTED AT TIME OF BIDDING. UNIT PRICE SHALL INCLUDE ALL MATERIAL, LABOR AND INCIDENTALS REQUIRED FOR INSTALLATION.
3. COAT ALL INTERIOR CONCRETE SURFACES (ROOF, MAT, COLUMNS, & WALLS) WITH SIKA FEROGUARD 903 (128,618 SFT).
4. BOTTOM SLAB OF RESERVOIR COULD NOT BE INSPECTED. CONTRACTOR TO CLEAN THE SLAB AND SOUND THE CONCRETE WITH A CHAIN TO LOCATE ANY POSSIBLE DELAMINATIONS CONTRACTOR SHALL PROVIDE A SKETCH TO ENGINEER NOTING ANY DETERIORATION FOR REVIEW & DIRECTION.
5. REPAIR ALL CRACKS PER DETAIL 2/S-103
6. REPAIR ALL EXPANSION JOINTS PER DETAILS ON S-103.
7. CLEAN AND REPLACE WEEP HOLES IN THE BRICK VENEER WITH MTI RETROFIT WEEP

LEGEND

CJ	CONSTRUCTION JOINT
FH	FULL HEIGHT WALL CRACK
5'	APPROXIMATE LENGTH OF WALL CRACK
	APPROXIMATE LOCATION/EXTEND OF CRACK IN BOTTOM OF ROOF

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WARNING
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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

SOUTH RESERVOIR REHABILITATION
RESERVOIR REHABILITATION
Cedar Street
Flint, Michigan 48503

N

0 20' 40'
SCALE

MARK	ISSUED FOR	DATE
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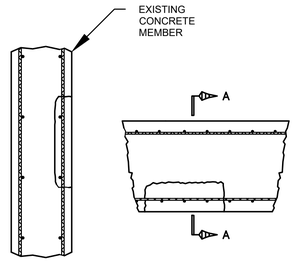
	ISSUED FOR BID	07-05-23
	EGLE PERMIT	06-08-23

DRAWN BY: DLZ
DESIGN BY: -
CHECKED BY: -

DLZ JOB NUMBER: 1949-0188-00

SHEET NO.
S-102

PLOT DATE: 6/29/2023 6:17:34 PM SAVE DATE: 6/8/2023 10:48:28 AM IAN BLAIR K:\Projects\2019\1949\0188\00 Flint-Cort & Cedar\01_Const\Docs\CAD\Sheet Files\Cedar S\Reservoir\STRUCT\1949018800 S-102 - Structural Renovation South Plan.dwg



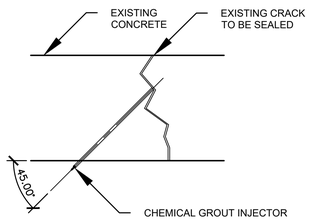
SECTION A–A

NOTES:
1. THE EXTENT OF THE AREA TO BE REPAIRED SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER BY TAPPING THE CONCRETE WITH A HAMMER TO FIND THE PERIMETER EDGES WHERE UNSOUND MATERIAL MEETS SOUND MATERIAL.
2. PERIMETER OF REPAIR AREA SHALL BE SAW CUT PERPENDICULAR TO THE SURFACE TO A MINIMUM DEPTH OF 1/2". PERIMETER OF PATCH AREA SHALL HAVE STRAIGHT EDGES 90 DEGREE CORNERS AND NO RE–ENTRANT CORNERS. PATCH AREAS SHALL BE EITHER SQUARE OR RECTANGULAR.
3. REMOVE ALL UNSOUND CONCRETE DOWN TO SOUND CONCRETE USING LIGHTWEIGHT PNEUMATIC HAMMERS. ANY REINFORCEMENT THAT IS EXPOSED DURING THIS PROCESS SHALL BE COMPLETELY EXPOSED BY REMOVING CONCRETE TO 3/4" BEYOND THE BAR LEAVING THE ENTIRE CIRCUMFERENCE EXPOSED. FINAL PATCH DEPTH SHALL BE UNIFORM (+/– 1/4") AND SHALL NOT BE LESS THAN 1". IF MORE THAN 30% OF THE BAR CROSS SECTION AREA IS LOST, REPLACE WITH SAME SIZE NEW BAR.
4. ENTIRE CONCRETE SURFACE OF REPAIR AREA SHALL BE MECHANICALLY ABRADED.
5. ALL EXPOSED REBAR SHALL BE CLEANED OF CORROSION BY EITHER SANDBLASTING OR GRINDER. REMOVE ALL LOOSE SCALE AND CORROSION DEPOSITS. STEEL SHALL BE CLEANED TO A BRIGHT CONDITION PAYING PARTICULAR ATTENTION TO THE BACK OF THE EXPOSED BARS. DO NOT USE WIRE BRUSH FOR CLEANING REINFORCEMENT.
6. COAT ENTIRE CIRCUMFERENCE OF ALL EXPOSED REINFORCING STEEL WITH EPOXY BONDING.
7. CONCRETE SURFACE TO BE REPAIRED SHALL BE PREPARED IN ACCORDANCE WITH PATCHING SYSTEM MANUFACTURER'S REQUIREMENTS.
8. REPAIR AREA BY INSTALLING THE PATCHING MORTAR AND CURING IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
9. BIDS ARE TO BE BASED ON 100 SFT OF CONCRETE PATCHING.

CONCRETE PATCHING

SCALE: NTS

1 / S–103

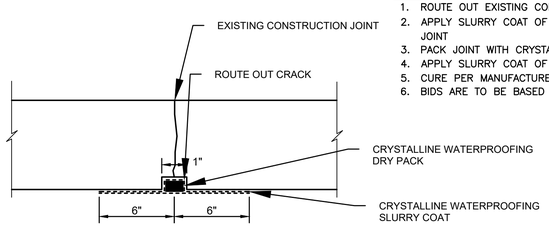


NOTE:
1. PREPARE CRACK AND INJECT CHEMICAL GROUT PER MANUFACTURER'S RECOMMENDATIONS.
2. CONTRACTOR TO ASSUME A TOTAL UNDISTRIBUTED QUANTITY OF 1551 LFT OF CRACK REPAIR

TYPICAL CONCRETE CRACK REPAIR

SCALE: NTS

2 / S–103

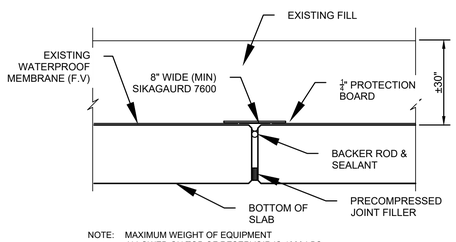


NOTES:
1. ROUTE OUT EXISTING CONSTRUCTION JOINTS WITH 1" X 1'–1/2" SQUARE CUT.
2. APPLY SLURRY COAT OF CRYSTALLINE WATER PROOFING 6" EACH SIDE OF JOINT & IN JOINT
3. PACK JOINT WITH CRYSTALLINE WATER PROOFING DRY PACK
4. APPLY SLURRY COAT OF CRYSTALLINE WATER PROOFING 6" EACH SIDE OF JOINT
5. CURE PER MANUFACTURE RECOMMENDATIONS.
6. BIDS ARE TO BE BASED ON 2100 LFT OF CONSTRUCTION JOINT REPAIR

CONSTRUCTION JOINT REPAIR

SCALE: NTS

3 / S–103



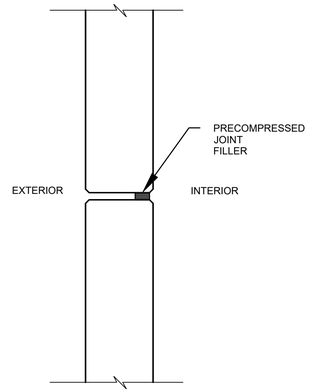
NOTE: MAXIMUM WEIGHT OF EQUIPMENT ALLOWED ON TOP OF RESERVOIR IS 4000 LBS

NOTES:
1. CUT BACK/REMOVE EXISTING WATERPROOFING MEMBRANE IF IT EXISTS, REMOVE EXISTING JOINT FILLER, POWERWASH, AND MECHANICALLY ABRADE TOP OF EXISTING SLAB PRIOR TO INSTALLATION OF TOP SLAB MATERIALS. TURN UP/DOWN A MINIMUM OF 1'–0" AT EXTERIOR EDGE OF TANK.
2. PRIME EXISTING CONCRETE AND REINFORCE SIKAGUARD 7600
3. APPROXIMATELY 30" OF FILL EXISTS ABOVE CONCRETE SLAB. FILL SHALL BE REMOVED AND REINSTALLED PER ORIGINAL DRAINAGE DETAILS.
4. SEALANT TO BE SIKA 2C NS EZ.
5. PRECOMPRESSED JOINT FILLER TO BE EMSEAL SUBMERSEAL WITH PREFABRICATED 90 DEGREE CORNERS.
6. BIDS ARE TO BE BASED ON 570 LFT OF ROOF EXPANSION JOINT REPAIR

TOP SLAB EXPANSION JOINT REPAIR

SCALE: NTS

4 / S–103



NOTES:
1. DETAIL IS SIMILAR AT BASE SLAB.
2. REMOVE INTERIOR JOINT FILLER AND POWER WASH WITH HIGH PRESSURE SPRAY PRIOR TO INSTALLATION OF PRECOMPRESSED JOINT FILLER.
3. PRECOMPRESSED JOINT FILLER TO BE EMSEAL SUBMERSEAL WITH PREFABRICATED CORNERS.
4. BIDS ARE TO BASED ON 570 LFT OF BASE SLAB JOINT REPAIR AND 540 LFT OF WALL JOINT REPAIR

WALL AND BASE SLAB EXP. JOINT REPAIR

SCALE: NTS

5 / S–103

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CITY OF FLINT
CEDAR STREET
FLINT, MI 48503

REHABILATATION DETAILS
RESERVOIR REHABILITATION
Cedar Street
Flint, Michigan 48503

N
DLZ
0 40' 80'
SCALE

MARK	ISSUED FOR	DATE
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	ISSUED FOR BID	07-05-23
	EGLE PERMIT	06-08-23

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