



December 28, 2020

Mr. Stephen Parretti, Chair
Conservation Commission
3 Washburn Square
Leicester, MA 01524

Subject: Request for Determination of Applicability
Grindstone Well and Clearwell Reactivation
148 Henshaw Street
Leicester, Massachusetts
T&H No. 6029

Dear Mr. Parretti,

Please find attached one (1) original and one (1) copy of the Request for Determination of Applicability (RDA) and five (5) copies of plans for the proposed Grindstone Well and Clearwell Reactivation project located at 148 Henshaw Street, Leicester, Massachusetts. The Cherry Valley and Rochdale Water District (CVRWD) proposes to reactivate grindstone well and clearwell by installing 6-inch diameter water main, upgrading the water treatment facility, rehabilitation of the clearwell and demolition of two existing structures. All work is proposed within the previously disturbed areas. Best management practices are proposed to minimize impacts to sensitive environmental receptors. Refueling will be restricted within the wetland buffer zones. We do not anticipate any impacts to the surrounding wetland resource areas.

The CVRWD respectfully requests a determination from the Conservation Commission regarding the applicability of the Wetlands Protection Act to the proposed work. We trust that the documentation enclosed herein is sufficient for the Commission's review of the proposed project. As always, we are available should any questions arise or further information be required. We look forward to attending the Commission's next scheduled meeting to discuss the project.

Sincerely,
TATA & HOWARD, INC.

Yogesh Jitoo, P.E.
Project Manager

Enclosures

cc: Mr. Benjamin Morris, Superintendent, Cherry Valley and Rochdale Water District

REQUEST FOR DETERMINATION OF APPLICABILITY DECEMBER 2020

Grindstone Well and Clearwell Reactivation
Cherry Valley Rochdale Water District
Leicester, Massachusetts



12-28-20



Enter your transmittal number

X287208

Transmittal Number

Your unique Transmittal Number can be accessed online:

<http://www.mass.gov/eea/agencies/massdep/service/approvals/transmittal-form-for-payment.html>

Massachusetts Department of Environmental Protection

Transmittal Form for Permit Application and Payment

1. Please type or print. A separate Transmittal Form must be completed for each permit application.

2. Make your check payable to the Commonwealth of Massachusetts and mail it with a copy of this form to: MassDEP, P.O. Box 4062, Boston, MA 02211.

3. Three copies of this form will be needed.

Copy 1 - the original must accompany your permit application. **Copy 2** must accompany your fee payment. **Copy 3** should be retained for your records

4. Both fee-paying and exempt applicants must mail a copy of this transmittal form to:

MassDEP
P.O. Box 4062
Boston, MA
02211

*** Note:**
For BWSC Permits, enter the LSP.

A. Permit Information

WPA Form 1

1. Permit Code: 4 to 7 character code from permit instructions

Reactivation of Grindstone Well and Clearwell

3. Type of Project or Activity

Request for Determination of Applicability

2. Name of Permit Category

B. Applicant Information – Firm or Individual

Cherry Valley and Rochdale Water District

1. Name of Firm - Or, if party needing this approval is an individual enter name below:

Morris

Benjamin

J

2. Last Name of Individual

3. First Name of Individual

4. MI

148 Henshaw Street

5. Street Address

Leicester

MA

01524

508-303-9400

3

6. City/Town

7. State

8. Zip Code

9. Telephone #

10. Ext. #

Benjamin J. Morris, Superintendent

bmorris@cwrwd.com

11. Contact Person

12. e-mail address

C. Facility, Site or Individual Requiring Approval

Grindstone Water Treatment Facility

1. Name of Facility, Site Or Individual

148 Henshaw Street

2. Street Address

Leicester

MA

01524

3. City/Town

4. State

5. Zip Code

6. Telephone #

7. Ext. #

8. DEP Facility Number (if Known)

9. Federal I.D. Number (if Known)

10. BWSC Tracking # (if Known)

D. Application Prepared by (if different from Section B)*

Tata & Howard, Inc.

1. Name of Firm Or Individual

Yogesh Jitoo, P.E.

2. Address

67 Forest Street

MA

01752

508-303-9400

3. City/Town

4. State

5. Zip Code

6. Telephone #

7. Ext. #

Yogesh Jitoo

8. Contact Person

9. LSP Number (BWSC Permits only)

E. Permit - Project Coordination

1. Is this project subject to MEPA review? ☐ yes ☐ no
If yes, enter the project's EOE file number - assigned when an Environmental Notification Form is submitted to the MEPA unit:

EOEA File Number

F. Amount Due

Special Provisions:

1. ☐ Fee Exempt (city, town or municipal housing authority)(state agency if fee is \$100 or less).
There are no fee exemptions for BWSC permits, regardless of applicant status.
2. ☐ Hardship Request - payment extensions according to 310 CMR 4.04(3)(c).
3. ☐ Alternative Schedule Project (according to 310 CMR 4.05 and 4.10).
4. ☐ Homeowner (according to 310 CMR 4.02).

DEP Use Only

Permit No:

Rec'd Date:

Reviewer:

Check Number

Dollar Amount

Date

TABLE OF CONTENTS

Letter of Transmittal

Section – Description	Page
Section 1 – WPA Form 1 – Request for Determination of Applicability	2
Section 2 – Narrative.....	6
2.1 Project Description.....	6
2.2 Wetland Resource Areas	6
2.3 Exemptions from the Wetlands Protection Act.....	7
2.4 Conclusion	7

LIST OF APPENDICES

Appendix	Description
A	Figure No. 1 - Locus Map
B	Drawings Nos. C-1 thru I-1 Clearwell Inspection Report
C	EcoTec's Wetland Resource Evaluation
D	Specification Sections <ul style="list-style-type: none">• 01100 - Special Project Procedures• 01567 - Environmental Protection• 02140 - Site Drainage and Dewatering• 02222 - Earthwork for Water Distribution Systems

Section 1 – WPA Form 1 – Request for Determination of Applicability



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Leicester
City/Town

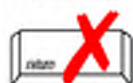
WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A. General Information

Important:

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Applicant:

Benjamin J. Morris, Superintendent

Name

bmorris@cwrwd.com

E-Mail Address

148 Henshaw Street

Mailing Address

Leicester

City/Town

MA

State

01524

Zip Code

508-892-9616

Phone Number

Fax Number (if applicable)

2. Representative (if any):

Tata & Howard, Inc.

Firm

Yogesh Jitoo, P.E.

Contact Name

yjitoo@tataandhoward.com

E-Mail Address

67 Forest Street

Mailing Address

Marlborough

City/Town

MA

State

01752

Zip Code

508-303-9400

Phone Number

Fax Number (if applicable)

B. Determinations

1. I request the Town of Leicester make the following determination(s). Check any that apply:
Conservation Commission

- ☐ a. whether the **area** depicted on plan(s) and/or map(s) referenced below is an area subject to jurisdiction of the Wetlands Protection Act.
- ☐ b. whether the **boundaries** of resource area(s) depicted on plan(s) and/or map(s) referenced below are accurately delineated.
- ☒ c. whether the **work** depicted on plan(s) referenced below is subject to the Wetlands Protection Act.
- ☒ d. whether the area and/or work depicted on plan(s) referenced below is subject to the jurisdiction of any **municipal wetlands ordinance** or **bylaw** of:

the Town of Leicester

Name of Municipality

- ☐ e. whether the following **scope of alternatives** is adequate for work in the Riverfront Area as depicted on referenced plan(s).



Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

Leicester

City/Town

WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

C. Project Description

1. a. Project Location (use maps and plans to identify the location of the area subject to this request):

148 Henshaw Street

Street Address

Leicester

City/Town

24A2 0

Parcel/Lot Number

Assessors Map/Plat Number

- b. Area Description (use additional paper, if necessary):

See Locus Map Appendix A and area description in Section 2

- c. Plan and/or Map Reference(s):

Appendix B - Drawings C1 through I1

Title

December 2020

Date

Appendix B - Clearwell Inspection Report

Title

December 2020

Date

Title

Date

2. a. Work Description (use additional paper and/or provide plan(s) of work, if necessary):

See Section 2



Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

Leicester

City/Town

WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

C. Project Description (cont.)

b. Identify provisions of the Wetlands Protection Act or regulations which may exempt the applicant from having to file a Notice of Intent for all or part of the described work (use additional paper, if necessary).

See Section 2

3. a. If this application is a Request for Determination of Scope of Alternatives for work in the Riverfront Area, indicate the one classification below that best describes the project.

- ☐ Single family house on a lot recorded on or before 8/1/96
- ☐ Single family house on a lot recorded after 8/1/96
- ☐ Expansion of an existing structure on a lot recorded after 8/1/96
- ☐ Project, other than a single-family house or public project, where the applicant owned the lot before 8/7/96
- ☐ New agriculture or aquaculture project
- ☐ Public project where funds were appropriated prior to 8/7/96
- ☐ Project on a lot shown on an approved, definitive subdivision plan where there is a recorded deed restriction limiting total alteration of the Riverfront Area for the entire subdivision
- ☐ Residential subdivision; institutional, industrial, or commercial project
- ☐ Municipal project
- ☐ District, county, state, or federal government project
- ☐ Project required to evaluate off-site alternatives in more than one municipality in an Environmental Impact Report under MEPA or in an alternatives analysis pursuant to an application for a 404 permit from the U.S. Army Corps of Engineers or 401 Water Quality Certification from the Department of Environmental Protection.

b. Provide evidence (e.g., record of date subdivision lot was recorded) supporting the classification above (use additional paper and/or attach appropriate documents, if necessary.)



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Leicester
City/Town

WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

D. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Request for Determination of Applicability and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge.

I further certify that the property owner, if different from the applicant, and the appropriate DEP Regional Office were sent a complete copy of this Request (including all appropriate documentation) simultaneously with the submittal of this Request to the Conservation Commission.

Failure by the applicant to send copies in a timely manner may result in dismissal of the Request for Determination of Applicability.

Name and address of the property owner:

Cherry Valley and Rochdale Water District

Name

148 Henshaw Street

Mailing Address

Leicester

City/Town

MA

State

01524

Zip Code

Signatures:

I also understand that notification of this Request will be placed in a local newspaper at my expense in accordance with Section 10.05(3)(b)(1) of the Wetlands Protection Act regulations.

Signature of Applicant

Date

12-29-2020

Signature of Representative (if any)

Date

Section 2 – Narrative

2.1 Project Description

The Cherry Valley and Rochdale Water District (CVRWD) is proposing to reactivate Grindstone well and the existing 100,000-gallon Clearwell located at 148 Henshaw Street, Leicester, MA. The project goals are to fix pressure problems in the water system and to reduce the volume of water purchased from the City of Worcester by up to 100,000 gpd.

The proposed project includes:

- Grindstone Well Reactivation
 - Water from Grindstone well will be treated in the Water Treatment Facility (WTF) and pumped into the Clearwell.
 - Water will be pumped to the Rochdale side via the existing high lift pumps.
 - Installation of new 6-inch piping, flow meter and motorized butterfly valve in existing filter pipe gallery.
 - Modifications to the WTF.
 - Remove and Dispose One Story Building and Shed.
- Clearwell Reactivation
 - Full interior rehabilitation (coat all wall and floor surfaces, clean and patch exposed rebar, coat all metal piping).
 - Seal structural joints and floor cracks.
 - Install a vent or second access point.
 - Reconfigure access hatch, add interior ladder.

A locus map of the project area is shown on Figure No. 1 attached in Appendix A.

The work will generally consist of furnishing and installing of 6-inch diameter DI water main with associated valves, fittings, service connections and removal and disposal of existing dilapidated structures within the above referenced project area. The work will be located within the previously disturbed right-of-way and no direct impacts to the resource area are anticipated. The proposed project design and improvements are depicted on Drawing Nos. C-1 through I-1 and Clearwell Inspection report in Appendix B.

2.2 Wetland Resource Areas

In August 2020, EcoTec, Inc. (EcoTec) was contracted by Tata & Howard, Inc. to delineate wetlands resource areas in the vicinity of the proposed project as defined by the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, Section 40) and its implementing regulations (310 CMR 10.00), the Town of Leicester Wetlands Administration Bylaw, and the U.S. Clean Water Act (Section 404 and 401). The areas of wetlands identified within the project area are described in further detail in EcoTec's Wetlands Resource Evaluation in Appendix C.

2.3 Exemptions from the Wetlands Protection Act

While the work proposed is not specifically identified as exempt under the Wetlands Protection Act, the proposed disturbance will be temporary in nature and will not result in any permanent change in grading or impervious area. Although the work is proposed within the 100-foot Wetland Buffer Zones, it will occur within the previously disturbed right-of-way. The contractor will be responsible for returning all disturbed areas to equal or better condition. The only permanent structure will be the proposed 6-inch diameter DI water main, located below ground, and all associated appurtenances. No negative impacts to the wetland buffer zones are anticipated as a result of this project. Based on EcoTec Memorandum, there are no Estimated Habitats or Certified Vernal Pools in the proposed work area or in the immediate vicinity.

2.4 Conclusion

The CVRWD seeks a determination from the Leicester Conservation Commission on the applicability of the Wetlands Protection Act to the proposed project. The proposed disturbances will be temporary and the location of the work will be in previously disturbed areas exclusively within the buffer zones. No permanent impacts to the resource areas are anticipated. Based on the information provided, it is requested that the Commission consider the Wetlands Protection Act not applicable to the activities involved with the proposed project as they are not anticipated to negatively impact the resource areas.

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Appendix A



Legend

 Wetlands Delineation



Date: August 2020
Approximate Scale: 1:3,000

Wetlands Delineation
Grindstone Well and Clearwell Reactivation
Cherry Valley Rochdale Water District

Figure No.

1



Appendix B

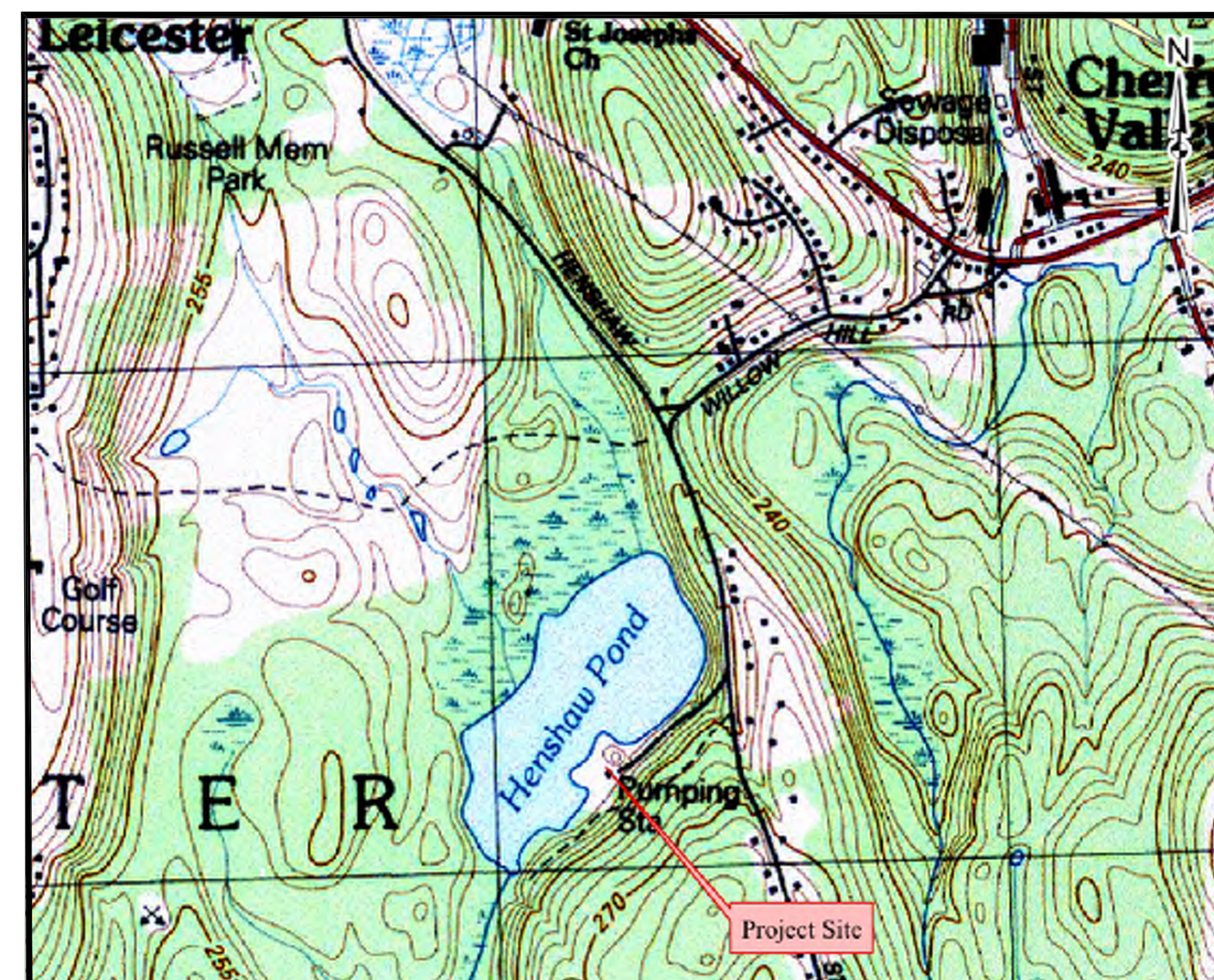
CHERRY VALLEY ROCHDALE WATER DISTRICT

REACTIVATION OF

GRINDSTONE WELL AND

CLEARWELL

CONTRACT NO. 1



LOCATION PLAN
NO SCALE

BOARD OF WATER COMMISSIONERS

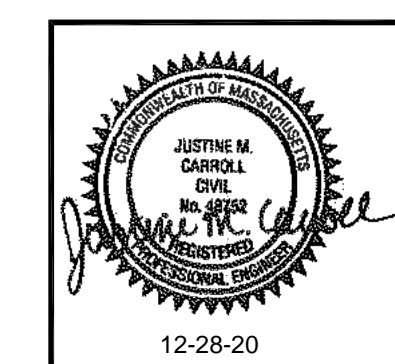
KEVIN M. BERGIN, CHAIRMAN
ARTHUR E.J. LEVESQUE
ROBERT H. LEMIEUX, SR.

SHEET INDEX
























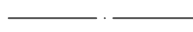







- C-1 - SITE PLAN
- C-2 - DETAIL SHEET
- D-1 - PROCESS FLOOR PLAN
- D-2 - PROCESS SECTION VIEWS
- E-1 - ELECTRICAL FLOOR PLAN
- I-1 - INSTRUMENTATION FLOOR PLAN AND SCHEDULE



TATA & HOWARD



RDA
SUBMITTAL
DECEMBER
2020

LEGEND		
EXISTING	DESCRIPTION	PROPOSED
	WATER MAIN	
	GATE VALVE	
	BUTTERFLY VALVE	
	SOLID SLEEVE	
	TRANSITION COUPLING	
	PIPE FITTINGS	
	CAP	
	FIRE HYDRANT	
	SEWER MANHOLE	
	SEWER LINE	
	SEWER SERVICE	
	SEWER FORCE MAIN	
	ELEC. UNDERGROUND	
	UTILITY POLE	
	GAS LINE	
	GAS VALVE	
	RAW WATER LINE	
	TREE LINE	
	WETLANDS	
	WETLAND FLAG	
	WETLAND BUFFER	
	GUARD RAIL	
	BUILDING	

ABBREVIATIONS

APPROX.	APPROXIMATE
BFV	BUTTERFLY VALVE
CB	CATCH BASIN
CI	CAST IRON
CONC.	CONCRETE
DI	DUCTILE IRON
DIA.	DIAMETER
DMH	DRAIN MANHOLE
DWGS	DRAWINGS
ELEV.	ELEVATION
FF	FINISHED FLOOR ELEVATION
FM	FORCE MAIN
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE
HYD	HYDRANT
INV.	INVERT
MAX.	MAXIMUM
MIN.	MINIMUM
PVC	POLYVINYL CHLORIDE
TYP.	TYPICAL

GENERAL NOTES

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CHERRY VALLEY ROCHDALE WATER DISTRICT. ALL EXCAVATION AND RESTORATION SHALL MEET TOWN SPECIFICATIONS.
- THE ENGINEER MAY DIRECT THE CONTRACTOR TO VARY THE PROPOSED WORK DURING CONSTRUCTION TO MEET EXISTING CONDITIONS.
- THE SITE IS NOT LOCATED WITHIN A FLOOD ZONE.
- AREAS WITHIN THE 100-FOOT BUFFER ZONE OF A BORDERING VEGETATED WETLAND ARE SUBJECT TO AN ORDER OF CONDITIONS ISSUED BY THE FALMOUTH CONSERVATION COMMISSION.
- THE CONTRACTOR SHALL ESTABLISH A STAGING AREA OUTSIDE OF THE 100-FOOT BUFFER ZONE, FOR THE OVERNIGHT STORAGE OF EQUIPMENT AND STOCKPILING OF MATERIALS. NO STORAGE OF GASOLINE, OIL OR OTHER FUEL OR HAZARDOUS MATERIALS IS PERMITTED WITHIN THE 100-FOOT BUFFER ZONE. STAGING AREA LOCATIONS SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER.
- STOCKPILES SHALL BE LOCATED AS NEEDED, WITHIN THE LIMIT OF WORK, IN AREAS OF MINIMAL IMPACT.
- IF SEASON OR ADVERSE WEATHER CONDITIONS DO NOT ALLOW THE ESTABLISHMENT OF VEGETATION, TEMPORARY MULCHING WITH HAY, TACKFIELD WOOD CHIPS OR OTHER METHODS SHALL BE PROVIDED.
- THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES AND SHALL PROVIDE ALL NECESSARY CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE AND STRENGTH TO PREVENT ACCESS TO ALL OPEN EXCAVATIONS AT THE COMPLETION OF EACH WORK DAY.
- THE CONTRACTOR AT HIS EXPENSE SHALL BRACE UTILITY POLES IF REQUIRED, AND REPAIR ANY DAMAGE TO EXISTING SIDEWALKS, CURBS, PAVING, SHRUBS, TREES, STONE WALLS, LAWNS, ETC. ALL EXCAVATED MATERIALS SHALL BE RETURNED TO EQUAL OR BETTER THAN PRIOR CONDITION BY THE CONTRACTOR.
- ALL EXISTING CONCRETE AND ASPHALT PAVEMENT SHALL BE SAW-CUT PRIOR TO EXCAVATION IN ORDER TO PROVIDE UNIFORM ASPHALT REPLACEMENT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF PAVEMENT MARKINGS, TRAFFIC SIGN LOOPS, STRIPING, ARROWS, CROSSWALKS, ETC.
- ALL EXISTING CONCRETE STRUCTURES THAT REQUIRE CORING NEW INLET OR OUTLET PIPE PENETRATIONS SHALL HAVE A MECHANICAL LINK SEAL INSTALLED AT THE ANNULAR SURFACE BETWEEN THE PIPE OUTER DIAMETER AND THE CORING DIAMETER.
- CORING DIAMETER SHALL BE AS REQUIRED BY THE LINK SEAL MANUFACTURER.
- CORINGS THROUGH WALL THICKNESSES 12-INCHES AND GREATER SHALL RECEIVE A DOUBLE MECHANICAL LINK SEAL.
- PIPE PENETRATIONS THROUGH THE WALL/FLOORS OF A NEW CONCRETE UTILITY STRUCTURE SHALL UTILIZE A MECHANICAL JOINT END-PLAIN END WALL PIPE, WITH AN INTEGRALLY CAST COLLAR, CAST INTO THE NEW CONCRETE UTILITY STRUCTURE.

EROSION & SEDIMENT CONTROL NOTES

- THE CONTRACTOR SHALL DEVELOP AND IMPLEMENT A STORMWATER POLLUTION PREVENTION PLAN IN ACCORDANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM.
- THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE AND REPAIR OF ALL EROSION CONTROL DEVICES ON-SITE INCLUDING SILT FENCE INSTALLED UNDER THIS CONTRACT AND SILT FENCE INSTALLED BY OTHERS IN SEPTEMBER 2014, REGARDLESS OF WHETHER THE MEASURES ARE SPECIFIED IN THE ORDER OF CONDITIONS. ALL EROSION CONTROL DEVICES SHALL BE REGULARLY INSPECTED. ANY SEDIMENTS REMOVED FROM THE CONTROL DEVICES SHALL BE DISPOSED OF ON THE UPLAND SIDE OF THE EROSION CONTROL LINE.
- IN THE STAGING AREA, THE CONTRACTOR SHALL HAVE A STOCKPILE OF MATERIALS REQUIRED TO CONTROL EROSION ON-SITE TO BE USED TO SUPPLEMENT OR REPAIR EROSION CONTROL DEVICES. THESE MATERIALS SHALL INCLUDE, BUT ARE NOT LIMITED TO, HAY BALES, SILT FENCE AND CRUSHED STONE.
- IF A STOCKPILE IS LOCATED ON A SLOPE, THE RUNOFF SHALL BE DIRECTED AWAY FROM THE PILE. STOCKPILES SHALL BE CONTAINED WITHIN STRAW DIKES.
- PRIOR TO CONSTRUCTION, AN EROSION CONTROL BARRIER (SILT FENCE, HAY BALE DIKE, OR SILTATION BARRIER) SHALL BE INSTALLED DOWN GRADIENT OF THE RETENTION BASINS AS SHOWN ON THE SITE PLAN. THESE BARRIERS SHALL REMAIN IN PLACE UNTIL ALL TRIBUTARY SURFACES HAVE BEEN FULLY STABILIZED. THE EROSION CONTROL BARRIERS AS SHOWN ON THE SITE PLAN ARE THE MINIMUM REQUIRED TO PROTECT THE SENSITIVE AREAS.
- AT NO TIME SHALL SILT-LADEN WATER BE ALLOWED TO ENTER SENSITIVE AREAS (WETLANDS, OFF-SITE AREA AND DRAINAGE SYSTEMS). ANY RUNOFF FROM DISTURBED SURFACES SHALL BE DIRECTED THROUGH SETTLING BASINS AND EROSION CONTROL BARRIERS PRIOR TO ENTERING ANY SENSITIVE AREAS.
- NO MATERIALS SHALL BE DISPOSED OF INTO ANY WETLANDS OR EXISTING OR PROPOSED DRAINAGE SYSTEMS.
- ANY REFUELING OF CONSTRUCTION VEHICLES AND EQUIPMENT SHALL TAKE PLACE OUTSIDE OF ANY 100-FOOT BUFFER ZONE TO ANY WETLANDS.
- CONTRACTOR SHALL UTILIZE A VARIETY OF SLOPE STABILIZATION METHODS AND MATERIALS, WHICH SHALL BE ADJUSTED TO THE SITE CONDITIONS. EROSION CONTROL BLANKETS OR MIRAFI MIRAMAT (OR SIMILAR PRODUCTS) SHALL BE AVAILABLE ON SITE.
- WATER SHALL NOT BE ALLOWED TO ENTER PIPES FROM UNSTABILIZED SURFACES.
- THE DRAINAGE SYSTEM SHALL BE INSTALLED FROM THE DOWNSTREAM END UP. SEDIMENT SHALL NOT BE ALLOWED TO ENTER THE SYSTEM.
- RIP RAP SHALL BE INSTALLED AT THE PIPE INLETS AND OUTLETS IMMEDIATELY UPON THE PLACEMENT OF THE PIPE. SILT FENCES SHALL BE INSTALLED AT THE OUTFALLS OF THE DETENTION BASIN. THEY SHALL REMAIN IN PLACE UNTIL ALL TRIBUTARY AREAS ARE STABILIZED.
- IF INTENSE RAINFALL IS ANTICIPATED, THE INSTALLATION OF SUPPLEMENTAL STRAW DIKES, SILT FENCES, OR ARMORED DIKES SHALL BE UTILIZED. ADDITIONAL TEMPORARY SETTLING BASINS ARE REQUIRED TO BE LOCATED WITHIN THE DISTRIBUTED AREA, TO MINIMIZE THE TRIBUTARY AREAS.

WATER MAIN NOTES

- THE CONTRACTOR SHALL MAKE EVERY EFFORT NOT TO DISTURB THE EXISTING WATER SYSTEM. NO ADDITIONAL PAYMENT SHALL BE MADE FOR DAMAGE CREATED FOR THE CONVENIENCE OF THE CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING & GRUBBING TREES WHERE THEY CONFLICT WITH THE PROPOSED WATER MAIN INSTALLATION.
- UNLESS OTHERWISE NOTED OR APPROVED BY THE ENGINEER, THE NEW WATER MAIN SHALL PASS UNDER EXISTING UTILITIES.
- ALL WATER MAINS ARE TO BE LAID WITH A MINIMUM OF 5'-0" COVER.
- ALL BENDS, TEE, CAPS AND HYDRANTS SHALL BE BACKED WITH CONCRETE THRUST BLOCKS AS INDICATED ON THE CONTRACT DRAWINGS. ALL BENDS, TEE, CAPS, VALVES AND MISCELLANEOUS FITTINGS SHALL BE RESTRAINED AS SPECIFIED.
- CONTRACTOR SHALL USE A WATER TIGHT PLUG DURING THE WATER MAIN INSTALLATION. PLUG SHALL REMAIN IN PLACE AT ALL TIMES.
- THE CONTRACTOR SHALL NOT CONNECT TO THE EXISTING WATER MAIN UNTIL IT HAS BEEN PRESSURE TESTED AND CHLORINATED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL PROVIDE ADDITIONAL TAPS IF REQUIRED FOR CHLORINATING AND HYDROSTATIC TESTING AT HIS EXPENSE. TAPS SHALL BE REMOVED AND THE WATER MAIN PLUGGED AFTER TESTING IS COMPLETE.

SURVEY NOTES

- BASE PLANS AND PROPERTY LINE DETERMINATIONS ARE BASED OFF A PREVIOUS SURVEY AND GPS POINTS LOCATED IN THE FIELD.
- DELINEATION OF BORDERING VEGETATED WETLANDS, AND EDGE OF BANK MEAN ANNUAL HIGH WATER WERE DETERMINED BY ECOTEC, INC. (102 GROVE STREET, WORCESTER, MA 01605).
- THE LOCATION OF THE EXISTING UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE AND ARE INTENDED ONLY TO ADVISE THE CONTRACTOR OF THEIR PRESENCE. CALL "DIG SAFE" (1-888-344-7233) FOR FIELD LOCATIONS OF ALL EXISTING UTILITIES.

CHERRY VALLEY ROCHDALE
WATER DISTRICT

GRINDSTONE WELL AND
CLEARWELL REACTIVATION

Down By: MEC/CEd
Designed By: RSP
Checked By: YKU
Approved By: PBH

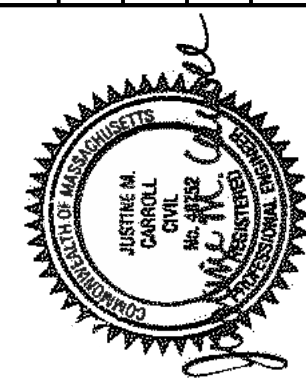
CIVIL
LEGEND, GENERAL NOTES,
AND ABBREVIATIONS

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Description

Date

Rev.



12-28-20



TATA & HOWARD

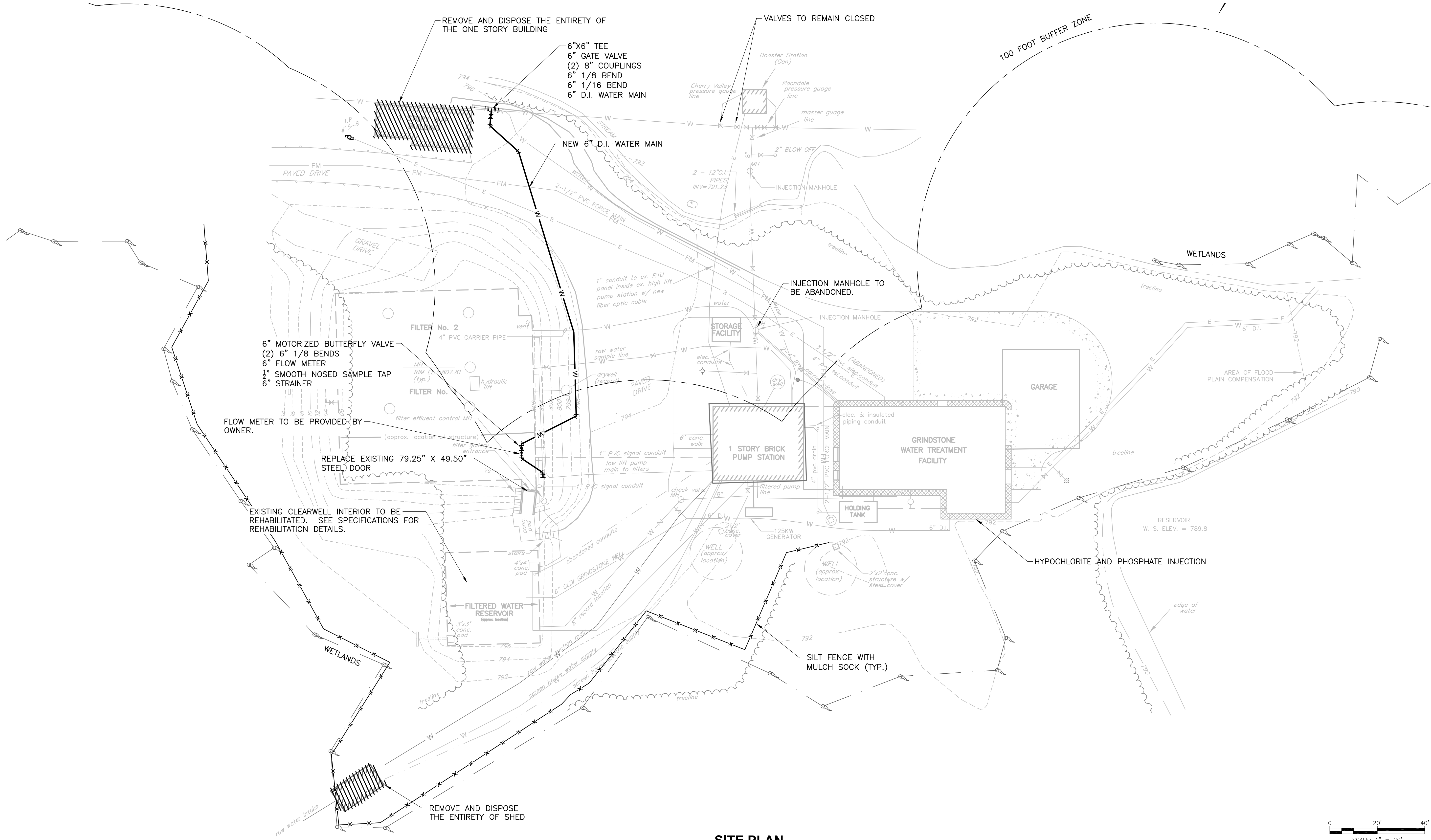
T&H NO.: 6029

DATE: DECEMBER 2020

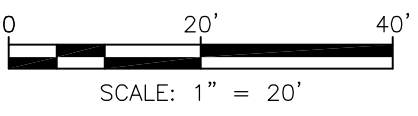
SCALE: AS NOTED

C-1

RDA
SUBMITTAL
NOT FOR
CONSTRUCTION




SITE PLAN
SCALE: 1" = 20'

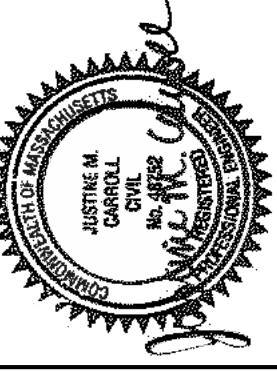


RDA
SUBMITTAL
NOT FOR
CONSTRUCTION

CHERRY VALLEY ROCHDALE WATER DISTRICT		CIVIL SITE PLAN	<table border="1"><thead><tr><th>Description</th><th>Date</th><th>Rev.</th></tr></thead><tbody><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></tbody></table>	Description	Date	Rev.													THIS DOCUMENT IS THE PROPERTY OF TATA & HOWARD, INC. AND ITS CLIENT. REPRODUCTION OR MODIFICATION WITHOUT WRITTEN CONSENT IS PROHIBITED.	Down By: MEC/CED Checked By: YKJ Approved By: PBH
Description	Date			Rev.																
GRINDSTONE WELL AND CLEARWELL REACTIVATION																				



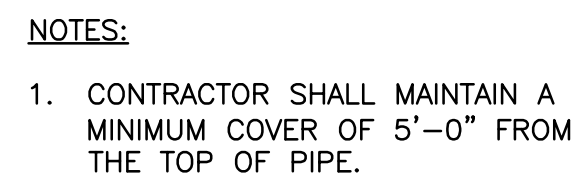
TATA & HOWARD



12-28-20

T&H NO.: 6029
DATE: DECEMBER 2020
SCALE: AS NOTED

C-2



*The values in parenthesis (X') indicate the required restraint length for each side of the Tee Run.
The values in the column are the required restraint length for the Tee Branch.



SCALE: NONE

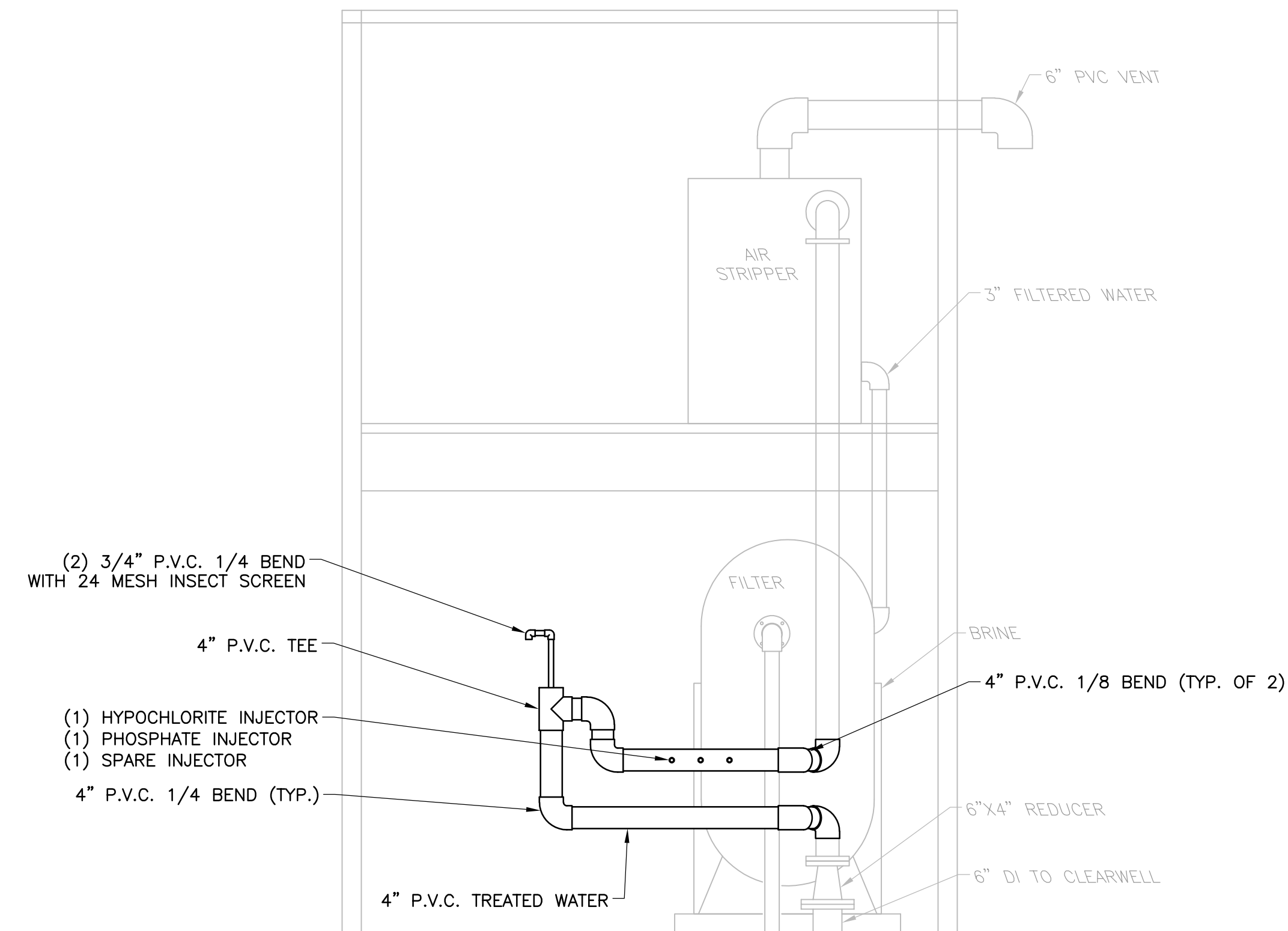


SCALE: NONE

NOTES:

1. CONCRETE SHALL BE 3,000 PSI MINIMUM AT 28 DAYS.
2. THRUST BLOCKS SHALL BE PLACED AGAINST UNDISTURBED MATERIAL WHENEVER POSSIBLE.
3. ALL FITTINGS SHALL BE SUPPORTED IN CONCRETE.
4. FOR FIRE HYDRANT THRUSTING SEE HYDRANT DETAIL.
5. SEE VERTICAL BEND DETAIL FOR RESTRAINED PIPE REQUIREMENTS FOR VERTICAL BENDS.
6. POURED CONCRETE NOT TO COME WITHIN 6" OF MECHANICAL JOINTS.
7. BEARING FACE AREA CALCULATED ASSUMING 250 PSI AND 1.5 TON/S.F. ALLOWABLE SOIL BEARING CAPACITY.

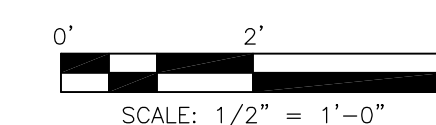


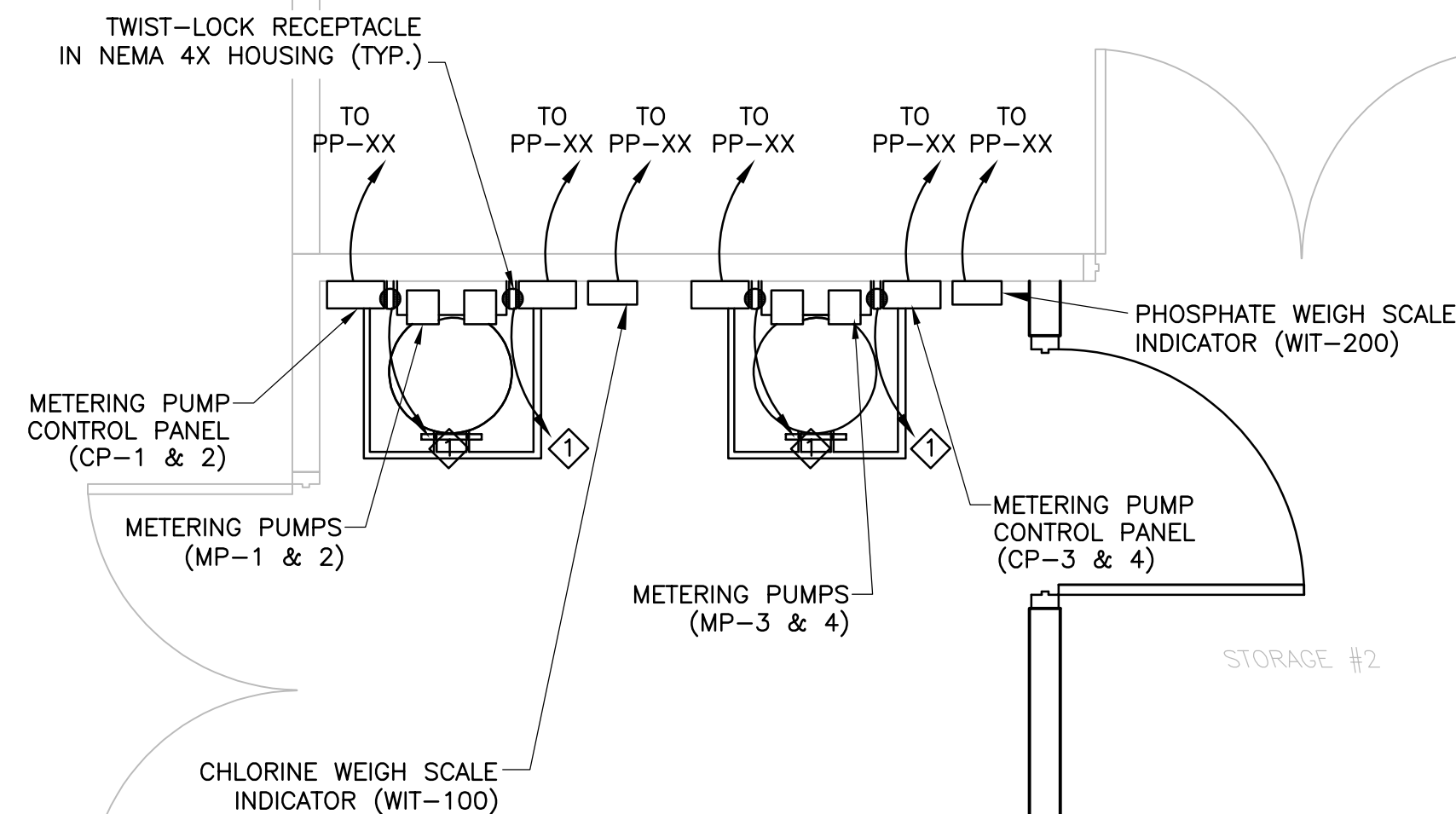


SECTION VIEW
SCALE: $1/2" = 1'-0"$

SECTION VIEW
SCALE: $1/2" = 1'-0"$

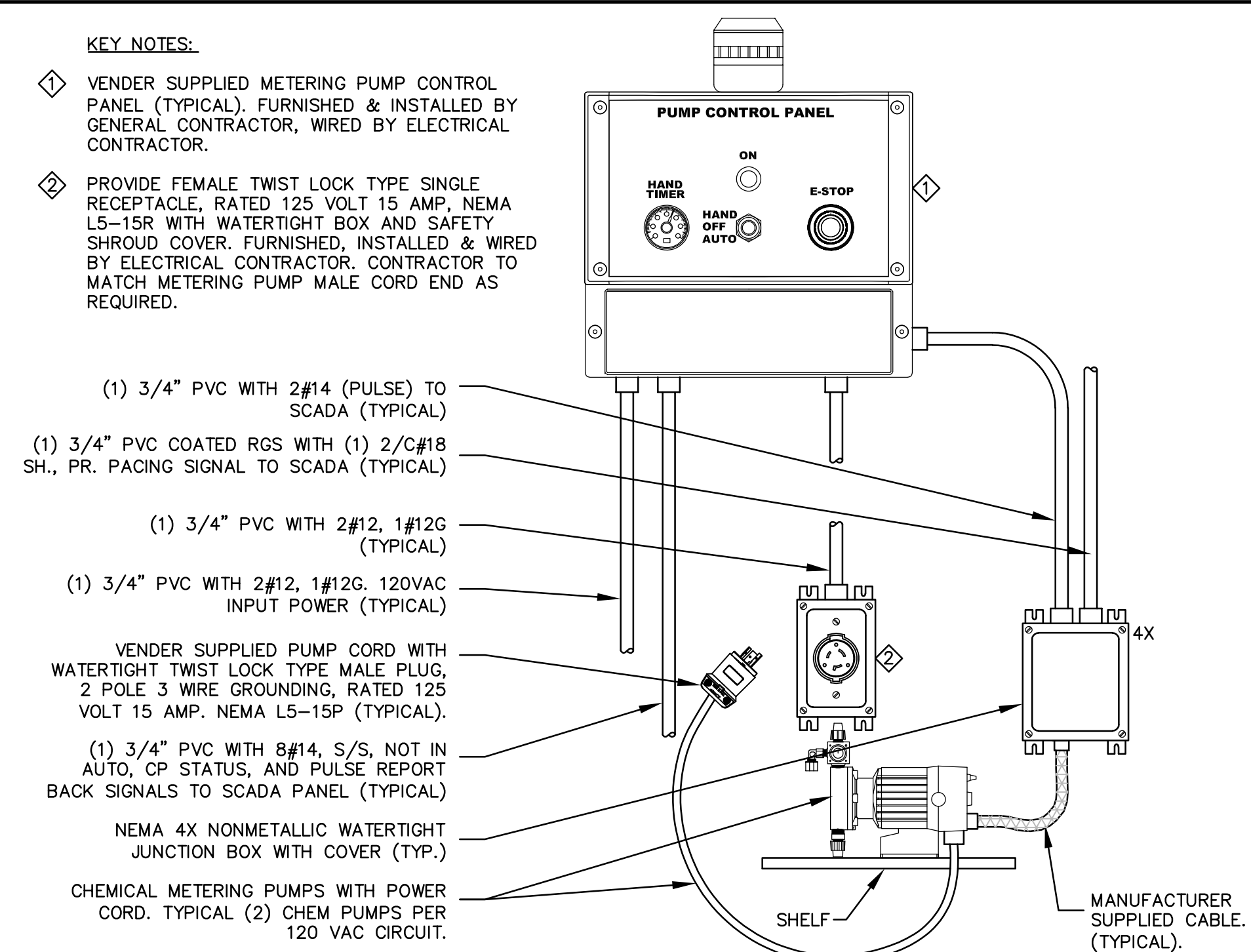
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- NOTES:
1. ALL WIRING WITHIN THE CHEMICAL FEED AND STORAGE AREA SHALL BE WITHIN PVC SCHEDULE 40 RACEWAY SYSTEM EXCEPT FOR ANALOG SIGNALS (4-20mA) WHICH SHALL BE WITHIN PVC COATED RGS CONDUITS.
 2. ALL ELECTRICAL ENCLOSURES, PUMP BOXES, J-BOXES, ETC SHALL BE 1/2" X 1/2" X 1/2" NEMA-1 CONSTRUCTION UNLESS OTHERWISE NOTED.
 3. ALL 120-VOLT POWER WIRING SHALL BE 3/4" CONDUIT WITH 2-#12, 1-#12G TO RESPECTIVE PUMP CONTROL PANELS AND WEIGH SCALE INDICATORS.

① INSTALL 3/4" FLEXIBLE CONDUIT WITH 2-#12, 1-#12G BETWEEN TWIST-LOCK RECEPTACLE AND RESPECTIVE PUMP CONTROL PANEL.

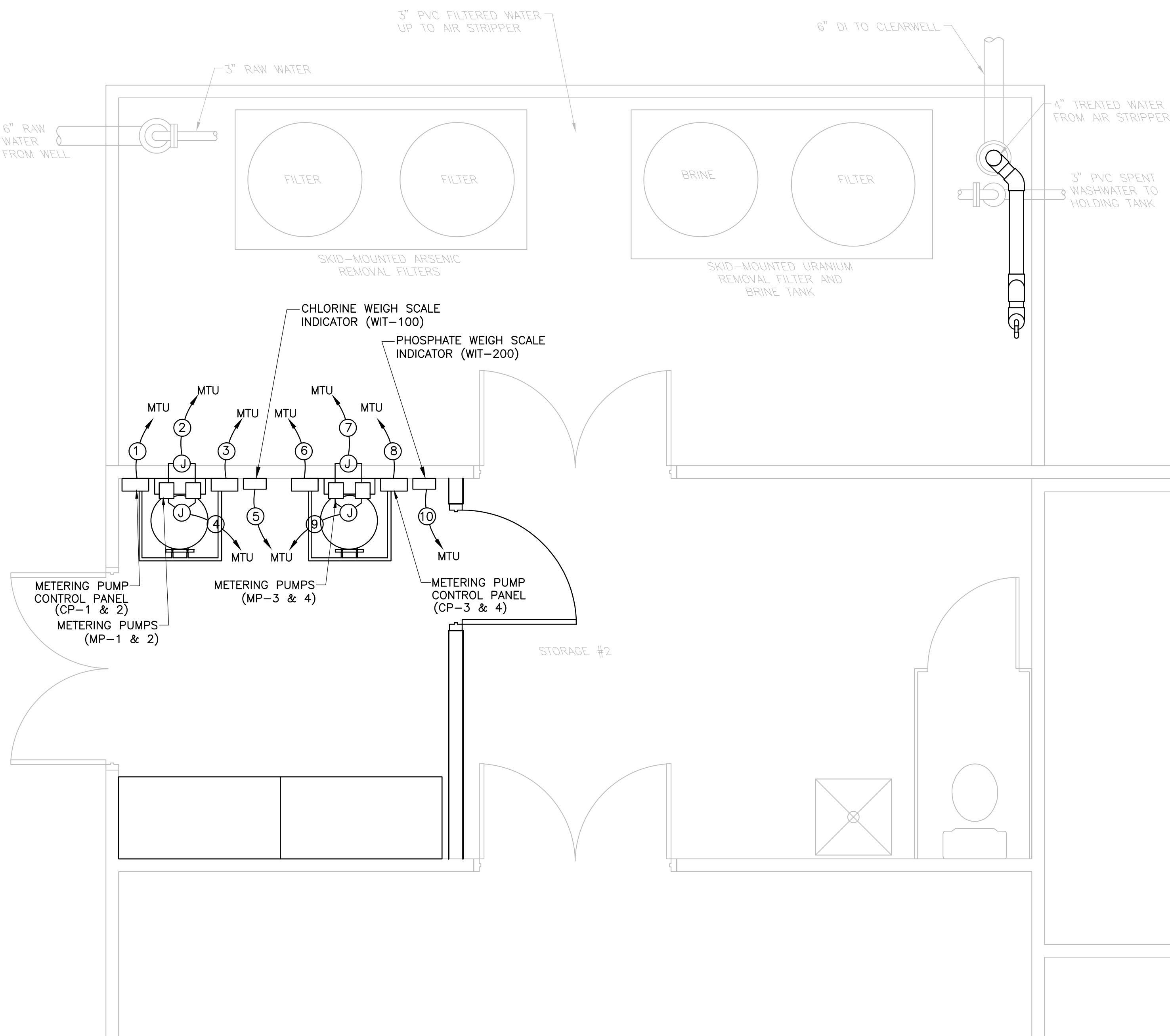


N.T.S.

SCALE: 1/2" = 1'-0"



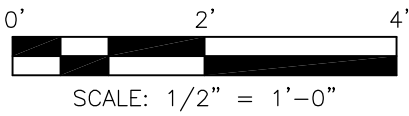
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SCADA RTU INPUT/OUTPUT LISTING				
DESCRIPTION	DISCRETE INPUT	DISCRETE OUTPUT	ANALOG INPUT	ANALOG OUTPUT
CL2 METERING PUMP NO. 1 STATUS (MP-1)	1			
CL2 METERING PUMP NO. 2 STATUS (MP-2)	2			
CL2 METERING PUMP NO. 1 "IN AUTO" (MP-1)	3			
CL2 METERING PUMP NO. 2 "IN AUTO" (MP-2)	4			
CL2 METERING PUMP PULSE	5			
CL2 METERING PUMP PULSE	6			
PHOS. METERING PUMP NO. 1 STATUS (MP-3)	7			
PHOS. METERING PUMP NO. 2 STATUS (MP-4)	8			
PHOS.I METERING PUMP NO. 1 IN AUTO (MP-3)	9			
PHOS. METERING PUMP NO. 2 IN AUTO (MP-4)	10			
PHOS. METERING PUMP PULSE	11			
PHOS. METERING PUMP PULSE	12			
CL2 METERING PUMP NO. 1 START (MP-1)		1		
CL2 METERING PUMP NO. 2 START (MP-2)		2		
PHOS. METERING PUMP NO. 1 START (MP-3)		3		
PHOS. METERING PUMP NO. 2 START (MP-4)		4		
CL2 DAY TANK WEIGHT			1	
PHOS. DAY TANK WEIGHT			2	
CL2 METERING PUMP NO. 1 SPEED (MP-1)				1
CL2 METERING PUMP NO. 2 SPEED (MP-2)				2
PHOS.I METERING PUMP NO. 1 SPEED (MP-3)				3
PHOS.I METERING PUMP NO. 2 SPEED (MP-4)				4

CONDUIT SCHEDULE				
CONDUIT NO.	CONDUIT SIZE	CONDUCTORS	SCADA I/O REFERENCE	
CHEMICAL	INJECTION	FACILITY	RTU	(RTU-B)
1	3/4"	8-#14	DI-1,3,5	DO-1
2	3/4"	8-#14	DI-2,4,6	DO-2
3	3/4"	2-2C/#18TS	AO-1,2	
4	3/4"	1-2C/#18TS	AI-1	
5	3/4"	8-#14	DI-7,9,11	DO-3
6	3/4"	8-#14	DI-8,10,12	DO-4
7	3/4"	2-2C/#18TS	AO-3,4	
8	3/4"	1-2C/#18TS	AI-2	

LOWER LEVEL FLOOR PLAN
SCALE: 1/2" = 1'-0"



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T&H NO.: 6029
DATE: DECEMBER 2020
SCALE: AS NOTED

INSTRUMENTATION
FLOOR PLANS AND SCHEDULE

CHERRY VALLEY ROCHDALE
WATER DISTRICT
GRINDSTONE WELL AND
CLEARWELL REACTIVATION

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Drawn By: CED
Checked By: RSP
Designed By: YKJ
Approved By: PBH

Advanced Solutions

Scott Kelley
Water System Consultant
603-724-8226
SKelley@UtilityService.com



Clearwell Tank

100,000 gallon Underground Concrete Tank

Condition Assessment Report

Cherry Valley and Rochdale Water District, Leicester, MA



Prepared By:

Ken Lunetta
NACE Level III Cert #3199
Region Inspection Manager
kenneth.lunetta@suez.com

Assessment Performed 06/19/2020

TANK DATA

TANK NAME:	100,000 Gallon Clearwell				
TANK DESIGN:	Underground	CONSTRUCTION TYPE:	Concrete		
LOCATION:	148 Henshaw St				
	CITY:	Leicester	STATE:	MA	
CAPACITY:	~100,000 gallon	HEIGHT:	11.5' Wall Hgt	LENGTH/WIDTH:	36' x 36'
BUILDER:	Unknown	YEAR:	Unknown	CONTRACT #	
EXT. COATING:	N/A	LEAD:	N/A	CHROMIUM:	N/A
INT. COATING:	N/A	LEAD:	N/A	CHROMIUM:	N/A
INSPECTOR(S):	Ken Lunetta/Rich Pena		DATE:	06/19/2020	

SUMMARY

SUEZ –Advanced Solutions (SUEZ-AS) conducted a visual inspection of the interior surfaces of the 100,000 gallon underground Clearwell Tank. The purpose of the inspection was to determine the condition of the coatings and structure, and to evaluate the tank for compliance with current sanitation guidelines, safety and security regulations, and guidelines in accordance with AWWA, OSHA, related state and federal agencies. The information contained herein is as accurate as could be obtained by SUEZ-AS personnel at the time of the inspection.

The tank is buried below approximately 3-4 feet of soil with no exterior surfaces visible for inspection. This inspection focused on the tank interior and associated visible interior and exterior appurtenances.

At the time of this inspection all but 5-6" of water had been drained and reportedly the subject tank has not been in use since 2016. The wall surfaces from the high water level down to the floor exhibit extensive heavy staining, with no evidence of any coating present. All visible interior wall and ceiling surfaces appear to be uncoated concrete original to the tank with no evidence of a coating/sealer/surfacer, nor does it appear repairs have been performed.

The wall surfaces initially appeared to be in generally good condition with only localized areas of bug holes/exposed aggregate primarily along poured concrete joint lines. Additional small rust spots were noted but they appear to be emanating from aggregate embedded close to the surface and not a major concern.

However, upon close inspection when the wall surfaces were physically probed, it became readily apparent there was significant cement paste loss affecting the top ¼" to ½" surface layer. Once you get past the soft layer, the underlying concrete was found to be solid and consistent with typical concrete. This condition was present at all locations subjected to physical testing with few exceptions.

A secondary issue observed along the wall surfaces approximately 4' above the floor where large bug holes/voids/exposed aggregate and a visible joint line were noted along poured concrete lifts. When probed, the cement paste was found degraded to the point that the aggregate is loose and the bug holes were easily opened up to a depth of approximately 2". The underlying surfaces were found to be hard and consistent with a concrete material. See the condition assessment report for details.

Of significant importance is the lack of visible water infiltration through the walls. The only active infiltration noted during this inspection is along the fill pipe penetration joints as shown in "Interior Fill Pipe" photos 1 thru 4 on the attached photo gallery. This area appeared to be wet despite the tank being drained for 4 years and when probed the surface layer of concrete exhibited the same cement paste degradation as the remainder of the walls. The wetness may be a residual from trapped moisture in the joint but sealing the joints should be a part of the future maintenance operations.

The underside of the ceiling appears in good condition with only a few small areas of spalled material typically less than 3"Ø as viewed from the floor. The majority of the ceiling exhibits a white coloration consistent with efflorescence, which appears to be very thin. The ceiling did not exhibit any evidence of cracking/leaking or other structural deficiencies. Two parallel formed joint lines spanning across the ceiling appear in good condition with no significant separation observed. The joints should be inspected to determine the extent of repairs (if any) after surface preparation is performed if it is decided to rehabilitate the tank.

Finally yet importantly, there are four (4) separate pipes of varying sizes and configurations penetrating the walls, one is the 8"Ø suction line, one is the 6"Ø fill line, one is the 8"Ø overflow and the fourth is unclear but could be a secondary 6"Ø (est) fill line. All four pipes are in poor condition and exhibit heavy rust with medium to large rust tubercles along the majority of all surfaces. Localized tubercles were removed to expose the underlying steel substrate which was found to be relatively free of significant metal loss however be advised that does not mean that no metal loss is occurring. Pipe repairs/replacement should be anticipated but the extent will not be known until the surfaces are abrasive blast cleaned as part of the overall maintenance program.

EXTERIOR COATING RECOMMENDATIONS

No exterior coating recommendations.

INTERIOR COATING RECOMMENDATIONS

Based on the current condition of the concrete surfaces, a full interior renovation is recommended as outlined below to restore the sanitary condition and protection of the substrate/structure prior to repurposing the tank.

Prepare the concrete (Ceiling/walls/floor) to remove all loose and failing concrete by means of UHPWJ (10,000psi minimum) with the final target of CSP 5. Followed by the application of Tnemec Series 218, with filler if necessary, to all wall and floor surfaces and two coats of Series 22 @ total DFT of 30-40 mils. Apply a one full coat 100% solids epoxy (Series 22 @ total DFT of 15-20 mils) to all surfaces of the interior ceiling.

Exposed rebar (if any) will need to be power tool or abrasive blast cleaned, primed and the surrounding area patched before the application of top coats.

All metal piping within the water chamber should be abrasive blast cleaned to an SSPC-SP10 Near White metal blast grade followed by the application of a zinc primer and two coats of Series 22 @ total DFT of 30-40mils.

Any welding repairs to the interior piping should be prepared in the same manner as listed above and coated with same coating system.

STRUCTURAL RECOMMENDATIONS

The two parallel joint lines (approximately 72 lineal feet total length) in the ceiling do not exhibit any differential movement at this time. Recommended these joints be inspected during any future renovations and routed out and sealed if necessary.

Sealing the tops of the four (4) support columns at the junction with the ceiling should also be anticipated. (Est 64 lineal feet)

As noted above the floor surfaces were covered with approximately 5-6" of water and not visible for inspection. Allowance for floor crack repairs should be included in any scope of work developed to return the tank to active service. Estimated allowance of 200' lineal feet of crack repair would be prudent.

SANITARY RECOMMENDATIONS

The tank is not equipped with any form of vent assembly. In order to repurpose the tank, at a minimum, it will be necessary to install a downward facing screened gooseneck vent assembly. The top soil would need to be excavated (approximately 3') to expose the roof surfaces to allow for cutting a penetration to accept the new vent assembly. Total length of the new vent pipe would be approximately 7-8' with the final length needed to allow the opening to terminate 24" above grade to be determined in the field.

Alternatively, and probably a better option, would be to install a second tank access point (minimum 24"Ø with the top 24" above grade) which combines a pallet vent and access point into one assembly. This would allow for a vent as well as a second means of access and/or extra opening for ventilation during tank maintenance while also aiding in compliance with OSHA Confined Space regulations. Recommend construction drawings be reviewed to determine possible presence of re-bar in the roof structure so that proper installation requirements are accounted for.

The overflow discharge opening is in the vertical face of a concrete headwall along the backside of the tank. The opening is protected with both fine mesh non-corrodible and expanded metal mild steel screens, with the bottom of the opening only 5-6" above grade as detailed in the conditions report. Recommend modifying the overflow elevation above grade to a minimum of 18" to comply with MA DEP regulations. This will require re-grading of the surrounding grade to allow for proper clearance.

There is a 4"Ø penetration and associated pipe in the roof adjacent to the overflow pipe, which was originally used to transfer water directly from the adjacent reservoir but has since been abandoned. The piping should be removed and the penetration sealed to prevent infiltration of groundwater into the tank. Access to the piping is thru a concrete vault along the rear of the tank as shown in the attached photographs.

There is an old boxed shaped wood assembly attached to the interior tank wall adjacent to the tank level piping under the access opening in the roof. See "Interior Access" photo 4 in the photo gallery. The wood no longer serves a purpose, is severely deteriorated and creates a potential sanitary issue therefore should be removed if the tank is ever returned to active service.

SAFETY & SECURITY RECOMMENDATIONS

Access to the water chamber is via a single 30"Ø x ~3-4' long access sleeve assembly embedded within a concrete pad along the front right corner of the roof. The hatch opening is equipped with a heavy steel cover held in place by gravity, with a secondary 4" thick x 46" x 46" concrete cap for additional security.

This configuration does not comply with MADEP regulations in that the top of the pad and opening into the tank is only 4-6" above grade. Recommend the access be reconfigured to comply with the >24" above grade requirement and topped with a Bilco hatch assembly.

There is no interior ladder present therefore installation of a stainless steel ladder spanning approximately 18' from the top of the reconfigured roof hatch access down to the floor is recommended.

WATER STORAGE TANK CONDITION ASSESSMENT REPORT

SUEZ Advanced Solutions



Date:		Project:		Task:	
Tank Name:					
Address:			City:		State:
County:		Lat:		Long:	
Capacity:		gallons	Tank Type:		Construction:
Height:		Diameter / Dimensions:		Yr Built:	By:
Exterior Last Painted:		Exterior Color:		Interior Last Painted:	Interior Color:
% Inground:					
Contract:					

Exterior Roof Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Roof Coating or Surfacer	Surfacer visual assessment? (G/F/P)		Coating Type: Lead Bearing: DFT:
	Actionable checking / delamination?		
	Actionable deterioration / efflorescence?		
	Is there any graffiti paint or etchings?		
	Coating adhesion assessment? (G/F/P)		
	Does soiling impact visual appearance?		
	Roof seam sealer condition (G/F/P)?		
Roof Structure	Structural visual assessment? (G/F/P)		
	Significant cracking / bug holes evident?		
	Significant spalling evident?		
	Significant exposed rebar?		
	Unsealed penetrations to WC present?		
	Is the roof perimeter watertight?		
Roof Vent	Design meets state standards?		Finial Stub OD:
	Screen intact?		
	Vacuum pallet functional?		
	Unsealed penetrations present?		
Roof Access	At least two hatches to WC present?		
	Primary meets state standards?		
	Additional meet state standards?		
	All roof access points secured?		
	Ground level access >24" above grade?		
Roof Safety	Is there a roof ladder / stair present?		
	Is there a guardrail system present?		
	Required fall arrest system present?		
	Tank access inside a secured structure?		

Exterior Shell Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Shell Coating or Surfacer	Surfacer visual assessment? (G/F/P)		Coating Type: Lead Bearing: DFT:
	Actionable checking / delamination?		
	Actionable deterioration / efflorescence?		
	Is there any graffiti paint or etchings?		
	Coating adhesion assessment? (G/F/P)		
	Does soiling impact visual appearance?		
	Is majority of the tank wall below grade?		

Shell Structure	Structural visual assessment? (G/F/P)		
	Significant cracking / bug holes evident?		
	Significant spalling evident?		
	Significant exposed rebar?		
	Dome cap to shell transition? (G/F/P)		
	Is the base of the tank wall visible?		
	Any active leakage observed?		
Foundation	Structural visual assessment? (G/F/P)		
	Increased deterioration at grade?		
	Any undermining evident at grade?		
	Does grade promote good drainage?		
	Evidence of unexplained standing water?		
Shell Access	At least two manholes present?		
	Primary meets state standards?		
	Additional meet state standards?		
	Structural damage / leakage visible?		
Shell Safety	Required shell ladder present?		Safety Climb Type:
	Required safety climb system present?		
	Is shell ladder equipped with a cage?		
	Are there rest platforms present?		
	Actionable corrosion / deterioration?		
	Functional security gate present?		
	Do antennas / cables impact climbing?		
Overflow	Is the overflow system internal?		Pipe OD:
	Is the overflow pipe encased in concrete?		
	Significant cracking or efflorescence?		
	Significant spalling evident?		
	Is the overflow discharge above grade?		
	Required air gap present?		
	Screen is intact or was replaced?		
	Flapper is functional or was replaced?		
	Drain, spillway or rip-rap present?		

Interior Roof Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments		
Roof Coating	Surfacer visual assessment? (G/F/P)		Coating Type:	Lead Bearing:	DFT:
	Actionable blistering / delamination?				
	Actionable deterioration / efflorescence?				
	Surfacer adhesion assessment? (G/F/P)				
	Roof seam sealer condition? (G/F/P)				
	Roof to shell junction? (G/F/P)				
Roof Structure	Structural visual assessment? (G/F/P)				
	Significant cracking / bug holes evident?				
	Significant spalling evident?				
	Significant exposed rebar?				
	Support columns in sound condition?				
	Roof to column junctions are sound?				

Interior Shell & Floor Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Shell & Floor Coatings or Surfacer	Surfacer visual assessment? (G/F/P)		Coating Type: Lead Bearing: DFT:
	Actionable blistering / delamination?		
	Actionable deterioration / efflorescence?		
	Surfacer adhesion assessment? (G/F/P)		
Shell & Floor Structure	Structural visual assessment? (G/F/P)		
	Significant cracking / bug holes evident?		
	Significant spalling evident?		
	Significant exposed rebar?		
	Column or wall conditions? (G/F/P)		
	Shell to floor junction? (G/F/P)		
	Fill line opening in sound condition?		
	Is there a silt stop present?		
	Is a separate floor drain present?		
Shell Safety	Is an interior shell ladder present?		Safety Climb Type:
	Required safety climb system present?		
	Actionable corrosion / deterioration?		
	Internal cage or platforms present?		
Water Quality	Water quality visually acceptable?		
	Significant staining or biofilm present?		
	Significant floor sediment present?		
	Is there a mixing system present?		
	Is there evidence of tank infiltration?		
	Root growth or soil entry evident?		

Site Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Site	Is site equipped with a security fence?		
	Any signs of damage to the fence?		
	Are fence gates secured with locks?		
	Is a vault or pump house present?		
	Sample tap onsite?		
	Is there telemetry / SCADA onsite?		
	In-ground tank roof well maintained?		
	Is there non-tank pooling water onsite?		
	Is there electrical service onsite?		
	Are there power lines near the tank?		
	Is there a non-tank water source onsite?		
	Is the tank located in a coastal area?		
	Site utility during tank rehab (G/F/P)?		

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Interior Access 01



Interior Access 02



Interior Access 03



Interior Access 04



Interior Columns 01



Interior Columns 02

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Interior Columns 03



Interior Columns 04



Interior Columns 05



Interior Columns 06



Interior Columns 07



Interior Columns 08

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Interior Columns 09



Interior Columns 10



Interior Columns 11



Interior Columns 12



Interior Drain Pipe 01



Interior Fill Pipe 01

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Interior Fill Pipe 02



Interior Fill Pipe 03



Interior Fill Pipe 04



Interior Floor 01



Interior Floor 02



Interior Floor 03

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Interior Overflow Pipe 01



Interior Overflow Pipe 02



Interior Roof 01



Interior Roof 02



Interior Roof 03



Interior Roof 04

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Interior Roof 05



Interior Roof 06



Interior Roof 07



Interior Roof 08



Interior Roof 09



Interior Secondary Fill Pipe 01

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Interior Secondary Fill Pipe 02



Interior Secondary Fill Pipe 03



Interior Walls 01



Interior Walls 02



Interior Walls 03



Interior Walls 04

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Interior Walls 05



Interior Walls 06



Interior Walls 07



Interior Walls 08



Interior Walls 09



Interior Walls 10

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
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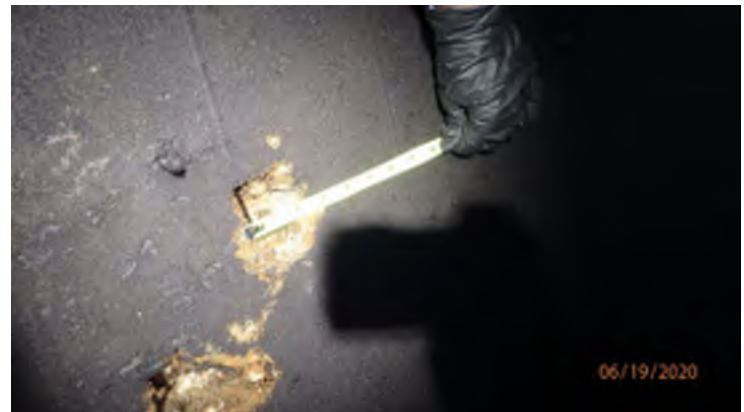
Interior Walls 11



Interior Walls 12



Interior Walls 13



Interior Walls 14



Interior Walls 15



Interior Walls 16

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Interior Walls 17



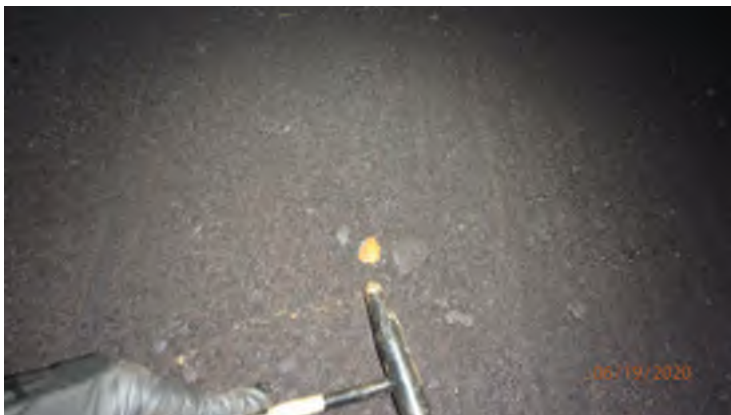
Interior Walls 18



Interior Walls 19



Interior Walls 20



Interior Walls 21



Interior Walls 22

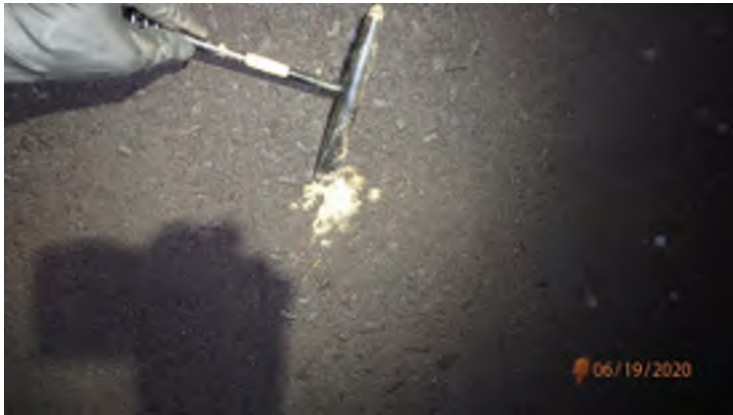
100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Interior Walls 23



Interior Walls 24



Interior Walls 25



Interior Walls 26



Site 01



Site 02

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Site 03



Site 04



Site 05



Site 06



Site 07



Site 10

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Site 11



Site 12



Site 13



Site 14



Site 15



Site 16

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Site 17



Site 18



Site 19



Site 20



Site 21



Exterior Overflow 01

100,000 Gallon Underground Concrete Tank
Cherry Valley Water District Leicester, MA
Inspected on June 19, 2020



Exterior Overflow 02



Appendix C

EcoTec, Inc.

102 Grove Street
Worcester, MA 01605-2629
(508) 752-9666
FAX (508) 752-9494

To: Molly Caruso
Via Email

Date: August 29, 2020

From: Scott M. Morrison, PWS

Re: Wetland Flagging Memorandum,
Henshaw Street (Well Site-see figure),
Leicester, Massachusetts

=====

This memorandum including the attached sketch map is provided to EcoTec's client to explain the work that was done and to facilitate locating wetland flags and other identified resources. It is neither intended nor should it be used for any other purpose. This memorandum is not intended to be used as part of a wetland filing; a formal wetland resource evaluation will be provided for that purpose.

Attached is a rough sketch of the wetland flag and boundary locations at the above-referenced property that were delineated on August 29, 2020. In the table below, you will find the flag series numbers, flag type, and wetland types and locations. Locate all of these listed flags, including blue/white striped test plot flags located near wetland flag A-45. These test plot flags will be referenced in our wetland resource evaluation report.

Flag Numbers	Flag Type	Wetland Types and Locations
Start A1 to A52 Stop (A50 & A51 connect to bridge abutment)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the # portion of the site that is associated with a # located #.
Start B1 to B64 Stop (B6 & B7 connect to bridge abutment)	Blue Flags	Boundary of Bordering Vegetated Wetlands located in the # portion of the site that is associated with a # located #.
Start R1 to R13 Stop	Red Flags	Mean Annual High-water Line (MAHWL) of # located in the # portion of the site.

The wetland resource areas listed in the table above were delineated in accordance with the Massachusetts Wetlands Protection Act (the "Act"; M.G.L c. 131, § 40) and its implementing regulations (the "Regulations"; 310 CMR 10.00).

FEDERAL WETLANDS

EcoTec has presumed that federal wetland boundaries are conterminous with the delineated Bordering Vegetated Wetlands or Bank. Federal wetland jurisdiction can be determined by the U.S. Army Corps of Engineers ("Corps") upon the filing of a Jurisdictional Determination or through the submittal of an Application for Permit to the Corps.

LOCAL WETLANDS PROTECTION BYLAW

The Town of Leicester has a wetlands protection bylaw ("Bylaw") and has associated regulations ("Bylaw Regulations").

BUFFER ZONE

A 100-foot Buffer Zone extends horizontally outward from the A & B-series flags under the Regulations and the Bylaw/Bylaw Regulations.

RIVERFRONT AREA

Based upon a review of the current USGS Map, Worcester South Quadrangle, dated 1983, there is a stream located on or within 200 feet of the site. Based upon observations made during the site inspection, there are no unmapped streams located on or within 200 feet of the site.

Based upon the stream mapping, the stream would be designated as perennial and Riverfront Area under the Act/Regulations would occur on the site.

BORDERING LAND SUBJECT TO FLOODING (BLSF)

Based upon a review of the Flood Insurance Rate Map, Worcester County, Massachusetts, Map Number 25027C0782E, Effective Date July 4, 2011, there is a mapped Zone A (i.e., 100-year floodplain with an unspecified flood elevation) located over Henshaw Pond.

The project engineer should determine the presence and extent or absence of Bordering Land Subject to Flooding on the site. When present, Bordering Land Subject to Flooding would occur in areas where the mapped Zone A / 100-year flood elevation is located outside of or upgradient of the delineated Bordering Vegetated Wetlands (or in the absence of Bordering Vegetated Wetlands, Bank) boundary.

VERNAL POOLS

Vernal pools are not a resource area under the Act or Regulations; they are simply a type of wildlife habitat that may occur within other wetland resource areas (or even within unregulated uplands).

Based upon a review of the 2017 *Massachusetts Natural Heritage Atlas*, 14th edition, as viewed through NHESP Interactive Viewer with Certified Vernal Pool layer active, there are no mapped Certified Vernal Pools on the site. There are no mapped Certified Vernal Pools located within approximately 500 feet of the site. Certified Vernal Pools are Outstanding Resource Waters ("ORWs") under the Massachusetts water quality regulations.

Based upon a review of the Spring 2001 *Massachusetts Aerial Photo Survey of Potential Vernal Pools*, there are no mapped Potential Vernal Pools on the site. There are no mapped Potential Vernal Pools located within approximately 500 feet of the site.

Unless noted otherwise, this mapping information is provided for general information purposes only, and should not be considered definitive regarding the presence or absence of vernal

pools. If information regarding vernal pools is required, a site evaluation for that specific purpose would be required during the spring vernal pool season to document requisite vernal pool biology and hydrology. The presence of vernal pools on or near a site can trigger additional permitting requirements. Unless specifically stated, EcoTec's standard Wetland Resource Evaluation report is not considered to be a vernal pool evaluation.

RARE SPECIES

Based upon a review of the 2017 *Massachusetts Natural Heritage Atlas*, 14th edition, as viewed through NHESP Interactive Viewer, the site is not located within a mapped Estimated Habitat [for use with the Act and Regulations] and is not located within a mapped Priority Habitat [for use with Massachusetts Endangered Species Act (M.G.L. Ch. 131A; "MESA") and MESA Regulations (321 CMR 10.00)].

DISCLAIMER

The reader should be aware that the regulatory authority for the determination of wetland jurisdiction rests with local, state, and federal authorities. Please note, that any work on the site, depending upon its scope, proximity to wetlands, and other project specific factors, may trigger the need for permitting under various local, state, and federal statutes.

The wetland report will be prepared shortly. If you have any questions, please feel free to contact me at any time.

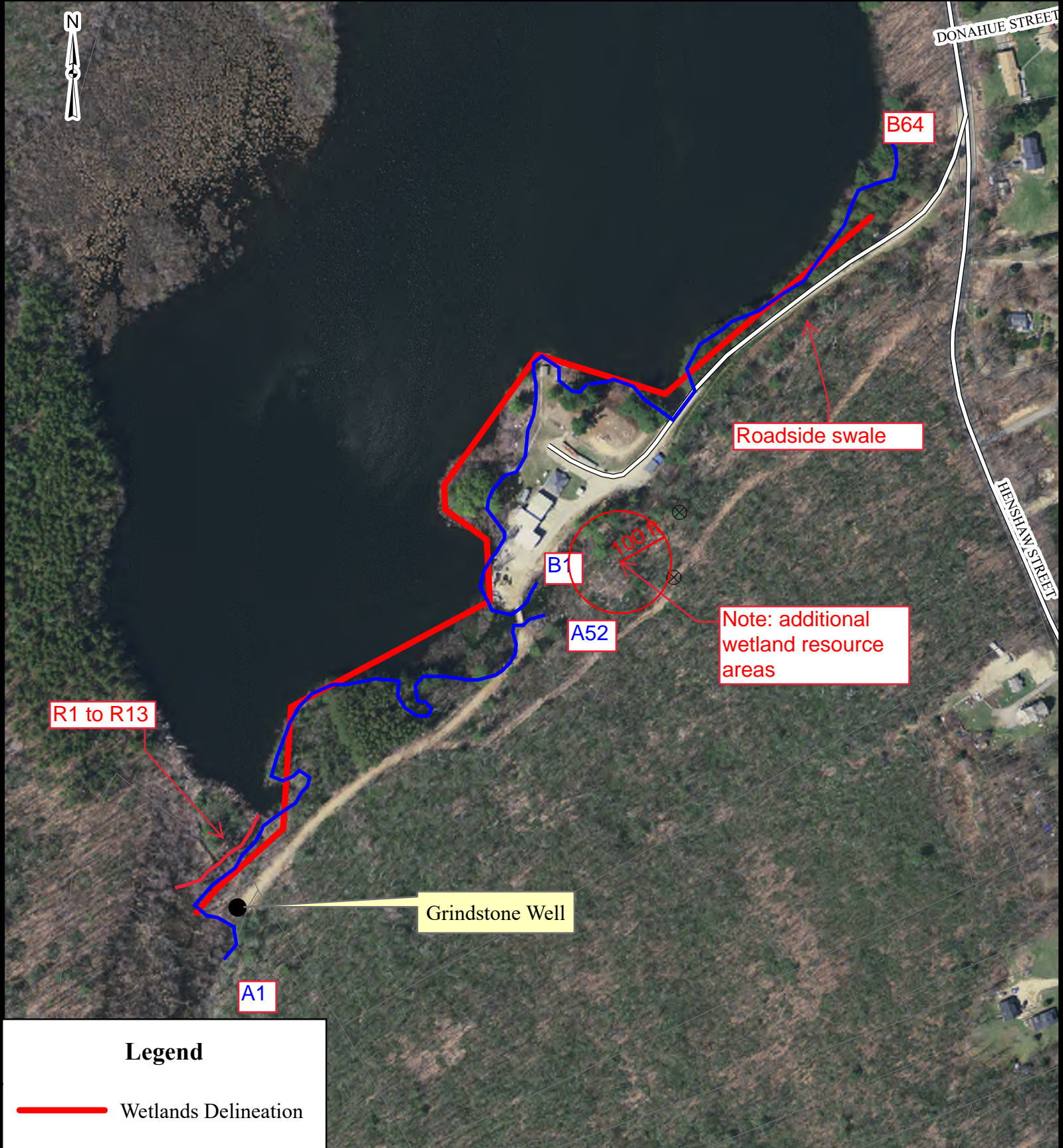
Memorandum
August 29, 2020
Page 4.

**Wetland Delineation Field Sketch
Henshaw Street, Leicester
August 29, 2020
Prepared By: EcoTec, Inc.: Scott Morrison**

NOT TO SCALE

This sketch is intended to provide a rough location of wetland delineation flags to facilitate field location. It should not be relied upon for any other purpose.

(SEE SKETCH ON FOLLOWING PAGE)



Legend

 Wetlands Delineation



Date: August 2020
Approximate Scale: 1:3,000

Wetlands Delineation
Grindstone Well and Clearwell Reactivation
Cherry Valley Rochdale Water District

Figure No.

1



Appendix D

SECTION 01100

SPECIAL PROJECT PROCEDURES

PART 1 GENERAL

1.01 DESCRIPTION

- A. The work of this section consists of special project procedures during construction including:
1. Rehabilitation of the Existing 100,000 gallon Clearwell.
 2. Construction of 6-inch water main to connect existing water main to the Clearwell
 3. Installation of motorized butterfly valve and flow meter, and replacement of steel door in the filter gallery.
 4. Installation of new chemical feed equipment in Grindstone well water treatment facility.
 5. Revise existing SCADA programming to incorporate monitoring and control of equipment being furnished.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.01 GENERAL SEQUENCE OF WORK TO BE PERFORMED:

- A. The Cherry Valley and Rochdale Water District Water Department currently pumps water from its low service area that is supplied by the City of Worcester via a booster pump station located at the District's former surface water treatment facility to the Rochdale high service side of the water distribution system. The Contractor shall construct a new 6-inch water main connecting the low service supply main to the existing treatment facility's clearwell.
- B. All new pumping equipment, piping, electrical equipment and controls for the work shall be on site and ready for installation prior to removing any well from service.
- C. The existing SCADA system must remain fully operational during all construction. No existing SCADA system equipment shall be removed from service until the new SCADA system upgrades has been installed, programmed, tested and accepted.
- D. The general sequence of construction shall be as follows:
1. Deliver all new equipment for the wells to the site.
 2. Connect the raw water main from Grindstone Well to the water treatment facility.
 3. Connect the finished water main from the water treatment facility to the clearwell.
 4. Install and test all new sampling equipment.
 5. Connect the new 6-inch water main from existing water main to the Clearwell.
 6. Install and test all new equipment at Water Treatment Facility.
- F. Refer to electrical drawings and Division 16 for wiring and control requirements for additional upgrade and construction phasing sequence. The work includes but is not limited to installing new conduits, branch circuit conductors, control wiring at the WTF.

3.02 DISPOSAL OF SURPLUS MATERIALS

- A. Surplus excavated materials shall be removed from the site and properly disposed of after approval is given by the Engineer. The Contractor shall not dispose of surplus materials in wetlands or other areas prohibited by the Army Corps of Engineers, the State, the Local Conservation Commission, or any other government agency having jurisdiction in such matters.
- B. Records as to the destination of all materials to be removed from the site, including stumps, brush, and excess fill, shall be maintained by the Contractor and supplied to the Owner, if requested.

3.03 SITE ACCESS AND COORDINATION OF WORK

- A. The Contractor shall make the road passable within 2 hours of being notified.
- B. The access road shall be made passable at the end of each work day prior to the Contractor leaving the site.

3.04 TEMPORARY CONSTRUCTION FENCE

- A. Contractor shall provide temporary construction fencing as specified in Specification Section 01567, Environmental Protection, as needed.
- B. Temporary construction fencing shall be used to isolate and protect work areas that present a danger to the public including but not limited to excavated areas, staged equipment and materials, or other areas of the construction site at the discretion of the Owner or Engineer.

3.05 PROTECTION OF WATER RESOURCES

- A. The Contractor shall not pollute streams, wetlands, or ponds with fuels, oils, bitumens, calcium chloride, acids or harmful materials. It is the Contractor's responsibility to comply with all applicable Federal, State, and Municipal laws regarding pollution of rivers, wetlands, and streams.
- B. Special measures shall be taken to insure against spillage of any pollutants into public waters. Contractor shall maintain an appropriately sized spill containment kit on site when any fueled vehicles or equipment are present.
- C. The work area is located inside of the 100-foot buffer zone of wetlands. Refueling and/or maintenance of construction equipment shall only take place on paved areas off site not located within any of the following:
 - 1. Wetland resource area or water body;
 - 2. 100 feet of a wetland resource area or water body.
- D. Erosion control measures as depicted on the Contract Drawings shall be installed prior to the commencement of construction. Erosion control measures shall remain in place until the conclusion of construction and removal is approved by the Engineer.
- E. Contractor shall be responsible for maintaining the erosion control measures throughout the duration of construction.
- F. At the commencement of work and again prior to completion, the Contractor shall collect and remove by hand all trash, compost, and loose man-made debris from the site, including anything within the site's wetland resource areas and buffer zones.
- G. Contractor shall clean all machinery of plant parts and loose soil prior to entering the construction site to prevent invasive plant species from entering the resource areas.
- H. Heavy equipment shall be stored in an upland area at least 50-feet from any resource area when not in use or overnight.

3.06 CONTRACTOR'S EMERGENCY SERVICE

- A. Any contractor whose place of business is located beyond the vicinity of the site of work and who does not maintain local headquarters 24 hours a day must make satisfactory arrangements with the Owner to service emergencies or complaints which may occur at night, over the week-end, or when the job is shut down.
 - 1. If he does not, the Owner may make arrangements, and the cost will be charged to the Contractor.
 - 2. Before the final estimate is certified for payment, the Contractor shall make similar arrangements to cover the guarantee period.

3.07 COMPLIANCE WITH REDUCTION OF LEAD IN DRINKING WATER ACT AND SECTION 1417 OF THE SAFE DRINKING WATER ACT (SDWA)

- A. All pipes, pipe fittings, plumbing fittings and fixtures must meet the requirements of the 2011 Reduction of Lead in Drinking Water Act and amendments to SDWA Section 1417 for potable water use.

B. Certification of compliance shall be provided for all applicable materials herein.

3.08 COMMONWEALTH OF MASSACHUSETTS COVID-19 GUIDELINES AND PROCEDURES
FOR ALL CONSTRUCTION SITES AND WORKERS AT ALL PUBLIC WORK

A. The General Contractor, as the responsible party for all safety practices and safety compliance measures at the construction site, shall bear sole responsibility for compliance with all guidelines, procedures, and directives outlined in the Commonwealth of Massachusetts COVID-19 Guidelines and Procedures for All Construction Site and Workers at All Public Work document, dated March 25, 2020. All costs associated with compliance with these guidelines and procedures, either in their current form or any future modifications thereof, which are current as of the time of the bid, shall be paid for by the General Contractor. A web link to the guidelines and procedures is provided below.
<https://www.mass.gov/doc/march-25-2020-construction-guidance>

END OF SECTION

SECTION 01567

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.01 DESCRIPTION

- A. The work covered by this section of the specifications consists of furnishing all labor, materials, equipment and services, and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.
- B. The requirements set forth in this section of the specifications apply where indicated on the Contract Drawings and to any areas adjacent to wetlands, unless otherwise specifically stated.
- C. All work under this Contract shall be in accordance with the conditions stated herein and in the General Conditions. The Determination of Applicability or Order of Conditions issued by the local Conservation Commission applies to this Contract, and all conditions and requirements shall be met by the Contractor.
- D. All erosion control devices shall be constructed or installed prior to beginning any form of excavation, grading, placement of materials, or general construction.

PART 2 PRODUCTS

2.01 SILT FENCE

- A. The silt fence shall consist of a 3-foot wide continuous length sediment control fabric, stitched to a 25-foot wide continuous length support netting, and stapled to pre-weathered oak posts spaced at a maximum of 4-feet. The oak posts shall be 1.5-inches by 1.5-inches by 5-feet and shall be tapered. The support netting shall be industrial strength polypropylene. The sediment control fabric should conform to the following properties:
 - 1. Minimum weight: 2.5 oz/sy (ASTM D3776)
 - 2. Minimum thickness: 17 mils (ASTM D1777)
 - 3. Minimum tear strength: 65 lbs (ASTM D1117)
 - 4. Minimum burst strength: 210 psi (ASTM D3786)
 - 5. Minimum coefficient of permeability: 0.0009 cm/sec
 - 6. Equivalent opening size (EOS): 20 (U.S. Standard Sieve)
 - 7. Allowable water flow rate: 40 gal/min/sf
- B. Sediment control fabric shall be non-rotting, acid and alkali resistant and have sufficient strength and permeability for the purpose intended, including handling and backfilling operations. Fibers shall be low water absorbent. The fiber network must be dimensionally stable and resistant to delamination. The fabric shall be free of any chemical treatment or coating that will reduce its permeability. The fabric shall also be free of any flaws or defects which will alter its physical properties. Torn or punctured fabrics shall not be used. For each specific use, only commercially available fabric which

is certified in writing by the manufacturer for the purpose intended shall be used. The Contractor shall submit a technical data sheet and certified test reports for each type of fabric to be used. The Owner reserves the right to reject any fabric which he deems unsatisfactory for a specific use. The brand name shall be labeled on the fabric or the fabric container.

- C. Fabrics which are susceptible to damage from sunlight or heat shall be so identified by suitable warning information on the packaging material. Fabrics susceptible to sunlight damage shall not be used in any installations where exposure to light will exceed 30 days, unless specifically authorized in writing by the Owner.

2.02 CONSTRUCTION FENCE

- A. Construction fence shall have the following properties:
 - 1. Height: 4 feet
 - 2. Color: Orange
 - 3. Tensile Yield: 3,200 psi
 - 4. Ultimate Tensile Strength: 2,600 psi
 - 5. Nominal Mesh Opening: 2-1/2-inch
- B. Construction fence shall be installed in accordance with the manufacturer's recommendations.

2.03 SPILL CONTAINMENT KIT

- A. Contractor shall maintain a spill containment kit on site throughout the duration of construction. Spill containment kit shall be sized to contain a volume greater than the largest fuel tank on site.

2.04 MULCH SOCKS

- A. Mulch socks shall be constructed with a mesh tube filled with biodegradable material, with a tube diameter of 8-inches, as manufactured by Filtrexx Sustainable Technologies or approved equal. The sock shall be installed as indicated in the Contract Documents.

PART 3 EXECUTION

3.01 NOTIFICATION

- A. The Owner will notify the Contractor in writing of any non-compliance with the foregoing provisions. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails to act promptly, the Owner may order stoppage of all or part of the work until satisfactorily corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the Contractor as a result of time lost due to any stop orders shall be made unless it was later determined that the Contractor was in compliance.

3.02 AREAS OF CONSTRUCTION ACTIVITY

- A. Insofar as possible, the Contractor shall confine his construction activities to those areas defined by the plans and specifications. All land resources within the project boundaries under this contract shall be preserved in their present condition or be restored to a condition after completion of construction at least equal to that which existed prior to work under this contract.

3.03 PROTECTION OF WATER RESOURCES

- A. The Contractor shall not pollute streams, wetlands, or ponds with fuels, oils, bitumens, calcium chloride, acids or harmful materials. It is the Contractor's responsibility to comply with all applicable Federal, State, County and Municipal laws regarding pollution of rivers, wetlands and streams.
- B. Special measures should be taken to insure against spillage of any pollutants into public waters.
- C. Where material or debris has washed or flowed into or has been placed in existing watercourses, ditches, drains, pipes or structures, such material or debris shall be entirely removed and satisfactorily disposed of during progress of the work, and the ditches, channels, drains, pipes, structures, and work shall, upon completion of the work, be left in a clean and neat condition.

3.04 LOCATION OF STORAGE AREAS

- A. The location of the Contractor's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared, as approved by the Conservation Commission, Owner, and/or the Engineer prior to commencement of construction activities. Plans showing storage facilities for equipment and materials shall be submitted for approval of the Owner.
- B. Adequate measures for erosion and sediment control, such as the placement of baled hay or straw around the downstream perimeter of stockpiles, shall be employed to protect any downstream areas from siltation.
- C. The Owner may designate a particular area or areas where the Contractor may store materials used in his operations.

3.05 DISCHARGE OF DEWATERING OPERATIONS

- A. Any water that is pumped and discharged from an excavation as part of the Contractor's water handling shall be filtered by an approved method prior to its discharge into a receiving water or drainage system.
- B. The pumped water shall be filtered through baled hay or straw, a vegetative filter strip or a vegetated channel to trap sediment occurring as a result of the construction operations. The vegetated channel shall be constructed such that the discharge flow rate shall not exceed a velocity of more than 1 foot per second. The sediment shall be cleared from the channel periodically.

3.06 PROTECTION OF AIR RESOURCES

- A. During the progress of work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of water as necessary, so as to minimize the creation and dispersion of dust.
 - 1. If the Engineer decides that it is necessary to use calcium chloride for more effective dust control, then the Contractor shall furnish and apply the material as directed.
 - 2. Calcium chloride shall be commercial grade, furnished in 100-pound, 5-ply bags, stored under weatherproof cover and stacked alternately for ventilation.
 - 3. Application for dust control shall be at the rate of about 1/2 pound per square yard per application.
- B. Burning of rubbish and waste material on the site shall not be permitted.

3.07 SEPARATION AND REPLACEMENT OF TOPSOIL

- A. Topsoil shall be carefully removed and separately stored to be used again as directed. The topsoil shall be stored in an area acceptable to the Owner and adequate measures shall be employed to prevent erosion of said material.

3.08 SILT FENCE

- A. Where indicated on the drawings or where directed by the Owner, the Contractor shall erect and maintain a temporary silt fence. The silt fence shall be used specifically to contain sediment from runoff water and to minimize environmental damage caused by construction.
- B. The 5-foot oak posts shall be driven so that 2-1/2-feet remain above the ground. A 6-inch by 6-inch trench shall then be excavated at the base of the fence for the purpose of laying, backfilling and tamping a minimum of 6-inches of the filter fabric.
- C. The Contractor shall remove the trapped sediment as soon as it reaches a depth of 1-foot or when directed by the Owner.
- D. The silt fence systems will be completely removed from the project at the completion of the project, unless specifically authorized by the Owner to be left in place.

3.10 INSPECTION OF CONSTRUCTION PERIOD BEST MANAGEMENT PRACTICES (BMPs)

- A. Construction Period BMPs shall be inspected and maintained routinely throughout the duration of the project and after every storm event producing a 1/2-inch of precipitation or more.

END OF SECTION

SECTION 02140

SITE DRAINAGE AND DEWATERING

PART 1 GENERAL

1.01 DESCRIPTION

- A. Provide drainage and dewatering as required by the Contract Documents.
 - 1. In general the Contractor shall furnish all materials, equipment, labor and incidentals necessary to provide dewatering and drainage control during construction.

1.02 RELATED WORK

- A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions and Sections in Division 1 of these Specifications.
 - 1. Section 01567 Environmental Protection
 - 2. Section 02222 Earthwork for Water Distribution Systems

1.03 QUALITY ASSURANCE

- A. Comply with all pertinent requirements of governmental agencies having jurisdiction.

1.04 SUBMITTALS

- A. None required.

PART 2 PRODUCTS

2.01 EROSION AND SEDIMENTATION CONTROL

- A. Devices for erosion and sedimentation control shall be as specified in Section 01567, Environmental Protection.

PART 3 EXECUTION

3.01 INSTALLATION

- A. To ensure proper conditions at all times during construction the Contractor shall provide and maintain ample means and devices with which to remove and dispose of all water entering the construction area and all excavations.
 - 1. Means of water removal and disposal shall include but not be limited to wells, surface pumps, and/or well point systems, to the extent required to prevent “boils” or softening of the foundation soils.
 - 2. The Contractor shall pitch the ground around the excavation to prevent water from running into excavated areas and to prevent damage to other structures or work on adjacent property.

3. The Contractor shall remove immediately any surface or seepage water or water from sewers, drains, creeks, or other sources, which may accumulate during the excavation and construction work.
- B. Sufficient stand-by pumping equipment shall be installed and mounted for immediate use in case of emergencies. The Contractor shall be responsible for the adequacy of their dewatering equipment and system in controlling the water and for protection to adjacent public and private property from damage. Any damage to permanent work or existing property resulting from the failure of the Contractor to provide an adequate dewatering system shall be repaired by the Contractor at their expense.
 1. Wells, well points and pump sumps shall be installed with adequate filters to prevent loss of fine grained soils.

3.02 DISPOSAL OF DRAINAGE WATER

- A. All water pumped or drained from the work shall be disposed of in such a manner as to not cause injury to public health, damage to public or private property, interference with other work or adverse impacts to adjacent wetlands.
 1. Effluent from dewatering operations shall not be discharged directly to wetlands or waterways and shall not be discharged to storm drain systems prior to being filtered through a siltation basin.
 2. Discharge shall be such that no erosion occurs. Erosion protection shall be as specified in Section 01567, Environmental Protection.

END OF SECTION

SECTION 02222

EARTHWORK FOR WATER DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work Included: Provide all earthwork as required by the Contract Documents.
- B. In general the work of this Section shall include but not necessarily be limited to, excavation, trenching, filling, backfilling, compaction and grading for water distribution systems.

1.02 RELATED WORK

- A. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions and Sections in Division 1 of these Specifications.
 - 1. Section 02140 Site Drainage and Dewatering
 - 2. Section 02160 Support of Excavation
 - 3. Section 02930 Loam and Seed

1.03 SITE INVESTIGATION

- A. The grades and other site information have been compiled by field surveys.
 - 1. The Contractor acknowledges that it has satisfied itself as to the nature and location of the work.
 - 2. Failure by the Contractor to acquaint itself with all available information concerning the site will not relieve it from the responsibility, for estimating properly, the difficulty or cost of successfully performing the work.

1.04 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
 - 1. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

1.05 PROTECTION OF PROPERTY AND UTILITIES

- A. Extreme care shall be exercised to prevent damage to existing trees, shrubs, utilities, walls, sidewalks, fences and private property.
 - 1. Any damage to these items as a result of work performed by the Contractor shall be repaired by the Contractor at its own expense.
 - 2. Existing property boundary markers, control points and datum elevation markers or bench marks shall be preserved.
 - a. All such items which are displaced or destroyed by the Contractor shall be replaced by a registered Engineer or Land Surveyor, as required, with all expenses paid by the Contractor.

- B. Utility agencies shall be contacted and advised of proposed work prior to the start of work by the Contractor.
 - 1. Notify Dig Safe.
 - 2. Obtain information from the proper sources and authorities concerning locations of all utilities within the scope of this work.
 - 3. If and when encountered, utilities shall be supported and protected, and the Engineer shall be notified.
 - a. Ample time shall be allowed for entrance and taking such measures as may be required for the continuance of such services by the utility owner.
 - 4. Rules and regulations governing the respective utilities shall be observed. The Contractor's responsibilities with respect to utility locations, protection, interferences and relocations shall be as further specified in Section 01013.

1.06 REFERENCE STANDARDS

- A. The Contractor shall comply with the provisions of the following agencies as they apply to this project and as referenced:
 - 1. Associated General Contractors of America, Inc. (AGCA) "Manual of Accident Prevention in Construction."
 - 2. Occupational Safety and Health Administration (OSHA), United States Department of Labor Requirements.
 - 3. American National Standards Institute (ANSI) "Safety Requirements for Construction and Demolition."
 - 4. American Society for Testing & Materials (ASTM).
 - 5. American Water Works Association (AWWA) Standards.
 - 6. Massachusetts Department of Transportation Highway Division "Standard Specifications for Highways and Bridges"
- B. The following American Society for Testing and Materials (ASTM) standards form a part of this specification as referenced:
 - 1. ASTM C33 Standard Specification for Concrete Aggregates
 - 2. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
 - 3. ASTM D6913 Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
 - 4. ASTM D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- C. The following Massachusetts Department of Transportation (MassDOT) Standard Specifications form a part of the specification as referenced:
 - 1. Section M1 Soils and Borrow Materials
 - 2. Section M2 Aggregates and Related Materials

1.07 SUBMITTALS

- A. Comply with pertinent provisions of Section 01300.
- B. Testing and Samples:
 - 1. Test reports on backfill materials, moisture density tests, in place density tests (ASTM D1557 and D6938).
 - 2. Representative backfill and bedding samples and gradation tests (ASTM D6913).
 - 3. Tests shall be in conformance with paragraph 3.16; compaction requirements and testing as specified herein.

PART 2 PRODUCTS

2.01 GENERAL

- A. Except as specified for pipe bedding, pipe cover, roadway subbase, tank demolition backfill, and refill for rock and unsuitable materials, backfill materials may be as follows:
 - 1. Suitable materials for trench backfill shall be the material excavated during the course of construction, but excluding debris, pieces of pavement, frozen materials, organic matter, silt, top soil, ledge excavation and rocks over six inches in largest dimension.
 - 2. Gradation of material shall be generally as specified for granular fill except that maximum size of stone shall be 6 inches.
 - 3. The suitability of existing material for use as backfill will be determined by the Engineer based on sample testing conducted by the Contractor.
 - 4. All unsuitable materials shall be disposed of as per paragraph 3.18.A.

2.02 CONCRETE SAND

- A. Concrete sand shall meet ASTM C33 for fine aggregate.

2.03 ORDINARY FILL

- A. Ordinary fill shall be used for general raise-in-grade fill in proposed drainage channel and landscaping areas. It shall consist of inorganic soil from on-site cut areas with a maximum particle size of 8 inches and less than 60 percent passing the No. 200 sieve. The material shall be free from ice, snow, roots, surface coatings, sod, loam, clay, rubbish, and other deleterious matter. It is anticipated that typical material excavated on site will be able to be used as ordinary fill, subject to sieve analysis and final approval by the Engineer.

2.04 GRANULAR FILL

- A. Granular fill shall be used for general raise-in-grade fill in trench areas below the base course material under pavement and access roads. It shall consist of inorganic soil and shall be free from ice, snow, roots, surface coatings, sod, loam, clay, rubbish, and other deleterious matter. It is anticipated that typical material excavated will be able to be used as granular fill, subject to sieve analysis and final approval by the Engineer.
1. Granular fill shall meet the following gradation requirements:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
4-inch	100
No. 4	30-95
No. 40	15-75
No. 200	0-10

2.05 PROCESSED GRAVEL FOR ROADWAY BASE

- A. Shall meet the requirements of the Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges, latest edition, M1.03.1.

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
3 inch	100
1 1/2 inch	70-100
1/4 inch	50-85
No. 4	30-60
No. 200	0-10

2.06 DENSE GRADED CRUSHED STONE

- A. Shall meet the requirements of the Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges, latest edition, M2.01.7.

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
2 inch	100
1 1/2 inch	70-100
3/4 inch	50-85
No. 4	30-55
No. 50	8-24
No. 200	3-10

2.07 3/4-INCH CRUSHED STONE

- A. Crushed Stone: Shall consist of durable crushed stone or durable crushed gravel stone, washed, free from ice and snow, stone dust, sand, clay, loam, or other deleterious material. The crushed stone shall be uniformly blended and conform to the following:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1 inch	100
3/4 inch	90-100
1/2 inch	10-50
3/8 inch	0-20
No. 4	0-5

PART 3 EXECUTION

3.01 TRENCH EXCAVATION

- A. The Contractor shall make all excavation in earth and in rock, necessary or incidental to the proposed construction under the terms of this Contract and as herein specified or indicated on the Drawings.
 - 1. All trench excavation shall be accomplished by open cut method.
 - 2. All excavation shall be made in such manner and to such widths as will give ample room for properly installing, constructing and inspecting pipe lines and structures they are to contain.
 - 3. The width of trenches shall be sufficient to allow thorough compacting of the refill adjacent to the lower quarters of the pipe. At pipe joints such additional width and depth shall be excavated as is necessary to give ample room for properly making and inspecting the pipe joint.
 - 4. Bracing and support of all trench excavation shall meet all requirements of Local and State ordinances and OSHA regulations.
 - a. Sheet piling and bracing, or the use of a steel support box shall be used where required to maintain a safe working condition and provide protection from collapse of the trench walls.
 - 5. During excavations, material determined by the Engineer to be suitable for backfilling, shall be placed a sufficient distance from the banks of the trench to avoid slides or cave-ins. Unsuitable material shall be disposed of as specified in paragraph 3.18 and replaced with surplus suitable material and gravel borrow to the extent necessary.
 - 6. Should conditions make it impractical or unsafe to place material along the trench, it shall be hauled and stored at a location provided by the Contractor. When required, it shall be re-handled and used in backfilling the trench. No additional compensation will be made for re-handling this material.

3.02 EXCAVATION CLASSIFICATION

- A. Earth excavation shall comprise all materials not classified as rock excavation and shall include clay, silt, sand, muck, gravel, hardpan, loose shale, pavement, pavement bases, loose stone in masses and boulders measuring less than one cubic yard in volume.

3.03 NOT USED

3.04 UNSUITABLE MATERIAL

- A. All pipes and structures are to be laid on a stable foundation. If material at grade is determined to be unsuitable by the Engineer, the Contractor shall excavate a further depth and/or width, and refill with an approved material. Refill material shall be crushed stone or as determined by the Engineer.
 - 1. Any excavation in excess of the amount ordered by the Engineer shall be backfilled and compacted with an approved granular material, at the Contractor's expense.

3.05 NOT USED

3.06 DEWATERING

- A. See Specification Section 02140.

3.07 BACKFILLING AND COMPACTING

- A. Backfill shall be placed in uniform layers. Each layer shall be thoroughly compacted by tamping or vibrating with mechanical compacting equipment.
 - 1. Care shall be taken to compact the backfill materials throughout the full width of the excavation and beneath all pipes and structures.
 - 2. The backfilling of trenches shall proceed as soon as the laying of the pipe(s) or installation of the structures will allow.
 - 3. Backfill shall be granular fill or suitable material from the excavation if the material complies with the granular fill gradation requirements.
 - a. This backfill shall be placed in layers 12 inches deep in loose measure, and each layer shall be thoroughly compacted.
 - b. This backfill shall be placed up to the bottom of materials specified to be placed for surfacing requirements.

3.08 NOT USED

3.09 STRIPPING TOPSOIL

- A. Topsoil shall be carefully stripped and separately stored to be used again for topsoiling and seeding on off-pavement areas within which excavations are to be made.

3.10 EXCAVATION NEAR EXISTING STRUCTURES AND UTILITIES

- A. It is called to the attention of the Contractor that there are utilities and other underground pipes along the course of the work. Information shown on the Drawings as to the location of said utilities and pipes is from the best available sources, but no guarantee is implied, nor is it to be assumed that such information is accurate or complete. Utility lines shall be crossed in the course of the work.
- B. The Contractor shall exercise special care during his operations to avoid injury to all such underground utilities and structures.
 - 1. When necessary, the Contractor shall cooperate with, and consult with representatives of the Owner and the utility companies in order to avoid damage to the utilities.
 - 2. The Contractor shall arrange for or furnish and erect suitable supports and shoring or other means of protection where required to protect the utilities, all at no additional cost to the Owner.
 - 3. Hand methods of excavating shall be used around buried utilities and is included in the work to be done under this Contract, at no additional cost to the Owner.
 - 4. Interference between the proposed work and existing utilities, relocation of existing utilities, repair or damage to existing utilities, and protection and support of existing utilities during construction of the proposed work will be as specified in Section 01013.

3.11 NOT USED

3.12 PROTECTION OF PROPERTY

- A. The Contractor shall, at his own expense, preserve and protect from injury all property either public or private along and adjacent to the line of work, and be responsible for and repair any and all damage and injury thereto, arising out of or in consequence of any act or omission of the Contractor.
 - 1. All existing pipes, culverts, poles, wires, fences, mailboxes, stone walls, curbs, bounds, etc., shall be temporarily removed, supported in place or otherwise protected from injury, and shall be restored to at least as good condition as that in which they were found immediately prior to the start of work.
 - 2. Lawns, shrubs, bushes, planting beds and decorative trees disturbed or damaged shall be restored to a condition equal to that found prior to the start of construction, either by temporary transplant or replacement in kind, except as otherwise indicated on the Drawings.

3.13 SAFETY AND ACCOMMODATION

- A. The Contractor shall provide, at his own expense, suitable bridges over trenches where required for the accommodation and safety of the traveling public, and provide facilities for access to private driveways for vehicular use.
 - 1. It shall erect suitable barriers around the excavation to prevent accidents to the public and shall place and maintain during the night, sufficient lights on or near the work.
 - 2. A space of twenty (20) feet shall be left so that free access may be had at all times to fire hydrants and proper precautions shall be taken so that the entrances to fire hydrants and fire stations shall not be blocked or obstructed.

3.14 NOT USED

3.15 NOT USED

3.16 COMPACTION REQUIREMENTS AND TESTING

- A. All backfill materials shall be thoroughly compacted by rolling, tamping or vibrating with approved mechanical or pneumatic compacting equipment so that pipe, structures, paving and other construction will not settle at the time of construction or in the future. The responsibility for thorough compaction is that of the Contractor irrespective of methods of backfill and depth of backfill layers placed.
- B. All percentages of compaction specified herein shall be of the maximum dry density at the optimum moisture content as established by ASTM D1557 and verified by ASTM D6938. When the term “thoroughly compacted” is used in these specifications, it shall mean compaction to at least 95% of the maximum density of the soils at optimum moisture content.
- C. The following numbers and types of soil tests shall be made where directed by the Engineer. These tests shall be made by qualified personnel of an independent testing laboratory, acceptable to the Engineer and paid by the Contractor. Electronic copies of all test results shall be delivered to the Engineer.
 - 1. Particle-Size analysis of Soils and Backfill Materials in accordance with ASTM D6913. A minimum of one satisfactory test from each material in the field shall

- be submitted to the Owner and Engineer in addition to the initial shop drawings confirming material compliance with the specifications.
2. Moisture-Density Relationship of soil in accordance with ASTM D1557, Method D. A minimum of one satisfactory test from each material in the field shall be submitted to the Owner and Engineer in addition to the initial shop drawings confirming material compliance with the specifications.
 3. In-Place Density Tests of materials in accordance with ASTM D6938. Compaction tests will be taken at random on compaction layers below and at finished surfaces. Compaction testing frequency shall occur as outlined below, or as directed by the Engineer.
 - a. Not less than one compaction test for every 300 linear feet.
 - b. Not less than one compaction test for every 5,000 sq. ft. for each lift.
 4. Failed tests shall be repeated at the Contractor's expense.
- D. The Owner reserves the right to have additional compaction tests performed by an independent laboratory with testing costs borne by the Owner, except that failed tests shall be repeated at the Contractor's expense.
- E. If any of the field density test results fail to meet the density as specified herein for the earthwork involved, then the Contractor shall remove all of the earthwork in that portion of the work involved as determined by the Engineer, and shall replace it in accordance with these Specifications to the required density. After the work is replaced, additional field density tests will be made by an independent testing laboratory retained by the Owner, and the Contractor shall reimburse the Owner for all costs for such additional testing.
1. Compaction shall be to the following densities:
- | <u>Fill and Backfill Location</u> | <u>Modified Proctor
Density (Percent)</u> |
|---|---|
| Under structures and pipes | 95 |
| Beside structure foundation walls | 95 |
| Top two feet under pavements or access road | 95 |
| Under pavements or access road below top two feet | 95 |
| Trenches through unpaved areas | 90 |
| In embankment | 90 |
- F. Puddling and jetting of the backfill shall not be permitted except in special cases approved by the Engineer.

3.17 TRENCH EXCAVATION IN FILL

- A. Where the existing ground surface does not permit at least 4 feet of cover over the finished pipe, and where indicated on the Drawings, the Contractor shall place and compact suitable fill material to the depth necessary to provide the 4 foot minimum cover, including loam to a minimum top width of 6 feet, or as otherwise shown on the Drawings
1. Minimum side slopes shall be two horizontal to one vertical.
 2. Fill material shall be from surplus suitable material or granular fill, and be clean, dry, and capable of satisfactory compaction, all as approved by the Engineer, and shall be placed in layers not exceeding 8 inches thick and compacted.
 3. The trench shall be excavated in the compacted fill and the remainder of the work shall be in accordance with other portions of these Specifications.

3.18 DISPOSAL OF SURPLUS AND UNSUITABLE EXCAVATED MATERIAL

- A. All surplus excavated material and any material unsuitable for use shall be disposed of in disposal areas provided by the Contractor.
 - 1. It is the Contractor's responsibility to dispose of unsuitable excavated material in an approved manner.
 - 2. The Contractor shall not dispose of surplus materials on wetlands or other areas prohibited by the Corps of Engineers or the Commonwealth of Massachusetts Department of Environmental Protection, or any other local authority having jurisdiction.

3.19 DUST CONTROL

- A. The Contractor shall perform dust control operations as specified in Section 01567.

3.20 CLEAN-UP

- A. The Contractor shall remove all surplus materials (earth, pipe, fittings, storage and office trailers, barricades, etc.), from the construction site.
 - 1. All paved roadways affected by the construction shall have their full width swept clean (paved edge to paved edge) using methods which control the dust.
 - 2. Before the Contractor may proceed to another roadway, clean up of the previous roadway must be complete.

END OF SECTION



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