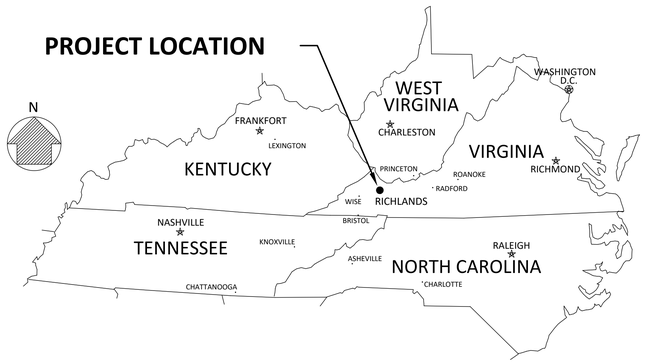

VICINITY MAP

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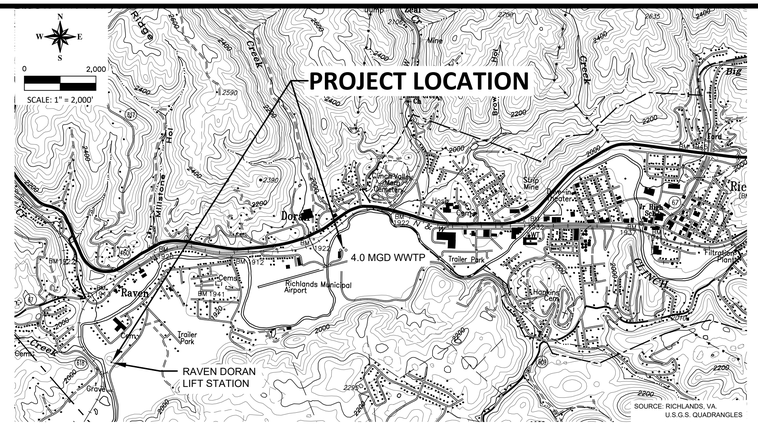

LOCATION MAP

TOWN OF RICHLANDS - 4.0 MGD WWTP UPGRADES AND IMPROVEMENTS

WITH FINANCIAL ASSISTANCE FROM

VIRGINIA CLEAN WATER REVOLVING LOAN FUND
PROJECT NO. C-515667

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

TOWN OF RICHLANDS, VIRGINIA
200 WASHINGTON SQUARE
RICHLANDS, VIRGINIA 24641
(276) 964-2566

ISSUED FOR BIDS

PROJECT NO. 14249
January 7, 2022

McGill Associates Note:
Project scope has been reduced from original design. Out-of-scope plan sheets and items have been removed or crossed out in red to reflect the current project scope.

COMMONWEALTH OF VIRGINIA
D. BRIAN MCGOUGH
Lic. No. 036275
1-7-22
PROFESSIONAL ENGINEER

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

TITLE SHEET

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS

Designed	DBM
Drawn	ESB
Checked	
Date	JULY 2020

Project No.
14249

THOMPSON & LITTON

Sheet No.
T001

SHEET INDEX

GENERAL DRAWINGS		
T001		COVER SHEET
G001		SHEET INDEX, GENERAL & CIVIL NOTES & ABBREVIATIONS
CIVIL DRAWINGS		
C001		EROSION & SEDIMENT CONTROL DETAILS
C002		EROSION & SEDIMENT CONTROL DETAILS
C003		MISCELLANEOUS DETAILS
C004		MISCELLANEOUS DETAILS
C005		MAJOR EQUIPMENT SCHEDULES
C006		VALVE SCHEDULES
C101		SITE SURVEY
C102		SITE DEMOLITION AND EROSION & SEDIMENT CONTROL PLAN PHASE 1
~~C103~~		~~SITE PLAN~~
~~C104~~		~~EROSION & SEDIMENT CONTROL PLAN PHASE 2~~
~~C201~~		~~MAIN PUMP STATION DEMOLITION PLAN~~
C202		PRELIMINARY TREATMENT BUILDING DEMOLITION PLAN
~~C203~~		~~AERATION BASIN DEMOLITION PLAN~~
~~C204~~		~~UV AND EFFLUENT SYSTEMS DEMOLITION PLAN~~
~~C205~~		~~ANAEROBIC DIGESTERS ROOF DEMOLITION PLAN~~
~~C206~~		~~ANAEROBIC DIGESTERS UPPER LEVEL DEMOLITION PLAN~~
~~C207~~		~~ANAEROBIC DIGESTERS LOWER LEVEL DEMOLITION PLAN~~
~~C208~~		~~ANAEROBIC DIGESTERS DEMOLITION SECTIONS~~
C209		SHOP BUILDING EQUIPMENT DEMOLITION PLAN
~~C210~~		~~RAVEN-DORAN LIFT STATION DEMOLITION PLAN~~
~~C301~~		~~MAIN PUMP STATION RENOVATION PLAN~~
~~C302~~		~~MAIN PUMP STATION SECTIONS~~
~~C303~~		~~RAVEN-DORAN LIFT STATION RENOVATION & ADDITION PLAN~~
~~C304~~		~~RAVEN-DORAN LIFT STATION SECTIONS~~
C401		PRELIMINARY TREATMENT BUILDING RENOVATION PLAN
C402		PRELIMINARY TREATMENT BUILDING SECTIONS
~~C403~~		~~SEPTAGE RECEIVING STATION PLAN AND SECTIONS~~
C501		PRIMARY CLARIFIERS RENOVATION PLAN
C502		PRIMARY CLARIFIERS SECTIONS
C503		SECONDARY CLARIFIERS RENOVATION PLAN
C504		SECONDARY CLARIFIERS PLAN AT PUMP LEVEL & SECTIONS
~~C505~~		~~GRAVITY THICKENER RENOVATION PLAN & SECTION~~
~~C601~~		~~AERATION BASIN RENOVATION PLAN~~
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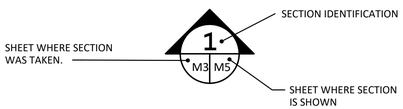
~~C701~~		~~UV AND EFFLUENT SYSTEMS RENOVATION PLAN~~
~~C702~~		~~UV AND EFFLUENT SECTIONS~~
C801		SHOP BUILDING RENOVATION PLAN
C802		SHOP BUILDING SECTIONS
~~C803~~		~~ANAEROBIC DIGESTERS ROOF RENOVATION PLAN~~
~~C804~~		~~ANAEROBIC DIGESTERS UPPER LEVEL RENOVATION PLAN~~
~~C805~~		~~ANAEROBIC DIGESTERS LOWER LEVEL RENOVATION PLAN~~
~~C806~~		~~ANAEROBIC DIGESTER RENOVATION SECTIONS~~
ARCHITECTURAL DRAWINGS		
A201		NEW PRELIMINARY TREATMENT BUILDING EXTERIOR ELEVATIONS
STRUCTURAL DRAWINGS		
S001		GENERAL NOTES AND DESIGN CRITERIA
~~S101~~		~~MAIN PUMP STATION PLANS~~
S102		EXISTING PRELIMINARY TREATMENT BUILDING PLAN
S300		SECTIONS AND DETAILS

MECHANICAL DRAWINGS		
M001		MECHANICAL LEGEND, ABBREVIATIONS, AND GENERAL NOTES
~~M101~~		~~UPPER AND LOWER LEVEL HVAC PLAN - MAIN PUMP STATION~~
~~M102~~		~~ELEVATION HVAC PLAN - MAIN PUMP STATION~~
M103		LOWER AND UPPER HVAC PLAN - PRETREATMENT BUILDING
ELECTRICAL DRAWINGS		
E001		ELECTRICAL LEGEND, ABBREVIATIONS, AND GENERAL NOTES
ES1		ELECTRICAL SITE PLAN
~~E101~~		~~UPPER AND LOWER LEVEL LIGHTING PLAN - MAIN PUMP STATION~~
E102		LOWER AND UPPER LIGHTING PLAN - PRETREATMENT BUILDING
~~E201~~		~~UPPER AND LOWER LEVEL POWER PLAN - MAIN PUMP STATION~~
E202		LOWER AND UPPER POWER PLAN - PRETREATMENT BUILDING
E203		POWER PLAN - PRIMARY CLARIFIERS
E204		POWER PLAN - SECONDARY CLARIFIERS
~~E205~~		~~POWER PLAN - AERATION BASIN~~
~~E206~~		~~POWER PLAN - UV AND EFFLUENT SYSTEMS BUILDING~~
~~E207~~		~~NOT USED~~
~~E208~~		~~POWER PLAN - ANAEROBIC DIGESTERS UPPER LEVEL~~
~~E209~~		~~POWER PLAN - ANAEROBIC DIGESTERS LOWER LEVEL~~
E210		POWER PLAN - SHOP BUILDING
~~E211~~		~~POWER PLAN - RAVEN DORAN PUMP STATION~~
~~E212~~		~~POWER PLAN - GRAVITY THICKENER~~
E501		ELECTRICAL DETAILS
E601		EXISTING ELECTRICAL ONE-LINE DIAGRAM
E701		ELECTRICAL SCHEDULES
E702		ELECTRICAL SCHEDULES
E703		ELECTRICAL SCHEDULES
INSTRUMENTATION DRAWINGS		
I001		INSTRUMENTATION & CONTROLS SYMBOLS & ABBREVIATIONS
I101		CONTROL SYSTEM ARCHITECTURE DIAGRAM
~~I201~~		~~AERATION BASINS INSTRUMENTATION DIAGRAM~~

Sheet C-807 "Details Digesters" has been omitted.

GENERAL NOTES

1. OWNERSHIP OF DOCUMENTS -THIS DOCUMENT INCLUDING THE IDEAS AND DESIGNS INCORPORATED HEREIN AS AN INSTRUMENT OF THE PROFESSIONAL SERVICE IS THE PROPERTY OF THOMPSON & LITTON AND IS NOT TO BE USED IN WHOLE OR IN PART FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF THOMPSON & LITTON.
2. MINIMUM PIPE COVER SHALL BE 3'-0" UNLESS NOTED OTHERWISE.
3. PIPE FITTINGS SHOWN ARE NOT INTENDED TO BE PRECISE, EITHER IN QUANTITY OR LOCATION. EXACT NUMBER WILL DEPEND ON PIPE MATERIAL SELECTED AND MUST BE DETERMINED BY THE CONTRACTOR.
4. ALL UNPAVED AREAS DISTURBED BY EXCAVATION SHALL BE SEEDED.
5. EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES ARE NOT GUARANTEED AND SHALL BE INVESTIGATED AND VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING WORK. ANY DAMAGE DONE TO EXISTING UTILITIES AND FACILITIES SHALL BE REPAIRED AND RESTORED TO ORIGINAL CONDITION.
6. DO NOT SCALE CONCRETE WALL THICKNESS OR OTHER CONCRETE DIMENSIONS FROM PLAN DRAWINGS. REFER TO PLAN DIMENSIONS OR SECTION DRAWINGS.
7. SECTIONS ON DRAWINGS ARE IDENTIFIED AS FOLLOWS:



CIVIL ABBREVIATIONS

BOT	Bottom	FIN.	Finished	NPT	National Pipe Thread	SCH.	Schedule
C/C	Center to Center	FLG	Flange	OHE	Over Head Electric	Sec.	Secondary
CONC	Concrete	FRP	Fiber Reinforced Polymer	PD	Positive Displacement	T.O.S.	Top of Slab
CPVC	Chlorinated Polyvinyl Chloride	HLU	Hand Lay Up	PE	Polyethylene	T.O.W.	Top of Wall
DIP	Ductile Iron Pipe	INV	Invert	PMM	Packaged Metering Manhole	TEFC	Totally Enclosed, Fan Cooled
E/W	Each Way	MAX	Maximum	PRV	Pressure Reducing Valve	TYP.	Typical
EL	Elevation	Min	Minimum	PVC	Polyvinyl Chloride	VDOT	Virginia Department of Transportation
ELEV	Elevation	MJ	Mechanical Joint	RAS	Return Activated Sludge	W.L.	Water Level
EQ	Equalization	N/C	Normally Closed	RPZ	Reduced Pressure Zone	WAS	Waste Activated Sludge
FFE	Finished Floor Elevation	N/O	Normally Open	S.S.	Stainless Steel	WW	Wastewater

STRUCTURAL ABBREVIATIONS

BLDG.	Building
E.W. T&B	Each Way, Top and Bottom
FLR.	Floor
FTG.	Footing
INSUL	Insulation
LGTH.	Length
MTL.	Metal
REINF.	Reinforcement
S.O.G.	Slab On Grade
W.W.F.	Welded Wire Fabric

MECHANICAL ABBREVIATIONS

EF	Exhaust Fan
HVAC	Heating, Ventilation, and Air Conditioning
LV	Louver
UH	Unit Heater

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

SHEET INDEX, GENERAL & CIVIL NOTES & ABBREVIATIONS

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Designed	DBM
Drawn	ESB
Checked	
Date	JULY 2020

Project No.
14249

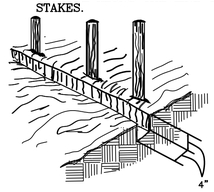
THOMPSON & LITTON

Sheet No.
G001

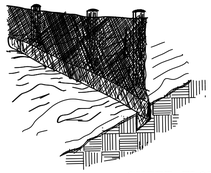
CONSTRUCTION OF A SILT FENCE (WITHOUT WIRE SUPPORT)

1. SET THE STAKES.

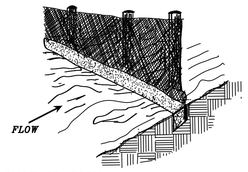
2. EXCAVATE A 4"X 4" TRENCH UPSLOPE ALONG THE LINE OF STAKES.



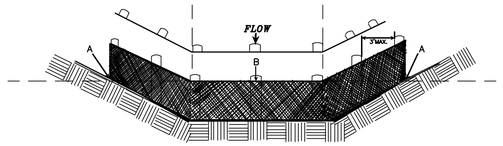
3. STAPLE FILTER MATERIAL TO STAKES AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT THE EXCAVATED SOIL.



SHEET FLOW INSTALLATION
(PERSPECTIVE VIEW)



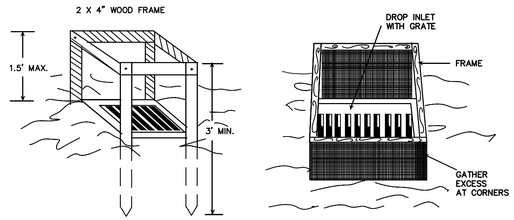
POINTS A SHOULD BE HIGHER THAN POINT B.

DRAINAGEWAY INSTALLATION
(FRONT ELEVATION)

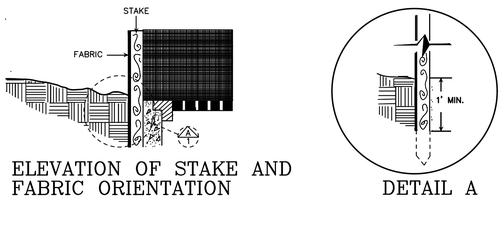
SOURCE: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control,VA. DSWC Sherwood and Wyant

PLATE 3.05-2

SILT FENCE DROP INLET PROTECTION



PERSPECTIVE VIEWS



ELEVATION OF STAKE AND FABRIC ORIENTATION

DETAIL A

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPE NO GREATER THAN 5%) WHERE THE INLET SHEET OR OVERLAND FLOWS (NOT EXCEEDING 1 C.F.S.) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.

SOURCE: N.C. Erosion and Sediment Control Planning and Design Manual, 1988

PLATE 3.07-1

TABLE 3.05-B

PHYSICAL PROPERTIES OF FILTER FABRIC IN SILT FENCE

Physical Property	Test	Requirements
Filtering Efficiency	ASTM 5141	75% (minimum)
Tensile Strength at 20% (max.) Elongation*	VTM-52	Extra Strength - 50 lbs./linear inch (minimum) Standard Strength - 30 lbs./linear inch (minimum)
Flow Rate	ASTM 5141	0.2 gal./sq.ft./ minute (minimum)
Ultraviolet Radiation Stability %	ASTM-G-26	90% (minimum)

* Requirements reduced by 50% after six months of installation.

Source: VHTRC

SOURCE: VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK

TABLE 3.30-A

CUBIC YARDS OF TOPSOIL REQUIRED FOR APPLICATION TO VARIOUS DEPTHS

Depth (inches)	Per 1,000 Square Feet	Per Acre
1	3.1	134
2	6.2	268
3	9.3	403
4	12.4	537
5	15.5	672
6	18.6	806

Source: Va. DSWC

SOURCE: VIRGINIA EROSION & SEDIMENT CONTROL HANDBOOK

TABLE 3.31-B

ACCEPTABLE TEMPORARY SEEDING PLANT MATERIALS

"QUICK REFERENCE FOR ALL REGIONS"

Planting Dates	Species	Rate (lbs./acre)
Sept. 1 - Feb. 15	50/50 Mix of Annual Ryegrass (Lolium multi-florum) & Cereal (Winter) Rye (Secale cereale)	50 - 100
Feb. 16 - Apr. 30	Annual Ryegrass (Lolium multi-florum)	60 - 100
May 1 - Aug 31	German Millet (Setaria italica)	50

Source: Va. DSWC

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

TABLE 3.31-C

TEMPORARY SEEDING PLANT MATERIALS, SEEDING RATES, AND DATES

SPECIES	SEEDING RATE		NORTH[a]			SOUTH[b]			PLANT CHARACTERISTICS
	Acre	1000 ft²	3/1 to 4/30	5/1 to 8/15	8/15 to 11/1	2/15 to 4/30	5/1 to 9/1	9/1 to 11/15	
OATS (Avena sativa)	3 bu. (up to 100 lbs., not less than 50 lbs.)	2 lbs.	X	-	-	X	-	-	Use spring varieties (e.g., Noble).
RYE[d] (Secale cereale)	2 bu. (up to 110 lbs., not less than 50 lbs.)	2.5 lbs.	X	-	X	X	-	X	Use for late fall seedings, winter cover. Tolerates cold and low moisture.
GERMAN MILLET (Setaria italica)	50 lbs.	approx. 1 lb.	-	X	-	-	X	-	Warm-season annual. Dies at first frost. May be added to summer mixes.
ANNUAL RYEGRASS[c] (Lolium multi-florum)	60 lbs.	1½ lbs.	X	-	X	X	-	X	May be added in mixes. Will mow out of most stands.
WEEPING LOVEGRASS (Eragrostis curvula)	15 lbs.	5½ ozs.	-	X	-	-	X	-	Warm-season perennial. May bunch. Tolerates hot, dry slopes and acid, infertile soils. May be added to mixes.
KOREAN LESPEDEZA[c] (Lespedeza stipulacea)	25 lbs.	approx. 1½ lbs.	X	X	-	X	X	-	Warm season annual legume. Tolerates acid soils. May be added to mixes.

[a] Northern Piedmont and Mountain region. See Plates 3.22-1 and 3.22-2.
[b] Southern Piedmont and Coastal Plain.
[c] May be used as a cover crop with spring seeding.
[d] May be used as a cover crop with fall seeding.
X May be planted between these dates.
- May not be planted between these dates.

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

APPENDIX 3.32-a

SEED QUALITY CRITERIA

Where certified seed is not available, the minimum requirements for grass and legume seed used in vegetative establishment are as follows:

a. All tags on containers of seed shall be labeled to meet the requirements of the State Seed Law.

b. All seed shall be subject to re-testing by a recognized seed laboratory that employs a registered seed technologist or by a state seed lab.

c. All seed used shall have been tested within twelve (12) months.

d. Inoculant - the inoculant added to legume seed in the seed mixtures shall be a pure culture of nitrogen-fixing bacteria prepared for the species. Inoculants shall not be used later than the date indicated on the container. Twice the supplier's recommended rate of inoculant will be used on dry seedings; five times the recommended rate if hydroseeded.

e. The quality of the seed used shall be shown on the bag tags to conform to the guidelines in Table 3.32-E.

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

TABLE 3.32-A (Continued)
CHARACTERISTICS OF COMMONLY SELECTED GRASSES

COMMON NAME (Botanical Name)		Life Cycle	Season	pH Range	Germination Time, In Days	Optimum Germination Temperature (°F)	Winter Hardiness	Drought Tolerance	Fertility	Soil Drainage Tolerance	Seeds Per Pound	MAINTENANCE REQUIREMENTS	REMARKS	Suggested Varieties for Virginia
FINE FESCUES	HARD FESCUE (Festuca Longifolia)	P	C	5.0-6.2	10-14	60-80	VG	G	L	MWD	400K	Grows well in sun or shade and will tolerate infertile soils; improved disease resistance.	Exceeds all fine fescues in most tests. Excellent for low-maintenance situations.	Reliant, Spartan, Aurora
	CHEWINGS FESCUE	P	C	5.0-6.2	10-14	60-80	VG	G	L	MWD	400K	Tolerates shade, dry infertile soils.	Poor traffic tolerance, less thatch than other fine fescues.	Flyer
	RED FESCUE (Festuca Rubra)	P	C	5.0-6.2	10-14	60-80	VG	G	L	MWD	400K	Low to medium fertility requirements. Requires well-drained soil.	Spreads by rhizomes, tillers and stolons. Will not take traffic - very shade tolerant.	Long-fellow, Victory
REED CANARYGRASS (Phalaris arundinacea)		P	C	5.8-6.2	21	70-85	G	G	M-H	VPD	530K	Do not mow closely or often.	Conservation cover in wet areas.	No named varieties

KEY

A = Annual P = Perennial C = Cool Season Plant W = Warm Season Plant G = Good F = Fair P = Poor VP = Very Poor H = High
M = Medium L = Low SPD = Somewhat Poorly Drained MPD = Moderately Poorly Drained PD = Poorly Drained VPD = Very Poorly Drained

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

TABLE 3.32-A
CHARACTERISTICS OF COMMONLY SELECTED GRASSES

COMMON NAME (Botanical Name)	Life Cycle	Season	pH Range	Germination Time, In Days	Optimum Germination Temperature (°F)	Winter Hardiness	Drought Tolerance	Fertility	Soil Drainage Tolerance	Seeds Per Pound	MAINTENANCE REQUIREMENTS	REMARKS	Suggested Varieties for Virginia
TALL FESCUE (Festuca arundinacea)	P	C	5.5-6.2	10-14	60-85	F	F	M	SPD	225K	Low when used for erosion control; high when used in lawn	Better suited for erosion control and rough turf application.	Ky 31
TALL FESCUES (Improved)	P	C	5.5-6.2	10-14	60-85	F	G	M	SPD	220K	Responds well to high maintenance.	Excellent for lawn and fine turf.	See current VCIA list.
KENTUCKY BLUEGRASS (Poa pratense)	P	C	6.0-6.5	14	60-75	G	P	M	SPD	2.2m	Needs fertile soil, favorable moisture. Requires several years to become well established.	Excellent for fine turf-taken traffic, mowing. Poor drought/heat tolerance.	See current VCIA list.
PERENNIAL RYEGRASS (Lolium perenne)	P	C	5.8-6.2	7-10	60-75	F	F	M-H	SPD	227K	Will tolerate traffic.	May be added to mixes. * Improved varieties will perform well all year.	See current VCIA list.

KEY

A = Annual P = Perennial C = Cool Season Plant W = Warm Season Plant G = Good F = Fair P = Poor VP = Very Poor H = High
M = Medium L = Low SPD = Somewhat Poorly Drained MPD = Moderately Poorly Drained PD = Poorly Drained VPD = Very Poorly Drained

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

TABLE 3.32-A (Continued)
CHARACTERISTICS OF COMMONLY SELECTED GRASSES

COMMON NAME (Botanical Name)	Life Cycle	Season	pH Range	Germination Time, In Days	Optimum Germination Temperature (°F)	Winter Hardiness	Drought Tolerance	Fertility	Soil Drainage Tolerance	Seeds Per Pound	MAINTENANCE REQUIREMENTS	REMARKS	Suggested Varieties for Virginia
REDTOP (Agrostis alba)	P	C	5.8-6.2	10	65-85	G	F	L	PD	5m	Will tolerate poor, infertile soils; deep rooted.	Does well in erosion control mixes - not for lawns.	No named varieties.
WEEPING LOVEGRASS (Eragrostis curvula)	P	W	4.5-6.2	14	65-85	F-P	G	L-M	SPD	1.5m	Low-fertility requirements; excellent drought tolerance.	Fast-growing, warm-season bunch grass. Excellent cover for erosion control.	No named varieties.
BERMUDAGRASS (Cynodon dactylon)	P	W	5.8-6.2	21	70-95	P	G	M-H	SPD	1.8m hulled	High nitrogen utilization, excellent drought tolerance. Some varieties adapted to western VA.	Common varieties used for erosion control. Hybrids used for fine turf.	See current VCIA list.
ORCHARDGRASS (Dactylis glomerata)	P	C	5.8-6.2	18	60-75	F	F	M	SPD	625K	Does best on well-drained, loamy soil.	Good pasture selection - may be grazed.	Virginia origin or Potomac

KEY

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SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

TABLE 3.32-C
SITE SPECIFIC SEEDING MIXTURES FOR APPALACHIAN/MOUNTAIN AREA

	Total Lbs. Per Acre
Minimum Care Lawn	
- Commercial or Residential	200-250 lbs.
- Kentucky 31 or Turf-Type Tall Fescue	90-100%
- Improved Perennial Ryegrass *	0-10%
- Kentucky Bluegrass	0-10%
High-Maintenance Lawn	
Minimum of three (3) up to five (5) varieties of bluegrass from approved list for use in Virginia.	125 lbs.
General Slope (3:1 or less)	
- Kentucky 31 Fescue	128 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop **	20 lbs.
	150 lbs.
Low-Maintenance Slope (Steeper than 3:1)	
- Kentucky 31 Fescue	108 lbs.
- Red Top Grass	2 lbs.
- Seasonal Nurse Crop **	20 lbs.
- Crownvetch ***	20 lbs.
	150 lbs.

* Perennial Ryegrass will germinate faster and at lower soil temperatures than fescue, thereby providing cover and erosion resistance for seedbed.

** Use seasonal nurse crop in accordance with seeding dates as stated below:
March, April through May 15th ..... Annual Rye
May 16th through August 15th ..... Foxtail Millet
August 16th through September, October ..... Annual Rye
November through February ..... Winter Rye

*** If Flatpea is used, increase to 30 lbs./acre. All legume seed must be properly inoculated. Weeping Lovegrass may also be included in any slope or low-maintenance mixture during warmer seeding periods; add 10-20 lbs/acre in mixes.

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

COMMONWEALTH OF VIRGINIA
D. BRIAN MCGOUGH
Lic. No. 036275
1-7-22
PROFESSIONAL ENGINEER

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

EROSION & SEDIMENT CONTROL DETAILS

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS

Designed	DBM
Drawn	ESB
Checked	
Date	JULY 2020

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THOMPSON & LITTON

Sheet No.
C001

APPENDIX 3.32-d

TABLE 3.32-F

LBS. OF GROUND AGRICULTURAL LIMESTONE* PER THOUSAND SQUARE FEET NEEDED TO CORRECT pH LEVEL OF ACID SOILS TO 6.5

Existing pH	Soil Texture		
	Sandy Loam	Loam	Clay Loam
6.2	20	35	40
6.0	40	55	70
5.8	55	65	85
5.6	70	80	105
5.4	90	100	125
5.2	105	120	140
5.0	120	140	160
4.8	125	180	205
4.6	155	210	230
4.0	200	250	300

* Lime should always be applied in accordance with the results of a soil test, such as may be obtained through the soil testing laboratory at VPI&SU or through a reputable commercial laboratory.

Source: DSWC's Basic Urban E&S in Virginia

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

TABLE 3.32-A (Continued)
CHARACTERISTICS OF COMMONLY SELECTED GRASSES

COMMON NAME (Botanical Name)	Life Cycle	Season	pH Range	Germination Time In Days	Optimum Germination Temperature (°F)	Winter Hardiness	Drought Tolerance	Fertility	Soil Drainage Tolerance	Seeds Per Pound	MAINTENANCE REQUIREMENTS	REMARKS	Suggested Varieties for Virginia
ANNUAL RYEGRASS (Lolium multiflorum)	A	C	5.8-6.2	7	60-70	G	P	M-H	SPD	227K	Will grow on most Virginia Soils. Do not use in fine-turf areas.	May be added into mixes or established alone as temporary cover in spring and fall.	No named varieties.
RYE (Secale cereale)	A	C	5.8-6.2	7	55-70	VG	G	L-M	SPD	18K	Will establish in most all Virginia soils. Do not use in fine-turf areas.	May be added into mixes or established alone for late fall/winter cover.	Abruzzi, Balboa
FOXTAIL MILLET (Setaria italica)	A	W	5.8-6.2	10	65-85	VP	G	M	MWD	220K	Establishes well during summer. Very low moisture requirements.	May be added to erosion-control mixes or established alone.	Common, German

KEY

A = Annual P = Perennial C = Cool Season Plant W = Warm Season Plant G = Good F = Fair P = Poor VP = Very Poor H = High
M = Medium L = Low SPD = Somewhat Poorly Drained MPD = Moderately Poorly Drained PD = Poorly Drained VPD = Very Poorly Drained

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

TABLE 3.32-B (Continued)
CHARACTERISTICS OF LEGUMES APPROPRIATE FOR EROSION CONTROL

COMMON NAME (Botanical Name)	Life Cycle	Season	pH Range	Germination Time In Days	Optimum Germination Temperature (°F)	Winter Hardiness	Drought Tolerance	Fertility	Soil Drainage Tolerance	Seeds Per Pound	MAINTENANCE REQUIREMENTS	REMARKS	Suggested Varieties for Virginia
ANNUAL LESPEDEZAS (Lespedeza striata, L. stipulacea)	A	W	5.8-6.2	14	70-85	F	VG	L	MWD	200K	Will grow on almost any well-drained soil.	Choose Kobe for southeastern Va.; needs almost no nitrogen to survive.	Kobe, Korean
RED CLOVER (Trifolium pratense)	P	C	6.0-6.5	7-14	70	G	F	M	SPD	275K	Needs high levels of phosphorus and potassium.	Acts as a biennial. Can be added to low-maintenance mixes.	Kenstar, Kenland
WHITE CLOVER (Trifolium repens)	P	C	6.0-6.5	10	70	G	P	M	PD	700K	Requires favorable moisture, fertile soils, high pH.	Spreads by soil surface stolons, white flowers.	Common, White Dutch

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SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

TABLE 3.32-B
CHARACTERISTICS OF LEGUMES APPROPRIATE FOR EROSION CONTROL

COMMON NAME (Botanical Name)	Life Cycle	Season	pH Range	Germination Time In Days	Optimum Germination Temperature (°F)	Winter Hardiness	Drought Tolerance	Fertility	Soil Drainage Tolerance	Seeds Per Pound	MAINTENANCE REQUIREMENTS	REMARKS	Suggested Varieties for Virginia
CROWNVETCH (Coronilla varia)	P	C	6.0-6.5	14-21	70	G	VG	M	MWD	110K	Does best on well-drained soils. Minimum maintenance when established. May need phosphorus. Inoculation is essential.	Excellent for steep, rocky slopes. Produces colorful blooms in May/June. Slow to establish. Does best when seeded in spring.	Penngift Chemung Emerald
SERICEA LESPEDEZA (Lespedeza cuneata)	P	W	5.8-6.2	21-28	70-85	F	VG	L	MWD	335K	Grows in most well-drained soils. Low fertility requirements. Inoculation is essential.	Use hulled seed in spring; unhulled in fall. Very deep-rooted legume. Excellent choice for eastern Va.	Sericea Interstate
FLATPEA (Lathyrus silvestrus)	P	C	5.0-7.0	14-28	65-75	G	G	L	PD	15K	Needs lime and high phosphorus. Good shade tolerance.	Tolerates acidic and wetter soils better than other legumes.	Latheo
BIRDSFOOT TREFOIL (Lotus corniculatus)	P	C	6.0-6.5	7	65-70	G	F	M	SPD	375K	Inoculation is essential. Grows in medium-fertile, slightly acid soils.	Grows better on poorly drained soils than most legumes. Poor drought/ heat tolerance.	No named varieties.

KEY

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SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

TABLE 3.32-E

QUALITY OF SEED*

	Minimum Seed Purity (%)	Minimum Germination (%)
Legumes		
Crownvetch	98	65**
Lespedeza, Korean	97	85**
Lespedeza, Sericea	98	85**
Grasses		
Bluegrass, Kentucky	97	85
Fescue, Tall (Improved, Turf-Type Cultivars)	98	85
Fescue, Tall (Ky-31)	97	85
Fescue, Red	98	85
Redtop	94	80
Reed Canarygrass	98	80
Perennial Ryegrass	98	90
Weeping Lovegrass	98	87
Annuals		
Annual Ryegrass	97	90
German Millet	98	85
Oats	98	80
Cereal Rye	98	85

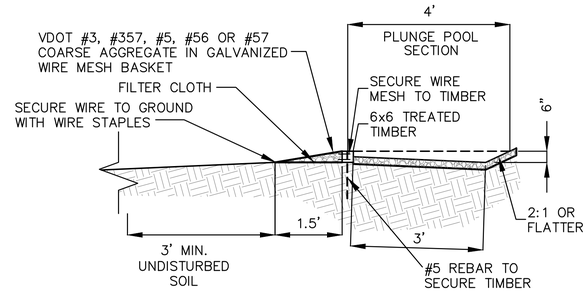
* Seed containing prohibited or restricted noxious weeds should not be accepted. Seed should not contain in excess of 0.5% weed seed. To calculate percent pure, live seed, multiply germination times purity and divide by 100.

Example: Ky-31 Tall Fescue with a germination of 85 percent and a purity of 97 percent.

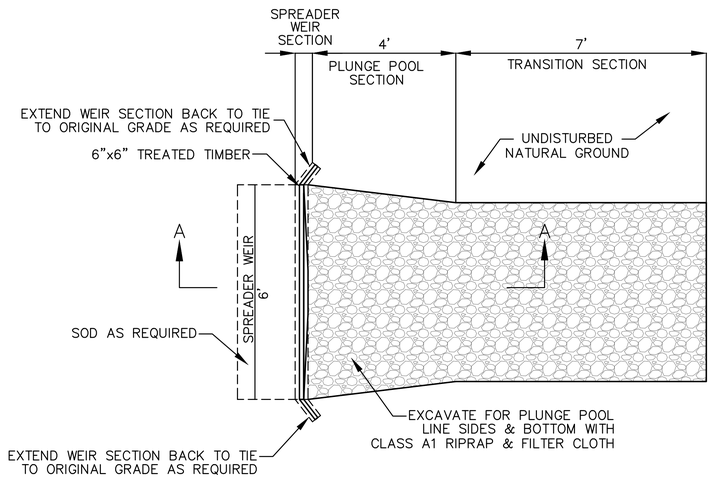
97 x 85 = 8245. 8245 ÷ 100 = 82.45 percent pure live seed.

** Includes "hard seed"

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK



SECTION A–A



TYPICAL DETAIL - LEVEL SPREADER

N.T.S.

TABLE 3.35-A

ORGANIC MULCH MATERIALS AND APPLICATION RATES

MULCHES:	RATES: Per Acre	RATES: Per 1000 sq. ft.	NOTES:
Straw or Hay	1½ - 2 tons (Minimum 2 tons for winter cover)	70 - 90 lbs.	Free from weeds and coarse matter. Must be anchored. Spread with mulch blower or by hand.
Fiber Mulch	Minimum 1500 lbs.	35 lbs.	Do not use as mulch for winter cover or during hot, dry periods.* Apply as slurry.
Corn Stalks	4 - 6 tons	185 - 275 lbs.	Cut or shredded in 4-6" lengths. Air-dried. Do not use in fine turf areas. Apply with mulch blower or by hand.
Wood Chips	4 - 6 tons	185 - 275 lbs.	Free of coarse matter. Air-dried. Treat with 12 lbs nitrogen per ton. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.
Bark Chips or Shredded Bark	50 - 70 cu. yds.	1-2 cu. yds.	Free of coarse matter. Air-dried. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.

* When fiber mulch is the only available mulch during periods when straw should be used, apply at a minimum rate of 2000 lbs./ac. or 45 lbs./1000 sq. ft.

Source: Va. DSWC

SOURCE: VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK

COMMONWEALTH OF VIRGINIA
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1-7-22
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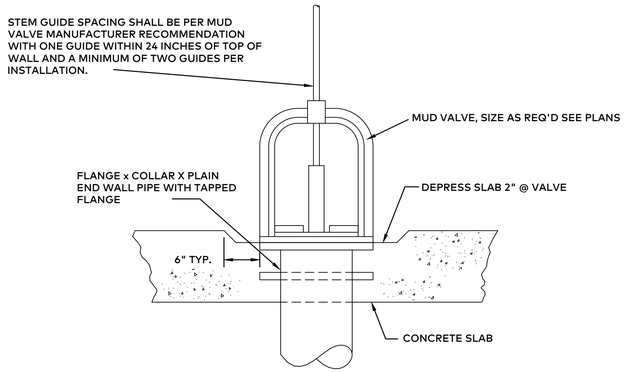
Date	JULY 2020

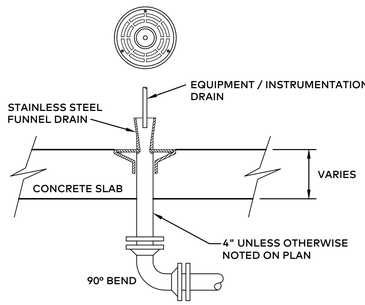
Project No. 14249

THOMPSON & LITTON

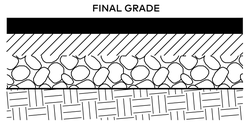
Sheet No. C002



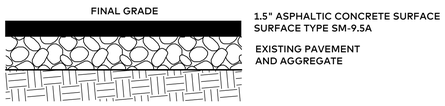
TYPICAL DETAIL - MUD VALVE INSTALLATION
NOT TO SCALE



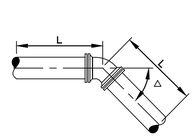
TYPICAL DETAIL - EQUIPMENT / INSTRUMENT DRAIN DETAL
NOT TO SCALE



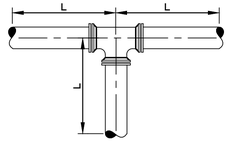
TYPICAL DETAIL - ASPHALT PAVEMENT
NOT TO SCALE



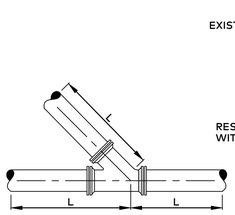
TYPICAL DETAIL - PAVEMENT OVERLAY
NOT TO SCALE



VERTICAL OR HORIZONTAL BENDS



VERTICAL OR HORIZONTAL TEES



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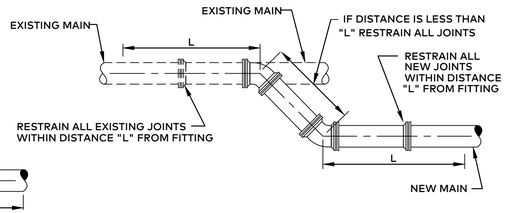


CONNECTION TO EXISTING MAIN

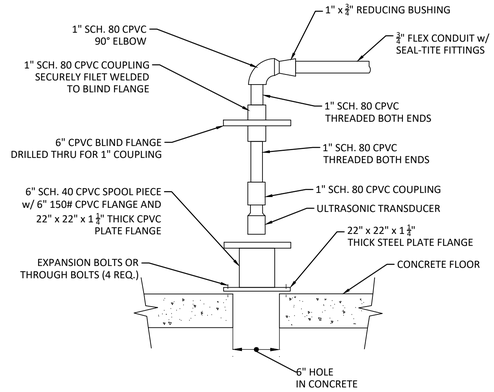
TYPICAL DETAILS-MECHANICAL JOINT RESTRAINING DEVICES
NOT TO SCALE

WORKING PRESSURE : 200 P.S.I.								
PIPE	L = MINIMUM LENGTH OF RESTRAINED PIPE (ft)							
SIZE (in)	△=90°		△=45°		△=22.5°		△=11.25°	
	HORIZ.	VERT.	HORIZ.	VERT.	HORIZ.	VERT.	HORIZ.	VERT.
4	37	38	16	16	8	8	4	4
6	52	57	21	24	11	12	5	7
8	70	77	30	32	16	16	7	8

NOTE:

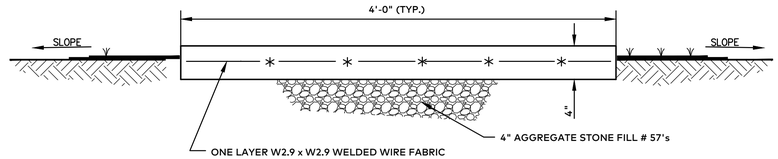
1. THE RESTRAINED LENGTH OF PIPE IS BASED ON THE FOLLOWING: A WORKING PRESSURE AS SHOWN IN THE TABLES, 3'-0" OF PIPE COVER, AND A SOIL TYPE CLASSIFICATION OF "MH".
2. PLUGS SHALL BE RESTRAINED BASED ON THE RESTRAINED LENGTH FOR 90° VERTICAL BENDS.
3. VALVES, TEES, AND WYES SHALL BE RESTRAINED BASED ON THE RESTRAINED LENGTH FOR 45° HORIZONTAL BENDS.
4. EXISTING PIPE ADJACENT TO PROPOSED BENDS, WYES, VALVES, TEES, AND PLUGS SHALL BE UNCOVERED AND THE EXISTING JOINTS SHALL BE RESTRAINED FOR THE LENGTH INDICATED. IF THE EXISTING WATER MAIN WILL NOT ACCEPT THE MECHANICAL JOINT RESTRAINING MECHANISM, THE EXISTING WATER MAIN SHALL BE REPLACED WITH DUCTILE IRON WATER MAIN FOR THE LENGTH INDICATED. MECHANICAL JOINT RESTRAINING MECHANISMS SHALL NOT BE USED ON EXISTING POLYVINYLCHLORIDE (PVC) PIPE.

CONSTRUCTION DATA - MECHANICAL JOINT RESTRAINING DEVICES
NOT TO SCALE

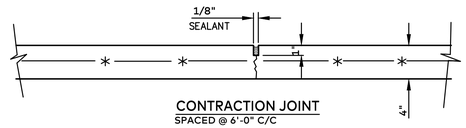


TYPICAL DETAIL - ULTRASONIC LEVEL CONTROL DETAIL
NOT TO SCALE

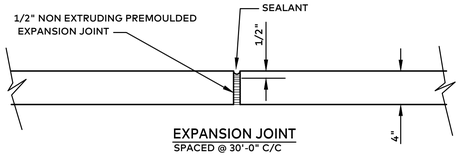
USE 1/2" NON-EXTRUDING PREMOULDED EXPANSION JOINT AND SEALANT WHERE WALK ABUTTS WALLS.



TYPICAL SECTION

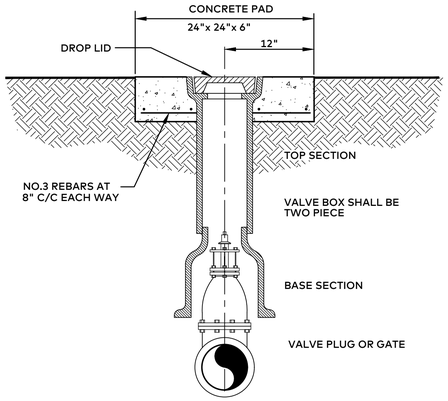


CONTRACTION JOINT
SPACED @ 6'-0" C/C

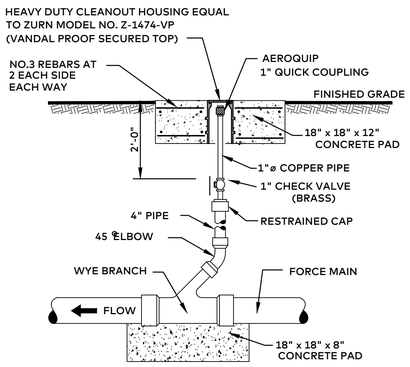


EXPANSION JOINT
SPACED @ 30'-0" C/C

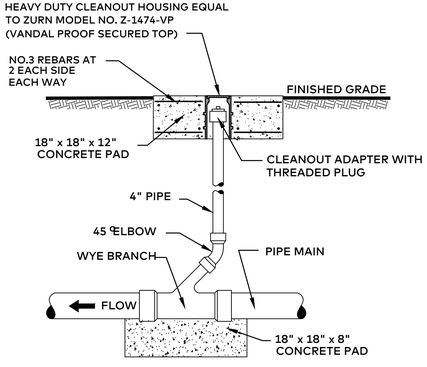
TYPICAL DETAIL - SIDEWALK
NOT TO SCALE



TYPICAL DETAIL - VALVE BOX
NOT TO SCALE



TYPICAL DETAIL- PRESSURE CLEANOUT
NOT TO SCALE
NOTE:
ALL PRESSURE CLEANOUT PIPING SHALL BE RESTRAINED.



TYPICAL DETAIL- CLEANOUT
NOT TO SCALE

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MISCELLANEOUS DETAILS

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THOMPSON & LITTON

Sheet No.
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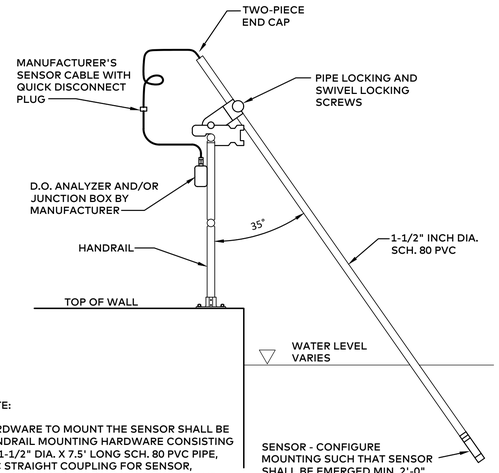
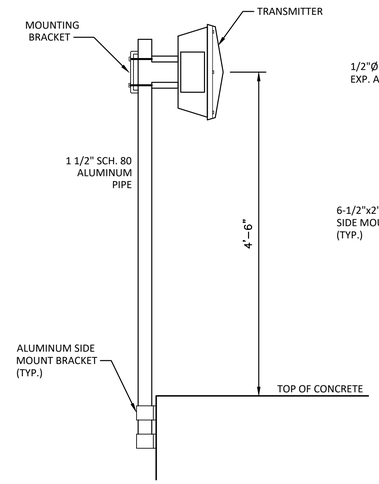


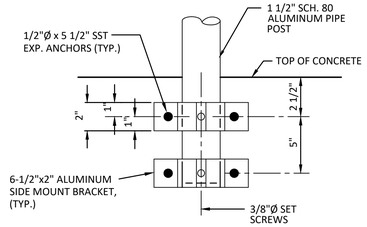
NOTE:

1. HARDWARE TO MOUNT THE SENSOR SHALL BE HANDRAIL MOUNTING HARDWARE CONSISTING OF 1-1/2" DIA. X 7.5' LONG SCH. 80 PVC PIPE, PVC STRAIGHT COUPLING FOR SENSOR, SWIVEL /PIVOT/PIPE CLAMP ASSEMBLY AND SURFACE-MOUNT JUNCTION BOX WITH QUICK-DISCONNECT RECEPTACLE, BY SENSOR SUPPLIER.
2. PROVIDE HANDRAIL MOUNTING FOR JUNCTION BOX AND/OR D.O. ANALYZER.

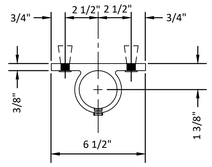
TYPICAL DETAIL - SUBMERGED SENSOR MOUNTING
NOT TO SCALE



ELEVATION

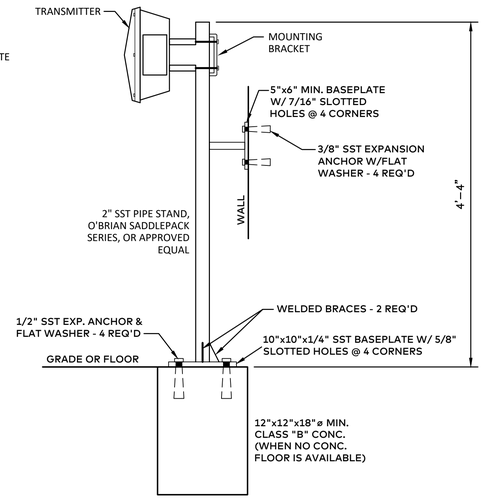


SIDE MOUNT TO CONCRETE

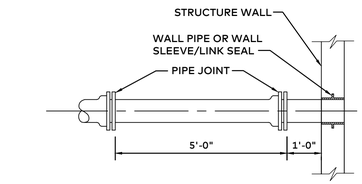


PLAN OF BRACKET

TYPICAL DETAIL - PIPE STAND TRANSMITTER MOUNTED ON SIDE WALL (PREFERRED INSTALLATION)
NOT TO SCALE

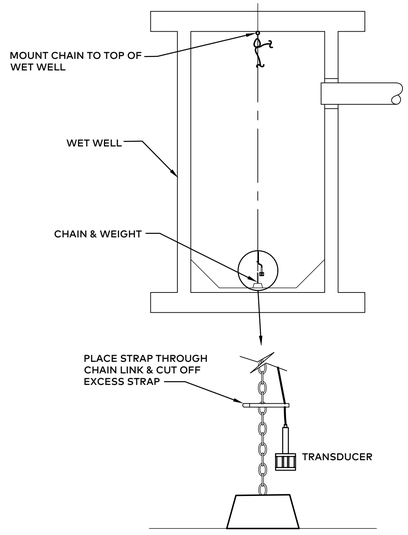


TYPICAL DETAIL - PIPE STAND TRANSMITTER MOUNTED ON FLOOR OR WALL (ALTERNATIVE INSTALLATION)
NOT TO SCALE



NOTES: PIPE ENTRANCE SHALL BE UTILIZED AT ALL WALL PENETRATIONS

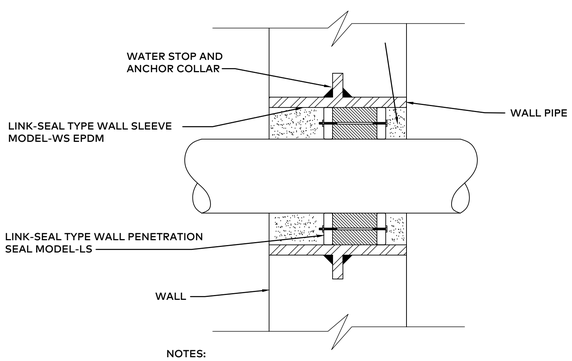
TYPICAL DETAIL - PIPE AT ENTRANCE OR EXIT FROM STRUCTURE
NOT TO SCALE



FLOAT DETAIL

TYPICAL DETAIL - SUBMERSIBLE TRANSDUCER INSTALLATION
NOT TO SCALE

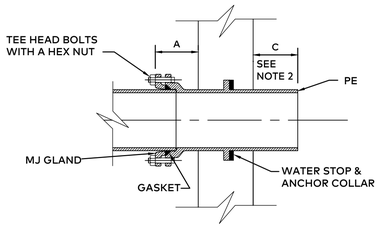
TYPICAL DETAIL - CONCRETE PIPE AND VALVE SUPPORT DETAIL
NOT TO SCALE



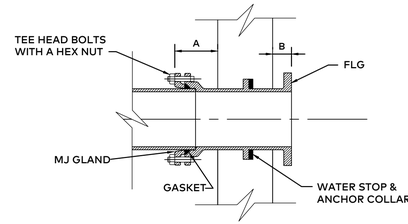
NOTES:

1. WALL PIPE TO BE OMITTED ON EXISTING CONCRETE WALLS.
2. DETAIL APPLICABLE TO NON-PRESSURE PIPING.

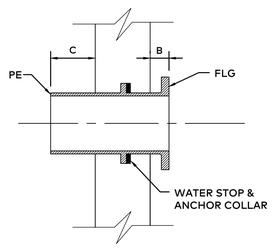
TYPICAL DETAIL - LINK SEAL
NOT TO SCALE



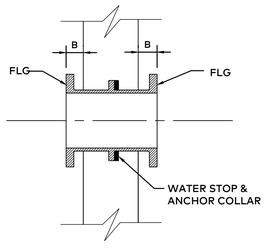
3" THRU 54" MJ-FLG-PE WALL PIPE



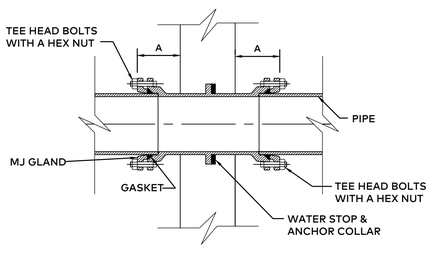
3" THRU 54" MJ-FLG-FLG WALL PIPE



3" THRU 54" PE-FLG-FLG WALL PIPE



3" THRU 54" FLG-FLG-FLG WALL PIPE



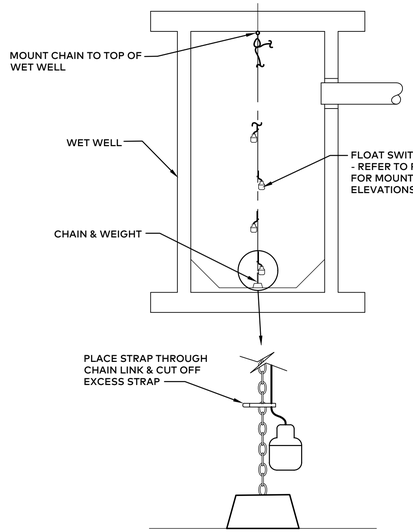
3" THRU 54" MJ-FLG-MJ WALL PIPE

NOTES:

1. WALL PIPE REQUIRED FOR ALL WALL AND SLAB PENETRATIONS ON NEW CAST IN PLACE CONCRETE.
2. CUT PE PIPE FLUSH WITH WALL OR SLAB WHEN PIPE RUN ENDS AT WALL OR SLAB.
3. FLANGED WALL PIPE MAY BE CAST FLUSH WITH THE WALL IF FLANGE BOLTS ARE PRE-THREADED IN PLACE.
4. DETAIL APPLICABLE FOR PRESSURE PIPING.

PIPE SIZE	A	B	C
3"	5.00"	2.00"	5.50"
4"	5.75"	2.25"	6.00"
6"	5.75"	2.75"	6.00"
8"	6.25"	2.75"	6.50"
10"	6.50"	3.00"	6.50"
12"	6.50"	3.00"	6.50"
14"	7.00"	3.50"	7.75"
16"	7.25"	3.50"	7.75"
18"	7.50"	3.75"	7.75"
20"	7.50"	3.75"	7.75"
24"	8.00"	4.00"	8.25"
30"	9.50"	5.00"	9.75"
36"	9.75"	5.25"	9.75"
42"	10.0"	5.50"	10.0"
48"	10.0"	6.00"	10.0"
54"	-	6.25"	-

TYPICAL DETAIL - WALL PIPES
NOT TO SCALE



FLOAT DETAIL

TYPICAL DETAIL - LEVEL FLOAT INSTALLATION
NOT TO SCALE

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

MISCELLANEOUS DETAILS

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS

Designed	DBM
Drawn	ESB
Checked	
Date	JULY 2020

Project No. 14249

THOMPSON & LITTON

Sheet No. C004

BLOWER SCHEDULE

BLOWER NUMBER	DESIGNATION	CAPACITY (SCFM)	DISCHARGE PRESSURE (PSI)	MAXIMUM MOTOR (HP)	OPERATING SPEED (RPM)	BLOWER & STARTER TYPE
B10	GRIT CHAMBER	200	4.5	10	2510	POSITIVE DISPLACEMENT/VFD
B20	GRIT CHAMBER	200	4.5	10	2510	POSITIVE DISPLACEMENT/VFD
B30	POST AERATION	250	3.2	10	2950	POSITIVE DISPLACEMENT/VFD
B40	POST AERATION	250	3.2	10	2590	POSITIVE DISPLACEMENT/VFD

PUMP SCHEDULE

PUMP NUMBER	DESIGNATION	DESIGN CAPACITY (GPM)	DESIGN TDH (FT.)	MAX. MOTOR HP	MAX. OPERATING SPEED (R.P.M.)	PUMP TYPE	MOTOR TYPE
~~P10~~	~~MAIN INFLUENT~~	~~4225~~	~~38~~	~~60~~	~~1160~~	~~NON-CLOG DRY PIT SUBMERSIBLE~~	~~O.D.P.~~
~~P20~~	~~MAIN INFLUENT~~	~~4225~~	~~38~~	~~60~~	~~1160~~	~~NON-CLOG DRY PIT SUBMERSIBLE~~	~~O.D.P.~~
~~P30~~	~~MAIN INFLUENT~~	~~4225~~	~~38~~	~~60~~	~~1160~~	~~NON-CLOG DRY PIT SUBMERSIBLE~~	~~O.D.P.~~
P40	GRIT	270	32	10	1000	GRIT SLURRY	O.D.P.
P50	GRIT	270	32	10	1000	GRIT SLURRY	O.D.P.
P60	PRIMARY SLUDGE	65	16	3	1130	NON-CLOG SUBMERSIBLE	SUBMERSIBLE
P70	PRIMARY SLUDGE	65	16	3	1130	NON-CLOG SUBMERSIBLE	SUBMERSIBLE
P80	SECONDARY SLUDGE (RECIRC.)	2600	43	50	1180	NON-CLOG DRY PIT SUBMERSIBLE	TEFC
P90	SECONDARY SLUDGE (RECIRC.)	2600	43	50	1180	NON-CLOG DRY PIT SUBMERSIBLE	TEFC
~~P100~~	~~EFFLUENT~~	~~14000~~	~~0~~	~~60~~	~~580~~	~~VERTICAL MIXED FLOW PROPELLER~~	~~TEFC~~
~~P110~~	~~EFFLUENT~~	~~14000~~	~~0~~	~~60~~	~~580~~	~~VERTICAL MIXED FLOW PROPELLER~~	~~TEFC~~
~~P120~~	~~SLUDGE TRANSFER~~	~~80 (MAX)~~	~~100 (MAX)~~	~~3~~	~~1200~~	~~PLUNGER SLUDGE~~	~~O.D.P.~~
~~P130~~	~~SLUDGE TRANSFER~~	~~80 (MAX)~~	~~100 (MAX)~~	~~3~~	~~1200~~	~~PLUNGER SLUDGE~~	~~O.D.P.~~
~~P140~~	~~SLUDGE RECIRCULATION~~	~~350~~	~~10~~	~~15~~	~~1750~~	~~NON-CLOG DRY PIT SUBMERSIBLE WITH RECESSED IMPELLER~~	~~O.D.P.~~
~~P150~~	~~SLUDGE TRANSFER (DIG)~~	~~350~~	~~10~~	~~15~~	~~1750~~	~~NON-CLOG DRY PIT SUBMERSIBLE WITH RECESSED IMPELLER~~	~~O.D.P.~~
P160	PROCESSED SLUDGE	75	92	3	370	PROGRESSIVE CAVITY SLUDGE	O.D.P.
P170	PROCESSED SLUDGE	75	92	3	370	PROGRESSIVE CAVITY SLUDGE	O.D.P.
~~P180~~	~~NOT USED~~						
P190	NONPOTABLE WATER	160	260	20	3530	CLOSED IMPELLER	O.D.P.
P200	NONPOTABLE WATER	160	260	20	3530	CLOSED IMPELLER	O.D.P.
P210	SECONDARY SLUDGE (WASTE)	150	32	7.5	1170	NON-CLOG DRY PIT SUBMERSIBLE WITH RECESSED IMPELLER	TEFC
P220	SECONDARY SLUDGE (WASTE)	150	32	7.5	1170	NON-CLOG DRY PIT SUBMERSIBLE WITH RECESSED IMPELLER	TEFC
~~P230~~	~~SUMP PUMP (DIGESTER)~~	~~67~~	~~15~~	~~0.5~~	~~1725~~	~~NON-CLOG SUBMERSIBLE~~	~~SUBMERSIBLE~~
~~P240~~	~~SUMP PUMP (MAIN P.S.)~~	~~50~~	~~20~~	~~0.5~~	~~1725~~	~~NON-CLOG SUBMERSIBLE~~	~~SUBMERSIBLE~~
P250	SUMP PUMP (GRIT BLDG.)	50	20	0.5	1725	NON-CLOG SUBMERSIBLE	SUBMERSIBLE
P260	SUMP PUMP (SEC. P.S.)	50	20	0.5	1725	NON-CLOG SUBMERSIBLE	SUBMERSIBLE
~~P270~~	~~LIME PUMP (GRAVITY THICKENER)~~	~~5~~	~~25~~	~~0.5~~	~~2200~~	~~CENTRIFUGAL~~	~~O.D.P.~~
~~P280~~	~~LIME PUMP (AERATION BASIN)~~	~~5~~	~~20~~	~~0.33~~	~~2800~~	~~CENTRIFUGAL~~	~~O.D.P.~~
~~P290~~	~~NOT USED~~						
~~P300~~	~~RAVEN DORAN LIFT STATION~~	~~1300~~	~~120~~	~~100~~	~~1770~~	~~NON-CLOG SUBMERSIBLE~~	~~SUBMERSIBLE~~
~~P310~~	~~RAVEN DORAN LIFT STATION~~	~~1300~~	~~120~~	~~100~~	~~1770~~	~~NON-CLOG SUBMERSIBLE~~	~~SUBMERSIBLE~~
~~P320~~	~~RAVEN DORAN LIFT STATION~~	~~1300~~	~~120~~	~~100~~	~~1770~~	~~NON-CLOG SUBMERSIBLE~~	~~SUBMERSIBLE~~

METER SCHEDULE

METER NUMBER	LOCATION	PROCESS FLUID	METER TYPE	METER SIZE (IN)	FLOW INDICATOR	FLOW RECORDER & TOTALIZER	MAXIMUM FLOW
M-10	GRIT BUILDING	GRIT	ULTRASONIC	6	X		270 GPM
M-11	PRIMARY CLARIFIERS	PRIMARY SLUDGE	ULTRASONIC	6	X		70 GPM
M-12	SECONDARY CLARIFIERS	WASTED SLUDGE	ULTRASONIC	6	X	X	150 GPM
~~M-13~~	~~PLANT INFLUENT~~	~~WASTE WATER~~	~~ULTRASONIC~~	~~16~~	~~X~~	~~X~~	~~10 MGD~~
~~M-14~~	~~DIGESTER~~	~~THICKENED SLUDGE~~	~~ULTRASONIC~~	~~6~~	~~X~~		~~70 GPM~~
M-15	SHOP BUILDING	THICKENED DIGESTED SLUDGE	ULTRASONIC	6	X	X	70 GPM
~~M-16~~	~~PLANT EFFLUENT~~	~~TREATED SEWAGE~~	~~PARSHALL FLUME / ULTRASONIC~~	~~16~~	~~X~~	~~X~~	~~10 MGD~~
~~M-17~~	~~AERATION BASIN~~	~~WASTE WATER~~	~~ULTRASONIC~~		~~X~~		~~10 MGD~~
~~M-18~~	~~AERATION BASIN~~	~~WASTE WATER~~	~~ULTRASONIC~~		~~X~~		~~10 MGD~~
~~M-19~~	~~AERATION BASIN~~	~~WASTE WATER~~	~~ULTRASONIC~~		~~X~~		~~10 MGD~~
M-20	RETURN SLUDGE SPLITTER BOX	RETURN SLUDGE	ULTRASONIC	10	X	X	10 MGD
M-21	RETURN SLUDGE SPLITTER BOX	RETURN SLUDGE	ULTRASONIC	10	X	X	10 MGD
M-22	RETURN SLUDGE SPLITTER BOX	RETURN SLUDGE	ULTRASONIC	10	X	X	10 MGD
M-23	RAVEN - DORAN FORCE MAIN	WASTE WATER	ULTRASONIC	12	X	X	1.5 MGD
M-24	SECONDARY CLARIFIER	RETURN SLUDGE	ULTRASONIC	14	X	X	10 MGD
~~M-25~~	~~DIGESTER 1 GAS~~	~~METHANE~~	~~THERMAL GAS MASS FLOW~~	~~4~~	~~X~~	~~X~~	~~4000 SCFM~~
~~M-26~~	~~DIGESTER 2 GAS~~	~~METHANE~~	~~THERMAL GAS MASS FLOW~~	~~4~~	~~X~~	~~X~~	~~4000 SCFM~~
~~M-27~~	~~WASTE GAS~~	~~METHANE~~	~~THERMAL GAS MASS FLOW~~	~~4~~	~~X~~	~~X~~	~~4000 SCFM~~

GATE SCHEDULE

GATE NUMBER	LOCATION	OPENING SIZE (W X H) (INCHES)	OPERATOR	REMARKS
~~SG-1~~	~~INFLUENT PUMP STATION~~	~~30X36~~	~~HANDWHEEL~~	~~SELF-CONTAINED SLIDE GATE~~
~~SG-2~~	~~INFLUENT PUMP STATION~~	~~30X36~~	~~HANDWHEEL~~	~~SELF-CONTAINED SLIDE GATE~~
~~SG-3~~	~~MAIN P.S. WETWELL~~	~~30X30~~	~~HANDWHEEL W/FLOOR STAND~~	~~SLUICE GATE~~
SG-4	MECH. BAR SCREEN	36X36	HANDWHEEL	SELF-CONTAINED SLIDE GATE
SG-5	MANUAL BAR SCREEN	36X36	HANDWHEEL	SELF-CONTAINED SLIDE GATE
~~SG-6~~	~~DELETED~~			
~~SG-7~~	~~DELETED~~			
SG-8	INFLUENT GRIT CHAMBER	36X36	HANDWHEEL	SELF-CONTAINED SLIDE GATE
SG-9	INFLUENT GRIT CHAMBER	36X36	HANDWHEEL	SELF-CONTAINED SLIDE GATE
~~SG-10~~	~~NOT USED~~			
~~SG-11~~	~~NOT USED~~			
~~SG-12~~	~~NOT USED~~			
~~SG-13~~	~~NOT USED~~			
~~SG-14~~	~~INFLUENT POST AERATION~~	~~30X30~~	~~HANDWHEEL~~	~~SELF-CONTAINED SLIDE GATE~~
~~SG-15~~	~~INFLUENT POST AERATION~~	~~30X30~~	~~HANDWHEEL~~	~~SELF-CONTAINED SLIDE GATE~~
~~SG-16~~	~~PLANT EFFLUENT~~	~~36X36~~	~~ELECTRIC~~	~~SLUICE GATE W/WALL THIMBLE FOR 30" PIPE~~
~~SG-17~~	~~INFLUENT AERATION BASIN~~	~~30X30~~	~~HANDWHEEL W/FLOOR STAND~~	~~SLUICE GATE W/WALL THIMBLE FOR 30" PIPE~~
~~SG-18~~	~~INFLUENT AERATION BASIN~~	~~30X30~~	~~HANDWHEEL W/FLOOR STAND~~	~~SLUICE GATE W/WALL THIMBLE FOR 30" PIPE~~
~~SG-19~~	~~INFLUENT AERATION BASIN~~	~~30X30~~	~~HANDWHEEL W/FLOOR STAND~~	~~SLUICE GATE W/WALL THIMBLE FOR 30" PIPE~~
SG-20	INFLUENT SEC. CLARIFIER	30X30	HANDWHEEL W/FLOOR STAND	SLUICE GATE W/WALL THIMBLE FOR 30" PIPE
SG-21	INFLUENT SEC. CLARIFIER	30X30	HANDWHEEL W/FLOOR STAND	SLUICE GATE W/WALL THIMBLE FOR 30" PIPE
SG-22	INFLUENT SEC. CLARIFIER	30X30	HANDWHEEL W/FLOOR STAND	SLUICE GATE W/WALL THIMBLE FOR 30" PIPE

COMMONWEALTH OF VIRGINIA
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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

MAJOR EQUIPMENT SCHEDULES

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS
1	02-21-22	ADDENDUM NO. 4

Designed	DBM
Drawn	ESB
Checked	
Date	JULY 2020

Project No.
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THOMPSON & LITTON

Sheet No.
C005

VALVE NUMBER	LOCATION	SIZE (IN.)	DESCRIPTION	OPERATOR	REMARKS
~~V10~~	~~MAIN PUMP~~	~~16~~	~~CHECK VALVE~~		~~FLANGED~~
~~V11~~	~~MAIN PUMP~~	~~16~~	~~CHECK VALVE~~		~~FLANGED~~
~~V12~~	~~MAIN PUMP~~	~~16~~	~~CHECK VALVE~~		~~FLANGED~~
V13	GRIT CHAMBER BLOWER	5	CHECK VALVE		FLANGED
V14	GRIT CHAMBER BLOWER	5	CHECK VALVE		FLANGED
V15	GRIT PUMP	6	CHECK VALVE		FLANGED
V16	GRIT PUMP	6	CHECK VALVE		FLANGED
V17	SECONDARY SLUDGE PUMP	12	CHECK VALVE		FLANGED
V18	SECONDARY SLUDGE PUMP	12	CHECK VALVE		FLANGED
V19	SECONDARY SLUDGE PUMP	6	CHECK VALVE		FLANGED
V20	SECONDARY SLUDGE PUMP	6	CHECK VALVE		FLANGED
V21	PRIMARY SLUDGE PUMP	6	CHECK VALVE		FLANGED
V22	PRIMARY SLUDGE PUMP	6	CHECK VALVE		FLANGED
~~V23~~	~~DELETED~~				
~~V24~~	~~DELETED~~				
V25	POST AERATION BLOWER	4	CHECK VALVE		FLANGED
V26	POST AERATION BLOWER	4	CHECK VALVE		FLANGED
~~V27~~	~~SLUDGE TRANSFER PUMP~~	~~4~~	~~CHECK VALVE~~		~~EXISTING~~
~~V28~~	~~SLUDGE TRANSFER PUMP~~	~~4~~	~~CHECK VALVE~~		~~EXISTING~~
~~V29~~	~~DIGESTER REGIRCULATION PUMP~~	~~6~~	~~CHECK VALVE~~		~~FLANGED~~
~~V30~~	~~DIGESTER TRANSFER PUMP~~	~~6~~	~~CHECK VALVE~~		~~FLANGED~~
~~V31~~	~~DELETED~~				
~~V32~~	~~DELETED~~				
V33	PROCESSED SLUDGE PUMP	6	CHECK VALVE		FLANGED
V34	PROCESSED SLUDGE PUMP	6	CHECK VALVE		FLANGED
~~V35~~	~~DELETED~~				
~~V36~~	~~DELETED~~				
V37	NONPOTABLE WATER PUMP	1.25	CHECK VALVE		FLANGED
V38	NONPOTABLE WATER PUMP	1.25	CHECK VALVE		FLANGED
~~V39~~	~~RAVEN DORAN LIFT STATION~~	~~6~~	~~CHECK VALVE~~		~~FLANGED~~
~~V40~~	~~RAVEN DORAN LIFT STATION~~	~~6~~	~~CHECK VALVE~~		~~FLANGED~~
~~V41~~	~~RAVEN DORAN LIFT STATION~~	~~6~~	~~CHECK VALVE~~		~~FLANGED~~
~~V42~~	~~DELETED~~				

VALVE NUMBER	LOCATION	SIZE (IN.)	DESCRIPTION	OPERATOR	REMARKS
~~V100~~	~~MAIN PUMP~~	~~12~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V101~~	~~MAIN PUMP~~	~~12~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V102~~	~~MAIN PUMP~~	~~12~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V103~~	~~MAIN PUMP~~	~~16~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V104~~	~~MAIN PUMP~~	~~16~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V105~~	~~MAIN PUMP~~	~~16~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
V106	GRIT PUMP	6	PLUG VALVE	HANDWHEEL	FLANGED
V107	GRIT PUMP	6	PLUG VALVE	HANDWHEEL	FLANGED
V108	GRIT PUMP	6	PLUG VALVE	HANDWHEEL	FLANGED
V109	GRIT CHAMBERS DRAIN	6	PLUG VALVE	HANDWHEEL	FLANGED
V110	PRIMARY CLARIFIER DRAIN	8	PLUG VALVE	HANDWHEEL W/STAND	MECHANICAL JOINT (BURIED)
V111	PRIMARY CLARIFIER SCUM DRAIN	6	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V112	PRIMARY CLARIFIER SCUM DRAIN	6	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V113	PRIMARY SLUDGE TSV	8	PLUG VALVE	HANDWHEEL & RT.ANGLE DR. W/STAND	FLANGED
V114	PRIMARY SLUDGE TSV	8	PLUG VALVE	HANDWHEEL & RT.ANGLE DR. W/STAND	FLANGED
V115	PRIMARY SLUDGE PUMP	6	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V116	PRIMARY SLUDGE PUMP	6	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V117	PRIMARY CLARIFIER DRAIN	8	PLUG VALVE	HANDWHEEL W/STAND	MECHANICAL JOINT (BURIED)
~~V118~~	~~AERATION BASIN DRAIN~~	~~8~~	~~PLUG VALVE~~	~~HANDWHEEL W/STAND~~	~~MECHANICAL JOINT (BURIED)~~
~~V119~~	~~DELETED~~				
~~V120~~	~~DELETED~~				
V121	SECONDARY CLARIFIER SCUM DRAIN	6	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V122	SECONDARY CLARIFIER SCUM DRAIN	6	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
~~V123~~	~~THICKENED SLUDGE~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V124~~	~~DELETED~~				
V125	SECONDARY CLARIFIER DRAIN	8	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V126	SECONDARY CLARIFIER DRAIN	8	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
~~V127~~	~~SECONDARY SLUDGE DRAIN~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL W/STAND~~	~~MECHANICAL JOINT (BURIED)~~
~~V128~~	~~THICKENED SLUDGE~~	~~6~~	~~PLUG VALVE~~		~~EXISTING (BURIED)~~
~~V129~~	~~THICKENED SLUDGE~~	~~6~~	~~PLUG VALVE~~		~~EXISTING (BURIED)~~
~~V130~~	~~THICKENED SLUDGE~~	~~6~~	~~PLUG VALVE~~		~~EXISTING (BURIED)~~
~~V131~~	~~THICKENED SLUDGE~~	~~6~~	~~PLUG VALVE~~		~~EXISTING~~
~~V132~~	~~DIGESTED SLUDGE~~	~~6~~	~~PLUG VALVE~~		~~EXISTING~~
~~V133~~	~~DIGESTED SLUDGE~~	~~6~~	~~PLUG VALVE~~		~~EXISTING~~
~~V134~~	~~SLUDGE TRANSFER PUMP~~	~~4~~	~~PLUG VALVE~~		~~EXISTING~~
~~V135~~	~~SLUDGE TRANSFER PUMP~~	~~4~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V136~~	~~SLUDGE TRANSFER PUMP~~	~~4~~	~~PLUG VALVE~~		~~EXISTING~~
~~V137~~	~~SLUDGE TRANSFER PUMP~~	~~4~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V138~~	~~SLUDGE TRANSFER PUMP~~	~~4~~	~~PLUG VALVE~~		~~EXISTING~~
~~V139~~	~~SLUDGE TRANSFER PUMP~~	~~4~~	~~PLUG VALVE~~		~~EXISTING~~
~~V140~~	~~SLUDGE TRANSFER PUMP~~	~~4~~	~~PLUG VALVE~~		~~EXISTING~~
~~V141~~	~~SLUDGE TRANSFER PUMP~~	~~4~~	~~PLUG VALVE~~		~~EXISTING~~
~~V142~~	~~SLUDGE STORAGE TANK~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL W/STAND~~	~~MECHANICAL JOINT (BURIED)~~
~~V143~~	~~SLUDGE STORAGE TANK~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL W/STAND~~	~~MECHANICAL JOINT (BURIED)~~
~~V144~~	~~DIGESTER INFLUENT~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V145~~	~~DIGESTER INFLUENT~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V146~~	~~SLUDGE TRANSFER/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V147~~	~~SLUDGE TRANSFER/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V148~~	~~HEATER INLET~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V149~~	~~SLUDGE REGIRC. PUMP~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V150~~	~~HEATER OUTLET~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V151~~	~~HEATER BY-PASS~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V152~~	~~SLUDGE REGIRC. PUMP~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V153~~	~~SLUDGE TRANSFER/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V154~~	~~SLUDGE TRANSFER/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V155~~	~~SLUDGE TRANSFER PUMP~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V156~~	~~SLUDGE TRANSFER PUMP~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V157~~	~~SLUDGE TRANSFER/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V158~~	~~SLUDGE TRANSFER/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V159~~	~~SLUDGE TRANSFER/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V160~~	~~DIGESTED SLUDGE~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V161~~	~~DIGESTED SLUDGE~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V162~~	~~SLUDGE REGIRC. SUCTION~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V163~~	~~SLUDGE REGIRC. SUCTION~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V164~~	~~DIGESTED SLUDGE DRAW-OFF~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V165~~	~~DIGESTED SLUDGE DRAW-OFF~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V166~~	~~SLUDGE INLET/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V167~~	~~SLUDGE INLET/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V168~~	~~SLUDGE INLET/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V169~~	~~SLUDGE INLET/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V170~~	~~SLUDGE INLET/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V171~~	~~SLUDGE INLET/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V172~~	~~SLUDGE INLET/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V173~~	~~SLUDGE INLET/REGIRC.~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V174~~	~~SUPERNATANT~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
V175	SEC. SLUDGE RETURN	10	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
~~V176~~	~~SUPERNATANT~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
~~V177~~	~~DIGESTED SLUDGE~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V178~~	~~BELT PRESS DRAIN~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V179~~	~~BELT PRESS DRAIN~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V180~~	~~SUPERNATANT~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V181~~	~~SUPERNATANT~~	~~6~~	~~PLUG VALVE~~	~~CHAINWHEEL (5')~~	~~FLANGED~~
V182	SEC. SLUDGE RETURN	10	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V183	SEC. SLUDGE RETURN	10	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
~~V184~~	~~DIGESTED SLUDGE~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL W/STAND~~	~~MECHANICAL JOINT (BURIED)~~
V185	PROCESSED SLUDGE PUMP	6	PLUG VALVE	HANDWHEEL	FLANGED
V186	PROCESSED SLUDGE PUMP	6	PLUG VALVE	HANDWHEEL	FLANGED
V187	PROCESSED SLUDGE PUMP	6	PLUG VALVE	HANDWHEEL	FLANGED
V188	PROCESSED SLUDGE PUMP	6	PLUG VALVE	HANDWHEEL	FLANGED
~~V189~~	~~DELETED~~				
~~V190~~	~~DELETED~~				
~~V191~~	~~DELETED~~				
~~V192~~	~~DELETED~~				
~~V193~~	~~DELETED~~				
~~V194~~	~~DELETED~~				
~~V195~~	~~DELETED~~				
~~V196~~	~~DELETED~~				
~~V197~~	~~DELETED~~				
~~V198~~	~~DELETED~~				
V199	GRIT PUMP	6	PLUG VALVE	HANDWHEEL	FLANGED
V200	GRIT PUMP	6	PLUG VALVE	HANDWHEEL	FLANGED
V201	SECONDARY SLUDGE PUMP	12	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V202	SECONDARY SLUDGE PUMP	12	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V203	SECONDARY SLUDGE PUMP	6	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V204	SECONDARY SLUDGE PUMP	6	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V205	SECONDARY SLUDGE PUMP	12	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V206	SECONDARY SLUDGE PUMP	12	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V207	SECONDARY SLUDGE PUMP	6	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
V208	SECONDARY SLUDGE PUMP	6	PLUG VALVE	HANDWHEEL W/STAND	FLANGED
~~V209~~	~~RAVEN DORAN LIFT STATION~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V210~~	~~RAVEN DORAN LIFT STATION~~	~~6~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V211~~	~~RAVEN DORAN LIFT STATION~~	~~8~~	~~PLUG VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V212~~	~~RAVEN DORAN LIFT STATION~~	~~16~~	~~PLUG VALVE~~	~~HANDWHEEL W/STAND~~	~~MECHANICAL JOINT (BURIED)~~
~~V213~~	~~RAVEN DORAN LIFT STATION~~	~~16~~	~~PLUG VALVE~~	~~HANDWHEEL W/STAND~~	~~MECHANICAL JOINT (BURIED)~~
~~V214~~	~~RAVEN DORAN LIFT STATION~~	~~8~~	~~PLUG VALVE~~	~~HANDWHEEL W/STAND~~	~~MECHANICAL JOINT (BURIED)~~

VALVE NUMBER	LOCATION	SIZE (IN.)	DESCRIPTION	OPERATOR	REMARKS
~~V300~~	~~DELETED~~				
~~V301~~	~~GAS ACCUMULATOR~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V302~~	~~GAS ACCUMULATOR~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V303~~	~~DELETED~~				
~~V304~~	~~DELETED~~				
~~V305~~	~~DELETED~~				
~~V306~~	~~DELETED~~				
~~V307~~	~~DELETED~~				
~~V308~~	~~GAS ACCUMULATOR~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V309~~	~~GAS ACCUMULATOR~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V310~~	~~DELETED~~				
~~V311~~	~~DELETED~~				
~~V312~~	~~DELETED~~				
~~V313~~	~~DELETED~~				
~~V314~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V315~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V316~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V317~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V318~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V319~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V320~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~CHAINWHEEL (4')~~	~~FLANGED~~
~~V321~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~CHAINWHEEL (4')~~	~~FLANGED~~
~~V322~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~CHAINWHEEL (4')~~	~~FLANGED~~
~~V323~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~CHAINWHEEL (4')~~	~~FLANGED~~
~~V324~~	~~GAS FLOW METER~~	~~1~~	~~GATE VALVE~~	~~CHAINWHEEL (4')~~	~~FLANGED~~
V325	NONPOTABLE WATER PUMP	2	GATE VALVE	HANDWHEEL	FLANGED
V326	NONPOTABLE WATER PUMP	2	GATE VALVE	HANDWHEEL	FLANGED
~~V327~~	~~NONPOTABLE WATER PUMP~~	~~1.25~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V328~~	~~NONPOTABLE WATER PUMP~~	~~1.25~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
~~V329~~	~~DELETED~~				
~~V330~~	~~GAS ACCUMULATOR~~	~~1~~	~~GATE VALVE~~	~~HANDWHEEL~~	~~FLANGED~~
V400	PRIMARY CLARIFIER	8	TELESCOPIC VALVE	HANDWHEEL W/STAND	FLANGED
V401	PRIMARY CLARIFIER	8	TELESCOPIC VALVE	HANDWHEEL W/STAND	FLANGED
V402	SECONDARY CLARIFIER	14	TELESCOPIC VALVE	HANDWHEEL W/STAND	FLANGED
V403	SECONDARY CLARIFIER	14	TELESCOPIC VALVE	HANDWHEEL W/STAND	FLANGED
~~V404~~	~~GRAVITY THICKENER~~	~~8~~	~~TELESCOPIC VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
~~V500 - V502~~	~~DELETED~~				
V504	GRIT CHAMBER BLOWER	5	BUTTERFLY VALVE	LEVER	FLANGED
V505	GRIT CHAMBER BLOWER	5	BUTTERFLY VALVE	LEVER	FLANGED
V506	GRIT CHAMBER	4	BUTTERFLY VALVE	LEVER	FLANGED
V507	GRIT CHAMBER	4	BUTTERFLY VALVE	LEVER	FLANGED
V508	GRIT CHAMBER	4	BUTTERFLY VALVE	LEVER	FLANGED
V509	GRIT CHAMBER	4	BUTTERFLY VALVE	LEVER	FLANGED
~~V510 - V524~~	~~DELETED~~				
V525	POST AERATION BLOWERS	4	BUTTERFLY VALVE	LEVER	FLANGED
V526	POST AERATION BLOWERS	4	BUTTERFLY VALVE	LEVER	FLANGED
~~V527~~	~~POST AERATION~~	~~4~~	~~BUTTERFLY VALVE~~	~~LEVER~~	~~FLANGED~~
~~V528~~	~~POST AERATION~~	~~4~~	~~BUTTERFLY VALVE~~	~~LEVER~~	~~FLANGED~~
~~V529~~	~~EFFLUENT PUMPING STATION~~	~~24~~	~~BUTTERFLY VALVE~~	~~ELECTRIC~~	~~FLANGED~~
~~V530~~	~~EFFLUENT PUMPING STATION~~	~~24~~	~~BUTTERFLY VALVE~~	~~ELECTRIC~~	~~FLANGED~~
V534	POST AERATION BLOWERS	4	BUTTERFLY VALVE	HANDWHEEL WITH STAND	FLANGED
V535	POST AERATION BLOWERS	4	BUTTERFLY VALVE	HANDWHEEL WITH STAND	FLANGED
V536	GRIT BLOWERS	6	BUTTERFLY VALVE	HANDWHEEL WITH STAND	FLANGED
V537	GRIT BLOWERS	6	BUTTERFLY VALVE	HANDWHEEL WITH STAND	FLANGED
V600	GRIT CHAMBER	6	MUD VALVE	HANDWHEEL W/STAND	FLANGED
V601	GRIT CHAMBER	6	MUD VALVE	HANDWHEEL W/STAND	FLANGED
~~V602~~	~~POST AERATION~~	~~6~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
~~V603~~	~~POST AERATION~~	~~6~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
V604	GRIT CHAMBER EFFLUENT	30	MUD VALVE	HANDWHEEL W/STAND	FLANGED
V605	GRIT CHAMBER EFFLUENT	30	MUD VALVE	HANDWHEEL W/STAND	FLANGED
V606	GRIT CHAMBER EFFLUENT	30	MUD VALVE	HANDWHEEL W/STAND	FLANGED
~~V607~~	~~AERATION BASIN~~	~~8~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
~~V608~~	~~AERATION BASIN~~	~~8~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
~~V609~~	~~AERATION BASIN~~	~~8~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
~~V610~~	~~AERATION BASIN~~	~~8~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
~~V611~~	~~AERATION BASIN~~	~~8~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
~~V612~~	~~AERATION BASIN~~	~~8~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
~~V613~~	~~AERATION BASIN~~	~~8~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
~~V614~~	~~AERATION BASIN~~	~~8~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~
~~V615~~	~~AERATION BASIN~~	~~8~~	~~MUD VALVE~~	~~HANDWHEEL W/STAND~~	~~FLANGED~~

COMMONWEALTH OF VIRGINIA
D. BRIAN MCGOUGH
Lic. No. 036275
1-7-22
PROFESSIONAL ENGINEER

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

VALVE SCHEDULES

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS
1	02-25-22	ADDENDUM NO. 5

Designed	DBM
Drawn	ESB
Checked	
Date	JULY 2020

Project No.
14249

THOMPSON=&=LITTON

Sheet No.
C006

Virginia State Plane Coordinate System — Grid North – South Zone

CONTROL POINT COORDINATE TABLE				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP#1	3573772.77	10511962.07	1918.31	5/8" ROD SET
CP#2	3573634.92	10511773.15	1915.92	MAG HUB SET

LEGEND AND ABBREVIATIONS:
FFE = FINISHED FLOOR
INV = INVERT
TC = TERRACOTTA
SSMH = SEWER MANHOLE
STMH = STORM MANHOLE
SGR = STORM GRATE
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SI = S
BOL = BOLLARD
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CMP = CORRUGATED METAL PIPE
HDPE = HIGH DENSITY POLYETHYLENE
] = END OF INFORMATION
OHE — OVERHEAD ELECTRICAL LINE
S — SEWER LINE
W — WATER LINE
FENCE LINE
EDGE OF PAVEMENT
SFM — FORCE MAIN SEWER
CE — CHEMICAL LINE

NOTE: INFORMATION SHOWN HEREON IN RED IS BEST FIT FROM THE AS-BUILT YARD PIPING PLAN BY THOMPSON & LITTON PROJECT NO. 3643 WITH A REVISION DATE OF 06-19-1989. LINES IN RED WERE NOT LOCATED/MARKED IN THE FIELD AND ARE APPROXIMATE LOCATION ONLY.

UTILITY STATEMENT
PER ASCE 38-02 USING QUALITY LEVEL(S) A B C D, UTILITY LOCATION SHOWN HEREON WAS DETERMINED PER:

(QL-C) SURVEYED LOCATION OF VISIBLE STRUCTURES AND CORRELATION WITH EXISTING UTILITY RECORDS(QL-D INFORMATION).

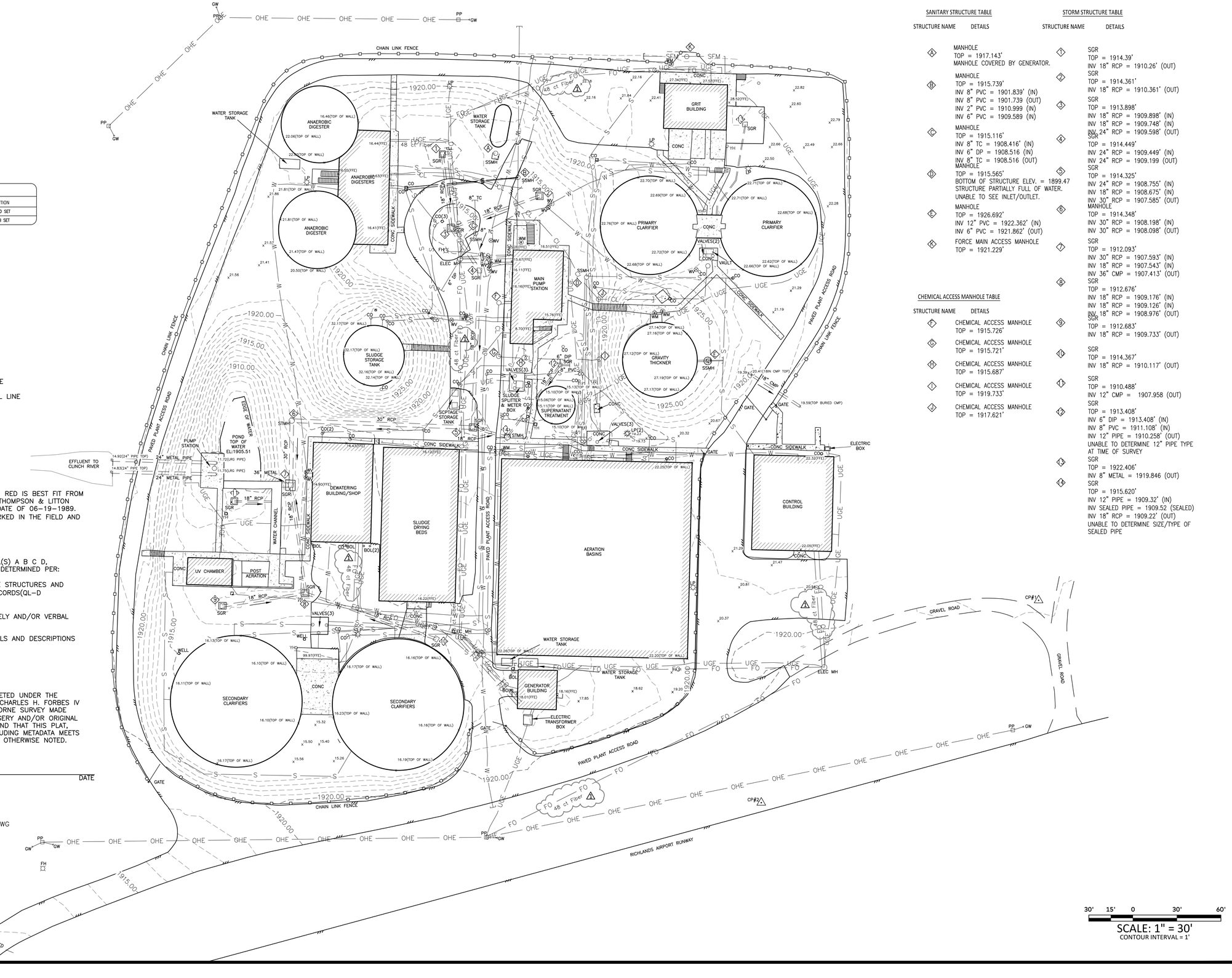
(QL-D) EXISTING UTILITY RECORDS SOLELY AND/OR VERBAL RECOLLECTIONS.

SEE ASCE 38-02 FOR COMPLETE DETAILS AND DESCRIPTIONS OF QUALITY LEVELS.

TOPOGRAPHIC CERTIFICATION
THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF, CHARLES H. FORBES IV FROM AN ACTUAL ☐ GROUND OR ☐ AIRBORNE SURVEY MADE UNDER MY SUPERVISION; THAT THE IMAGERY AND/OR ORIGINAL DATA WAS OBTAINED ON APRIL, 2020; AND THAT THIS PLAT, MAP, OR DIGITAL GEOSPATIAL DATA INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.

CHARLES H. FORBES IV, L.S. #2853 DATE

14249-001 RICHLANDS WWTP SURVEY.DWG
PROJECT NO. 14249-001



SANITARY STRUCTURE TABLE

STRUCTURE NAME	DETAILS
A	MANHOLE TOP = 1917.143' MANHOLE COVERED BY GENERATOR.
B	MANHOLE TOP = 1915.739' INV 8" PVC = 1901.839' (IN) INV 8" PVC = 1901.739 (OUT) INV 2" PVC = 1910.999 (IN) INV 6" PVC = 1909.589 (IN)
C	MANHOLE TOP = 1915.116' INV 8" TC = 1908.416' (IN) INV 6" DP = 1908.516 (IN) INV 8" TC = 1908.516 (OUT)
D	MANHOLE TOP = 1915.565' BOTTOM OF STRUCTURE ELEV. = 1899.47 STRUCTURE PARTIALLY FULL OF WATER. UNABLE TO SEE INLET/OUTLET.
E	MANHOLE TOP = 1926.692' INV 12" PVC = 1922.362' (IN) INV 6" PVC = 1921.862' (OUT)
K	FORCE MAIN ACCESS MANHOLE TOP = 1921.229'

CHEMICAL ACCESS MANHOLE TABLE

STRUCTURE NAME	DETAILS
F	CHEMICAL ACCESS MANHOLE TOP = 1915.726'
G	CHEMICAL ACCESS MANHOLE TOP = 1915.721'
H	CHEMICAL ACCESS MANHOLE TOP = 1915.687'
I	CHEMICAL ACCESS MANHOLE TOP = 1919.733'
J	CHEMICAL ACCESS MANHOLE TOP = 1917.621'

STORM STRUCTURE TABLE

STRUCTURE NAME	DETAILS
1	SGR TOP = 1914.39' INV 18" RCP = 1910.26' (OUT)
2	SGR TOP = 1914.361' INV 18" RCP = 1910.361' (OUT)
3	SGR TOP = 1913.898' INV 18" RCP = 1909.898' (IN) INV 18" RCP = 1909.748' (IN) INV 24" RCP = 1909.598' (OUT)
4	SGR TOP = 1914.449' INV 24" RCP = 1909.449' (IN) INV 24" RCP = 1909.199' (OUT)
5	SGR TOP = 1914.325' INV 24" RCP = 1908.755' (IN) INV 18" RCP = 1908.675' (IN) INV 30" RCP = 1907.585' (OUT)
6	MANHOLE TOP = 1914.348' INV 30" RCP = 1908.198' (IN) INV 30" RCP = 1908.098' (OUT)
7	SGR TOP = 1912.093' INV 30" RCP = 1907.593' (IN) INV 18" RCP = 1907.543' (IN) INV 36" CMP = 1907.413' (OUT)
8	SGR TOP = 1912.676' INV 18" RCP = 1909.176' (IN) INV 18" RCP = 1909.126' (IN) INV 18" RCP = 1908.976' (OUT)
9	SGR TOP = 1912.683' INV 18" RCP = 1909.733' (OUT)
10	SGR TOP = 1914.367' INV 18" RCP = 1910.117' (OUT)
11	SGR TOP = 1910.488' INV 12" CMP = 1907.958 (OUT)
12	SGR TOP = 1913.408' INV 6" DIP = 1913.408' (IN) INV 8" PVC = 1911.108' (IN) INV 12" PIPE = 1910.258' (OUT) UNABLE TO DETERMINE 12" PIPE TYPE AT TIME OF SURVEY
13	SGR TOP = 1922.406' INV 8" METAL = 1919.846 (OUT)
14	SGR TOP = 1915.620' INV 12" PIPE = 1909.32' (IN) INV SEALED PIPE = 1909.52 (SEALED) INV 18" RCP = 1909.22' (OUT) UNABLE TO DETERMINE SIZE/TYPE OF SEALED PIPE

30' 15' 0 30' 60'
SCALE: 1" = 30'
CONTOUR INTERVAL = 1'

COMMONWEALTH OF VIRGINIA
D. BRIAN MCGOUGH
Lic. No. 036275
1-7-22
PROFESSIONAL ENGINEER

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

SITE SURVEY / EXISTING CONDITIONS

No.	Date	Purpose of Document Issue
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	04.15.21	ISSUED FOR TOWN REVIEW
	06.07.21	ISSUED FOR TOWN REVIEW
	06.07.21	ISSUED FOR BIDS
1	02.11.22	ADDENDUM NO. 3

Designed	DBM
Drawn	ESB
Checked	
Date	JULY 2020

Project No.
14249

THOMPSON & LITTON

Sheet No.
C101

Virginia State Plane Coordinate System

Grid North – South Zone

CONTROL POINT COORDINATE TABLE				
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EDGE OF PAVEMENT
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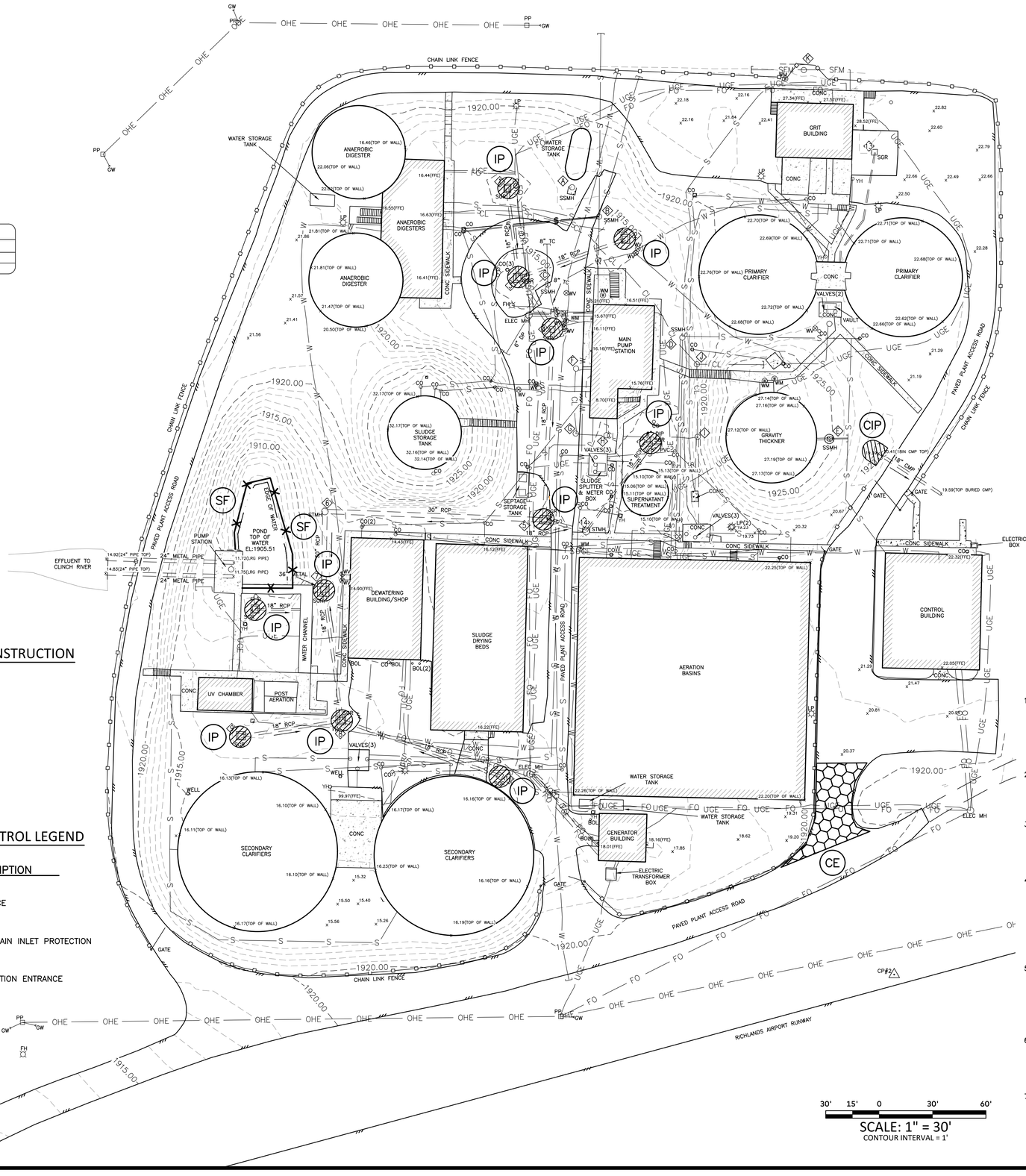
SUGGESTED SEQUENCE OF CONSTRUCTION

PHASE I:

1. INSTALL CONSTRUCTION ENTRANCE.
2. INSTALL SILT FENCE.
3. INSTALL STORM DRAIN INLET PROTECTION.

EROSION AND SEDIMENT CONTROL LEGEND

SYMBOL	DESCRIPTION
SF	SILT FENCE
IP	STORM DRAIN INLET PROTECTION
CE	CONSTRUCTION ENTRANCE



EROSION AND SEDIMENT CONTROL NOTES

1. EROSION AND SEDIMENT CONTROL SHALL BE IMPLEMENTED IN ACCORDANCE WITH ALL LOCAL REQUIREMENTS, THE EROSION AND SEDIMENT CONTROL PLAN FOR THIS PROJECT, AND THE LATEST EDITION OF THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK," BY THE DEPARTMENT OF ENVIRONMENTAL QUALITY, AS APPLICABLE.
2. THE CONTRACTOR SHALL KEEP AT THE PROJECT SITE COPIES OF THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" AND THE EROSION AND SEDIMENT CONTROL PLAN FOR THIS PROJECT.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ANY ADDITIONAL EROSION AND SEDIMENT CONTROL FACILITIES NECESSARY TO PREVENT EROSION AND SEDIMENTATION ON–SITE OR OFF–SITE AS DETERMINED BY THE PLAN–APPROVING AUTHORITY.
4. ALL DISTURBED AREAS SHALL DRAIN TO APPROVED EROSION AND SEDIMENT CONTROL FACILITIES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES UNTIL FINAL STABILIZATION IS ACHIEVED. ALL EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE CONSTRUCTED AS A FIRST STEP IN ALL LAND DISTURBING ACTIVITIES AND SHALL BE MADE FUNCTIONAL BEFORE UPSLOPE LAND DISTURBANCE TAKES PLACE.
5. ALL TEMPORARY EROSION CONTROL MEASURES MUST BE REMOVED WITHIN 30 DAYS, AFTER REACHING FINAL GRADE OR AFTER THEY ARE NO LONGER NEEDED. TRAPPED SEDIMENT AND DISTURBED AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY PRACTICES MUST BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.
6. MATERIAL STOCKPILES SHALL BE CONTAINED WITHIN SEDIMENT BARRIERS. STOCKPILES THAT ARE TO REMAIN UNWORKED FOR MORE THAN 30 DAYS SHALL BE STABILIZED WITH TEMPORARY SEEDING WITHIN 14 DAYS AFTER THE COMPLETION OF STOCKPILING.
7. TEMPORARY STABILIZATION SHALL BE INSTALLED WITHIN 14 DAYS ON DENUDED AREAS THAT ARE TO REMAIN DORMANT FOR GREATER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR. PERMANENT STABILIZATION SHALL BE INSTALLED WITHIN 7 DAYS OF FINAL STABILIZATION.
8. ALL AREAS WHICH REQUIRE SEEDING SHALL BE "TOPSOILED" AND STABILIZED WITH MULCH IN ACCORDANCE WITH THE SPECIFICATIONS FOR THIS PROJECT.
9. A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT, IN THE OPINION OF THE LOCAL PROGRAM ADMINISTRATOR OR HIS DESIGNATED AGENT, IS UNIFORM, MATURE ENOUGH TO SURVIVE, AND INHIBITS EROSION.
10. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME, OR SLOPE DRAIN STRUCTURE.
11. CUT AND FILL SLOPES SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.
12. STORM DRAIN INLET PROTECTION MUST BE INSTALLED ON ANY INLETS THAT MAY RECEIVE SEDIMENT–LADEN RUNOFF FROM THIS PROJECT, PRIOR TO BEING MADE OPERABLE.
13. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPEN AT ONE TIME.
14. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
15. PAVED OR PUBLIC ROAD SURFACES SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY.
16. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH A DEWATERING STRUCTURE AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF–SITE PROPERTY.
17. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, A CONSTRUCTION ENTRANCE SHALL BE INSTALLED, AS NECESSARY, TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. PAVED OR PUBLIC ROAD SURFACES SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY.

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

SITE DEMOLITION AND EROSION & SEDIMENT CONTROL PLAN PHASE 1

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS

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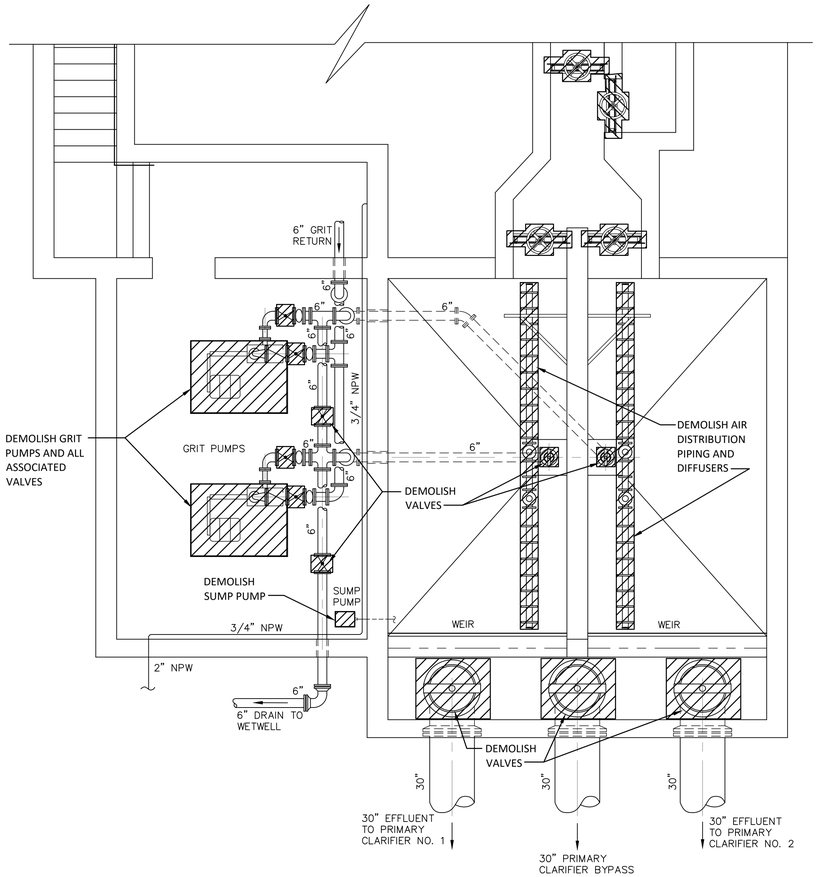
Date	JULY 2020

Project No. 14249

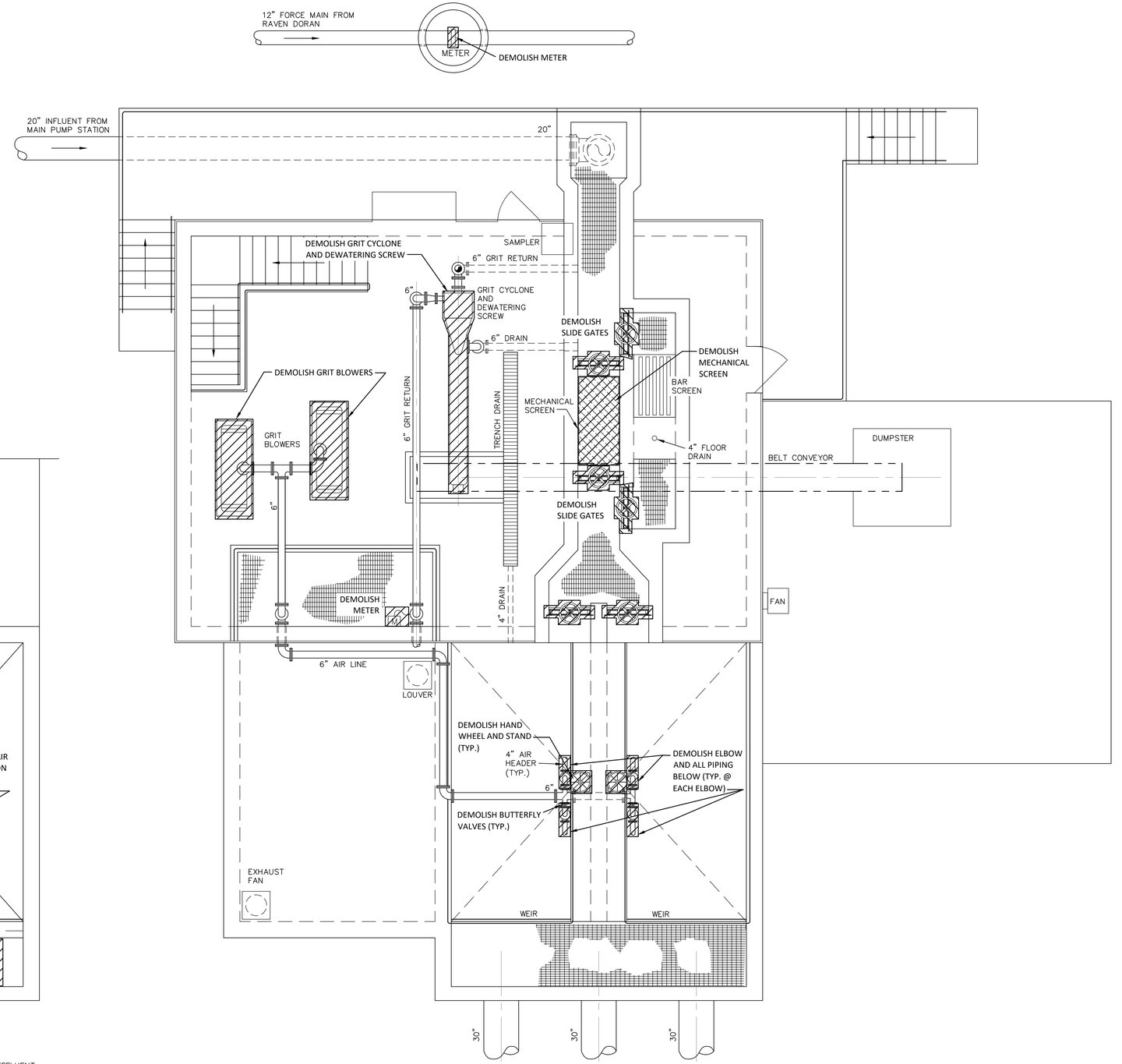
THOMPSON & LITTON

Sheet No. C102



LOWER FLOOR PLAN

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



UPPER FLOOR PLAN

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

4'-0" 2'-0" 0 4'-0" 8'-0"

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

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UPGRADES AND IMPROVEMENTS

PRELIMINARY TREATMENT BUILDING DEMOLITION PLAN

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS

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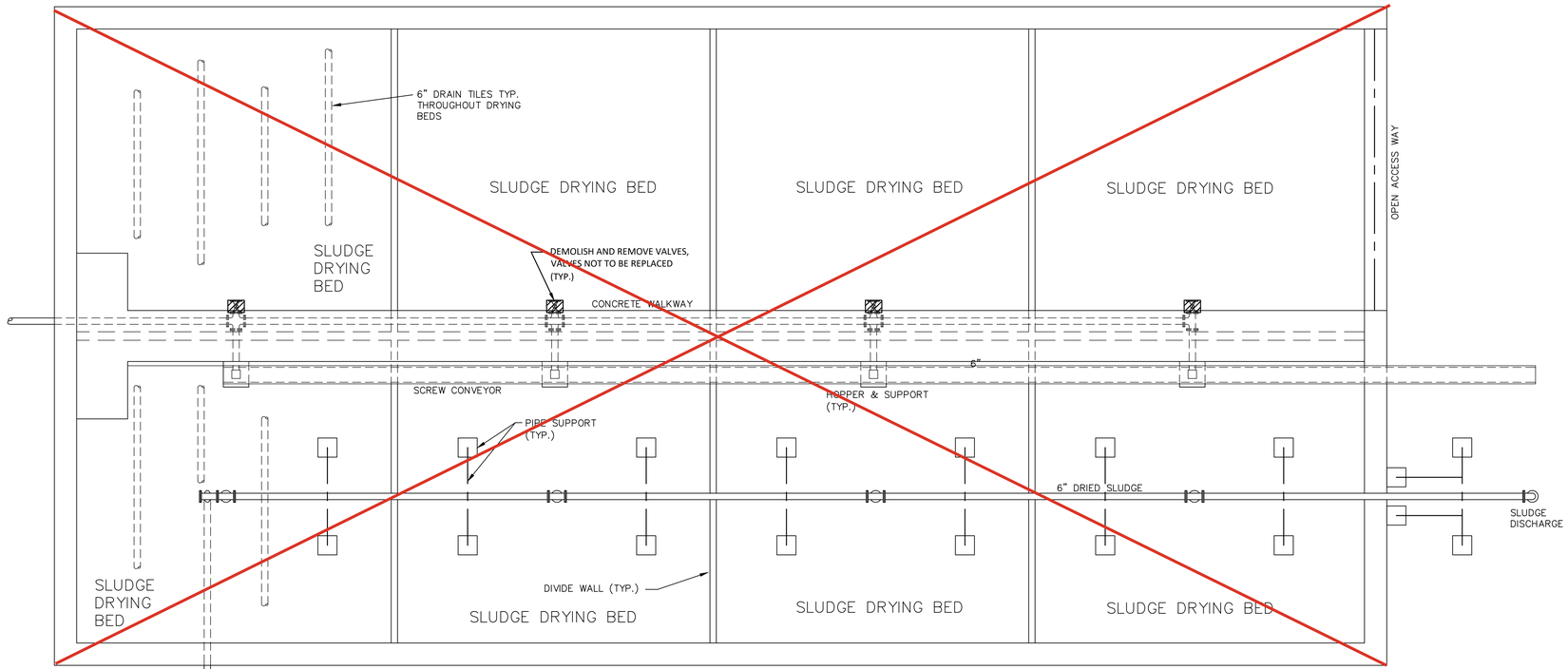
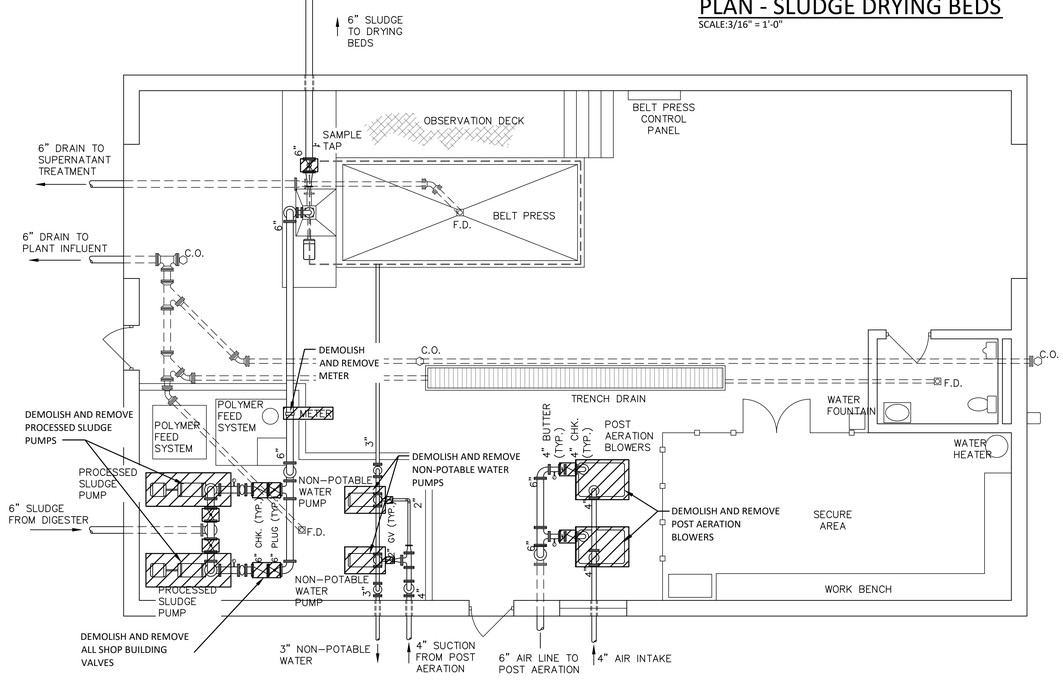
Sheet No.
C202



PLAN - SLUDGE DRYING BEDS

SCALE:3/16" = 1'-0"



PLAN - SHOP BUILDING

SCALE:3/16" = 1'-0"

5'-4" 2'-8" 0 5'-4" 10'-8"

SCALE: 3/16" = 1'-0"

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

SHOP BUILDING EQUIPMENT DEMOLITION PLAN

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS

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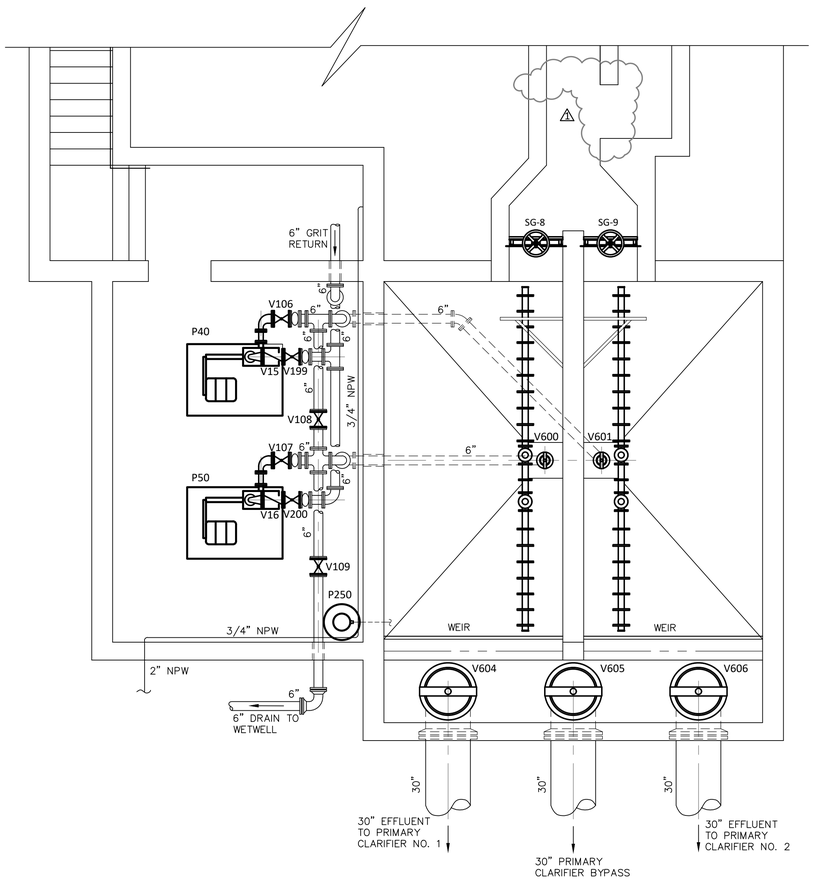
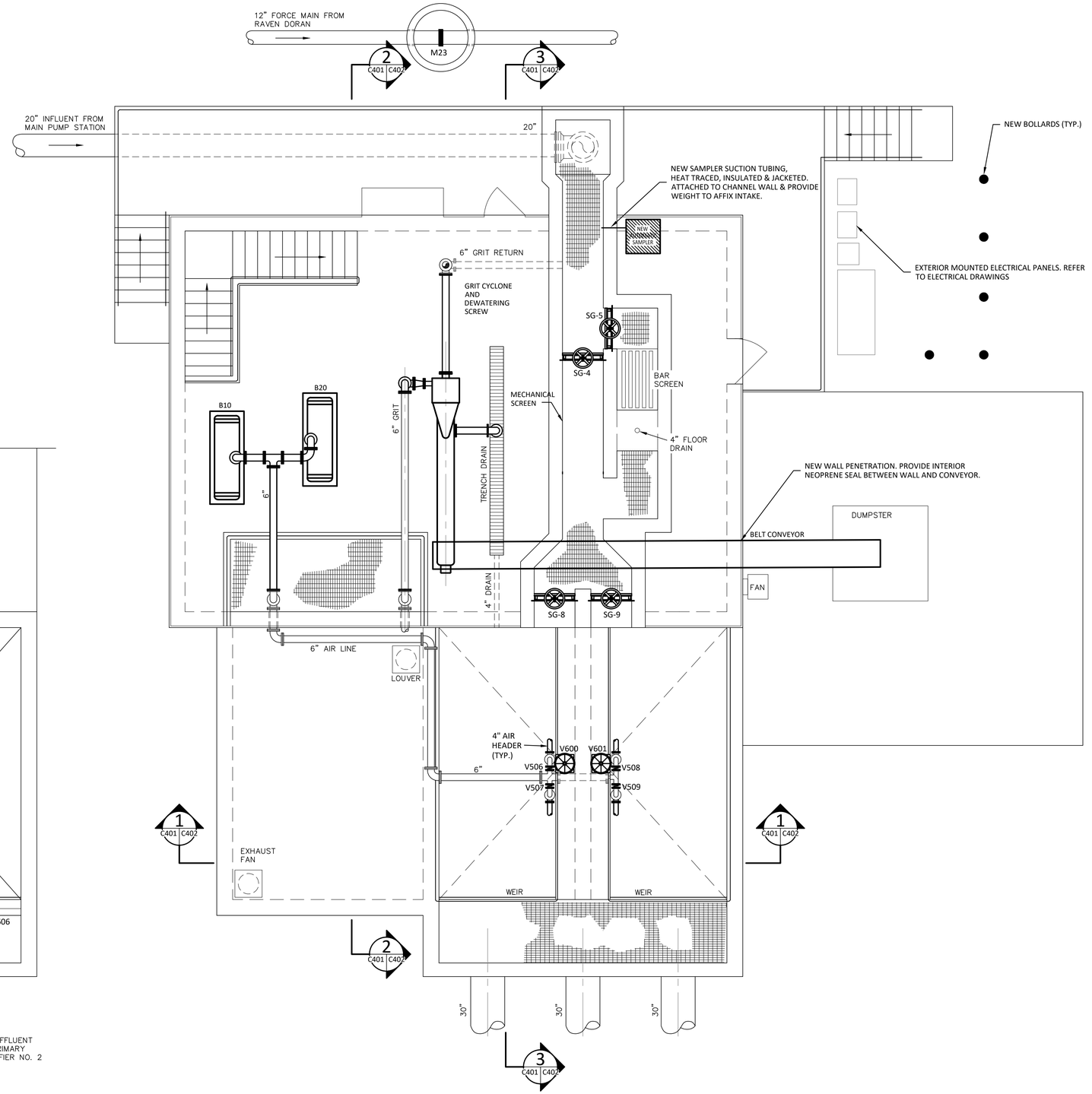
Sheet No.
C209



LOWER FLOOR PLAN

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



UPPER FLOOR PLAN

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

4'-0" 2'-0" 0 4'-0" 8'-0"

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

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

PRELIMINARY TREATMENT BUILDING RENOVATION PLAN

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS

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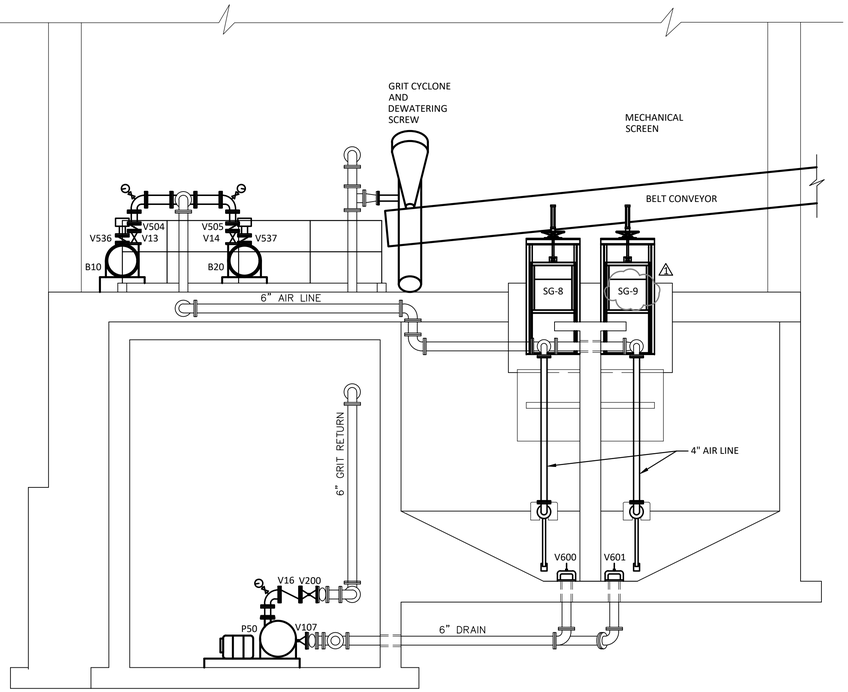
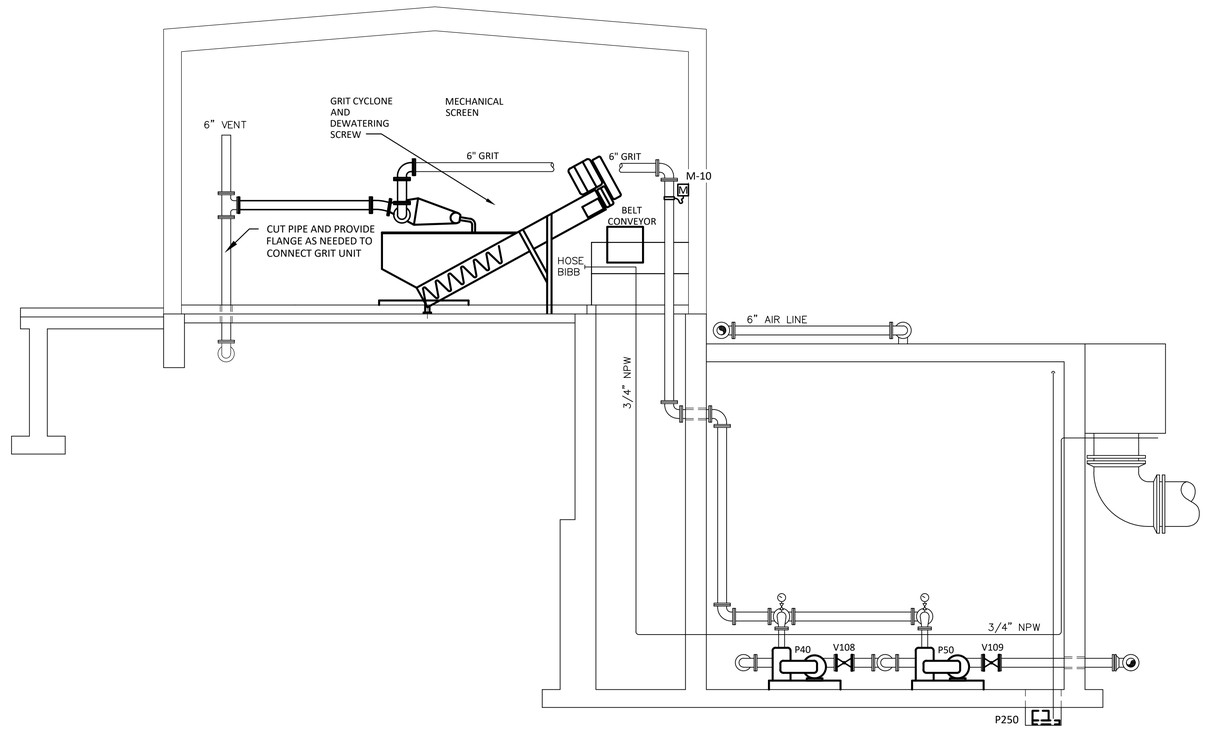
Sheet No.
C401



SECTION 1
SCALE: 1/4" = 1'-0" CX01 CX02



SECTION 2
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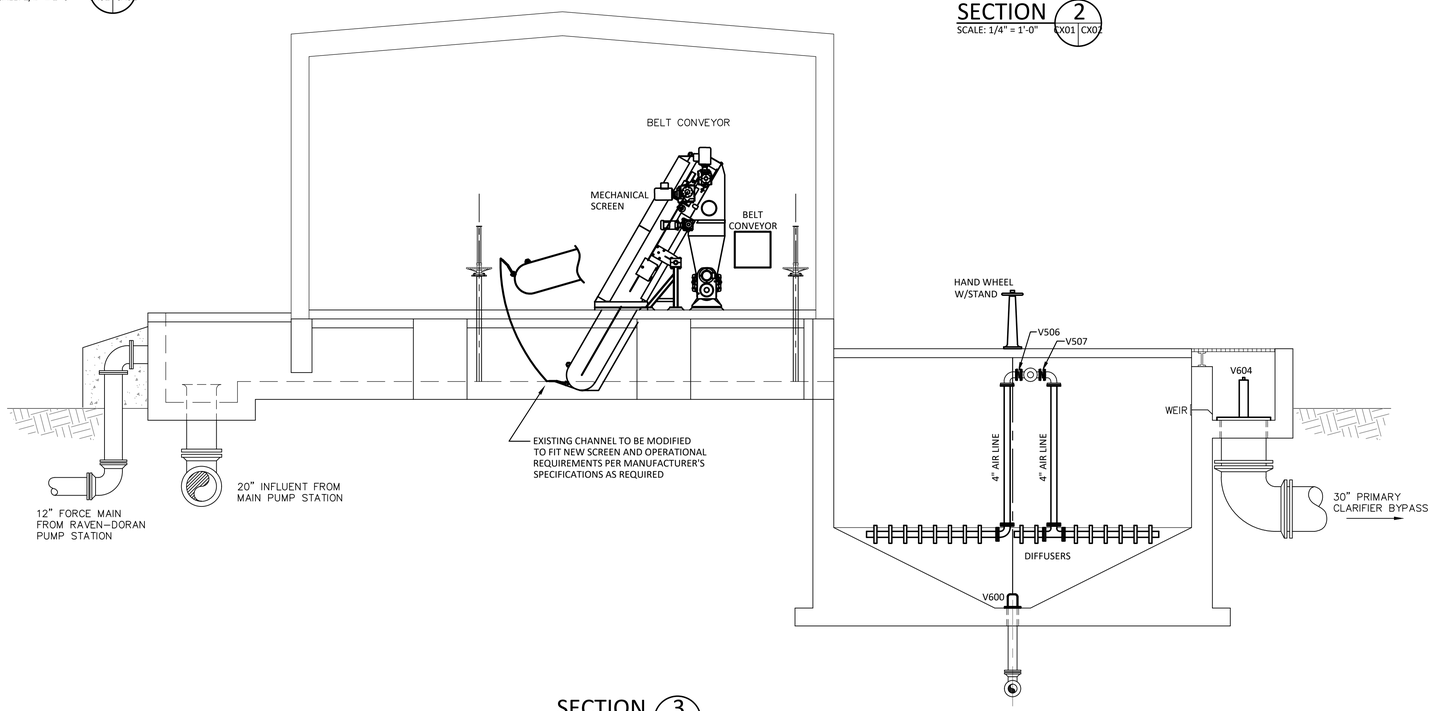

SECTION 3
SCALE: 1/4" = 1'-0" CX01 CX02

4'-0" 2'-0" 0 4'-0" 8'-0"

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

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

PRELIMINARY TREATMENT BUILDING SECTIONS

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS
1	02-25-22	ADDENDUM NO. 5

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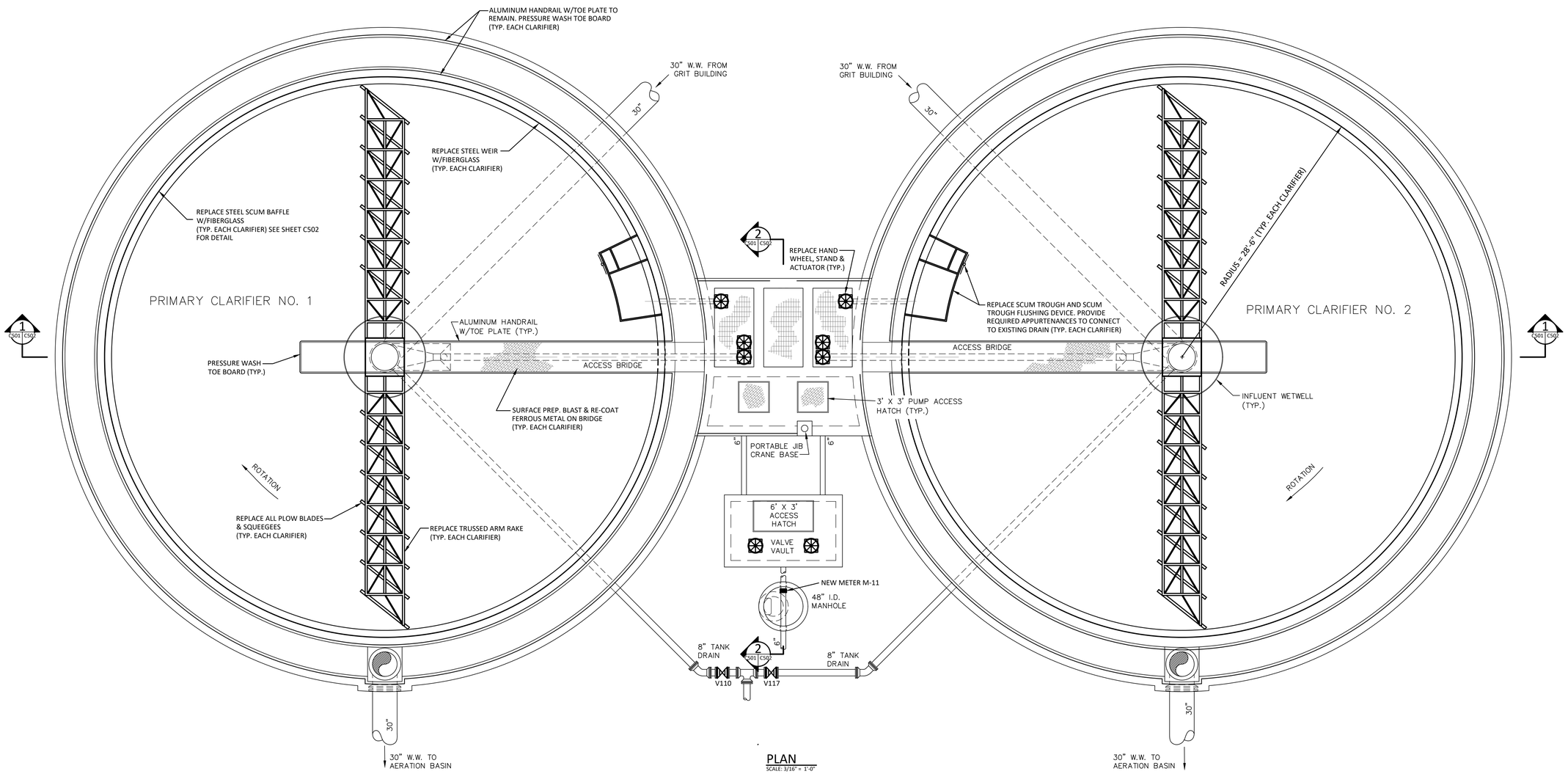
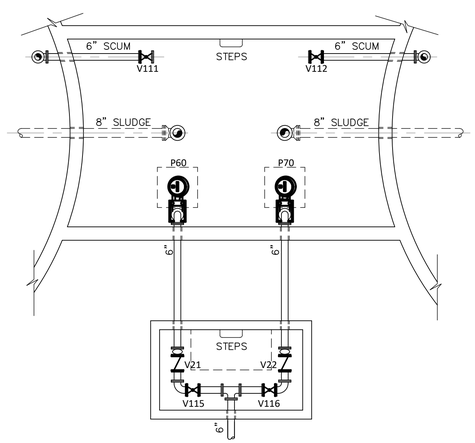
Sheet No.
C402



PLAN
SCALE: 3/16" = 1'-0"



PLAN @ PUMP LEVEL
SCALE: 3/16" = 1'-0"

NOTE:
REFER TO SPECIFICATIONS FOR COMPLETE CLARIFIER MECHANISM REHABILITATION REQUIREMENTS.

5'-4" 2'-8" 0 5'-4" 10'-8
SCALE: 3/16" = 1'-0"

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

PRIMARY CLARIFIERS RENOVATION PLAN

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS

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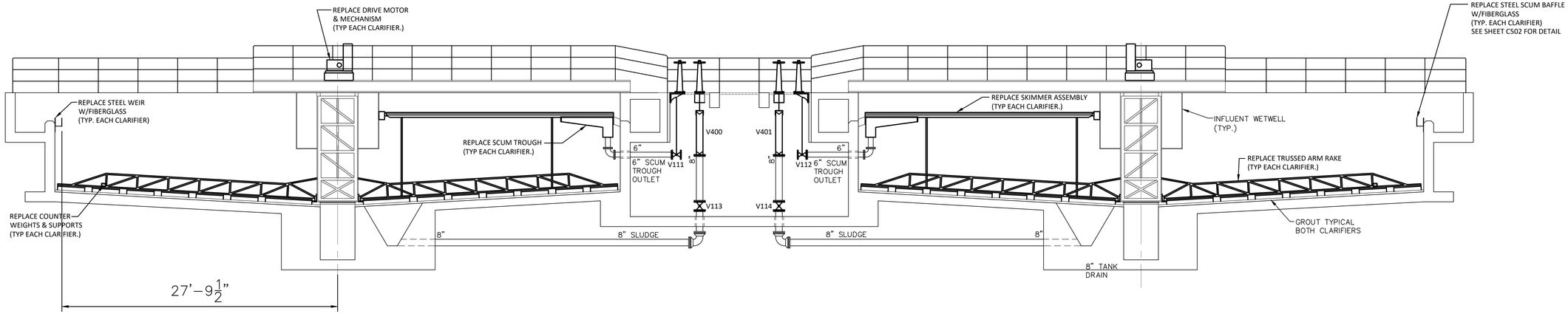
Sheet No.
C501



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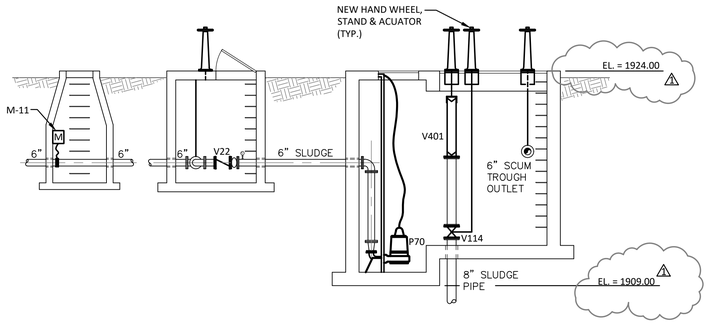
SCALE: 3/16" = 1'-0"
1 C501 C502



SECTION
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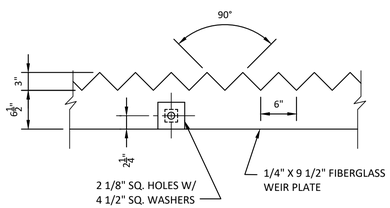
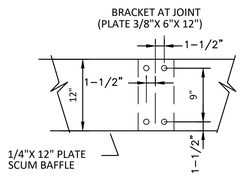
2 C501 C502



WEIR DETAIL
SCALE: 1" = 1'-0"



SCUM BAFFLE DETAIL
SCALE: 1" = 1'-0"

5'-4" 2'-8" 0 5'-4" 10'-8"
SCALE: 3/16" = 1'-0"

1'-0" 0'-6" 0 1'-0" 2'-0"
SCALE: 1" = 1'-0"

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

PRIMARY CLARIFIERS SECTIONS

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS
1	02-21-22	ADDENDUM NO. 4

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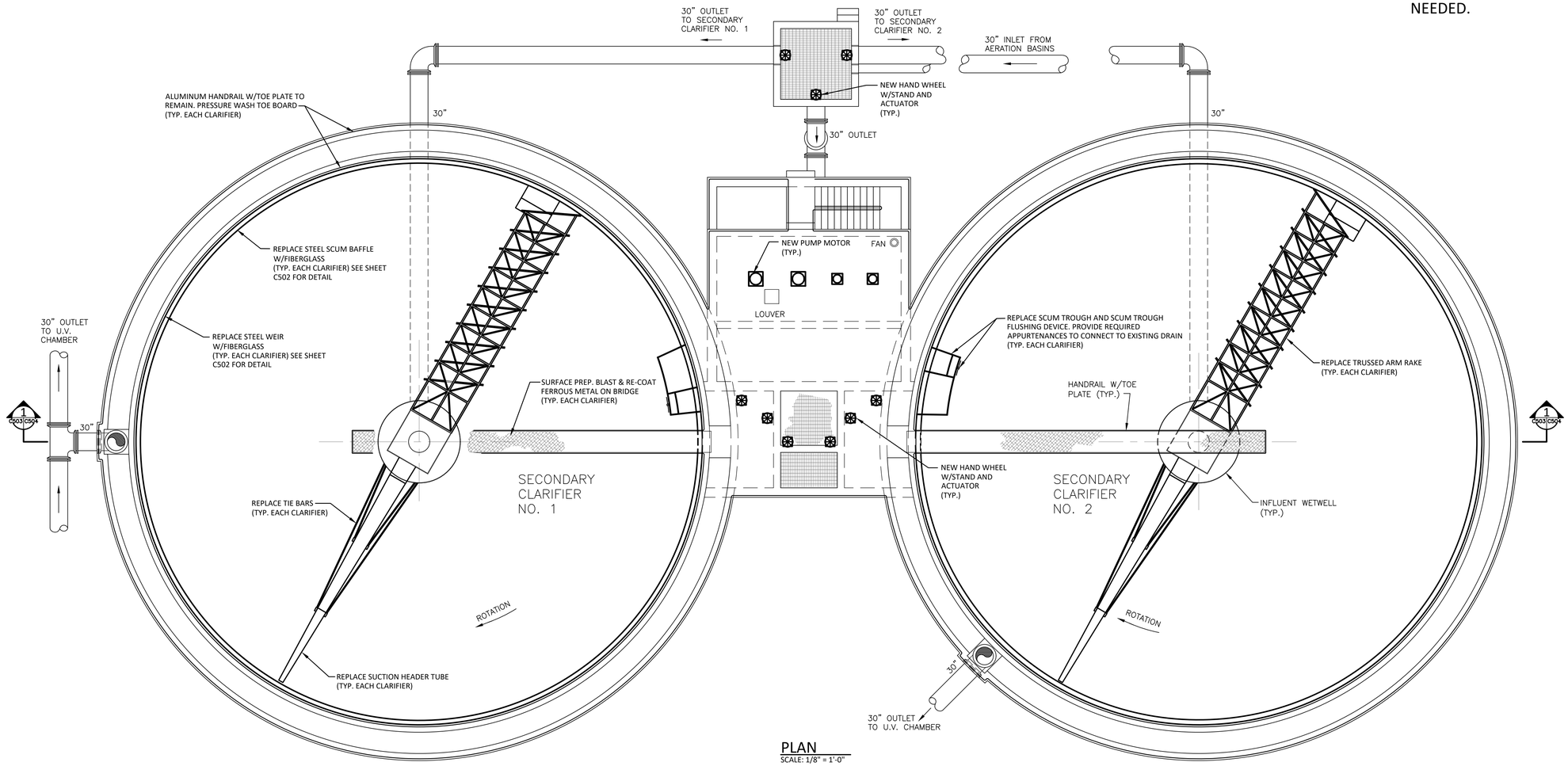
Sheet No.
C502

NOTE:

- REFER TO SPECIFICATIONS FOR COMPLETE CLARIFIER MECHANISM REHABILITATION REQUIREMENTS.
- WELL POINT PUMPING WILL NEED TO BE PERFORMED WHEN CLARIFIERS ARE DRAINED. UTILIZE EXISTING GROUNDWATER OBSERVATION WELLS AND INSTALL ADDITIONAL WELLS AS NEEDED.



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

8'-0" 4'-0" 0 8'-0" 16'-0"
SCALE: 1/8" = 1'-0"

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

SECONDARY CLARIFIERS RENOVATION PLAN

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS

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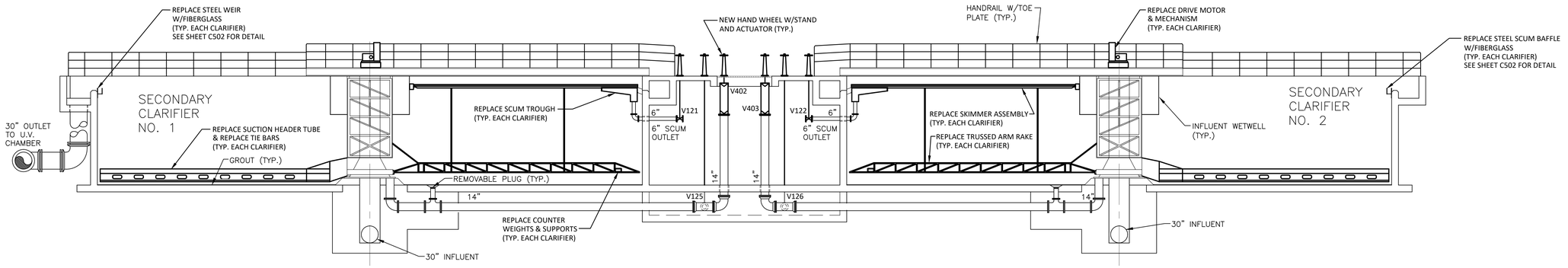
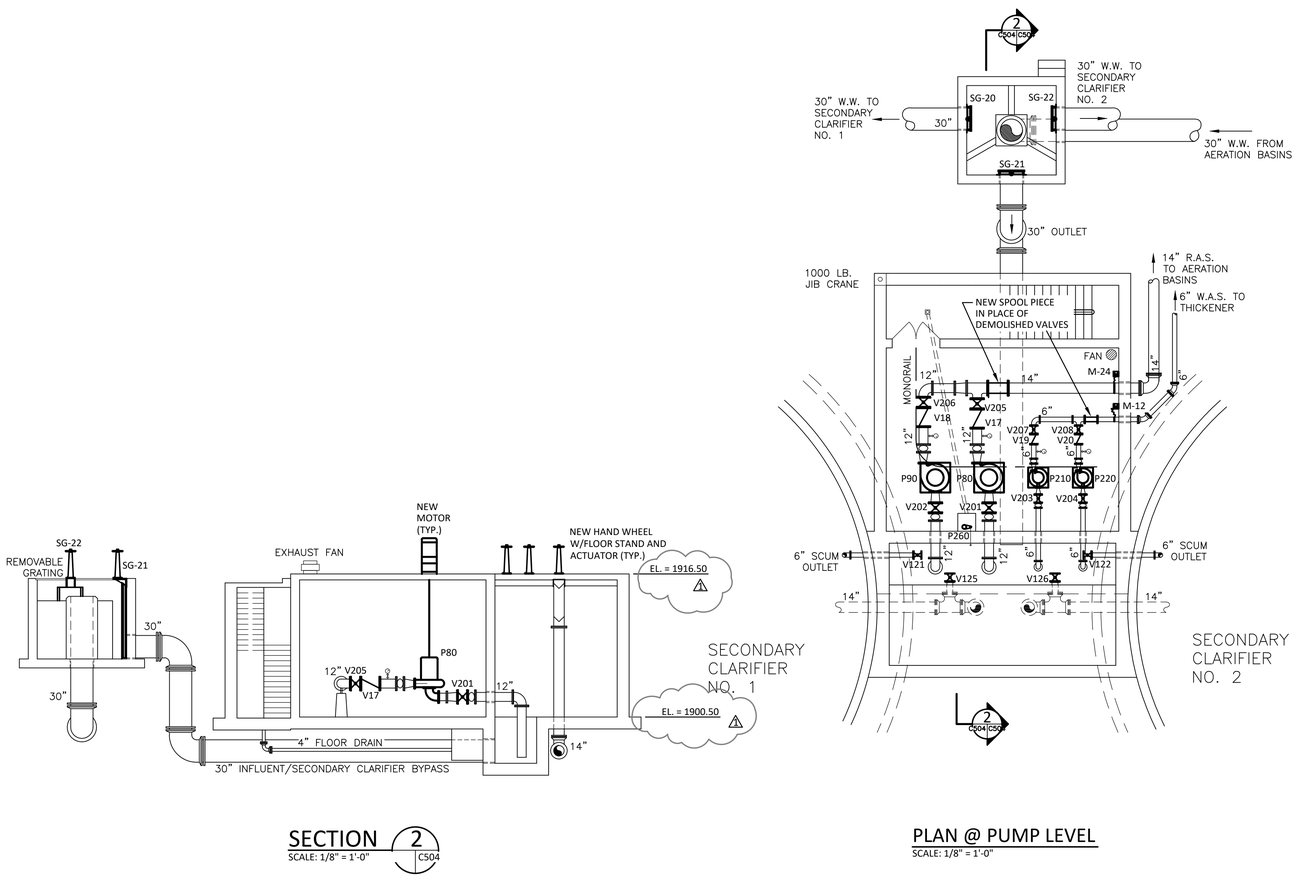
Sheet No.
C503

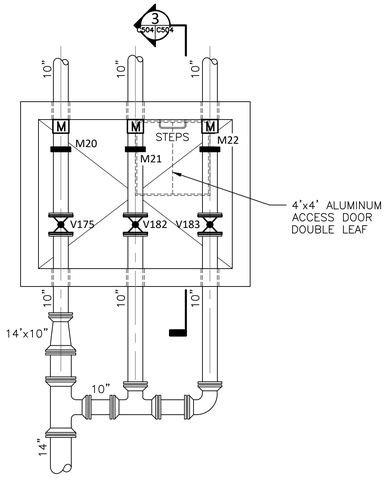


SECTION 1
SCALE: 1/8" = 1'-0" C503 | C504

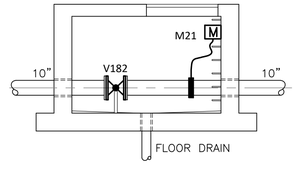


PLAN @ PUMP LEVEL
SCALE: 1/8" = 1'-0"

SECTION 2
SCALE: 1/8" = 1'-0" C504



PLAN - SLUDGE SPLITTER & METER BOX
SCALE: 1/4" = 1'-0"



SECTION 3
SCALE: 1/4" = 1'-0" C504 C504

4'-0" 2'-0" 0 4'-0" 8'-0"
SCALE: 1/4" = 1'-0"

8'-0" 4'-0" 0 8'-0" 16'-0"
SCALE: 1/8" = 1'-0"

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

SECONDARY CLARIFIERS PLAN AT PUMP LEVEL & SECTIONS

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS
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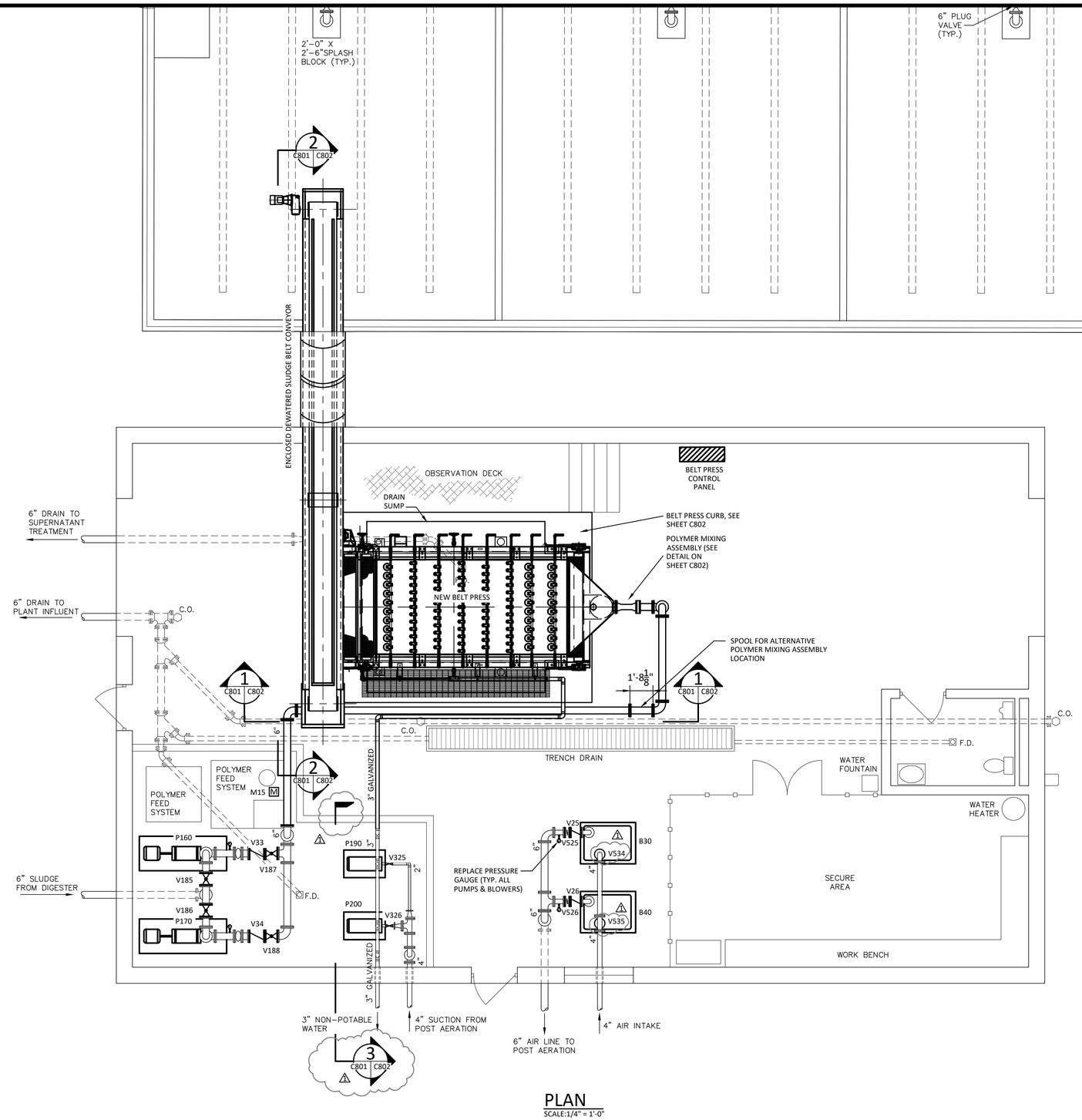
Sheet No.
C504



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

8'-0" 2'-0" 0 4'-0" 8'-0"

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

COMMONWEALTH OF VIRGINIA
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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

SHOP BUILDING RENOVATION PLAN

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS
1	02-25-22	ADDENDUM NO. 5

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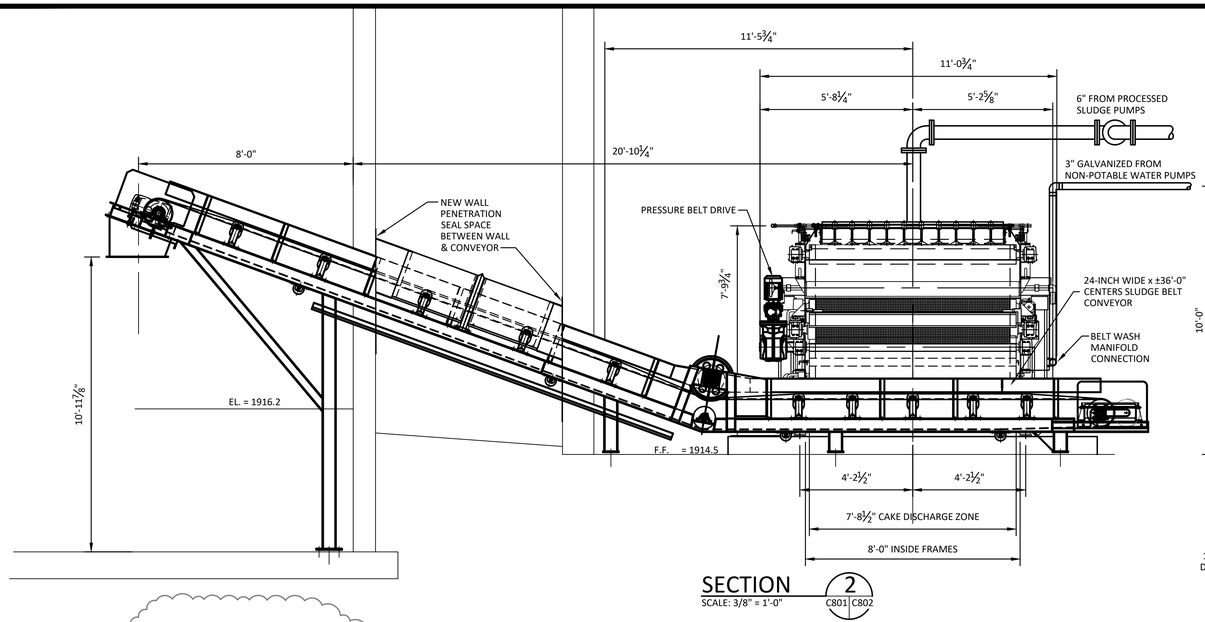
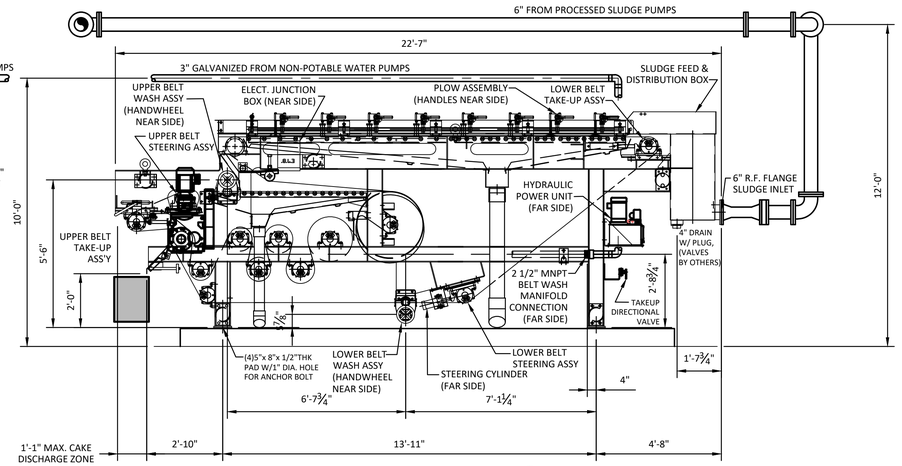
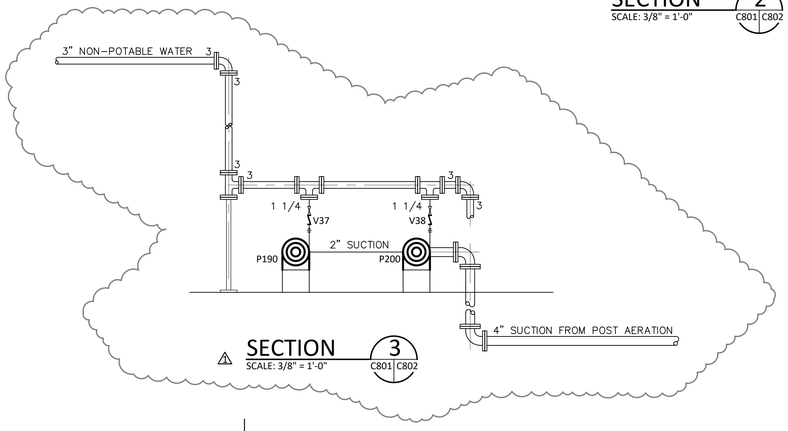
Sheet No.
C801



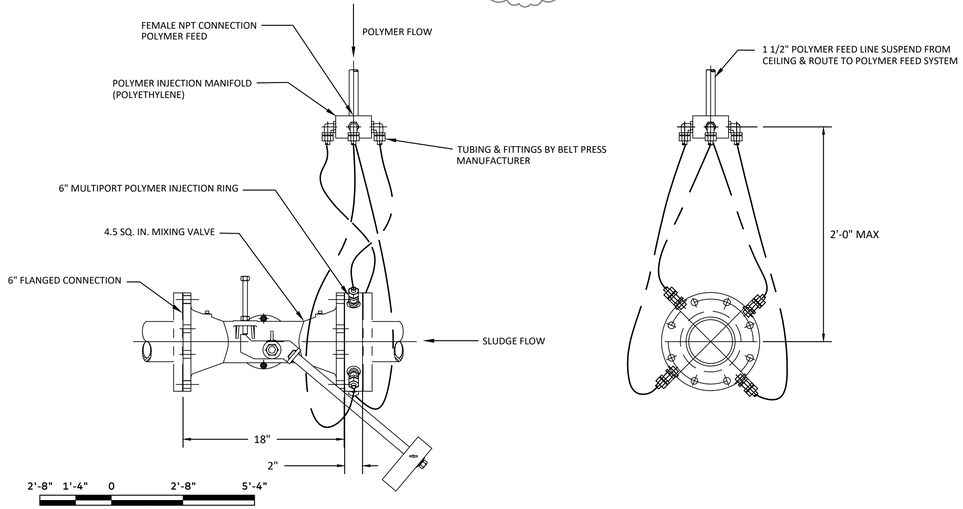
SECTION 2
SCALE: 3/8" = 1'-0" C801 C802



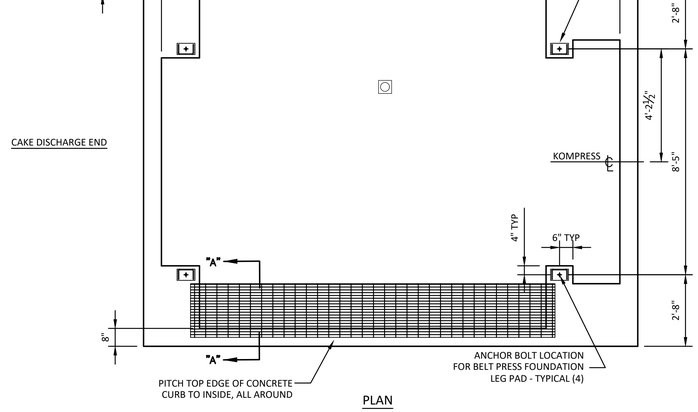
SECTION 1
SCALE: 3/8" = 1'-0" C801 C802



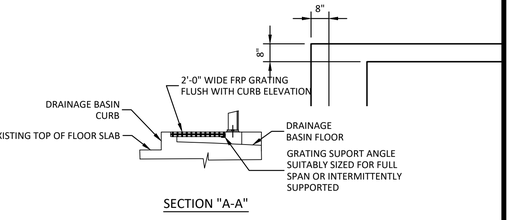
SECTION 3
SCALE: 3/8" = 1'-0" C801 C802



POLYMER MIXING ASSEMBLY
SCALE 1-1/2" = 1'-0"

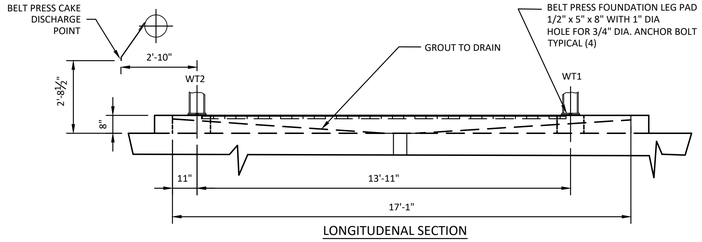


PLAN

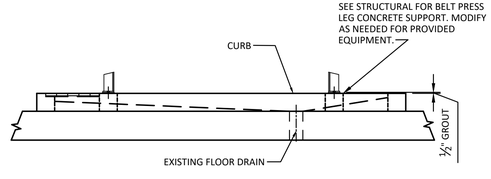


SECTION "A-A"

GRATING INSTALLATION DETAIL



LONGITUDENAL SECTION



LATERAL SECTION

BELT PRESS FOUNDATION DETAIL
SCALE 3/8" = 1'-0"

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

SHOP BUILDING SECTIONS

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR FIRST REVIEW
	01-07-22	ISSUED FOR BIDS
1	02-25-22	ADDENDUM NO. 5

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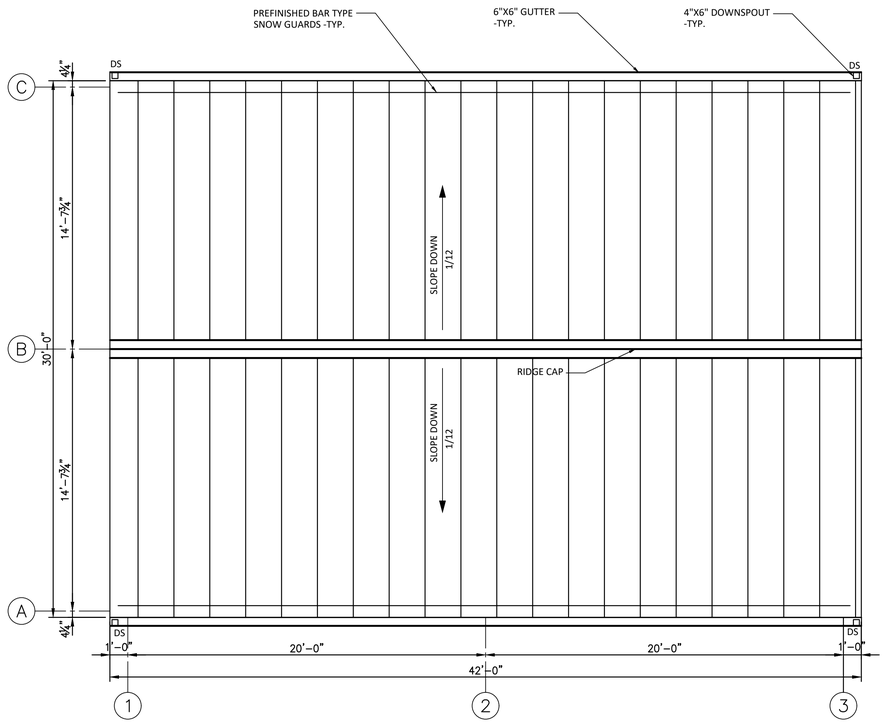
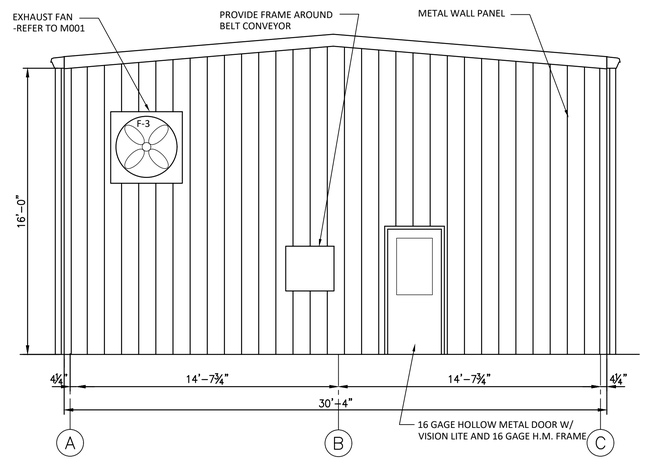
Sheet No.
C802



ROOF FRAMING PLAN

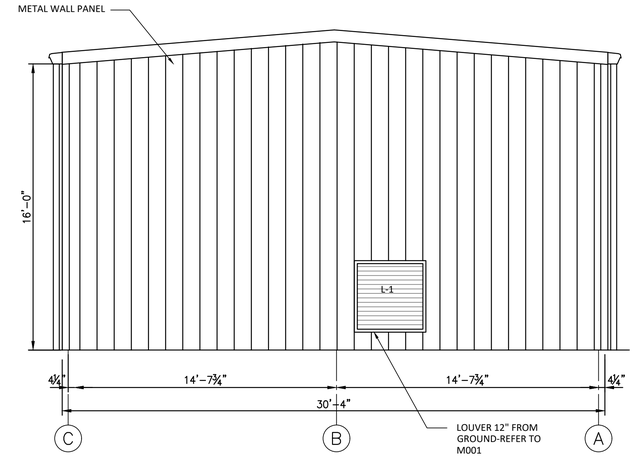
SCALE: 1/4"=1'-0"

PLAN NORTH



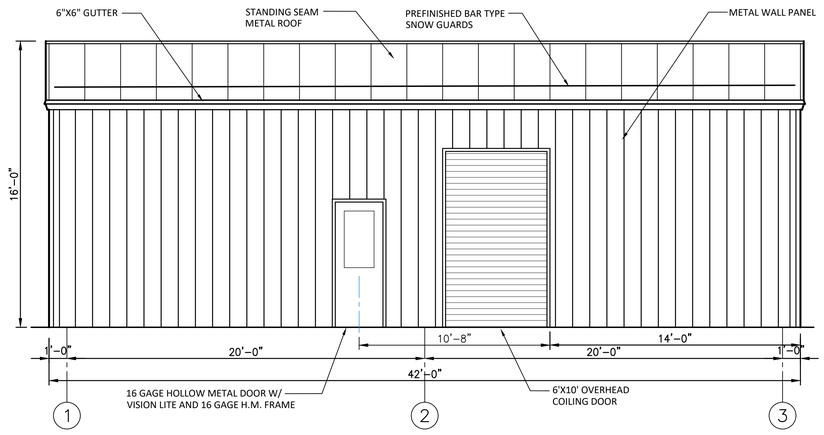
EAST ELEVATION

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



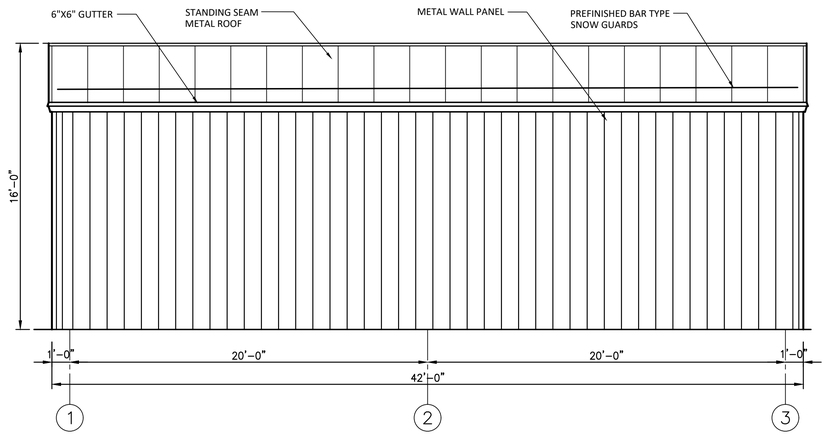
WEST ELEVATION

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



NORTH ELEVATION

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



SOUTH ELEVATION

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

COMMONWEALTH OF VIRGINIA
ELLIOTT LAMBERT
Lic. No. 0401018017
Aug. 27, 2021
ARCHITECT

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

NEW PRELIMINARY TREATMENT BUILDING EXTERIOR ELEVATIONS

No.	Date	Purpose of Document Issue
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Drawn	MLT
Checked	EL
Date	08-27-2021

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14249-00

THOMPSON & LITTON

Sheet No.
A201

GENERAL

1. THE CONTRACTOR SHALL INVESTIGATE ACTUAL LOCATIONS OF UNDERGROUND LINES AND UTILITIES BEFORE EXCAVATING AND ADVISE ENGINEER OF ANY VARIATIONS. ALL EXCAVATIONS NEAR THESE LINES TO BE CARRIED OUT WITH EXTREME CAUTION.

2. THE CONTRACTOR SHALL CONTACT "MISS UTILITY OF VIRGINIA" 72 HOURS BEFORE ANY EXCAVATION WORK IS BEGUN. "MISS UTILITY OF VIRGINIA" MAY BE REACHED AT 1–800–552–7001.

3. THE CONTRACTOR SHALL REFER TO DRAWINGS OF OTHER TRADES AND VENDOR DRAWINGS FOR EMBEDDED ITEMS AND RECESSES NOT SHOWN ON THE STRUCTURAL DRAWINGS.

4. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF EXISTING CONSTRUCTION WHICH AFFECT NEW CONSTRUCTION AND REPORT VARIATIONS TO THE ENGINEER PRIOR TO SUBMISSION OF SHOP DRAWINGS.

5. THE CONTRACTOR SHALL VERIFY ALL SIZES AND LOCATIONS OF ALL MECHANICAL AND ELECTRICAL OPENINGS AND EQUIPMENT PADS WITH THE MECHANICAL AND ELECTRICAL EQUIPMENT DETAILS AND SHOP DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL OPENINGS AND SLEEVES FOR THE PROPER DISTRIBUTION OF ALL UTILITY LINES THROUGHOUT THE BUILDING.

6. SEE ARCHITECTURAL DRAWINGS FOR THE LOCATION OF WINDOW AND DOOR OPENINGS AND FOR OTHER INFORMATION NOT SHOWN.

7. THE CONTRACTOR SHALL PROVIDE ADEQUATE BRACING FOR THE STRUCTURE SO THAT IT WILL BE STABLE DURING ALL STAGES OF CONSTRUCTION. THE STRUCTURE AND FOUNDATIONS ARE DESIGNED FOR A COMPLETED CONDITION ONLY AND, THEREFORE, REQUIRE ADDITIONAL SUPPORT TO MAINTAIN STABILITY BEFORE COMPLETION.

RENOVATION AND EXISTING STRUCTURES

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, ETC., NECESSARY FOR THE PROPER CONSTRUCTION AND ALIGNMENT OF THE NEW PORTIONS OF THE STRUCTURE TO THE EXISTING STRUCTURE. THE CONTRACTOR SHALL VERIFY ALL MEASUREMENTS NECESSARY FOR PROPER FABRICATION AND ERECTION OF ALL STRUCTURAL MEMBERS.

2. BEFORE PROCEEDING WITH ANY WORK WITHIN OR ADJACENT TO THE EXISTING STRUCTURE, THE CONTRACTOR SHALL BECOME FAMILIAR WITH EXISTING CONDITIONS. DURING THE PROCESS OF CONSTRUCTION, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE INTEGRITY OF THE EXISTING STRUCTURE WHERE THE EXISTING STRUCTURE IS MODIFIED TO ACCOMMODATE NEW CONSTRUCTION AND TO PROTECT FROM DAMAGE THOSE PORTIONS OF THE EXISTING STRUCTURE, WHICH ARE TO REMAIN.

3. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE OF ANY EXISTING CONDITIONS THAT DIFFER FROM THOSE INDICATED ON THE DRAWINGS.

PRE-ENGINEERED BUILDING

1. THE PRE–ENGINEERED BUILDING SHALL BE DESIGNED TO CONFORM TO THE DESIGN CRITERIA, LAYOUT AND DIMENSIONS SHOWN ON THE ARCHITECTURAL AND STRUCTURAL DRAWINGS AND IN THE SPECIFICATIONS. THE DESIGN SHALL BE PERFORMED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE COMMONWEALTH OF VIRGINIA. LATERAL BRACING IN THE FORM OF PORTAL FRAMES AND X–BRACING SHALL BE LOCATED ONLY WHERE SHOWN ON THE STRUCTURAL DRAWINGS.

2. COLUMN BASE PLATES AND GIRT LINE DIMENSIONS SHALL BE DETAILED TO PROPERLY FIT ON THE CONCRETE PIERS SHOWN ON THE STRUCTURAL DRAWINGS. THE EDGE DISTANCE FROM THE EDGE OF THE BASE PLATE TO THE EDGE OF THE CONCRETE PIER SHALL BE 2" MINIMUM.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL, UNLESS OTHERWISE NOTED, SHALL CONFORM TO THE REQUIREMENTS OF ASTM A992 WIDE FLANGED SHAPES, AND ASTM A500 FOR HOLLOW STRUCTURAL SHAPES. ANGLES, PLATES, AND OTHER MISCELLANEOUS MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36.

2. ALL DETAILING, FABRICATION AND ERECTION OF STRUCTURAL STEEL, UNLESS OTHERWISE NOTED, SHALL CONFORM TO THE REQUIREMENTS OF THE AISC SPECIFICATIONS FOR BUILDINGS, ASD DESIGN, 14TH EDITION.

3. UNLESS OTHERWISE NOTED, ALL SHOP CONNECTIONS SHALL BE MADE BY WELDING OR HIGH STRENGTH BOLTING (3/4" DIA. ASTM F3125 GRADE A325 BOLTS).

4. UNLESS OTHERWISE NOTED, WELDS SHALL BE MADE WITH E–70 ELECTRODES.

5. UNLESS OTHERWISE NOTED, ALL FIELD CONNECTIONS SHALL BE MADE WITH 3/4" DIA. HIGH STRENGTH BOLTS (ASTM F3125 GRADE A325). CONNECTIONS SHALL BE DESIGNED AS BEARING TYPE WITH THREADS IN THE SHEAR PLANE.

6. UNLESS OTHERWISE SHOWN, ALL BEAM CONNECTIONS SHALL BE STANDARD FRAMED, SEATED SINGLE–PLATE SHEAR CONNECTIONS AS SHOWN IN PART 4 OF THE AISC MANUAL OF STEEL CONSTRUCTION. SINGLE PLATE SHEAR CONNECTIONS MAY UTILIZE PLATES OR ANGLES. UNLESS REACTIONS ARE INDICATED ON THE PLANS, CONNECTIONS SHALL DEVELOP AT LEAST ONE–HALF OF THE TOTAL UNIFORM LOAD CAPACITY TABULATED IN THE TABLES OF THE MANUAL FOR THE GIVEN SHAPE AND SPAN OF THE BEAM IN QUESTION. HOWEVER, IN NO CASE SHALL THE LENGTH OF THE FRAMED CONNECTIONS BE LESS THAN ONE–HALF OF THE "T" DIMENSION OF THE BEAM WEB. ALSO, A 2–BOLT MINIMUM CONNECTION SHALL BE USED.

7. GUSSET PLATES SHALL BE 3/8" THICK MINIMUM.

8. ALL COLUMN ANCHOR BOLT HOLES SHALL BE OVERSIZED IN ACCORDANCE WITH THE RECOMMENDATIONS OF "AISC" MANUAL FOR "DETAILING FOR STEEL CONSTRUCTION".

DESIGN CRITERIA

1. GOVERNING CODES:

INTERNATIONAL BUILDING CODE (2015 EDITION)
VIRGINIA CONSTRUCTION CODE (2015)
VIRGINIA EXISTING BUILDING CODE (2015)
AISC STEEL CONSTRUCTION MANUAL (ASD 14TH EDITION)
AMERICAN SOCIETY OF CIVIL ENGINEERS ASCE–7 (2010)

2. ROOF LOADS: PRELIMINARY TREATMENT BUILDING

FRAMING ..... 5 PSF (OR SELF–WEIGHT)
INSULATION ..... 2 PSF
METAL ROOF ..... 2 PSF
SUSPENDED COLLATERAL (MEP) ..... 5 PSF

LIVE LOAD ..... 5 PSF

IN ADDITION TO THE ABOVE LISTED LOADS, AFFECTED ROOF FRAMING MEMBERS SHALL BE DESIGNED FOR

3. SNOW LOADS

GROUND SNOW LOADS (Pg) ..... 20 PSF
MINIMUM SNOW LOAD (Pm) ..... 22 PSF
FLAT ROOF SNOW LOAD (Pf) USED W/ DRIFT ..... 15.4 PSF
RISK CATEGORY III
SNOW IMPORTANCE FACTOR (Is) 1.1
SNOW EXPOSURE FACTOR (Ce) 1.0
THERMAL FACTOR (Ct) 1.0

4. WIND LOADS

ULTIMATE DESIGN WIND SPEED ..... 120 MPH
NOMINAL DESIGN WIND SPEED ..... 93 MPH
EXPOSURE CATEGORY C
RISK CATEGORY III
INTERNAL PRESSURE COEFFICIENT (GCPI) ..... ±0.18

ROOF

ZONE	EFFECTIVE AREA (SF)	PRESSURE (PSF)
1	10	+11/–17
1	20	+10/–16
1	50	+10/–16
1	100	+10/–15
2	10	+11/–29
2	20	+10/–26
2	50	+10/–23
2	100	+10/–21
3	10	+11/–42
3	20	+10/–39
3	50	+10/–36
3	100	+10/–33

WALLS

ZONE	EFFECTIVE AREA (SF)	PRESSURE (PSF)
4	10	+18/–20
4	20	+17/–19
4	50	+16/–18
4	100	+15/–17
4	500	+14/–15
5	10	+18/–24
5	20	+17/–22
5	50	+16/–20
5	100	+15/–19
5	200	+14/–15

CORNER AND EDGE ZONES ARE 3'–0" WIDE.

(POSITIVE INDICATES PRESSURE ACTING TOWARD SURFACE AND NEGATIVE INDICATES PRESSURE ACTING AWAY FROM THE SURFACE)

5. SEISMIC LOADS:

MAPPED SPECTRAL RESPONSE ACCELERATION (SHORT PERIOD), Ss 0.266
MAPPED SPECTRAL RESPONSE ACCELERATION (1–SEC), S_1 ..... 0.093
DESIGN SPECTRAL RESPONSE ACCELERATION (SHORT PERIOD), S_{D1} 0.281
DESIGN SPECTRAL RESPONSE ACCELERATION (1–SEC), S_{D1} 0.148
SOIL SITE CLASSIFICATION ..... D
RISK CATEGORY III
SEISMIC IMPORTANCE FACTOR 1.25
SEISMIC DESIGN CATEGORY C
BUILDING SYSTEM ..... TO BE DETERMINED BY PEMB DESIGNER
SEISMIC–FORCE RESISTING SYSTEMS ..... TO BE DETERMINED BY PEMB DESIGNER
RESPONSE MODIFICATION FACTOR ..... TO BE DETERMINED BY PEMB DESIGNER
SYSTEM OVER–STRENGTH FACTOR ..... TO BE DETERMINED BY PEMB DESIGNER
DEFLECTION AMPLIFICATION FACTOR ..... TO BE DETERMINED BY PEMB DESIGNER
SEISMIC RESPONSE COEFFICIENT (Cs) ..... TO BE DETERMINED BY PEMB DESIGNER
PROCEDURE USED ..... TO BE DETERMINED BY PEMB DESIGNER

COMMONWEALTH OF VIRGINIA
KEITH A. ALMONEY
Lic. No.38285
8-27-21
PROFESSIONAL ENGINEER

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

GENERAL NOTES AND DESIGN CRITERIA

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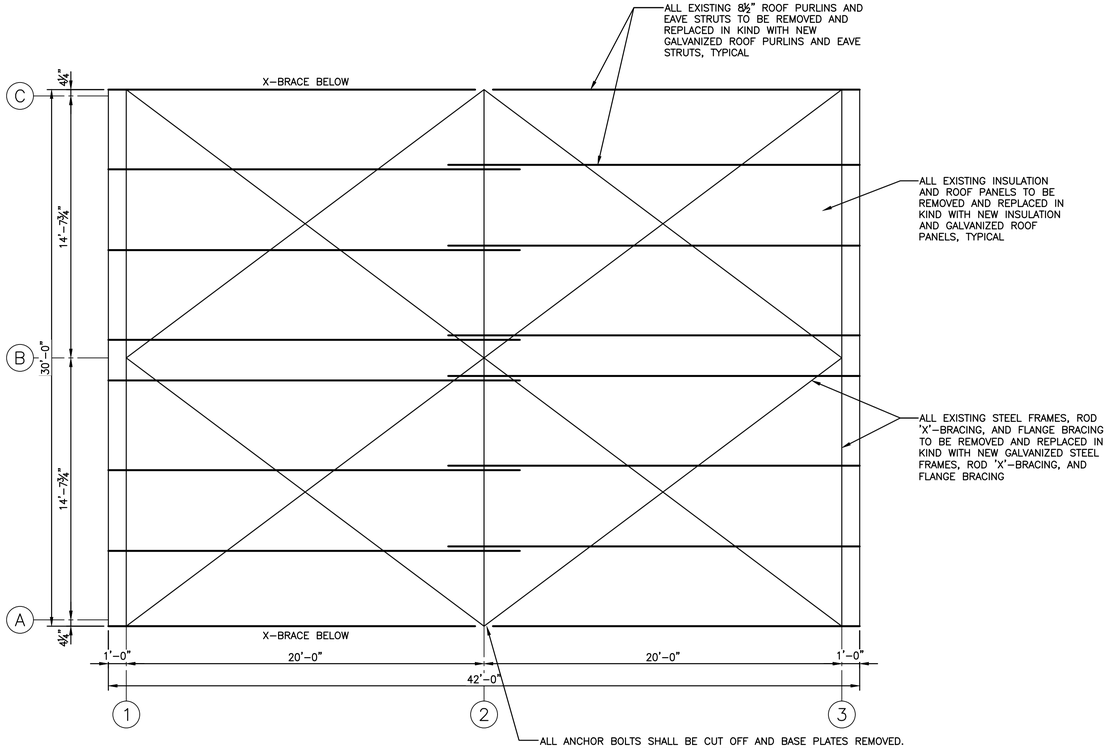
THOMPSON & LITTON

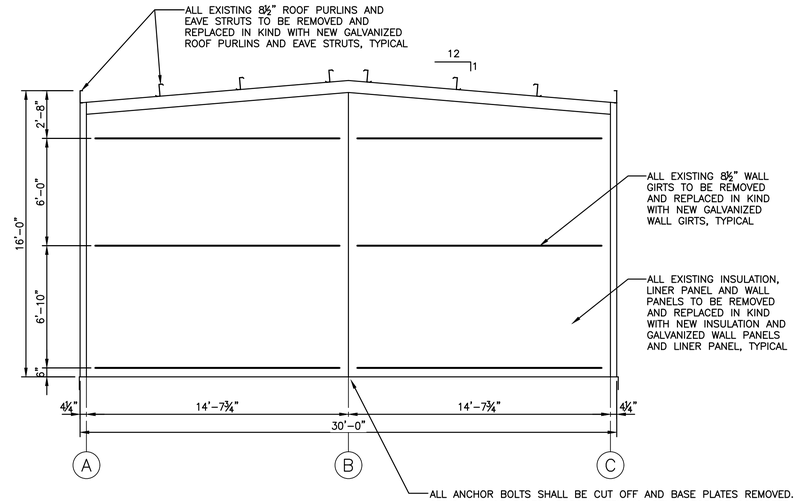
Sheet No.
S001



ROOF FRAMING PLAN

SCALE: ¼"=1'-0"

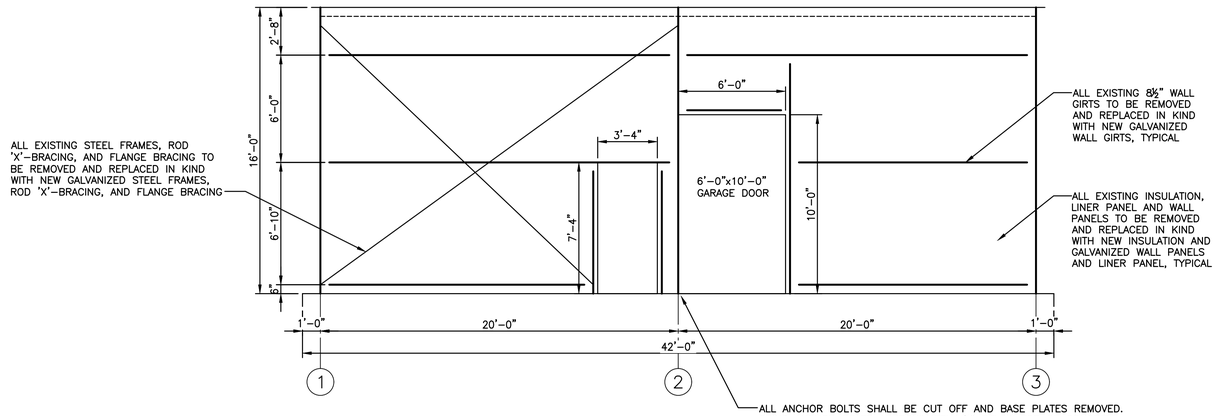
PLAN NORTH



END ELEVATION

SCALE: ¼"=1'-0"

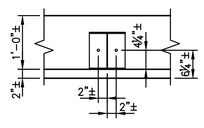
PLAN NORTH



SIDE ELEVATION

SCALE: ¼"=1'-0"

PLAN NORTH



TYPICAL DETAIL-EXISTING PEMB ANCHOR BOLT LAYOUT

NOT TO SCALE

0 2' 4' 8'

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

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

EXISTING PRELIMINARY TREATMENT BUILDING PLAN

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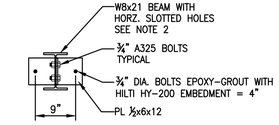
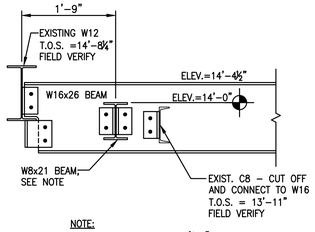
THOMPSON & LITTON

Sheet No.
S102



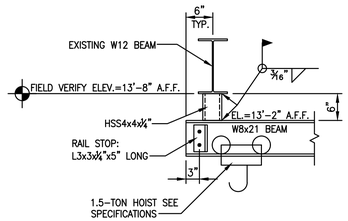
NOTES:
1. (7) LOCATIONS TYPICAL
2. PROVIDE RAIL STOP, L3x3x¼x5" LONG, AT END OF W8 EXCEPT WHERE RAIL STOP PROVIDED AT CROSS BEAM.

SECTION 1 (S101 | S300)
SCALE: 3/4"= 1'-0"

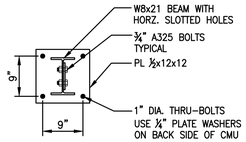


NOTE:
PROVIDE RAIL STOP, L3x3x¼x5" LONG, AT EACH END OF W8

SECTION 2 (S101 | S300)
SCALE: 3/4"= 1'-0"

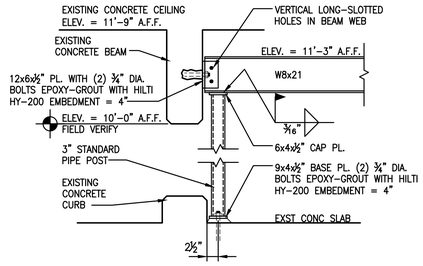


SECTION 3 (S101 | S300)
SCALE: 3/4"= 1'-0"



NOTES:
1. (3) LOCATIONS TYPICAL.
2. VERIFY CELLS WITH THRU-BOLTS ARE FILLED OR BLOCK IS SOLID. NOTIFY ENGINEER IF BLOCK IS NOT SOLID OR FILLED

SECTION 4 (S101 | S300)
SCALE: 3/4"= 1'-0"

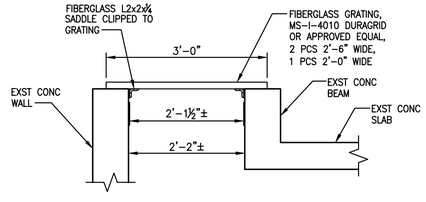


SECTION 5 (S101 | S300)
SCALE: 3/4"= 1'-0"

SECTION 6 (S101 | S300)
SCALE: 3/4"= 1'-0"

NOTE:
TOUCH UP PAINT AFTER WELD HANDRAIL TO ANGLE.

SECTION 7 (S101 | S300)
SCALE: 3/4"= 1'-0"



TYPICAL DETAIL-LOOSE GRATING AT STAIRWAY FOR GUARDRAIL REMOVAL

NOT TO SCALE

0 8" 1'-4" 2'-8"
SCALE: 3/4" = 1'-0"

COMMONWEALTH OF VIRGINIA
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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

SECTIONS AND DETAILS

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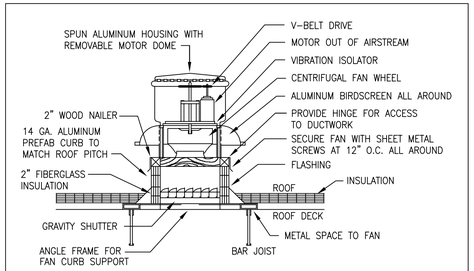
THOMPSON & LITTON

Sheet No.
S300

EXHAUST FAN SCHEDULE

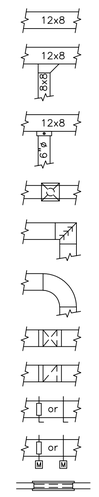
MARK	MANUFACTURER AND MODEL NO.	CFM	SP. WG	MOTOR HP	MOTOR VOLTS ø	TYPE	SONES	FAN RPM	T.S.	LOCATION	CONTROL	WEIGHT (LBS.)	NOTES
F-11	GREENHECK CUBE-141	2,300	0.3	1/2	115/1	UPBLAST	13.6	1383	5,295	PUMP STATION-DRY WELL	TSTAT/HUMIDISTAT	100	2,4,5,9,16
F-10	GREENHECK USF-15-B3	1,600	0.5	1/2	115/1	UTILITY	62 dBA	1094	4,295	PUMP STATION-WET WELL	CONTINUOUS	150	6,7,12,13,14,15,16,17,18
F-16	GREENHECK USF-15-B3	1,600	0.5	1/2	115/1	UTILITY	62 dBA	1094	4,295	PUMP STATION-WET WELL	CONTINUOUS	150	6,7,12,13,14,15,16,17,18
F-17	GREENHECK USF-15-B3	1,600	0.5	1/2	115/1	UTILITY	62 dBA	1094	4,295	PUMP STATION-WET WELL	CONTINUOUS	150	6,7,12,13,14,15,16,17,18
F-12	GREENHECK CUBE-141	1,450	0.3	1/4	115/1	UPBLAST	8.6	1726	3,753	PUMP STATION-LIME WELL	TSTAT/HUMIDISTAT	100	2,4,5,9,16
F-3	GREENHECK AER-E30C-310-VG	3500	0.25	3/4	115/1	PROPELLER	16.6	977	7,707	PRETREATMENT (GRIT) BUILDING	TSTAT/HUMIDISTAT	150	1,2,3,4,6,7,8
F-4	GREENHECK SQ-160-B	2600	0.3	1/2	115/1	INLINE	9.7	1022	NA	PRETREATMENT (GRIT) BUILDING	TSTAT/HUMIDISTAT	175	1,2,4,10,11,16

NOTES:
1. PROVIDE REMOTE SPEED CONTROLLER
2. PROVIDE DISCONNECT SWITCH
3. PROVIDE OSHA MOTOR GUARD, WALL HOUSING, GRAVITY DAMPER, WEATHERHOOD WITH BIRDSCREEN – WEATHERHOOD, HOUSING, AND GRAVITY DAMPER SHALL HAVE HI PRO POLYESTER COATING
4. PROVIDE COMBINATION HUMIDISTAT/THERMOSTAT EQUAL TO ILIVING MODEL ILG-001TH
5. PROVIDE INSULATED ROOF CURB WITH CURB SEAL
6. FAN TO HAVE TEAO OR TEFC MOTOR
7. FAN TO HAVE HI PRO POLYPROYLENE COATING
8. FAN SHALL HAVE CORROSION RESISTANT FASTENERS
9. PROVIDE BIRDSCREEN AND GRAVITY DAMPER, INTERLOCK FAN WITH MOTORIZED DAMPER ON CORRESPONDING GRAVITY VENTILATOR
10. PROVIDE HANGING NEOPRENE ISOLATORS
11. PROVIDE BACKDRAFT DAMPER
12. FAN SHALL BE TYPE A SPARK RESISTANT CONSTRUCTION WITH EXPLOSION PROOF MOTOR AND SHALL BE UL LISTED
13. PROVIDE NEMA-7 AND 9 CLASS 1 & DIVISION 1 DISCONNECT SWITCH, EXTENDED LUBE LINES, 1" DRAIN CONNECTION – PIPE THREADED IN LOWEST POINT OF FAN HOUSING, INLET FLANGE, OUTLET FLANGE, STEEL WEATHERHOOD, HIGH TEMPERATURE SHAFT SEAL, DIRECT MOUNT ISOLATORS – SPRING RESTRAINED-1", BEARINGS WITH L(10) LIFE OF 80K HOURS, WELDED SCROLL HOUSING, BACKWARD INCLINED WHEEL, UL LISTED, BOLTED ACCESS DOORS, EQUIPMENT SUPPORTS, CLASS 1 CONSTRUCTION
14. COAT ALUMINUM DUCT FLANGES WITH MASTIC WHERE STAINLESS STEEL DUCTWORK CONNECTS TO FAN.
15. USE WELL NUTS TO CONNECT STAINLESS STEEL TO FAN DUCT FLANGES, WELL NUTS CONSIST OF EPDM FASTENER WITH A HIDDEN BRASS NUT NEAR THE END
16. PROVIDE FLEXIBLE DUCT CONNECTIONS
17 FAN SHALL NOT HAVE A BACKDRAFT DAMPER
18 FAN SHALL RUN CONTINUOUSLY



ROOF CENTRIFUGAL EXHAUST FAN DETAIL FOR FLAT ROOF
NOT TO SCALE

H.V.A.C. LEGEND AND SYMBOLS



GENERAL MECHANICAL NOTES

1. FRESH AIR INTAKES SHALL NOT BE LOCATED CLOSER THAN 10 FEET FROM ANY EXHAUST OR OUTLET VENT.
2. COORDINATE GRILLE, REGISTER AND DIFFUSER LOCATIONS WITH LIGHTING AND CEILING GRID LAYOUT.
3. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO SUBMITTING A BID.
4. WORKMANSHIP: MECHANICAL EQUIPMENT AND ACCESSORIES SHALL BE INSTALLED IN A NEAT WORKMANLIKE MANNER. UNSIGHTLY INSTALLATIONS SHALL BE REMOVED OR REWORKED AT NO EXPENSE TO THE OWNER.
5. ALL EXPOSED DUCTWORK AND ACCESSORIES SHALL BE FURNISHED WITH A PAINTABLE FINISH.
6. COORDINATE MOUNTING HEIGHT OF EXPOSED DUCTWORK WITH LIGHTING.
7. WHERE DUCTWORK CAN BE SEEN THRU GRILLES; PAINT DUCT WITH FLAT BLACK ENAMEL PAINT.
8. DUCTWORK DIMENSIONS GIVEN ARE INSIDE CLEAR. SEE SPECIFICATIONS FOR INSULATION REQUIREMENTS.
9. REFER TO ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL COORDINATION WITH THESE DRAWINGS.
10. CONTRACTOR SHALL VERIFY ELECTRICAL VOLTAGE, LOADS ETC. WITH ELECTRICAL TRADE, OR EXISTING CONDITIONS, PRIOR TO ORDERING EQUIPMENT.
11. SEAL ALL WALL, ROOF AND FLOOR PENETRATIONS BY MECHANICAL AND ELECTRICAL SERVICE AIRTIGHT.
12. EQUIPMENT SIZES AND SERVICE SPACE REQUIREMENTS MAY VARY BETWEEN DIFFERENT MANUFACTURERS. CONSULT APPROVED MANUFACTURER AS SUBMITTED, AND COORDINATE WITH THESE DRAWINGS.
13. COORDINATE ALL PENETRATIONS OF FLOOR SLABS, ROOF AND WALLS WITH STRUCTURAL DRAWINGS.
14. PROVIDE COMPANION OPPOSED BLADE VOLUME DAMPERS WITH ALL DIFFUSERS MOUNTED IN DRYWALL.
15. CONTRACTOR SHALL VERIFY CLEARANCE REQUIREMENTS AND INDICATED ROUTING OF DUCTWORK PRIOR TO FABRICATION AS RISES AND DROPS MAY BE NECESSARY DUE TO THE TRUSS FRAMING SYSTEM.
16. CONTRACTOR SHALL REMOVE EXISTING HVAC EQUIPMENT, ALL ASSOCIATED ACCESSORIES AND MATERIALS AS SHOWN AND TURN OVER TO OWNER OR REMOVE FROM THE SITE LEGALLY IF SO DIRECTED BY THE OWNER.
17. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY EXISTING CONDITIONS BEFORE DEMOLITION WORK BEGINS. REPORT ANY DISCREPANCIES BETWEEN THE PLANS AND ACTUAL FIELD CONDITIONS TO THE ARCHITECT / ENGINEER PRIOR TO THE COMMENCEMENT OF DEMOLITION WORK.
18. DEMOLITION WORK SHALL BE PHASED TO ACCOMPLISH REPLACEMENT WITH MINIMUM AMOUNT OF DOWNTIME. SCHEDULE NEW AND DEMOLITION WORK IN ADVANCE WITH THE OWNER.
19. CONTRACTOR SHALL PROVIDE CERTIFIED AIR SYSTEM BALANCE. BALANCING CONTRACTOR SHALL BE AABC OR NEBB CERTIFIED. PROVIDE REPORT TO ENGINEER/ARCHITECT.
20. VARIATION OF DUCT CONFIGURATION OR SIZES OTHER THAN THOSE OF EQUIVALENT OR LOWER LOSS COEFFICIENT IS NOT PERMITTED EXCEPT BY WRITTEN PERMISSION. SIZE ROUND DUCTS INSTALLED IN PLACE OF RECTANGULAR DUCTS IN ACCORDANCE WITH ASHRAE TABLE OF EQUIVALENT RECTANGULAR AND ROUND DUCTS.
21. EQUIPMENT AND MATERIALS SUBMITTED "AS EQUAL" TO THE SPECIFIED DATA MUST BE CLEARLY MARKED AS TO THE DIFFERENCES IN SUBMITTED VERSUS SPECIFIED. FAILURE TO CLEARLY MARK THE SUBMITTALS AS SUCH IS GROUNDS FOR REJECTION. SUBMITTALS NOT CLEARLY MARKED WITH DIFFERENCES TO THE SPECIFIED DATA CAN BE ASSUMED TO MEET ALL SPECIFIED REQUIREMENTS AND CONTRACTOR IS RESPONSIBLE TO PROVIDE AS SUCH.
22. DUCT MOUNTED REGISTERS SHALL BE MOUNTED IN A COLLAR WITH SUFFICIENT LENGTH TO PREVENT DAMPERS FROM OBSTRUCTING AIR FLOW. COLLARS TO BE OVERSIZED FOR REVERSE FLANGE REGISTER MOUNTING.
23. ALL DUCTWORK SHALL BE INSTALLED AND LABELLED ACCORDING TO SEISMIC DESIGN CATEGORY C.

ELECTRIC HEATER SCHEDULE

MARK	STANDARD OF PERFORMANCE	LOCATION	AIRFLOW CFM	TYPE	ELECTRICAL VOLTAGE/PHASE	KW	AMPS	NOTES
UH-6	MARKEL P3PUH07CA1	PUMP STATION – UPSTAIRS	575	UNIT HEATER	480/3	7.5	9.1	1,2,3,4
UH-7	MARKEL P3PUH07CA1	PUMP STATION – ELECTRICAL	575	UNIT HEATER	480/3	7.5	9.1	1,2,3,4
UH-8	MARKEL P3PUH07CA1	PUMP STATION – DRY WELL	575	UNIT HEATER	480/3	7.5	9.1	1,2,3,4
UH-9	MARKEL P3PUH07CA1	PUMP STATION – WET WELL	575	UNIT HEATER	480/3	7.5	9.1	1,2,3,4
UH-1	MARKEL P3PUH20CA1	PRETREATMENT (GRIT) BUILDING	1350	UNIT HEATER	480/3	20	24.1	1,2,3,4
UH-2	MARKEL P3PUH20CA1	PRETREATMENT (GRIT) BUILDING	1350	UNIT HEATER	480/3	20	24.1	1,2,3,4
UH-3	MARKEL P3PUH03CA1	PRETREATMENT (GRIT) BUILDING	400	UNIT HEATER	480/3	3.3	4	1,2,3,4

NOTES:
1. PROVIDE UNIT MOUNTED THERMOSTAT
2. PROVIDE DISCONNECT SWITCH
3. PROVIDE WALL BRACKET
4. PROVIDE SUMMER FAN SWITCH

GRAVITY VENTILATOR SCHEDULE

MARK	STANDARD OF PERFORMANCE	LOCATION	AIRFLOW CFM	ESP (IN WG)	INTAKE	EXHAUST	THROAT VELOCITY FPM	THROAT AREA FT^2
GV-1	GREENHECK WIH 24X24	PUMP STATION-DRY WELL	2,300	0.07	Y	–	375	4.0
GV-2	GREENHECK WIH 36X36	PUMP STATION-WET WELL	4,800	0.052	Y	–	550	9.0
GV-3	GREENHECK WIH 28X28	PUMP STATION-LIME WELL	1,450	0.1	Y	–	450	5.44
GV-4	GREENHECK GRSR-24	PRETREATMENT (GRIT) BUILDING	2,600	0.08	–	Y	802	3.24
GV-5	GREENHECK WIH 24X24	PRETREATMENT (GRIT) BUILDING	2,600	0.072	Y	–	650	4.0

NOTES:
1. PROVIDE ROOF CURB ADAPTER FOR INSTALLATION OF INTAKE HOODS ON EXISTING CURB FOR MAIN PUMP STATION PROVIDE INSULATED ROOF CURB WITH CURB SEAL
2. PROVIDE 120V MOTORIZED DAMPER AND INSECT SCREEN, EXCEPT GV-2
3. DO NOT PROVIDE A INSECT SCREEN OR BACKDRAFT DAMPER FOR GV-2
4. ACCEPTABLE MANUFACTURERS: GREENHECK, COOK.
5. INTERLOCK GV-1 WITH F-11
6. INTERLOCK GV-2 WITH F-10, F-16, AND F-17
7. INTERLOCK GV-3 WITH F-12
8. INTERLOCK GV-5 WITH F-4

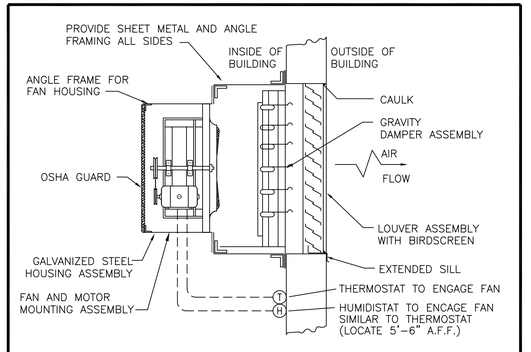
LOUVER SCHEDULE

MARK	MANUFACTURER AND MODEL NO.	LOCATION	CFM	APD	FA FT2	VEL	INTAKE	EXHAUST	SIZE W	SIZE H	SIZE D	ACCESSORIES	MAT'L
L-1	GREENHECK ESD-635	GRIT BUILDING	3500	0.1	4.32	810	Y	–	36	36	6	1,2,3,5,8	ALUM

ACCESSORIES:
1. LOUVER SHALL HAVE DRAINABLE BLADES
2. LOUVER SHALL HAVE INSECT SCREEN
3. 120V MOTORIZED BACKDRAFT DAMPER
4. LOUVER SHALL HAVE 2-COAT 70% KYNAR COATING FOR HYDROGEN SULFIDE, METHANE AND CARBON MONOXIDE ENVIRONMENT
5. INTERLOCK F-3 WITH L-1

DEMO NOTES:
DEMO AND REMOVE EXISTING EXHAUST FAN, LOUVERS, INTAKE HOODS AND UNIT HEATERS AS SHOWN IN THE FOLLOWING BUILDINGS:
SHUT OFF POWER TO EQUIPMENT BEFORE DEMO WORK.
MAIN PUMP STATION
GRIT CHAMBER BUILDING

NOTES:
1. BACKDRAFT DAMPERS SHALL BE AIR BALANCE INC., GREENHECK, RUSKIN, OR APPROVED EQUAL
   BACKDRAFT DAMPERS SHALL BE GRAVITY BALANCED WITH A MAXIMUM AIR VELOCITY OF 2500 FPM, AND A MAXIMUM SYSTEM PRESSURE OF 4-INCH W.G.
   THE FRAME SHALL BE HAT SHAPED, EXTRUDED ALUMINUM WITH WELDED CORNERS OR MECHANICALLY ATTACHED AND MOUNTING FLANGE. THE DAMPER SHALL CONSIST OF MULTIPLE SINGLE PIECE BLADES, EXTRUDED ALUMINUM WITH SEALED EDGES. THE BLADE ACTION SHALL BE PARALLEL WITH EXTRUDED VINYL, MECHANICALLY LOCKED SEALS. THE BLADE AXLES SHALL BE METALLIC. THE RETURN MECHANISM SHALL BE BY ADJUSTABLE TENSION SPRING. THE DAMPER SHALL HAVE SYNTHETIC PIVOT BUSHING BEARINGS. THE DAMPERS SHALL HAVE ADJUSTABLE DEVICE TO PERMIT SETTING FOR VARYING DIFFERENTIAL STATIC PRESSURE, COUNTERWEIGHTS AND SPRING ASSIST KITS FOR VERTICAL AIRFLOW INSTALLATIONS, AND ELECTRIC ACTUATORS WHERE INDICATED.
2. MASTIC: SOLVENT BASED VAPOR BARRIER MASTIC FOR OUTDOOR USE ON BELOW AMBIENT SERVICES EQUAL TO CHILDERS BRAND ENCACEL. THE MASTIC SHALL HAVE A WATER VAPOR PERMEANCE OF 0.05 PERMS AT 30-MIL DRY FILM THICKNESS MEASURED ACCORDING TO ASTM F 1249. THE MASTIC SHALL HAVE A SERVICE TEMPERATURE OF MINUS 50 TO PLUS 220 DEGREES F. THE MASTIC SHALL HAVE A SOLIDS CONTENT OF 33 PERCENT BY VOLUME AND 46 PERCENT BY WEIGHT ACCORDING TO ASTM D1644.



WALL PROPELLER EXHAUST FAN DETAIL
NTS

STEPHENSON G. THOMAS IV
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8/27/21
COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

MECHANICAL LEGEND, ABBREVIATIONS, AND GENERAL NOTES

No.	Date	Purpose of Document Issue
	01-07-22	ISSUED FOR BIDS

Designed	SGT
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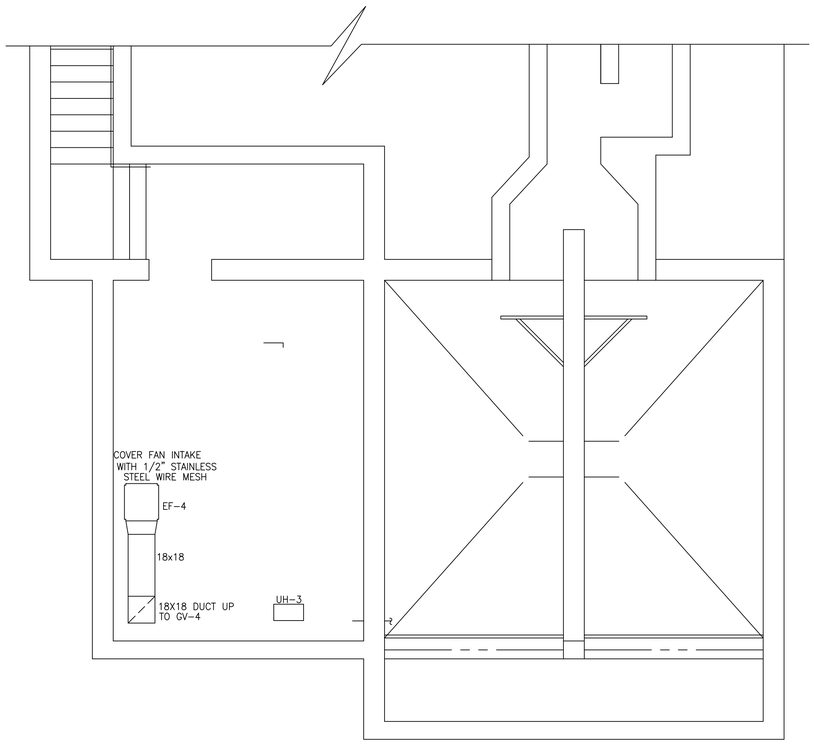
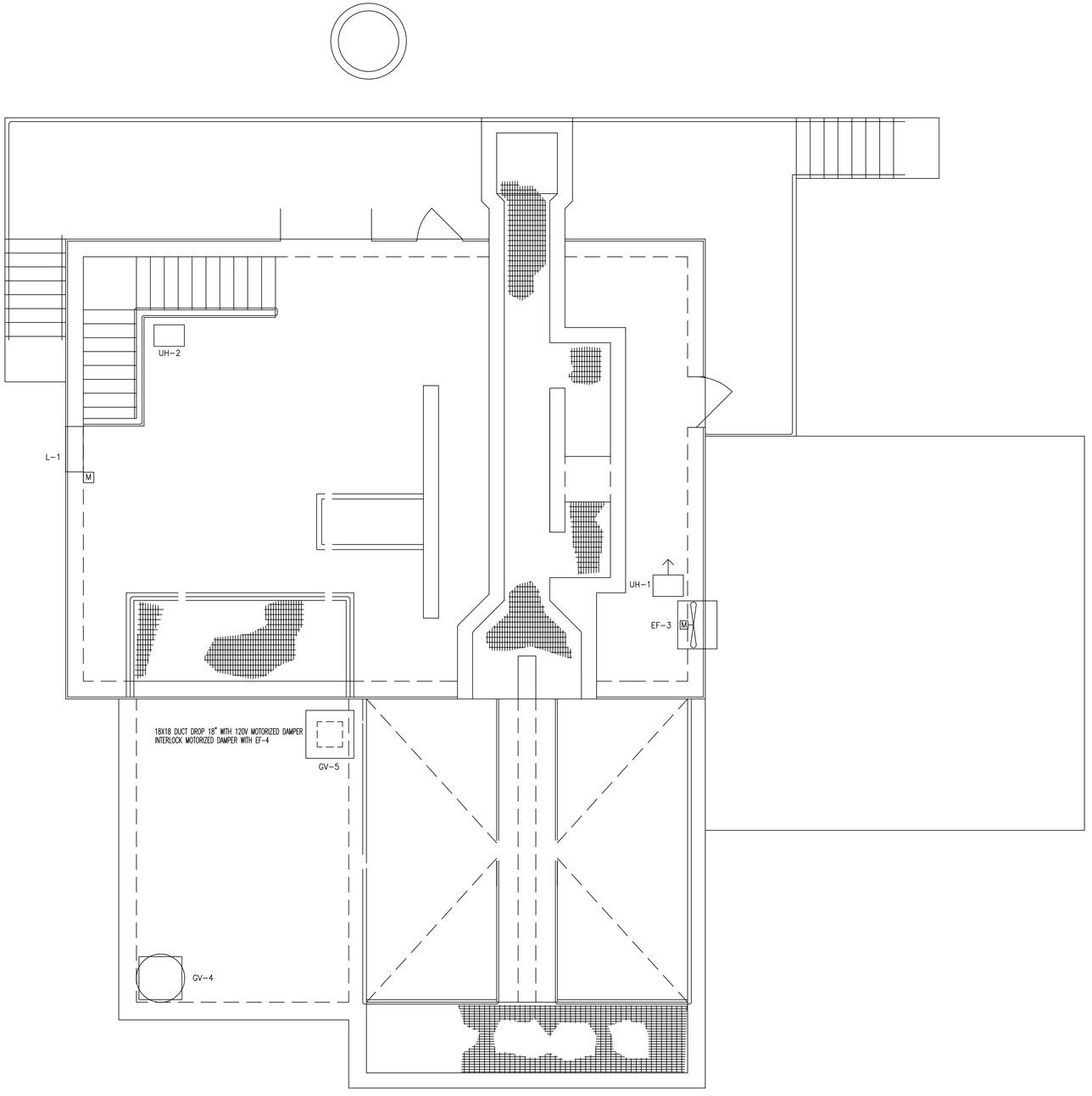
Date	FEBRUARY 2021

Project No.
14249-00

THOMPSON & LITTON

Sheet No.
M001





LOWER FLOOR HVAC PLAN - PRELIMINARY TREATMENT BUILDING
SCALE: 1/4"= 1'-0"

PLAN NORTH

UPPER FLOOR HVAC PLAN - PRELIMINARY TREATMENT BUILDING
SCALE: 1/4"= 1'-0"

PLAN NORTH

8'-0" 2'-0" 0 4'-0" 8'-0"
SCALE: 1/4" = 1'-0"

COMMONWEALTH OF VIRGINIA
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8/27/21

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

LOWER AND UPPER HVAC PLAN - PRETREATMENT BUILDING

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M103

GENERAL ELECTRICAL NOTES

1. ALL NOTES, SYMBOLS AND ABBREVIATIONS MAY NOT BE APPLICABLE TO THIS PROJECT.
2. COMPLY WITH THE FOLLOWING CODES PERTAINING TO THIS PROJECT:
   - 2.1. NATIONAL ELECTRIC CODE/ NFPA 70: NEC, 2014
   - 2.2. VIRGINIA ENERGY CODE: VECC 2015
   - 2.3. VIRGINIA UNIFORM STATEWIDE BUILDING CODE: VUSBC, 2015
3. CONTRACTORS SHALL VISIT SITE TO FAMILIARIZE THEMSELVES WITH CONDITIONS TO BE MET IN THE EXECUTION OF THE WORK UNDER THIS CONTRACT. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR ANY CHANGES THAT MAY BE REQUIRED DUE TO SITE CONDITIONS.
4. COORDINATE EXACT LOCATIONS OF ANY NEW OR RELOCATED PANELS AND ELECTRICAL EQUIPMENT WITH PLUMBING AND MECHANICAL SYSTEMS TO ENSURE NEC REQUIRED CLEAR WORKING SPACE AND DEDICATED EQUIPMENT SPACE PER NEC 110.
5. PROVIDE INCREASED CONDUCTOR SIZES FOR 120/208 BRANCH CIRCUITS AS FOLLOWS UNO:

CIRCUIT BREAKER SIZE	0–100 FT. LENGTH	100–200 FT. LENGTH	200–300 FT. LENGTH	OVER 300 FT. LENGTH
20 AMP	12 AWG	10 AWG	6 AWG	4 AWG
30 AMP	10 AWG	8 AWG	4 AWG	3 AWG

6. ALL EMPTY CONDUIT RUNS IN EXCESS OF 10 FEET SHALL BE PROVIDED WITH A PULLWIRE.
7. DO NOT SHARE NEUTRALS.
8. RECESSED DEVICES MAY BE ADJUSTED TO MATCH MASONRY COURSES IF APPLICABLE. MOUNT ALL BOXES TRUE AND PLUMB. ADJUSTED MOUNTING HEIGHTS SHALL REMAIN WITHIN ADA REQUIREMENTS.
9. MOUNT RECEPTACLES AT 20" AFF TO TOP, UNLESS OTHERWISE NOTED. ADJUST TO MATCH MASONRY COURSES IF APPLICABLE WITHIN CODE REQUIREMENTS. MOUNT ALL BOXES TRUE AND PLUMB.
10. RECEPTACLES, SWITCHES, THERMOSTATS, AND OTHER SIMILAR ITEMS SHALL ALIGN VERTICALLY OR HORIZONTALLY WITH EACH OTHER, WITH THE STRUCTURE AND OTHER FEATURES THEREOF WHEN IT APPEARS OBVIOUS AND LOGICAL THAT THEY SHOULD. THE ELECTRICAL CONTRACTOR SHALL CONSULT WITH THE GENERAL CONSTRUCTION SUPERINTENDENT REGARDING THIS REQUIREMENT AND ALSO FOR THE LOCATION OF EQUIPMENT, DOOR SWINGS, BLOCK COURSING, ALIGNMENT OF THIS AND OTHER SIMILAR FEATURES BEFORE ROUGHING–IN FOR THESE COMPONENTS.
11. THE MANUFACTURER AND MODEL NUMBER SHOWN ON THE LIGHT FIXTURE SCHEDULE INDICATES THE TYPE, CONSTRUCTION, STYLE, QUALITY AND STANDARD OF PERFORMANCE REQUIRED. OTHER MANUFACTURERS WITH EQUAL PRODUCTS ARE ACCEPTABLE UPON PRIOR APPROVAL.
12. CONTRACTOR SHALL VERIFY THAT ALL DOOR SWINGS ARE CORRECT BEFORE ROUGHING IN LIGHT SWITCH OUTLETS. LIGHT SWITCHES SHALL NOT BE LESS THAN 3 NOR MORE THAN 12 INCHES FROM DOOR TRIM.
13. FIXTURES MUST BE INDEPENDENTLY SUPPORTED BY BUILDING STRUCTURE. CONTRACTOR SHALL COORDINATE MOUNTING OF LIGHT FIXTURES WITH EXISTING AND NEW CONDITIONS AND EQUIPMENT TO MAXIMIZE COVERAGE.
14. ALL DEMOLITION AND CONSTRUCTION DESIGN IS BASED ON ORIGINAL CONSTRUCTION DOCUMENTS AND ON A SET OF RENOVATION DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL ASPECTS IN THE FIELD BEFORE STARTING WORK.
15. LOCATIONS OF LINES AND EQUIPMENT SHALL BE DETERMINED FROM ACTUAL FIELD CONDITIONS. THE OUTLINES OF THE CONSTRUCTION SHOWN ON THE ELECTRICAL DRAWINGS ARE INTENDED ONLY AS A GUIDE TO INDICATE RELATIVE LOCATIONS OF THE WORK. REFER TO THE APPLICABLE DRAWINGS OF OTHER TRADES AND THE EQUIPMENT SUPPLIER'S INSTALLATION DRAWINGS FOR EXACT LOCATIONS AND ARRANGEMENTS.
16. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION AND PROPER RELATION OF HIS WORK TO THE FACILITY STRUCTURES AND TO THE WORK OF OTHER TRADES. NO ADDITIONAL COMPENSATION NOR EXTENSION OF COMPLETION TIME WILL BE GRANTED FOR EXTRA WORK CAUSED BY THE LACK OF COORDINATION.
17. COORDINATE WITH MECHANICAL ON EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENTS FOR HVAC EQUIPMENT PROVIDED.
18. ELECTRICAL REQUIREMENTS FOR HVAC EQUIPMENT ARE FOR HVAC EQUIPMENT SPECIFIED. IF SUBSTITUTE HVAC EQUIPMENT IS SUPPLIED, CONTRACTOR IS RESPONSIBLE FOR MODIFICATIONS AND/OR ADDITIONS TO ELECTRICAL REQUIREMENTS OF HVAC EQUIPMENT SUPPLIED.
19. DUE TO DIFFERENCES IN VARIOUS MANUFACTURER'S EQUIPMENT CONNECTIONS AND MOTOR CURRENTS, THE ELECTRICAL CONTRACTOR SHALL COORDINATE HIS INSTALLATION WITH THAT EQUIPMENT ACTUALLY FURNISHED AND SHALL VERIFY THE CORRECT SIZES AND DETAILS OF INSTALLATION BEFORE ROUGHING IN.
20. THE CORRECT NUMBER OF WIRES MAY NOT BE INDICATED FOR ALL CIRCUITS, ONLY THOSE WHERE CLARIFICATION IS NECESSARY. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL WIRES NECESSARY FOR THE PROPER FUNCTION OF THE SYSTEM WHETHER INDICATED ON DRAWINGS OR NOT.
21. ALL CONDUITS WITH WIRING ENTERING UNDERGROUND STRUCTURES WHERE WATER MIGHT ENTER THE CONDUIT AND DRAIN INTO THE STRUCTURE, SHALL BE FITTED WITH WATERTIGHT BUSHINGS WITH SEALING COMPOUND SUCH AS OZ/GEDNEY STYLE CSB.
22. SOME UNDERGROUND UTILITIES, AS FAR AS THEIR LOCATIONS ARE KNOWN, ARE SHOWN ON THE DRAWINGS. HOWEVER, THIS DOES NOT GUARANTEE THAT THESE UTILITIES ARE IN THE LOCATIONS SHOWN, OR THAT THERE ARE NOT ADDITIONAL UTILITIES IN THE AREA OF WORK. CONTACT MISS UTILITY AT 811, 1800–552–7001,OR HTTP://WWW.MISSUTILITYOFVIRGINIA.COM NO LESS THAN 72 HOURS PRIOR TO EXCAVATION FOR LOCATING OF PUBLIC UTILITIES. DO NOT DISTURB THE SOIL UNTIL A DIG TICKET HAS BEEN PROCESSED. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL PRIVATE UTILITIES.
23. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR TRENCHING, DUCT BANK EXCAVATION AND BACKFILL FOR ALL ON SITE POWER AND LOW VOLTAGE CONNECTIONS BETWEEN BUILDINGS AS INDICATED ON ES–1, AND AS NECESSARY, INCLUDING RACEWAY AS REQUIRED. SEE ONE–LINE DIAGRAMS FOR CONDUCTOR REQUIREMENTS.
24. LABEL SWITCHBOARDS AND PANELS WITH SOURCE OF POWER IN ACCORDANCE WITH NEC ARTICLE 408.4(B).

LEGEND

- SURFACE MOUNTED LIGHT FIXTURE, TYPE AS INDICATED. SEE LIGHT FIXTURE SCHEDULE.
- EM — WALL MOUNTED LIGHT FIXTURE, TYPE AS INDICATED. SEE LIGHT FIXTURE SCHEDULE. 'EM' DENOTES FIXTURE WITH EMERGENCY BATTERY.
- CAN LIGHT, TYPE AS INDICATED. SEE LIGHT FIXTURE SCHEDULE.
- EM — SHADING OR EM DENOTES FIXTURE WITH EMERGENCY BATTERY FOR EMERGENCY EGRESS LIGHTING. BATTERY WHERE USED SHALL BE POWERED AT ALL TIMES. WHERE FIXTURES INDICATED TO BE SWITCHED, PROVIDE EMERGENCY SHUNT RELAY TO TURN FIXTURE ON WITH THE LOSS OF POWER REGARDLESS OF SWITCH POSITION. WHERE INTEGRAL BATTERY IS NOT AVAILABLE FOR FIXTURE SPECIFIED, PROVIDE A REMOTE BATTERY IN AN ACCESSIBLE LOCATION. SEE LIGHT FIXTURE SCHEDULE.
- XP — CEILING MOUNTED EXIT SIGN. SHADING INDICATES FACE AND ARROWS INDICATE DIRECTIONAL ARROWS WHERE SHOWN. 'XP' INDICATES CLASS 1 DIVISION 1 RATED EXIT SIGN. SEE LIGHT FIXTURE SCHEDULE.
- XP — WALL MOUNTED EXIT SIGN. SHADING INDICATES FACE AND ARROWS INDICATE DIRECTIONAL ARROWS WHERE SHOWN. 'XP' INDICATES CLASS 1 DIVISION 1 RATED EXIT SIGN. SEE LIGHT FIXTURE SCHEDULE.
- $ — LIGHT SWITCH, SINGLE POLE DEVICE, 20 AMP, 120/277 VOLT, FLUSH MOUNT 48" AFF TO TOP OF BOX. "K" INDICATES KEY OPERATED. "D" INDICATES DIMMER SWITCH. "P" INDICATES PILOT LIGHT.
- $3 — LIGHT SWITCH, THREE WAY DEVICE, 20 AMP, 120/277 VOLT, FLUSH MOUNT 48" AFF, TO TOP OF BOX.
- $4 — LIGHT SWITCH, FOUR WAY DEVICE, 20 AMP, 120/277 VOLT, FLUSH MOUNT 48" AFF TO TOP OF BOX.
- $M — MOTOR RATED SWITCH, FLUSH MOUNT 48" AFF, TO TOP OF BOX
- $ — LIGHT SWITCH, SINGLE POLE DEVICE, 20 AMP, 120/277 VOLT, SURFACE MOUNT 48" AFF TO TOP OF BOX.
- 120 V, 20 AMP, DUPLEX CONVENIENCE RECEPTACLE, FLUSH MOUNT 20" AFF TO TOP OF BOX, NEMA 5–20R.
- 120 V, 20 AMP, DUPLEX CONVENIENCE RECEPTACLE, FLUSH MOUNT 48" AFF TO TOP OF BOX, OR 6" ABOVE COUNTERTOP OR BACKSPLASH AS APPLICABLE TO TOP OF BOX
- 120 V, 20 AMP, DUPLEX CONVENIENCE RECEPTACLE, SURFACE MOUNT BOX 20" AFF TO TOP OF BOX, NEMA 5–20R.
- 120 V, 20 AMP, DOUBLE DUPLEX RECEPTACLE, NEMA 5–20R FLUSH MOUNT 20" AFF TO TOP OF BOX. SINGLE COVER PLATE.
- SPECIAL PURPOSE RECEPTACLE, TYPE AS INDICATED.
- A–1 / A–1 — CIRCUIT HOME RUN AND CONNECTION TO DEVICE (PANEL A, CIRCUIT #1), HASH MARKS INDICATE NUMBER OF CONDUCTORS EXCEPT GROUNDS WHERE SHOWN. ARROW HEADS INDICATE NUMBER OF CIRCUITS. PANEL DESIGNATION AS INDICATED. BRANCH CONDUCTORS ARE #12 AWG COPPER IN 3/4" MINIMUM RACEWAY, UNO. DASHED LINE DENOTES UNDERGROUND OR UNDER FLOOR CIRCUITS.
- J / JB — JUNCTION BOX / PULL BOX
- ELECTRIC MOTOR, HP/KW, VOLTAGE, AND PHASE AS INDICATED
- MAGNETIC MOTOR STARTER WITH OVERLOADS & DISCONNECT SWITCH
- MANUAL MOTOR STARTER WITH OVERLOAD PROTECTION, SURFACE MOUNT, NEMA 1, AS INDICATED.
- SAFETY SWITCH, HEAVY DUTY, FUSIBLE OR NON–FUSIBLE, POLES AS REQUIRED, "F" INDICATES FUSIBLE.
- C1 — CONTACTOR NUMBER AS INDICATED
- PANEL BOARD, EXISTING
- PANEL BOARD, NEW
- PP — POWER SERVICE POLE
- U — UTILITY METER
- G — GENERATOR
- T3 — TRANSFORMER, NAME AS INDICATED

- CIRCUIT BREAKER
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- CONNECTION
- SWITCH NO FUSE
- THERMAL OVERLOADS
- SWITCH WITH FUSE
- SELECTOR SWITCH
- NO — NORMALLY OPEN CONTACT
- NC — NORMALLY CLOSED CONTACT
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSOR
- UGE — UNDER GROUND ELECTRIC
- UGT — UNDER GROUND TELECOMMUNICATIONS
- OHE — OVER HEAD ELECTRIC
- OHT — OVER HEAD TELECOMMUNICATIONS
- G — GROUND RING
- RELAY COIL
- TIME DELAY CONTACT
- TIME DELAY CONTACT
- SV — SOLENOID VALVE, 120 VOLT
- PS — PRESSURE SWITCH
- LS — LEVEL SWITCH
- TIME DELAY CONTACT

GENERAL DEMOLITION NOTES

1. CONTRACTOR SHALL COORDINATE ALL ITEMS TO BE SALVAGED WITH THE OWNER AND RETURN TO OWNER AFTER DISCONNECTION. IF OWNER DEEMS MATERIALS UNSALVAGEABLE, CONTRACTOR IS RESPONSIBLE FOR REMOVING FROM PROJECT SITE ALONG WITH ALL OTHER DEMOLISHED MATERIAL AND DISPOSING OF PROPERLY IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL LAWS.
2. EXISTING FACILITY IS TO REMAIN POWERED DURING CONSTRUCTION, CONTRACTOR SHALL MINIMIZE ALL POWER OUTAGES. CONTRACTOR SHALL COORDINATE ALL POWER OUTAGES WITH OWNER WITH PRIOR APPROVAL.
3. THE CONTRACTOR SHALL REMOVE EXISTING WORK AS CALLED FOR ON THE DRAWINGS OR AS REQUIRED TO CLEAR THE AREAS FOR NEW CONSTRUCTION.
4. THE CONTRACTOR SHALL REMOVE DEVICES AND ASSOCIATED CIRCUITRY FROM WALLS AND CEILINGS THAT ARE REMOVED OR MODIFIED UNDER THIS CONTRACT.
5. IF EXISTING EQUIPMENT IS TO BE RELOCATED, CARE SHALL BE TAKEN TO PREVENT DAMAGE DURING THE REMOVAL AND REINSTALLATION. WHERE DAMAGE OCCURS, THE EQUIPMENT SHALL BE REPLACED OR REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
6. REMOVE EACH ITEM OF EQUIPMENT, DEVICE, AND FIXTURE INDICATED TO BE DEMOLISHED AND ASSOCIATED CIRCUITRY BACK TO THE PROTECTIVE DEVICE IN THE PANEL, SWITCHBOARD, OR CONTROLLER, EXCEPT AS OTHERWISE NOTED.
   - a. ASSOCIATED CIRCUITRY SHALL BE DEFINED TO INCLUDE ALL RACEWAYS, CONDUCTORS, ENCLOSURES, JUNCTION BOXES, WIRING DEVICES, COVERPLATES, LAMPS, FIXTURES, SWITCHES, STARTERS, ETC. WHICH ARE ASSOCIATED WITH THE ITEM TO BE REMOVED.
   - b. THE PROTECTIVE DEVICE SHALL REMAIN AS AN INTEGRAL PART OF THE EXISTING PANEL OR SWITCHBOARD. LABEL AS "SPARE" OR USE FOR NEW CIRCUITS AS INDICATED.
   - c. CONTROLLERS IN EXISTING MOTOR CONTROL CENTERS SHALL REMAIN. LABEL AS "SPARE" OR USE FOR NEW CIRCUITS AS INDICATED.
   - d. WHERE CONDUIT ASSOCIATED WITH AN ITEM TO BE REMOVED IS IN AN INACCESSIBLE AREA, SUCH AS ENCASED IN CONCRETE, THE INACCESSIBLE CONDUIT ONLY SHALL BE ABANDONED IN PLACE, UNLESS INDICATED TO BE REUSED. ALL CONDUCTORS SHALL BE REMOVED AND CONDUIT SHALL BE CUT OFF FLUSH AND SEALED OR CAPPED.
   - e. WHERE SUCH INACCESSIBLE CONDUIT ENDS OR MUST BE TERMINATED IN FINISHED SPACE, REMOVE THE CONDUIT OR BOX TO BELOW THE FINISHED SURFACE OR WALL, CEILING OR FLOOR, FILL VOID WITH NON–SHRINKING GROUT AND FINISH TO MATCH SURROUNDING SURFACES.
7. WHERE A PORTION OF A CIRCUIT'S LOAD IS SCHEDULED TO BE REMOVED, REMOVE ONLY THAT PORTION ASSOCIATED WITH THE DEMOLISHED DEVICE TO A POINT WHERE THE REMAINING LOAD IS ACTIVE; MAINTAIN REMAINING CIRCUITRY IN A GOOD OPERATING CONDITION. IF EXISTING CIRCUITRY IS DAMAGED DURING CONSTRUCTION, CONTRACTOR SHALL REPLACE, MATCHING EXISTING SIZES AND RATINGS AT NO ADDITIONAL COST TO THE OWNER.
8. WHERE EXTENSION OF AN EXISTING CIRCUIT IS REQUIRED, RUN CONDUIT AND WIRE (CONCEALED WHERE INDICATED) FROM THE CIRCUIT'S EXISTING LOCATION TO ITS NEW LOCATION. CIRCUIT EXTENSION SHALL MATCH EXISTING CIRCUITRY SIZE AND RATING.
9. WHERE AN ITEM OF EQUIPMENT IS INDICATED TO BE REMOVED AND RELOCATED, ANY ASSOCIATED CIRCUITRY, SWITCHES, DEVICES, ETC. SHALL ALSO BE REMOVED WITH THE EQUIPMENT. RELOCATE THE EQUIPMENT TO THE NEW LOCATION AND PROVIDE CONNECTION OF ALL ASSOCIATED ITEMS TO NEW OR EXTENDED CIRCUITRY AS INDICATED.
10. REUSE EXISTING CONDUITS IN PLACE DISCONNECTED DURING DEMOLITION WHERE APPLICABLE AND IN GOOD CONDITION.
11. WHERE EXISTING ELECTRICAL CONDUIT/DEVICES/EQUIPMENT INTERFERES WITH NEW WORK AND WHERE SUCH EXISTING INSTALLATIONS ARE TO REMAIN IN USE, THE CONDUIT/DEVICES/EQUIPMENT SHALL BE RELOCATED AND RECONNECTED. COORDINATE WITH OWNER ON NEW LOCATION.
12. EXISTING PANELBOARDS/SWITCHBOARDS MODIFIED UNDER THIS CONTRACT SHALL BE PROVIDED WITH REVISED TYPED SCHEDULES.

ABBREVIATIONS

A, AMP	AMPERE
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ANCH	ANCHOR
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BKR	BREAKER
C	CONDUIT
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CR	CONTROL RELAY
CT	CURRENT TRANSFORMER
CTB	CABLE TAP BOX
CTR	CURRENT RELAY
CU	COPPER
DDC	DIRECT DIGITAL CONTROL PANEL
DETD	DUAL ELEMENT TIME DELAY
DPS	DOOR POSITION SWITCH
EC	ELECTRICAL CONTRACTOR
ECB	ENCLOSED CIRCUIT BREAKER
EF	EXHAUST FAN
EM	EMERGENCY
EP	ELECTRIC PNEUMATIC
ER	EXISTING TO BE RELOCATED
EUH	ELECTRIC UNIT HEATER
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EX	EXISTING TO REMAIN
FA	FIRE ALARM
FP	FREEZE PROTECTION
FR	FAN RELAY
FT	FEET
GEC	GROUND ELECTRODE CONDUCTOR
GFEP	GROUND FAULT EQUIPMENT PROTECTION CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GND, G	GROUND
HP–1	HEAT PUMP
HP	HORSEPOWER
HSC	HYDRAULIC SYSTEMS CENTER
HSP	HAND STARTER WITH PILOT LIGHT
HVAC	HEATING, VENTILATION AND AIR CONDITIONING
LA	LIGHTNING ARRESTOR
IG	ISOLATED GROUND
JB	JUNCTION BOX
KVA	KILOVOLT AMPERE
KW	KILOWATT
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MLO	MAIN LUG ONLY
MM	MILLIMETER
MSBD	MAIN SWITCHBOARD
N	NEUTRAL
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUF. ASSOC.
NL	NIGHT LIGHT
OL	OVERLOAD
PB	PUSHBUTTON MOMENTARY CONTACT SWITCH
PDC	POWER DISTRIBUTION CENTER
PE	PHOTOELECTRIC CELL
PNL	PANEL
RAIL	REMOTE ALARM INDICATOR LIGHT
REC	RECESSED
RGS	RIGID GALVANIZED STEEL CONDUIT
RHC	REHEAT COIL
RTU	ROOF TOP UNIT
SCC	SYSTEM CONTROL CENTER
SUR	SURFACE
SV	SOLENOID VALVE
SWBD	SWITCHBOARD
TC	TIME CLOCK
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TW	TEST WELL
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT
WG	WIRE GUARD
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

COMMONWEALTH OF VIRGINIA
RUSSELL ANDERSON
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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

ELECTRICAL LEGEND, ABBREVIATIONS, AND GENERAL NOTES

No.	Date	Purpose of Document Issue
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THOMPSON & LITTON

Sheet No.
E001

Virginia State Plane Coordinate System

Grid North = South Zone

EXIST. DB–#8

EXIST. DB–#7

ANAEROBIC DIGESTERS (SEE SHEETS E208, 209)

PRETREATMENT BUILDING (SEE SHEETS E102, 202)

SHELTER FOR MCC–M AND EQUIPMENT. SEE SHEET E202.

PRIMARY CLARIFIERS (SEE SHEET E203)

EXIST. DB–#6

EXIST. ELECTRICAL MANHOLE

EXIST. DB–#5

MAIN PUMP STATION (SEE SHEETS E101, 201)

SLUDGE STORAGE TANK

GRAVITY THICKENER (SEE SHEET E212)

SEPTAGE RECEIVING STATION SINGLE POINT POWER CONNECTION. SEE MOTOR CONTROL SCHEDULE MCC–H, AND C403 FOR MORE INFORMATION. PROVIDE AN ADDITIONAL 1–1/2"C FROM CONTROL PANEL TO MAIN PUMP STATION PLC FOR LOW VOLTAGE CONTROLS INTERFACE.

SUPERNATANT TREATMENT

EFFLUENT PUMP STATION (SEE SHEET E206)

DEWATERING BUILDING/SHOP (SEE SHEET E210)

SLUDGE DRYING BEDS

AERATION BASIN VFD SHELTER. SEE SHEET E205 FOR DETAILS AND ELEVATIONS.

EXIST. PAD MOUNTED TRANSFORMER

CONTROL BUILDING

SHELTER FOR EFFLUENT PUMPS P100, P110 (SEE SHEET E206)

AERATION BASINS (SEE SHEET E205)

EXIST. DB–#4

POST AERATION

UV AND EFFLUENT SYSTEMS BUILDING (SEE SHEETS 206)

EXIST. ELECTRICAL MANHOLE

SECONDARY CLARIFIERS (SEE SHEET E204)

EXIST. DB–#2

GENERATOR BUILDING

EXIST. DB–#1

EXIST. ELECTRICAL MANHOLE

EXIST. PAD MOUNTED SERVICE TRANSFORMER

CIRCUIT GATE OPERATOR TO PANEL O–9 IN GENERATOR BUILDING. COORDINATE WITH CIVIL SITE PLAN FOR EXACT LOCATION AND REQUIREMENTS. PROVIDE AN ADDITIONAL 3/4"C TO GENERATOR BUILDING FOR LOW VOLTAGE CONTROLS INTERFACE.

EXIST. UNDERGROUND SERVICE

ELECTRICAL SITE PLAN

SCALE: 1"= 30'

30' 15' 0 30' 60'

SCALE: 1" = 30'

DUCT BANK SCHEDULE

DB	Power	Telephone	Data Hwy	Spares
EXIST. #1	2 - 3"	1 - 2"	1 - 1 1/4" GRC	2 - 4"
EXIST. #2	9 - 3"	1 - 2"	1 - 1 1/4" GRC	1 - 2", 2 - 4"
EXIST. #4	5 - 3"	1 - 2"	1 - 1 1/4" GRC	2 - 4"
EXIST. #5	3 - 3"	1 - 2"	1 - 1 1/4" GRC	4 - 4"
EXIST. #6	2 - 3"	1 - 2"	1 - 1 1/4" GRC	2 - 4"
EXIST. #7	1 - 3"	1 - 2"	1 - 1 1/4" GRC	2 - 4"
EXIST. #8	1 - 3"	1 - 2"	1 - 1 1/4" GRC	2 - 4"

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ELECTRICAL SITE PLAN

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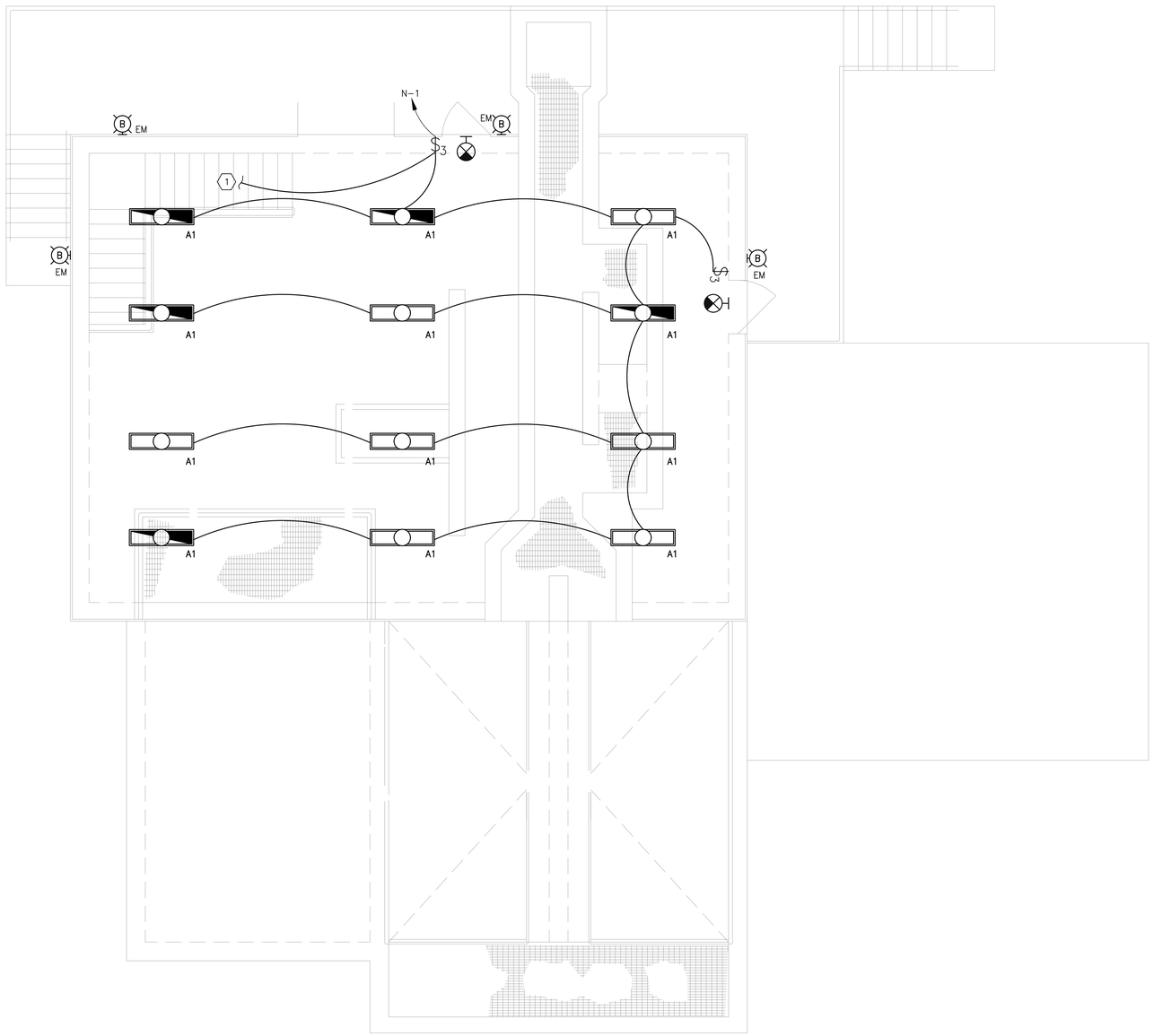
THOMPSON & LITTON

Sheet No.
ES1

SHEET GENERAL DEMOLITION NOTES:
1. DISCONNECT AND REMOVE ALL LIGHT FIXTURES AND SWITCHES. EXISTING LIGHTS AND SWITCHES NOT SHOWN.

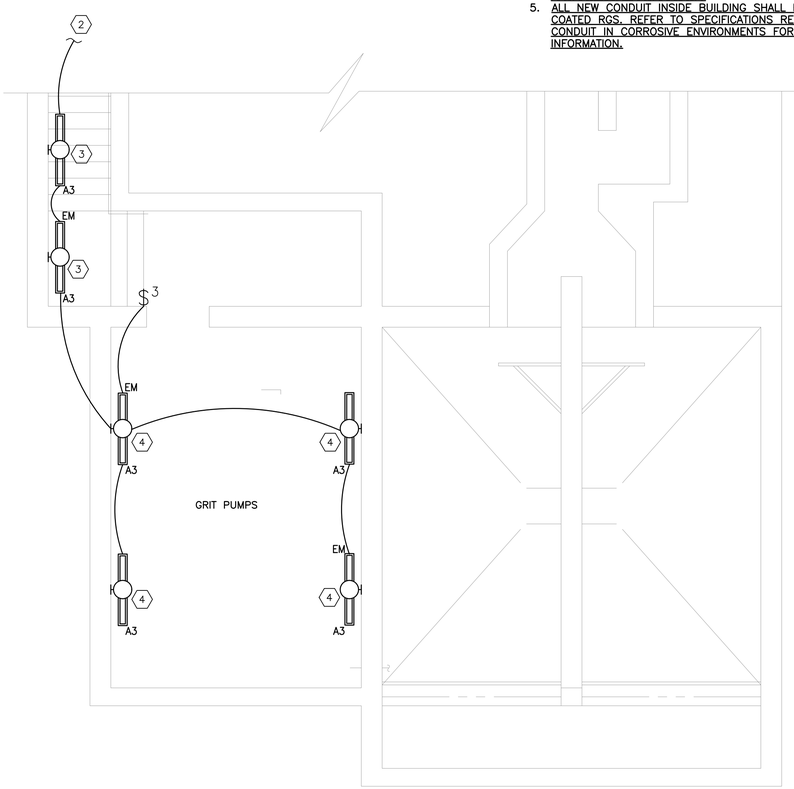
SHEET KEYED NOTES:
1. SWITCH FOR LIGHTS BELOW.
2. LIGHTS SWITCHED FROM ABOVE.
3. MOUNT LIGHT FIXTURE 8' ABOVE LANDING AND STAIR TREADS. COORDINATE EXACT MOUNTING LOCATION OF FIXTURE WITH ACTUAL CONDITIONS FOR MAXIMUM COVERAGE.
4. MOUNT LIGHT FIXTURES AT 10' AFF. COORDINATE EXACT MOUNTING LOCATION OF FIXTURE WITH ACTUAL CONDITIONS FOR MAXIMUM COVERAGE.

SHEET GENERAL NOTES:
1. SEE LIGHT FIXTURE SCHEDULE, SHEET E701.
2. CIRCUIT ALL EXTERIOR LIGHTING TO N-3
3. CONNECT EXIT SIGNAGE TO UNSWITCHED PORTION OF N-3.
4. WHERE INTEGRAL BATTERY IS NOT AVAILABLE FOR FIXTURE INDICATED AS 'EM', PROVIDE A REMOVE BATTERY PACK IN AN ACCESSIBLE LOCATION. IF A REMOTE BATTERY IS NECESSARY FOR FIXTURES IN A CLASSIFIED AREA, PROVIDE BATTERY IN AN ACCESSIBLE LOCATION IN AN ADJACENT NON-CLASSIFIED AREA.
5. REFER TO EQUIPMENT CONDITIONS AND MINIMUM RATINGS SCHEDULE ON SHEET E701.
6. EXISTING CIRCUITRY MAY BE REUSED IN CLASSIFIED SPACES IF IT IS RATED FOR CLASS 1 DIVISION 1 AND IN GOOD CONDITION. IF CIRCUITRY DOES NOT MEET THIS STANDARD, REPLACE AS NECESSARY.
4. ENTIRE METAL BUILDING STRUCTURE TO BE DEMOLISHED AND REPLACED. ALL ELECTRICAL CONDUIT, WIRING, DEVICES, AND FIXTURES ATTACHED OR SUPPORTED BY METAL BUILDING STRUCTURE SHALL BE DEMOLISHED. NEW EQUIPMENT INDICATED ON THIS SHEET AS EXISTING TO BE RECONNECTED AND SERVED BY CONDUIT SUPPORTED BY THE METAL BUILDING STRUCTURE SHALL BE RECIRCUITED USING ALL NEW CONDUIT AND CONDUCTORS.
5. ALL NEW CONDUIT INSIDE BUILDING SHALL BE PVC COATED RGS. REFER TO SPECIFICATIONS REGARDING CONDUIT IN CORROSIVE ENVIRONMENTS FOR MORE INFORMATION.



UPPER FLOOR LIGHTING PLAN - PRETREATMENT BUILDING
SCALE: 1/4"= 1'-0"

PLAN NORTH



LOWER FLOOR LIGHTING PLAN - PRETREATMENT BUILDING
SCALE: 1/4"= 1'-0"

PLAN NORTH

8'-0" 2'-0" 0 4'-0" 8'-0"
SCALE: 1/4" = 1'-0"

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LOWER AND UPPER LIGHTING PLAN - PRETREATMENT BUILDING

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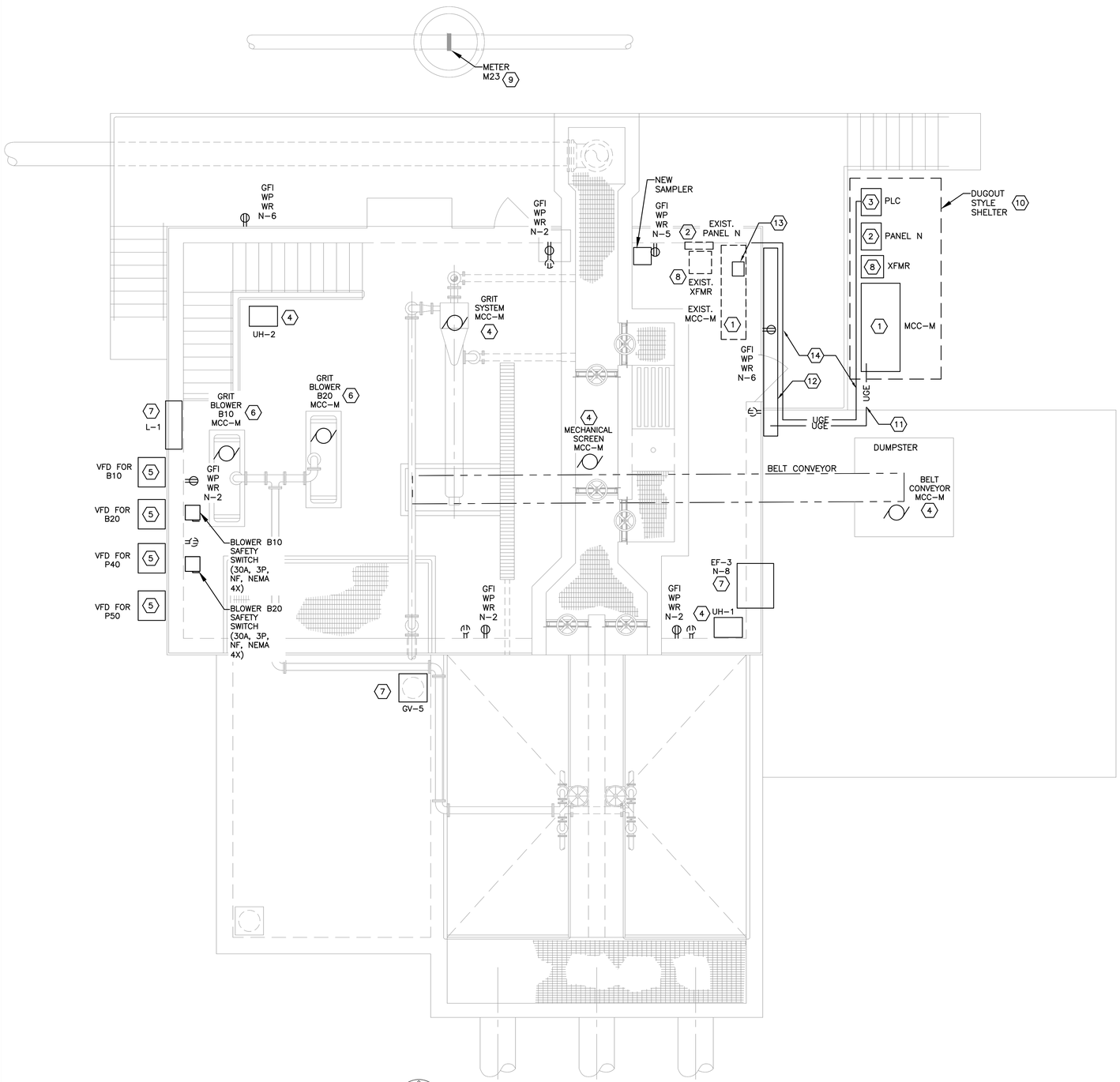
THOMPSON & LITTON

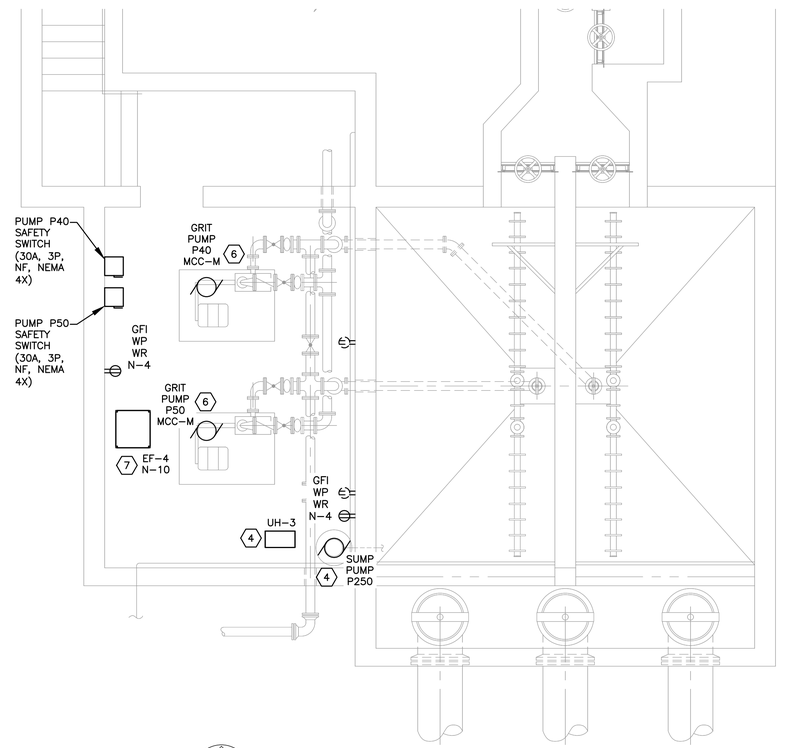
Sheet No.
E102



UPPER FLOOR POWER PLAN - PRETREATMENT BUILDING

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

PLAN NORTH



LOWER FLOOR POWER PLAN - PRETREATMENT BUILDING

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

PLAN NORTH

8'-0" 2'-0" 0 4'-0" 8'-0"

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

LEGEND:

EXISTING TO BE REMOVED — — —

NEW ———

SHEET GENERAL NOTES:

1. REFER TO EQUIPMENT CONDITIONS AND MINIMUM RATINGS SCHEDULE ON SHEET E701.
2. COORDINATE EXACT LOCATION OF ALL EQUIPMENT WITH ACTUAL FIELD CONDITIONS. ENSURE NEC REQUIRED CLEARANCES.
3. PROVIDE SEALING FITTINGS FOR ALL ELECTRICAL CONDUITS PENETRATING THE BUILDING ABOVE AND BELOW GRADE.
4. ENTIRE METAL BUILDING STRUCTURE TO BE DEMOLISHED, AND REPLACED. ALL ELECTRICAL CONDUIT, WIRING, DEVICES, AND FIXTURES ATTACHED OR SUPPORTED BY METAL BUILDING STRUCTURE SHALL BE DEMOLISHED. NEW EQUIPMENT INDICATED ON THIS SHEET AS EXISTING TO BE RECONNECTED AND SERVED BY CONDUIT SUPPORTED BY THE METAL BUILDING STRUCTURE SHALL BE RECIRCUITED USING ALL NEW CONDUIT AND CONDUCTORS.
5. ALL NEW CONDUIT INSIDE BUILDING SHALL BE PVC COATED RGS. REFER TO SPECIFICATIONS REGARDING CONDUIT AND EQUIPMENT IN CORROSIVE ENVIRONMENTS FOR MORE INFORMATION.

SHEET KEYED NOTES:

1. EXISTING MOTOR CONTROL CENTER M TO BE DEMOLISHED. NEW NEMA-3R MOTOR CONTROL CENTER TO BE INSTALLED OUTSIDE BUILDING AS INDICATED.
2. EXISTING PANEL N TO BE DEMOLISHED. NEW NEMA-3R PANEL N TO BE INSTALLED OUTSIDE BUILDING AS INDICATED. RECONNECT EXISTING AND NEW EQUIPMENT TO NEW PANEL AS INDICATED ON THE PANEL SCHEDULE ON SHEET E701.
3. NEW NEMA-3R PLC CABINET WITH HMI CONTROLS. EXTEND EXIST. FIBER AND COPPER CONDUCTORS TO LOCATION INDICATED. REFER TO SHEET I101 FOR CONTROL DIAGRAMS AND LAYOUT FOR MORE INFORMATION.
4. DEMOLISH EXIST. EQUIPMENT AND CONNECT NEW EQUIPMENT TO OVERCURRENT PROTECTION IN MCC-M. PROVIDE A LOCAL MEANS OF DISCONNECTION. REFER TO MOTOR CONTROL CENTER SCHEDULE ON E703.
5. PROVIDE NEMA-3R VFD. COORDINATE EXACT LOCATION WITH FIELD CONDITIONS. ENSURE NEC REQUIRED CLEARANCES.
6. DEMOLISH EXIST. MOTOR AND CIRCUIT NEW MOTOR THROUGH VFD TO OVERCURRENT PROTECTION IN MCC-M.
7. PROVIDE 120V 20AMP-1P CIRCUIT FOR MOTORIZED DAMPERS/LOUVERS. INTERLOCK MECHANICAL UNITS BY M001 REQUIREMENTS. SEE E502 FOR DAMPER CONTROL DETAIL.
8. EXIST. TRANSFORMER TO BE DEMOLISHED. PROVIDE NEW NEMA-3R TRANSFORMER OUTSIDE AS SHOWN. SEE ONE-LINE DIAGRAM ON SHEET E601 FOR DETAILS.
9. DEMOLISH EXIST. METER. CONNECT NEW METER TO EXIST. CIRCUITRY.
10. PROVIDE PRE-ENGINEERED DUG-OUT STYLE SHELTER, EQUAL TO APC SHELTERS DUGOUT STYLE RECTANGULAR. PROVIDE CHANNEL MOUNTING FOR NON-GROUND MOUNTED EQUIPMENT INDICATED. REFER TO SIMILAR DETAILS FOR AERATION BASIN VFD SHELTER AND PAD – SHEET E205. CIRCUIT LIGHTS AND CONVENIENCE RECEPTACLE TO N-7. COORDINATE STRUCTURE DIMENSIONS WITH EQUIPMENT DIMENSIONS AND CLEARANCES OF EQUIPMENT PROVIDED. PROVIDE A HOUSEKEEPING PAD FOR GROUND MOUNTED EQUIPMENT.
11. PROVIDE UNDERGROUND CONDUIT TO WIREWAY AS REQUIRED FOR CIRCUITS BETWEEN BUILDING AND EQUIPMENT.
12. PROVIDE NEW 12" X 12" NEMA-4X WIREWAY. WIREWAY SHALL BE MOUNTED HORIZONTALLY AT 8'-0" AS SHOWN, THEN TURN DOWN WALL, AND EXTEND TO GRADE BETWEEN EDGE OF ELEVATED WALKWAY AND CONVEYOR. SEE ONE-LINE DIAGRAM – SHEET E601.
13. PROVIDE 225A-3P ENCLOSED BREAKER IN NEMA-4X ENCLOSURE. CONNECT EXISTING BUILDING SERVICE CONDUCTORS IN NEW PVC COATED RGS CONDUIT TO EXISTING CONDUIT EXITING SLAB. CONNECT SUPPLEMENTARY GROUND TO GROUND BAR IN THIS ENCLOSURE. DO NOT BOND TO NEUTRAL. SEE ONE-LINE DIAGRAM – SHEET E601.
14. PROVIDE AN ADDITIONAL 2"C UNDERGROUND AND THEN PARALLEL TO WIREWAY FOR REQUIRED LOW VOLTAGE CABLING BETWEEN PLC AND DEVICES.

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

LOWER AND UPPER POWER PLAN - PRETREATMENT BUILDING

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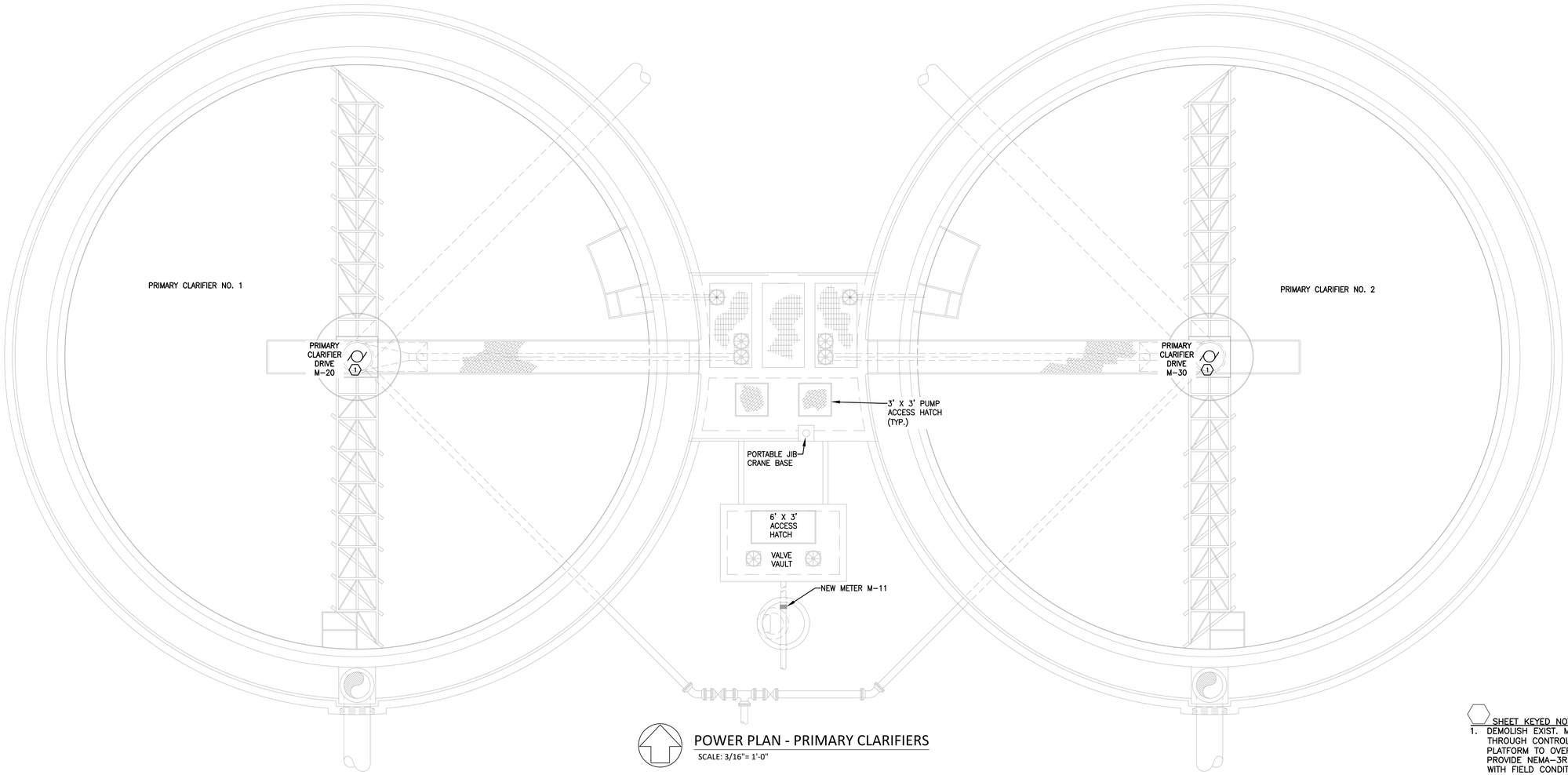
THOMPSON & LITTON

Sheet No.
E202



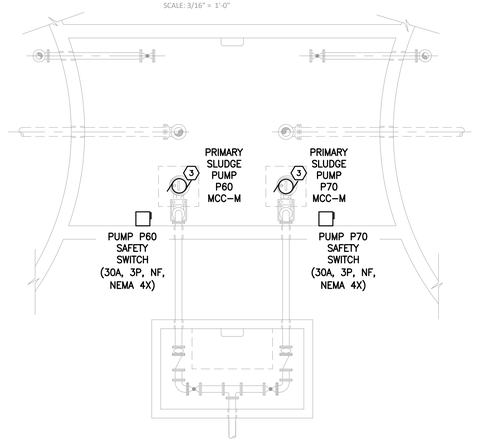
POWER PLAN - PRIMARY CLARIFIERS

SCALE: 3/16"= 1'-0"

PLAN NORTH

PLAN

SCALE: 3/16" = 1'-0"



POWER PLAN - PRIMARY CLARIFIERS AT PUMP LEVEL

SCALE: 3/16"= 1'-0"

PLAN NORTH

SHEET KEYED NOTES:

1. DEMOLISH EXIST. MOTOR AND CIRCUIT NEW MOTOR THROUGH CONTROL PANEL/VFDs ON ACCESS PLATFORM TO OVERCURRENT PROTECTION IN MCC-M. PROVIDE NEMA-3R VFD. COORDINATE EXACT LOCATION WITH FIELD CONDITIONS. ENSURE NEC REQUIRED CLEARANCES.
2. DEMOLISH EXIST. MOTOR AND CIRCUIT NEW MOTOR THROUGH VFD TO OVERCURRENT PROTECTION. REFER TO MOTOR CONTROL CENTER SCHEDULE ON E703.
3. DEMOLISH EXIST. EQUIPMENT AND CONNECT NEW EQUIPMENT TO OVERCURRENT PROTECTION IN MCC-M. PROVIDE A LOCAL MEANS ON DISCONNECTION. REFER TO MOTOR CONTROL CENTER SCHEDULE ON E703.

SHEET GENERAL NOTES:

1. REFER TO EQUIPMENT CONDITIONS AND MINIMUM RATINGS SCHEDULE ON SHEET E701.
2. COORDINATE EXACT LOCATION OF ALL EQUIPMENT WITH ACTUAL FIELD CONDITIONS. ENSURE NEC REQUIRED CLEARANCES.
3. FOR ALL EQUIPMENT, EXIST. CIRCUITRY MAY BE EXTENDED TO NEW MCC-M LOCATION AND REUSED IF IN GOOD CONDITION AND OF SUFFICIENT SIZE, AMPACITY, AND CLASSIFICATION RATING.

5'-4" 2'-8" 0 5'-4" 10'-8"

SCALE: 3/16" = 1'-0"

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UPGRADES AND IMPROVEMENTS

POWER PLAN - PRIMARY CLARIFIERS

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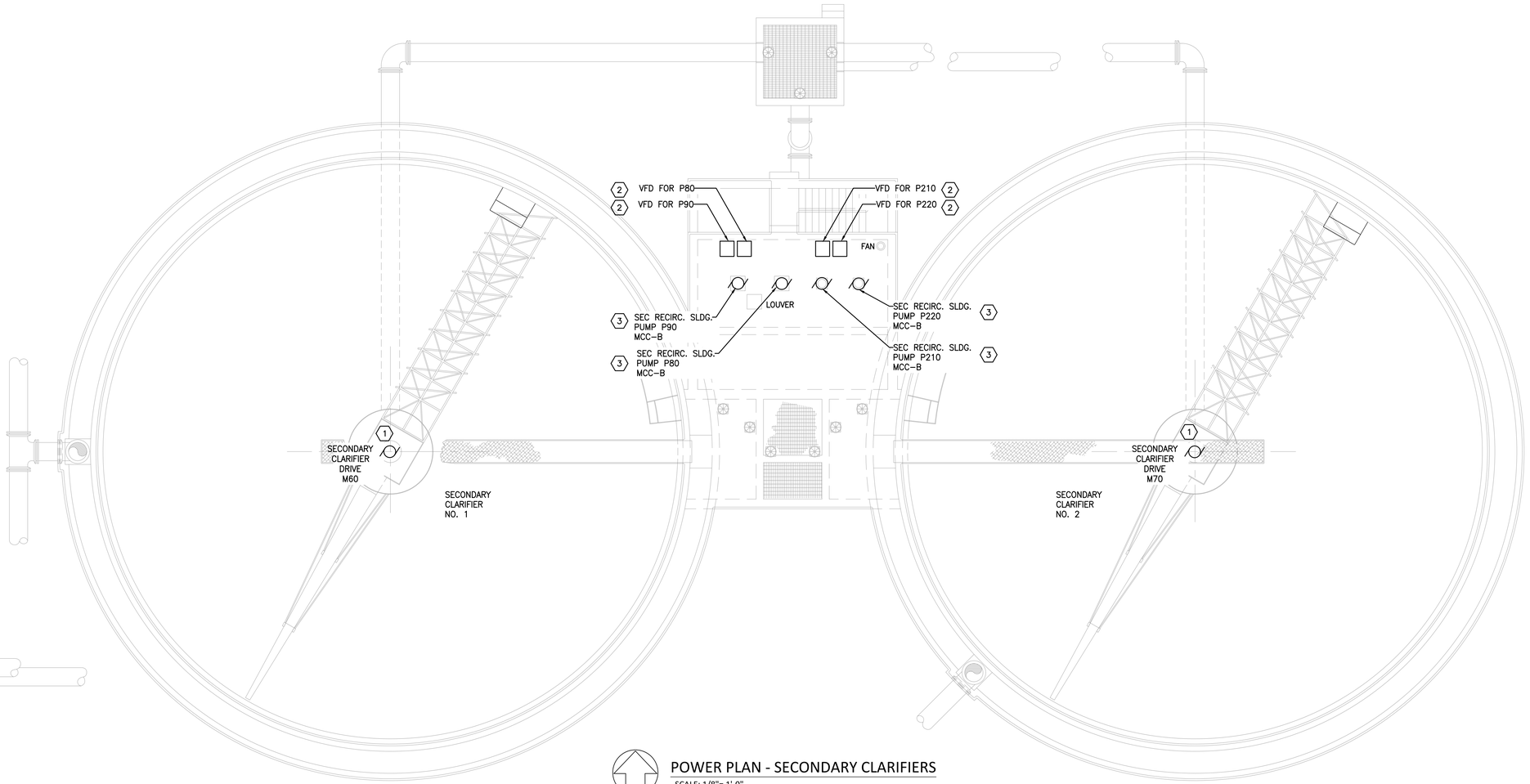
THOMPSON & LITTON

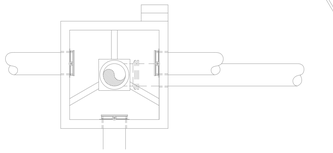
Sheet No.
E203

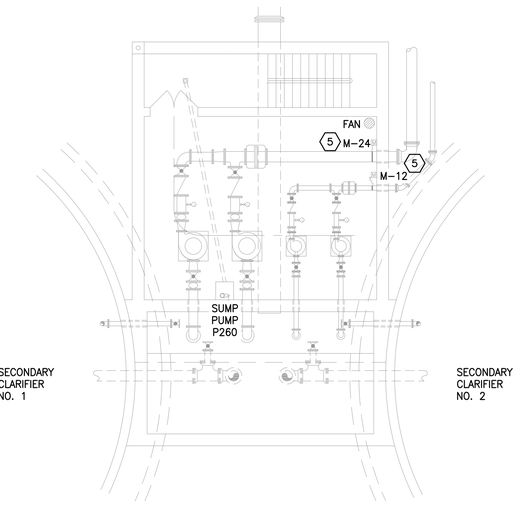


PLAN NORTH

POWER PLAN - SECONDARY CLARIFIERS

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

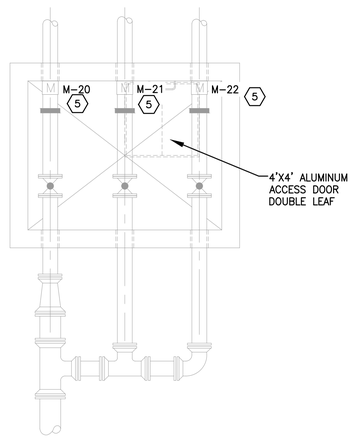




PLAN NORTH

POWER PLAN - SECONDARY CLARIFIERS AT PUMP LEVEL

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



PLAN NORTH

POWER PLAN - SLUDGE SPLITTER AND METER BOX

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

SHEET KEYED NOTES:

1. DEMOLISH EXIST. MOTOR AND CIRCUIT NEW MOTOR THROUGH CONTROL PANEL/VFDs ON ACCESS PLATFORM TO EXIST. OVERCURRENT PROTECTION IN MCC-B.
2. PROVIDE NEMA-4X VFD. COORDINATE EXACT LOCATION WITH FIELD CONDITIONS. ENSURE NEC REQUIRED CLEARANCES.
3. DEMOLISH EXIST. MOTOR AND CIRCUIT NEW MOTOR THROUGH VFD TO EXIST. OVERCURRENT PROTECTION. REFER TO MOTOR CONTROL CENTER SCHEDULE ON E702.
4. DEMOLISH EXIST. EQUIPMENT AND CONNECT NEW EQUIPMENT TO EXISTING CIRCUITRY AND OVERCURRENT PROTECTION. PROVIDE A LOCAL MEANS OF DISCONNECTION. REFER TO MOTOR CONTROL CENTER SCHEDULE ON E702.
5. DEMOLISH EXIST. METER. CONNECT NEW METER TO EXIST. CIRCUITRY.

SHEET GENERAL NOTES:

1. REFER TO EQUIPMENT CONDITIONS AND MINIMUM RATINGS SCHEDULE ON SHEET E701.
2. COORDINATE EXACT LOCATION OF ALL EQUIPMENT WITH ACTUAL FIELD CONDITIONS. ENSURE NEC REQUIRED CLEARANCES.
3. FOR ALL EQUIPMENT, EXIST. CIRCUITRY MAY BE EXTENDED TO NEW MCC-M LOCATION AND REUSED IF IN GOOD CONDITION AND OF SUFFICIENT SIZE, AMPACITY, AND CLASSIFICATION RATING.

4'-0" 2'-0" 0 4'-0" 8'-0"

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

8'-0" 4'-0" 0 8'-0" 16'-0"

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

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POWER PLAN - SECONDARY CLARIFIERS

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THOMPSON & LITTON

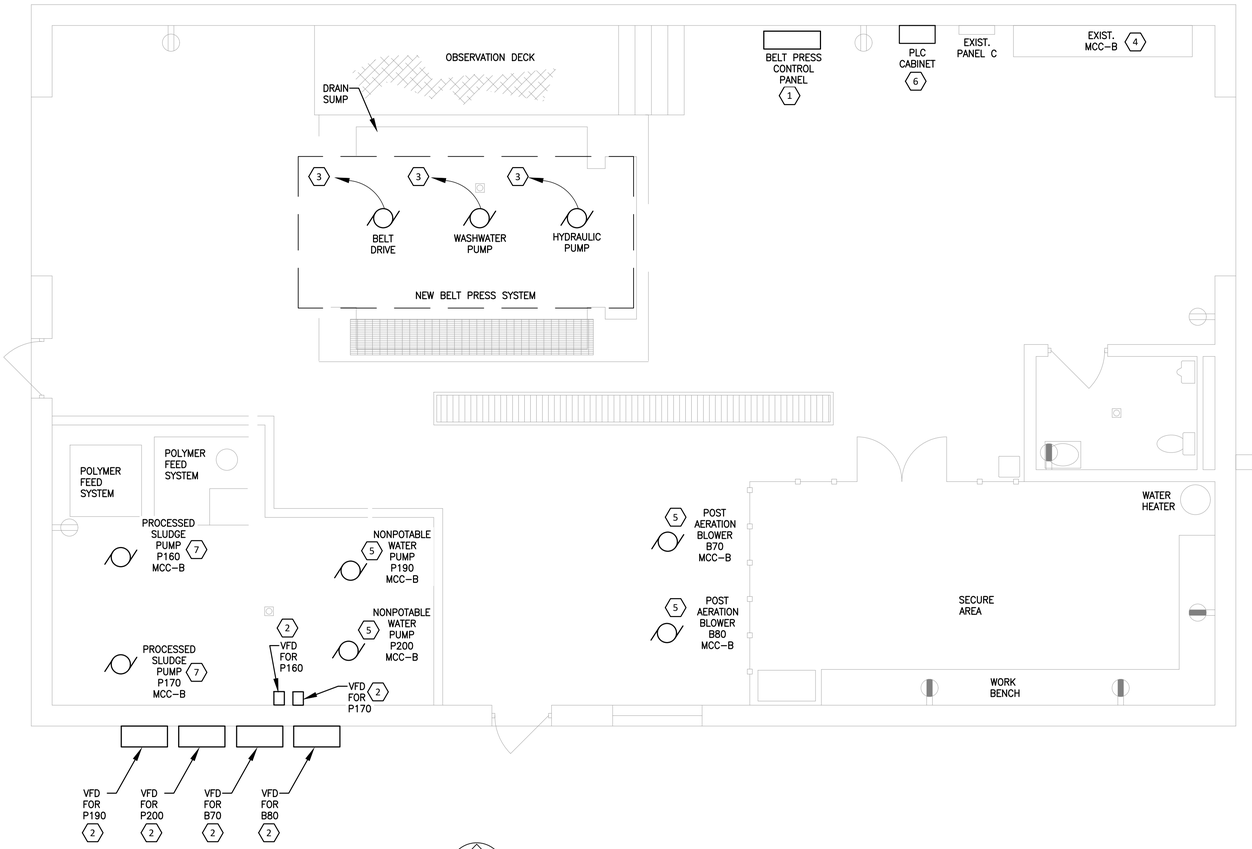
Sheet No.
E204

SHEET KEYED NOTES:

1. NEW BELT PRESS CONTROL PANEL. DEMOLISH EXIST. CONTROL PANEL AND CONNECT NEW EQUIPMENT TO EXISTING CIRCUITRY AND OVERCURRENT PROTECTION.
2. PROVIDE NEMA-3R VFD. COORDINATE EXACT LOCATION WITH FIELD CONDITIONS. ENSURE NEC REQUIRED CLEARANCES.
3. FED FROM BELT PRESS CONTROL PANEL (B.P.C.P). CONNECT WITH 3#12 CU, 1#12 CU GND, IN 1-1/2"C.
4. PROVIDE NEW 460V 3-PH, 2HP MOTOR STARTER FOR NEW BELT PRESS CONVEYOR MOTOR IN MCCB-24. EXIST. CONVEYOR MOTOR TO BE DEMOLISHED. MAINTAIN EXIST. CIRCUITRY FOR NEW MOTOR CONNECTION. PROVIDE AUXILIARY CONDUCTORS IN 3/4" CONDUIT TO B.P.C.P FOR MOTOR CONTROL.
5. DEMOLISH EXIST. MOTOR AND CIRCUIT NEW MOTOR THROUGH VFD TO EXIST. OVERCURRENT PROTECTION.
6. NEW PLC CABINET WITH HMI CONTROLS EXTEND EXIST. FIBER AND COPPER CONDUCTORS TO LOCATION INDICATED. REFER TO SHEET I101 FOR CONTROL DIAGRAMS AND LAYOUT FOR MORE INFORMATION.
7. DEMOLISH EXIST. MOTOR AND CIRCUIT NEW MOTOR THROUGH VFD TO NEW OVERCURRENT PROTECTION. SEE MOTOR CONTROL CENTER SCHEDULE ON SHEET E702 FOR OVERCURRENT AND WIRE SIZES.

SHEET GENERAL NOTES:

1. REFER TO EQUIPMENT CONDITIONS AND MINIMUM RATING SCHEDULE ON SHEET E701.
2. COORDINATE EXACT LOCATION OF ALL EQUIPMENT WITH ACTUAL FIELD CONDITIONS. ENSURE NEC REQUIRED CLEARANCES.



POWER PLAN - SHOP BUILDING

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

PLAN NORTH

8'-0" 2'-0" 0 4'-0" 8'-0"

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

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POWER PLAN - SHOP BUILDING

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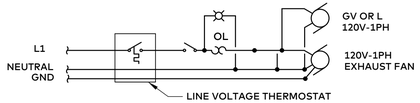
THOMPSON & LITTON

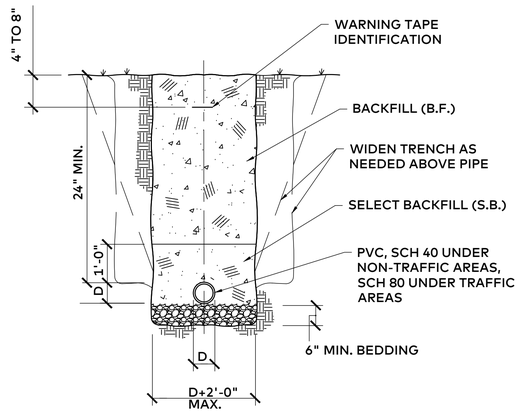
Sheet No.
E210



SINGLE PHASE EXHAUST FAN WITH LOUVER OR GRAVITY VENTILATOR INTERFACE SCHEMATIC DIAGRAM, TYP.

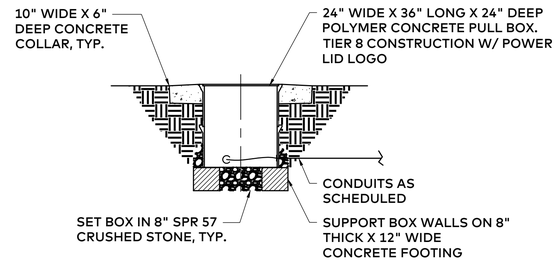
SCALE: NTS

NOTES:
1. EF-3 (120V 1-PHASE) INTERLOCKED WITH L-1 (120V)
2. EF-4 (120V 1-PHASE) INTERLOCKED WITH GV-5 (120V)
3. EF-10, 16, 17 (120V 1-PHASE) INTERLOCKED WITH GV-2
4. EF-11 (120V 1-PHASE) INTERLOCKED WITH GV-1 (120V)
5. EF-12 (120V 1-PHASE) INTERLOCKED WITH GV-3 (120V)



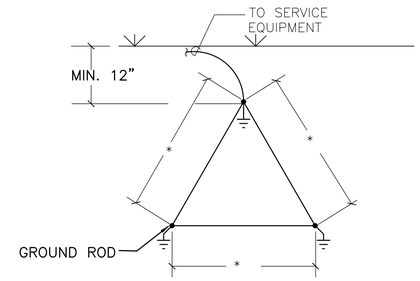
SINGLE CELL TRENCH DETAIL - 600V AND LESS

SCALE: NTS



PULL BOX INSTALLATION DETAIL

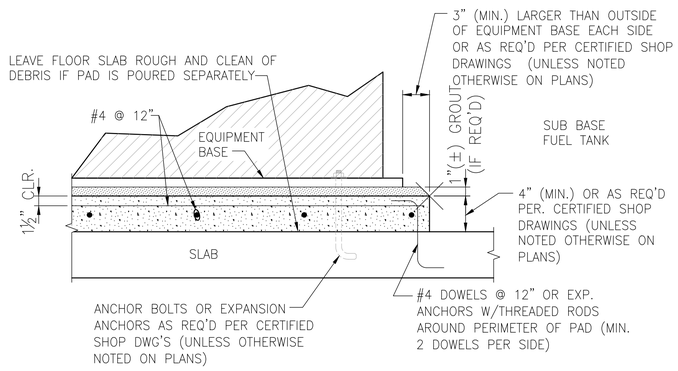
SCALE: NTS



*SPACING MINIMUM OF GROUND ROD LENGTH WITH MAXIMUM OF TWO TIMES GROUND ROD LENGTH

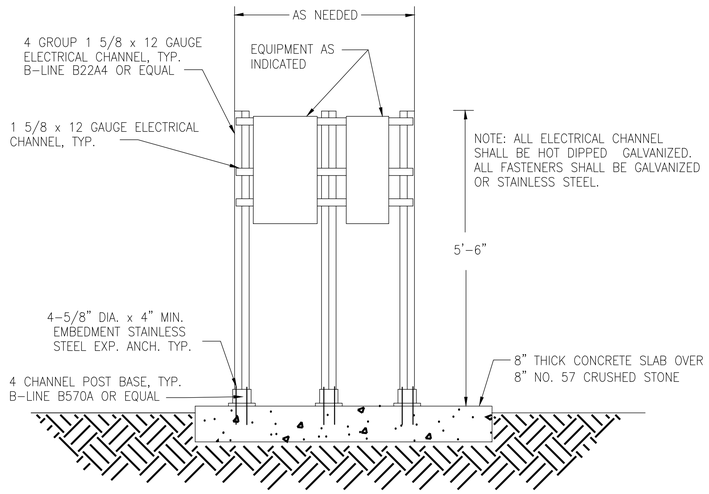
SERVICE GROUND CONNECTION DETAIL

SCALE: NTS



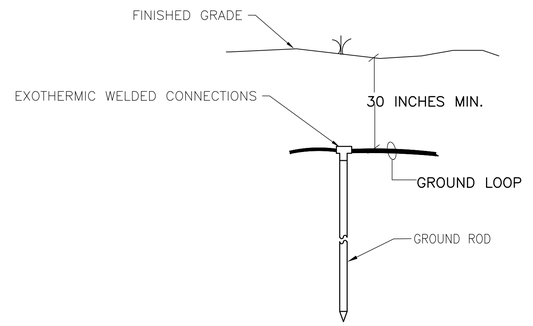
HOUSEKEEPING PAD DETAIL

SCALE: NTS



TYPICAL NON-SHELTER EQUIPMENT MOUNTING DETAIL

SCALE: NTS



TYPICAL GROUND CONNECTION

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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

ELECTRICAL DETAILS

No.	Date	Purpose of Document Issue
	10-21-20	ISSUED FOR 60% REVIEW
	01-07-22	ISSUED FOR BIDS

Designed	JBC
Drawn	JBC,TKR,TLP
Checked	RMA
Date	1/07/2022

Project No.
14249-00

THOMPSON & LITTON

Sheet No.
E501

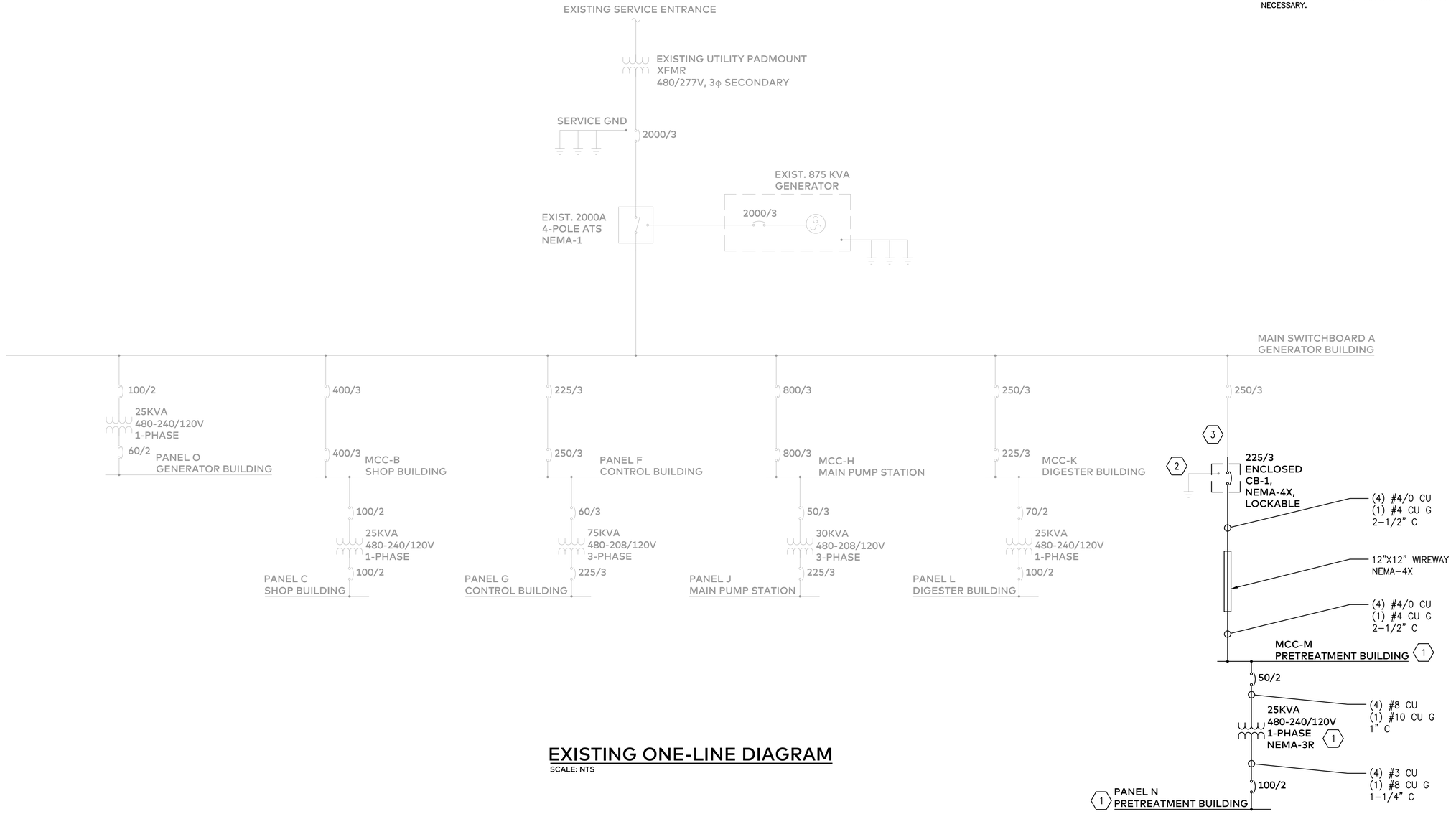
LEGEND:

EXISTING TO REMAIN

NEW

SHEET KEYED NOTES:

1. DEMOLISH EXISTING MCC–M, 25kVA TRANSFORMER, AND PANEL N. PROVIDE NEW MCC–M, 25kVA TRANSFORMER, AND PANEL N LOCATED OUTSIDE PRETREATMENT BUILDING. REFER TO POWER PLAN E202.
2. VERIFY CONDITION OF EXISTING SUPPLEMENTARY GROUND SYSTEM INCLUDING GROUND RODS, BONDS TO ANY METALLIC WATER PIPES, CONCRETE REINFORCING, ETC. AND PROVIDE NEW GEC/GROUNDING IF COMPONENTS ARE NOT IN GOOD CONDITION OR DO NOT MEET NEC REQUIREMENTS. EXTEND GEC IF NECESSARY. PROVIDE BOND TO NEW METAL BUILDING STRUCTURE. SUPPLEMENTARY GROUND SYSTEM SHALL NOT BE BONDED TO NEUTRAL.
3. EXISTING UNDERGROUND FEEDERS TO REMAIN. DISCONNECT FROM EQUIPMENT TO BE DEMOLISHED, AND RECONNECT TO NEW BUILDING SERVICE DISCONNECT. EXTED CONDUCTORS AND CONDUIT IF NECESSARY.



EXISTING ONE-LINE DIAGRAM

SCALE: NTS

COMMONWEALTH OF VIRGINIA
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TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

EXISTING ELECTRICAL ONE-LINE DIAGRAM

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THOMPSON & LITTON

Sheet No.
E601

EQUIPMENT CONDITIONS AND MINIMUM RATINGS

BUILDING	SPACE	EQUIPMENT CONDITIONS	MINIMUM RATING REQUIRED
PRETREATMENT BUILDING	ALL INDOOR SPACES (EXCEPT WHERE OTHERWISE INDICATED)	HOSE DOWN, CORROSIVE	NEMA-4X
	OUTDOOR LOCATIONS	WEATHERPROOF	NEMA-3R
EXIST. MAIN PUMP STATION	ALL INDOOR SPACES (EXCEPT WHERE OTHERWISE INDICATED)	DRY	NEMA-1
	VALVE ROOM	COMBUSTIBLE GASSES	CLASS 1 DIVISION 1
	CHEMICAL STORAGE ROOM	HOSE DOWN, CORROSIVE	NEMA-4X
	GRITWELL	HOSE DOWN	NEMA-4X
	WETWELL	COMBUSTIBLE GASSES	CLASS 1 DIVISION 1
EXIST. AERATION BASIN	OUTDOOR LOCATIONS	WEATHERPROOF	NEMA-3R
EXIST. PRIMARY CLARIFIER	OUTDOOR LOCATIONS	WEATHERPROOF	NEMA-3R
	VALVE VAULT	HOSE DOWN	NEMA-4X
EXIST. SECONDARY CLARIFIER	OUTDOOR LOCATIONS	WEATHERPROOF	NEMA-3R
	VALVE VAULT	HOSE DOWN	NEMA-4X
EXIST. SHOP BUILDING	ALL INDOOR SPACES (EXCEPT WHERE OTHERWISE INDICATED)	DRY	NEMA-1
	OUTDOOR LOCATIONS	WEATHERPROOF	NEMA-3R
	WITHIN 10' FROM BELT PRESS OR LIQUID CARRYING PROCESS EQUIPMENT OR PIPING	HOSE DOWN	NEMA-4X
EXIST. SLUDGE DRYING BEDS	ALL INDOOR SPACES (EXCEPT WHERE OTHERWISE INDICATED)	HOSE DOWN	NEMA-4X
EXIST. GRAVITY THICKENER	OUTDOOR LOCATIONS	WEATHERPROOF	NEMA-3R
EXIST. ANAEROBIC DIGESTER BUILDING	ALL INDOOR SPACES (EXCEPT WHERE OTHERWISE INDICATED)	DRY	NEMA-1
	HEATER ROOM	COMBUSTIBLE GASSES	CLASS 1 DIVISION 2
	MAIN DIGESTER ROOM/ BASEMENT	COMBUSTIBLE GASSES	CLASS 1 DIVISION 2
EXIST. UV TREATMENT	ALL SPACES	HOSE DOWN	NEMA-4X
EXIST. RAVEN-DORAN PUMP STATION	VALVE VAULT	HOSE DOWN	NEMA-4X
	WET WELL	COMBUSTIBLE GASSES	CLASS 1 DIVISION 1
	ALL INDOOR SPACES (EXCEPT WHERE OTHERWISE INDICATED)	DRY	NEMA-1
EXIST. CONTROL BUILDING	ALL INDOOR SPACES (EXCEPT WHERE OTHERWISE INDICATED)	DRY	NEMA-1
SEPTAGE RECEIVING STATION	OUTDOOR LOCATIONS	HOSE DOWN	NEMA-4X

NOTES:
1. EQUIPMENT CONDITIONS AND MINIMUM RATING INDICATE THE MINIMUM STANDARD OF CONSTRUCTION REQUIRED FOR THE INDICATED SPACE. ALL ELECTRICAL EQUIPMENT INCLUDING SWITCHES, CONDUIT, FITTINGS, ENCLOSURES, FIXTURES, ETC. SHALL BE LISTED FOR USE IN THESE CONDITIONS AND MEET OR EXCEED THIS RATING.

DEWATERING BUILDING — EX. PANEL C

VOLTAGE: 240 /120 PHASE: 1 WIRE: 3 BUS AMPS: 100 [ ] MLO [X] 100 MCB [X] SURFACE MOUNTED [ ] FLUSH MOUNTED NEMA ENCL.: AIC RATING: NOTE 2

LOAD DESCRIPTION	CONNECTED LOAD (KVA) A	B	*	WIRE SIZE	CIRCUIT BREAKER TRIP	P	NO	NO	P	TRIP	WIRE SIZE	*	CONNECTED LOAD (KVA) A	B	LOAD DESCRIPTION
SHOP BUILDING LIGHTS		----	E	12	20	1	1	2	1	20	12	E		----	SHOP BUILDING LIGHTS
SHOP BUILDING LIGHTS	----		E	12	20	1	3	4	1	20	12	E	----		METER M-15
SHOP BUILDING OUTLETS		----	E	12	20	1	5	6	1	20	12	E		----	WORKBENCH OUTLET
WORKBENCH OUTLET	----		E	12	20	1	7	8	1	20	12	E	----		WORKBENCH OUTLET
BATHROOM LIGHT & FAN		----	E	12	20	1	9	10	1	20	12	E		----	POLE LIGHT
EFFLUENT FLOW METER	----		E	12	20	1	11	12	1	20	12	E	----		POLE LIGHT
SAMPLER		----	E	12	20	1	13	14	1	20	12	E		----	SEC. CLARIFIER FAN
SHOP BLDG. FAN AND LOU	----		E	12	20	1	15	16	1	20	12	1	----	1.80	UV SYSTEM CONTROL (SCC)
SPARE		----	E	12	20	1	17	18	1	20	12	E		----	SEC OUTLETS
SPARE	----		E	12	20	1	19	20	1	20		E	----		240V OUTSIDE OUTLET
SEC. METERS		----	E	12	20	1	21	22						----	
HOT WATER HEATER	----		E	12	40	3	23	24	1	20	12	E	----		I O RACK
		----					25	26	1	20		E	----		EFF CHANNEL OUTLET
AIR COMP	----		E	12	30	2	27	28	1	20		E	----		DRYING BED REC.
		----					29	30	1	20		E	----		DUSK/DAWN OUTLET
LEFT SUB-TOTAL															TOTAL PANEL LOAD
RIGHT SUB-TOTAL		1.80													CONNECTED / DEMAND
PER PHASE TOTAL		1.80												KVA	1.8 / 2
PANEL TOTAL		1.80												AMPS	7.5 / 8

* NOTES: (E = EXST TO REMAIN UNO, G = GF, L = LOCKABLE, S = SHUNT TRIP)
1. PROVIDE NEW OVERCURRENT PROTECTION, CONDUCTORS, AND CONDUIT AS INDICATED.
2. ALL NEW DEVICES SHALL MEET OR EXCEED AIC RATING OF EXISTING PANEL.

MAIN PUMP STATION — EX. PANEL J

VOLTAGE: 208 Y120 PHASE: 3 WIRE: 4 BUS AMPS: 225 [ ] MLO [X] 225 MCB [X] SURFACE MOUNTED [ ] FLUSH MOUNTED NEMA ENCL.: AIC RATING: NOTE 3

LOAD DESCRIPTION	CONNECTED LOAD (KVA) A	B	C	*	WIRE SIZE	CIRCUIT BREAKER TRIP	P	NO	NO	P	TRIP	WIRE SIZE	*	CONNECTED LOAD (KVA) A	B	C	LOAD DESCRIPTION
MAIN STORAGE LTG	0.23	----	----	1	12	20	1	1	2	1	20	12	1	1.13	----	----	EF-11
MAIN OFFICE, BATHRM LTG	----	0.16	----	1	12	20	1	3	4	1	20	12	1	----	1.13	----	EF-2
MAIN UPP HALL, PUMP LTG	----	----	0.42	1	12	20	1	5	6	1	20		E	----	----	----	REC AT SINK IN OFFICE
MAIN CONTROL RM LTG	0.15	----	----	1	12	20	1	7	8	1	20	12	1	1.13	----	----	EF-17
MAIN LOWER PUMP LTG	----	0.28	----	1	12	20	1	9	10	1	20	12	1	----	1.13	----	EF-10
MAIN LOWER VALVE LTG	----	----	0.31	1	12	20	1	11	12	1	15	12	1	----	----	0.70	EF-12
MAIN OUTDOOR LTG	0.12	----	----	1	12	20	1	13	14	1	20		E	----	----	----	REC. OFFICE AND GALLARY
HOT WATER HEATER	----		----	E		20	2	15	16	1	20	12	1	----	0.50	----	MOTORIZED DAMPERS
	----	----						17	18	1	20		E	----	----		REC. SLUDGE PUMP ROOM
REC. OFFICE SINK		----	----	E		20	1	19	20	1	20		E		----	----	REC. CONTROL & CL2
REC. DRY WELL (SUMP)	----		----	E		20	1	21	22	1	20	12	1	----	0.72	----	QUAD RECPT AT ELEC RM
PROVISIONED SPACE	----	----					1	23	24	1	20	12	1	----	----	0.25	M-13 FLOW METER
NOT LABELED		----	----	E		20	1	25	26	1					----	----	PROVISIONED SPACE
HEAT AERATION MOTOR	----		----	E		20	1	27	28	1	20		E	----	----	----	REC. FERRIC/STORAGE RM
HEAT AERATION MOTOR	----	----		E		20	1	29	30	1	20		E	----	----		BUBBLER PANEL
HEAT AERATION MOTOR		----	----	E		20	1	31	32	1	20		E		----	----	I O RACK
M-20 RAS METER	----		----	E		20	1	33	34	2	30	10	2	----	2.20	----	CHAIN HOIST (2HP)
M-21 RAS METER	----	----		E		20	1	35	36					----	----	2.20	
M-22 RAS METER		----	----	E		20	1	37	38	1	20		E		----	----	OFFICE HEATER
SPARE	----		----	E			1	39	40					----	----	----	
SPARE	----	----		E			1	41	42	1			E	----	----		PROVISIONED SPACE
LEFT SUB-TOTAL	0.50	0.44	0.74														TOTAL PANEL LOAD
RIGHT SUB-TOTAL	2.25	5.67	3.15														CONNECTED / DEMAND
PER PHASE TOTAL	2.75	6.12	3.88											KVA	12.7	13	
PANEL TOTAL			12.75											AMPS	35.4	37	

* NOTES: (E = EXST TO REMAIN UNO, G = GF, L = LOCKABLE, S = SHUNT TRIP)
1. CONNECT NEW DEVICE TO EXIST. CIRCUITRY AND OVERCURRENT PROTECTION.
2. VERIFY OVERCURRENT PROTECTION REQUIREMENTS WITH EQUIPMENT PROVIDED.
3. ALL NEW DEVICES SHALL MEET OR EXCEED AIC RATING OF EXISTING PANEL.

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER	LAMPS NO.	LAMPS TYPE	LAMPS WATTS	TOTAL WATTS	VOLTAGE	MOUNTING	REMARKS
A1	LITHONIA - FEM L48 6000LM IMAFD MD 80CRI 35K	-	LED	37.8	37.8	MVOLT	SURFACE	FEM LED 48", 6000 LUMENS, ACRYLIC, LINEAL RIBBED DEEP FROSTED LENS, MEDIUM DISTRIBUTION, 80CRI, 3500K, 'EM' OR SHADING INDICATES TO PROVIDE WITH EMERGENCY BATTERY OPTION E10WMCP. NEMA 4X RATED.
A2	LITHONIA - FEM L96 9000LM IMAFD MD 80CRI 35K	-	LED	53.4	53.4	MVOLT	PENDANT	FEM LED 96", 9000 LUMENS, ACRYLIC, LINEAL RIBBED FROSTED LENS, MEDIUM DISTRIBUTION, 80 CRI, 3500K, 'EM' INDICATES TO PROVIDE WITH EMERGENCY BATTERY OPTION E10WMCP. NEMA 4X RATED.
A3	LITHONIA - FEM L48 8000LM IMAFD WD 80CRI 35K	-	LED	50.5	50.5	MVOLT	WALL	FEM LED 48", 8000 LUMENS, ACRYLIC, LINEAL RIBBED DEEP FROSTED LENS, WIDE DISTRIBUTION, 80CRI, 3500K, 'EM' INDICATES TO PROVIDE WITH EMERGENCY BATTERY OPTION E10WMCP. NEMA 4X RATED.
A4	LITHONIA - FEM L96 12000LM IMAFD MD 80CRI 35K	-	LED	75.8	75.8	MVOLT	WALL	FEM LED 96", 12000 LUMENS, ACRYLIC, LINEAL RIBBED FROSTED LENS, MEDIUM DISTRIBUTION, 80 CRI, 3500K, 'EM' INDICATES TO PROVIDE WITH EMERGENCY BATTERY OPTION E10WMCP. NEMA 4X RATED.
A5	LITHONIA - FEM L48 4000LM IMAFD MD 80CRI 40K	-	LED	25.8	25.8	MVOLT	SURFACE	FEM LED 48", 4000 LUMENS, ACRYLIC, LINEAL RIBBED DEEP FROSTED LENS, MEDIUM DISTRIBUTION, 80CRI, 4000K, 'EM' INDICATES TO PROVIDE WITH EMERGENCY BATTERY OPTION E10WMCP. NEMA 4X RATED.
B	LITHONIA - ARC1 LED P2 40K MVOLT PE DDBXD	-	LED	17	17	MVOLT	WALL	LED, 2000 LUMENS, 4000K, MVOLT, DARK BRONZE, PHOTOCELL, 'EM' INDICATES TO PROVIDE BATTERY OPTION E4WH. MOUNT AT 8'-0" UNLESS NOTED OTHERWISE.
C	SAFESITE - AL C 7 N 2 7 N B W N G N	-	LED	52	52	MVOLT	WALL	EXPLOSION PROOF LED, 7000 LUMENS, WIDE DISTRIBUTION, CLASS I, DIVISION I, GROUP B-D LOCATIONS, 'EM' INDICATES TO PROVIDE WITH EMERGENCY BATTERY, NEMA 4X RATED, MOUNT AT 8'-0" AFF
XP XP	LITHONIA - LV S W R EL N CW 4X	-	LED	3.3	3.3	MVOLT	SURFACE/WALL	RED LETTERING, WHITE FACEPLATE AND HOUSING, FOR USE IN DAMP, WET, OR CORROSIVE ENVIRONMENTS, NEMA 4X RATED, COLD WEATHER RATED BATTERY. MOUNT AT 8'-0" UNLESS NOTED OTHERWISE.
XP XP	TLS - EXC T1R	-	LED	15	15	120	SURFACE/WALL	RED LETTERING, WHITE FACEPLATE, FOR USE IN CLASS 1 DIVISION 1 ENVIRONMENTS, COLD WEATHER RATED BATTERY. MOUNT AT 8'-0" UNLESS NOTED OTHERWISE.

ANAEROBIC DIGESTERS — EX. PANEL L

VOLTAGE: 240 /120 PHASE: 1 WIRE: 3 BUS AMPS: 100 [ ] MLO [X] 100 MCB [X] SURFACE MOUNTED [ ] FLUSH MOUNTED NEMA ENCL.: AIC RATING: NOTE 2

LOAD DESCRIPTION	CONNECTED LOAD (KVA) A	B	*	WIRE SIZE	CIRCUIT BREAKER TRIP	P	NO	NO	P	TRIP	WIRE SIZE	*	CONNECTED LOAD (KVA) A	B	LOAD DESCRIPTION
BASEMENT LIGHTS		----	E	12	20	1	1	2	1	20	12	E		----	BASEMENT LIGHTS
GAS METER (BASEMENT)	----		E	12	20	1	3	4	1	20	12	E	----		GAS METER (BASEMENT)
FLOW METER (BASEMENT)		----	E	12	20	1	5	6	1	20	12	E		----	HEAT EXCHANGER CTRL
COVER INDIC. (PRIMARY)	----		E	12	20	1	7	8	1	20	12	E	----		COVER INDIC. (SEC.)
SUMP PUMP - BASEMENT		----	E	12	20	1	9	10	1	20	12	E		----	I O RACK
METHANE MON.	----		E	12	20	1	11	12	1	20	12	E	----		NOT LABELED
GAS FLOW METER - BOILER		----	E	12	20	1	13	14	1	20	12	E		----	HEATER ROOM LIGHTS
DIG. GALLERY FAN EF-7	----		E		40	1	15	16	1	40		E	----		DIG. GALLERY FAN EF-8
HEATER ROOM LIGHT		----	E	12	20	1	17	18	1	20	12	E	----		DIGESTER GALLERY LIGHTS
DIGESTER GALLERY LIGHTS	----		E	12	20	1	19	20	1	20	12	E		----	ELECTRICAL ROOM LIGHTS
ELECTRICAL ROOM RECPT		----	E	12	20	1	21	22	1	20	12	E	----		DIG. BOILER ROOM FAN
OUTDOOR LIGHTS	----		E	12	20	1	23	24	1	20	12	E		----	FAN ELEC. ROOM
NOT LABELED		----	E		50	2	25	26	1	20		E		----	NOT LABELED
	----						27	28					----		
PLC CABINET	0.25	----	1	12	20	1	29	30	1			E		----	PROVISIONED SPACE
LEFT SUB-TOTAL	0.25														TOTAL PANEL LOAD
RIGHT SUB-TOTAL															CONNECTED / DEMAND
PER PHASE TOTAL	0.25													KVA	0.3 / 0
PANEL TOTAL		0.25												AMPS	1.0 / 1

* NOTES: (E = EXST TO REMAIN UNO, G = GF, L = LOCKABLE, S = SHUNT TRIP)
1. PROVIDE NEW OVERCURRENT PROTECTION, CONDUCTORS, AND CONDUIT AS INDICATED.
2. ALL NEW DEVICES SHALL MEET OR EXCEED AIC RATING OF EXISTING PANEL.

PRETREATMENT BUILDING — PANEL N

VOLTAGE: 240 /120 PHASE: 1 WIRE: 3 BUS AMPS: 100 [ ] MLO [X] 100 MCB [X] SURFACE MOUNTED [ ] FLUSH MOUNTED NEMA ENCL.: 3R AIC RATING: NOTE 2

LOAD DESCRIPTION	CONNECTED LOAD (KVA) A	B	*	WIRE SIZE	CIRCUIT BREAKER TRIP	P	NO	NO	P	TRIP	WIRE SIZE	*	CONNECTED LOAD (KVA) A	B	LOAD DESCRIPTION
GRIT INDOOR LGT	0.76	----		12	20	1	1	2	1	20	12		0.72	----	GRIT UPPER RECPT
GRIT OUTDOOR, EXIT LGT	----	0.07		12	20	1	3	4	1	20	12		----	0.36	GRIT LOWER RECPT
SAMPLER RECPT	0.18	----		12	20	1	5	6	1	20	12		0.36	----	GRIT OUTDOOR RECPT
SHELTER LGT AND RECPT.	----	0.28		12	20	1	7	8	1	20	12		----	1.13	EF-3
PROVISIONED SPACE		----				1	9	10	1	20	12			----	EF-4
PROVISIONED SPACE	----					1	11	12	1	20	12	1	----		WASTE METER M-23
GRIT METER M-10		----	1	12	20	1	13	14	1	20	12	1		----	PRI. CLARI. METER M-11
PROVISIONED SPACE	----					1	15	16	1	20	12	1	----		SOLENOID
PROVISIONED SPACE		----				1	17	18	1	20	12	1		----	NOT LABELED
PROVISIONED SPACE	----					1	19	20	1	20	12	1	----	0.50	MOTORIZED DAMPER
PROVISIONED SPACE		----				1	21	22	1					----	PROVISIONED SPACE
PROVISIONED SPACE	----					1	23	24	1				----		PROVISIONED SPACE
LEFT SUB-TOTAL	0.94	0.35													TOTAL PANEL LOAD
RIGHT SUB-TOTAL	1.08	1.99													CONNECTED / DEMAND
PER PHASE TOTAL	2.02	2.34												KVA	4.4 / 4
PANEL TOTAL		4.36												AMPS	18.2 / 18

* NOTES: (E = EXST TO REMAIN UNO, G = GF, L = LOCKABLE, S = SHUNT TRIP)
1. RECONNECT EXIST. EQUIPMENT TO NEW PANEL. IN LOCATIONS WHERE CONDUIT AND CONDUCTORS ARE TO REMAIN, THEY MAY BE REUSED AND EXTENDED IF IN GOOD CONDITION AND OF MINIMUM SIZE AND AMPACITY.
2. NEW PANEL AND DEVICES SHALL MEET OR EXCEED THE AIC RATING OF THE EXISTING PANEL N TO BE REPLACED.

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TOWN OF RICHLANDS - 4.0 MGD WWTP
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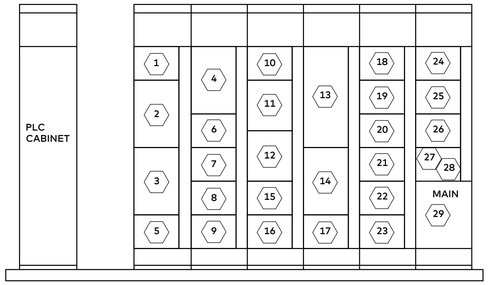
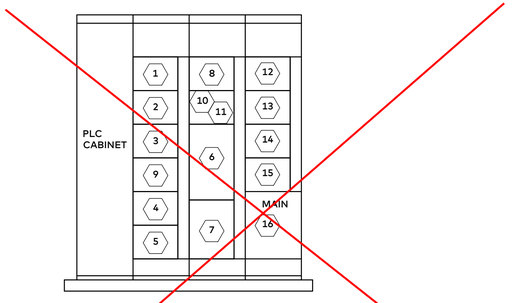
THOMPSON & LITTON

Sheet No. E701



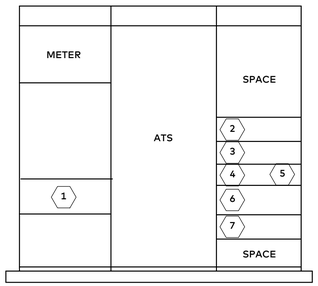
EXIST. MOTOR CONTROL CENTER "MCC-B"

NTS



EXIST. MOTOR CONTROL CENTER "MCC-K"

NTS



EXIST. MAIN SWITCHBOARD

NTS

EXIST. MAIN SWITCHBOARD SCHEDULE — **LOCATION: GENERATOR BUILDING**
480/277 VOLT, 3 PHASE, 4 WIRE, 2000 AMP BUS

UNIT NO.	NAMEPLATE	LOAD HP OR KVA	FULL LOAD AMPS	CIRCUIT BREAKER NO. POLES	CIRCUIT BREAKER TRIP AMPS	CONDUCTORS POWER NO.	CONDUCTORS POWER SIZE	CONDUCTORS GROUND NO.	CONDUCTORS GROUND SIZE	CONDUIT NO.	CONDUIT SIZE	REMARKS
1	SERVICE DISCONNECT	-	-	3	2000	-	-	-	-	-	-	NOTE 1
2	GENERATOR BUILDING PANEL-O	-	-	1	100	-	-	-	-	-	-	NOTE 1
3	PANEL-F CONTROL BUILDING	-	-	3	225	-	-	-	-	-	-	NOTE 1
4	MCC-M PRETREATMENT BUILDING	-	-	3	250	-	-	-	-	-	-	NOTE 1
5	MCC-K DIGESTOR BUILDING	-	-	3	250	-	-	-	-	-	-	NOTE 1
6	MCC-B SHOP BUILDING	-	-	3	400	-	-	-	-	-	-	NOTE 1
7	MCC-H MAIN PUMP STATION	-	-	3	800	-	-	-	-	-	-	NOTE 1

NOTES:
1. EXISTING TO REMAIN, NO NEW WORK.

EXIST. MOTOR CONTROL CENTER SCHEDULE — **LOCATION: SHOP BUILDING**
MCC-B - 480/277 VOLT, 3 PHASE, 4 WIRE, 600 AMP BUS

UNIT NO.	NAMEPLATE	LOAD HP OR KVA	FULL LOAD AMPS	CIRCUIT BREAKER NO. POLES	CIRCUIT BREAKER TRIP AMPS	CONDUCTORS POWER NO.	CONDUCTORS POWER SIZE	CONDUCTORS GROUND NO.	CONDUCTORS GROUND SIZE	CONDUIT NO.	CONDUIT SIZE	STARTER TYPE	REMARKS
1	BELT PRESS CONTROL PANEL	20 HP	27	3	60	4	#6	1	#10	1	1-1/4"	-	
2	POST AERATION BLOWER (B-70)	10 HP	14	3	20	4	#12	1	#12	1	1-1/4"	VFD	NOTE 2
3	POST AERATION BLOWER (B-80)	10 HP	14	3	20	4	#12	1	#12	1	1-1/4"	VFD	NOTE 2
4	NONPOTABLE WATER PUMP (P-190)	20 HP	27	3	60	4	#6	1	#10	1	1-1/4"	VFD	NOTE 2
5	NONPOTABLE WATER PUMP (P-200)	20 HP	27	3	60	4	#6	1	#10	1	1-1/4"	VFD	NOTE 2
6	TRANSFORMER SHOP LOAD	25 KVA	52.1	2	100	-	-	-	-	-	-	-	NOTE 1
7	UV BANK 1A	9.2 KVA	11.1	3	20	4	#12	1	#12	-	-	-	NOTE 3
8	UV BANK 1B	9.2 KVA	11.1	3	20	4	#12	1	#12	-	-	-	NOTE 3
9	SECONDARY CLARIFIER #1 (M-60)	1 HP	1.8	3	20	4	#12	1	#12	-	-	VFD	NOTE 8
10	SECONDARY CLARIFIER #2 (M-70)	1 HP	1.8	3	20	4	#12	1	#12	-	-	VFD	NOTE 8
11	SECONDARY RECIRC. SLDGE PUMP (P-80)	50 HP	65	3	100	4	#3	1	#8	1	1-1/2"	VFD	NOTE 7
12	SECONDARY RECIRC. SLDGE PUMP (P-90)	50 HP	65	3	100	4	#3	1	#8	1	1-1/2"	VFD	NOTE 7
13	EFFLUENT PUMP #1 (P-100)	60 HP	77	3	125	4	#1	1	#6	1	2"	VFD	NOTE 2
14	EFFLUENT PUMP #2 (P-110)	60 HP	77	3	125	4	#1	1	#6	1	2"	VFD	NOTE 2
15	UNIT HEATER SHOP BLDG.	15 KVA	18	3	30	-	-	-	-	-	-	-	NOTE 1
16	UNIT HEATER SHOP BLDG.	30 KVA	36.1	3	50	-	-	-	-	-	-	-	NOTE 1
17	MOTORIZED SLUICE GATE	0.5 HP	1.1	3	20	-	-	-	-	-	-	-	NOTE 1
18	UV HYDRUALIC SYSTEM CENTER (HSC)	2.5 KVA	3	3	20	3	#12	1	#12	1	3/4"	-	NOTE 4
19	P-210 & P-220 PROGRAM TIMER	-	-	-	-	-	-	-	-	-	-	-	NOTE 1
20	SEC. WASTE SLUDGE PUMP (P-210)	7.5 HP	11	3	20	4	#12	1	#12	1	1-1/4"	VFD	NOTE 7
21	SEC. WASTE SLUDGE PUMP (P-220)	7.5 HP	11	3	20	4	#12	1	#12	1	1-1/4"	VFD	NOTE 7
22	UNIT HEATER SEC. CLARIFIER	3 KVA	3.6	3	20	-	-	-	-	-	-	-	NOTE 1
23	SUMP PUMP SEC. CLARIFIER	0.5 HP	1.1	3	20	4	#12	1	#12	1	1-1/4"	HOA	
24	BELT PRESS CONVEYOR	2 HP	3.4	3	15	4	#12	1	#12	1	1-1/4"	-	NOTE 5
25	PROCESSED SLUDGE (P-160)	3 HP	4.8	3	15	4	#12	1	#12	1	1-1/4"	VFD	NOTE 6
26	PROCESSED SLUDGE (P-170)	3 HP	4.8	3	15	4	#12	1	#12	1	1-1/4"	VFD	NOTE 6
27	PINCH VALVE #1	-	-	-	-	-	-	-	-	-	-	-	NOTE 1
28	PINCH VALVE #2	-	-	-	-	-	-	-	-	-	-	-	NOTE 1
29	MAIN BREAKER	-	-	3	400	-	-	-	-	-	-	-	NOTE 1

NOTES:
1. EXISTING TO REMAIN, NO NEW WORK.
2. EXISTING STARTER TO BE REMOVED FROM BUCKET BUT OVERCURRENT PROTECTION TO REMAIN. CIRCUIT TO VFD AT REMOTE LOCATION. REFER TO FLOOR PLAN SHEET E210 FOR VFD LOCATION. PROVIDE NEW LED INDICATOR LIGHTS ON BUCKET FOR VFD STATUS. REFER TO CONTROL DRAWINGS FOR DETAILS.
3. DEMOLISH EXISTING OVERCURRENT PROTECTION AND INSTALL NEW OVERCURRENT PROTECTION AS INDICATED. EXIST CONDUCTORS AND CONDUIT MAY BE REUSED IF THEY ARE OF SUFFICIENT CAPACITY FOR NEW EQUIPMENT AS INDICATED.
4. PROVIDE NEW OVERCURRENT PROTECTION AND CIRCUITRY AS INDICATED. EXIST CONDUIT MAY BE REUSED IF THEY ARE OF SUFFICIENT CAPACITY FOR NEW EQUIPMENT AS INDICATED.
5. MOTOR STARTER TO BE CONTROLLED BY BELT PRESS CONTROL PANEL.
6. EXISTING STARTER AND OVERCURRENT PROTECTION TO BE REMOVED FROM BUCKET. CIRCUIT TO VFD AT REMOTE LOCATION. PROVIDE NEW OVERCURRENT PROTECTION AND CONDUCTORS AS INDICATED. REFER TO FLOOR PLAN SHEET E210 FOR VFD LOCATION. PROVIDE NEW LED INDICATOR LIGHTS ON BUCKET FOR VFD STATUS. REFER TO CONTROL DRAWINGS FOR DETAILS.
7. EXISTING STARTER TO BE REMOVED FROM BUCKET BUT OVERCURRENT PROTECTION TO REMAIN. CIRCUIT TO VFD AT REMOTE LOCATION. REFER TO POWER PLAN SHEET E204 FOR VFD LOCATION. PROVIDE NEW LED INDICATOR LIGHTS ON BUCKET FOR VFD STATUS. REFER TO CONTROL DRAWINGS FOR DETAILS.
8. CONNECT THROUGH CONTROL PANEL TO EQUIPMENT INDICATED. CONTROL PANEL LOCATED AT SECONDARY CLARIFER ACCESS PLATFORM.

EXIST. MOTOR CONTROL CENTER SCHEDULE — **LOCATION: ANAEROBIC DIGESTERS UPPER LEVEL**
MCC-K - 480/277 VOLT, 3 PHASE, 4 WIRE, 225 AMP BUS

UNIT NO.	NAMEPLATE	LOAD HP OR KVA	FULL LOAD AMPS	CIRCUIT BREAKER NO. POLES	CIRCUIT BREAKER TRIP AMPS	CONDUCTORS POWER NO.	CONDUCTORS POWER SIZE	CONDUCTORS GROUND NO.	CONDUCTORS GROUND SIZE	CONDUIT NO.	CONDUIT SIZE	STARTER TYPE	REMARKS
1	DIGESTER ROOM TRANSFORMER	25 KVA	52.1	2	70	-	-	-	-	-	-	-	NOTE 1
2	WALL HTR. DIQ. GALLERY	3 KVA	3.6	2	20	-	-	-	-	-	-	-	NOTE 1
3	WALL HTR. DIQ. GALLERY	3 KVA	3.6	2	20	-	-	-	-	-	-	-	NOTE 1
4	SLUDGE RECIRC. PUMP (P-140)	15 HP	21	3	40	4	#8	1	#10	1	1-1/4"	VFD	NOTE 2
5	SLUDGE RECIRC. PUMP (P-150)	15 HP	21	3	40	4	#8	1	#10	1	1-1/4"	VFD	NOTE 2
6	GAS COMPRESSOR (B-90)	15 HP	21	3	40	4	#8	1	#10	1	1-1/4"	VFD	NOTE 2
7	GAS COMPRESSOR (B-100)	15 HP	21	3	40	4	#8	1	#10	1	1-1/4"	VFD	NOTE 2
8	BOILER RECIRC. PUMP	3 HP	4.8	3	20	-	-	-	-	-	-	-	NOTE 1
9	SUMP PUMP "BASEMENT" (P-230)	0.5 HP	1.1	3	20	4	#12	1	#12	1	1-1/4"	HOA	NOTE 3
10	PRIMARY DIGESTOR ROTARY VALVE	-	-	-	-	-	-	-	-	-	-	-	NOTE 1
11	SECONDARY DIGESTOR ROTARY VALVE	-	-	-	-	-	-	-	-	-	-	-	NOTE 1
12	SPACE	-	-	-	-	-	-	-	-	-	-	-	NOTE 1
13	SPACE	-	-	-	-	-	-	-	-	-	-	-	NOTE 1
14	SPACE	-	-	-	-	-	-	-	-	-	-	-	NOTE 1
15	UNKNOWN LOAD	-	-	-	-	-	-	-	-	-	-	-	NOTE 1
16	MAIN BREAKER	-	-	3	225	-	-	-	-	-	-	-	NOTE 1

NOTES:
1. EXISTING TO REMAIN, NO NEW WORK.
2. EXISTING STARTER TO BE REMOVED FROM BUCKET BUT OVERCURRENT PROTECTION TO REMAIN. CIRCUIT TO VFD AT REMOTE LOCATION. REFER TO FLOOR PLAN SHEET E208 FOR VFD LOCATION. PROVIDE NEW LED INDICATOR LIGHTS ON BUCKET FOR VFD STATUS. REFER TO CONTROL DRAWINGS FOR DETAILS.
3. PROVIDE NEW OVERCURRENT PROTECTION AND CIRCUIT AS INDICATED.

GENERATOR BUILDING — **EX. PANEL O**

VOLTAGE: 240 /120 — PHASE: 1 — WIRE: 3 — BUS AMPS: 60 — [ ] MLO — [X] 60 MCB — [X] SURFACE MOUNTED — [ ] FLUSH MOUNTED — NEMA ENCL. — AIC RATING: NOTE 2

LOAD DESCRIPTION	CONNECTED LOAD (KVA) A	CONNECTED LOAD (KVA) B	*	WIRE SIZE	CIRCUIT BREAKER TRIP	P	NO	NO	P	TRIP	WIRE SIZE	*	CONNECTED LOAD (KVA) A	CONNECTED LOAD (KVA) B	LOAD DESCRIPTION
GEN BUILDING LIGHTS		----	E		20	1	1	2	1	20		E		----	OUTLETS
HEATER	----		E		20	2	3	4	1	20		E	----		DAY PUMP
		----					5	6						----	GEN HEATER
BATTERY CHARGER	----		E		20	1	7	8	2	30		E	----		
GATE	0.25	----	I	12	20	1	9	10	1	20		E		----	GEN EXHAUST LOUV.
PROVISIONED SPACE	----					1	11	12	1				----		PROVISIONED SPACE
PROVISIONED SPACE		----				1	13	14	1					----	PROVISIONED SPACE
PROVISIONED SPACE	----					1	15	16	1				----		PROVISIONED SPACE
PROVISIONED SPACE		----				1	17	18	1					----	PROVISIONED SPACE
LEFT SUB-TOTAL	0.25														TOTAL PANEL LOAD
RIGHT SUB-TOTAL															CONNECTED / DEMAND
PER PHASE TOTAL	0.25														KVA 0.3 / 0
PANEL TOTAL		0.25													AMPS 1.0 / 1

* NOTES: (E = EXST TO REMAIN UNO, G = GF, L = LOCKABLE, S = SHUNT TRIP)
1. PROVIDE NEW OVERCURRENT PROTECTION, CONDUCTORS, AND CONDUIT AS INDICATED.
2. ALL NEW DEVICES SHALL MEET OR EXCEED AIC RATING OF EXISTING PANEL.

COMMONWEALTH OF VIRGINIA
RUSSELL ANDERSON
Lic. No. 42449
01-07-2022
PROFESSIONAL ENGINEER

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

ELECTRICAL SCHEDULES

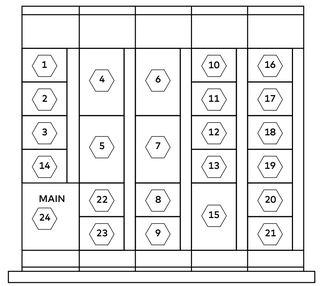
No.	Purpose of Document Issue	Date
	ISSUED FOR 60% REVIEW	10-21-20
	ISSUED FOR BIDS	01-07-22

Designed	JBC
Drawn	JBC,TKR,TLP
Checked	RMA
Date	1/07/2022

Project No. 14249-00

THOMPSON & LITTON

Sheet No. E702

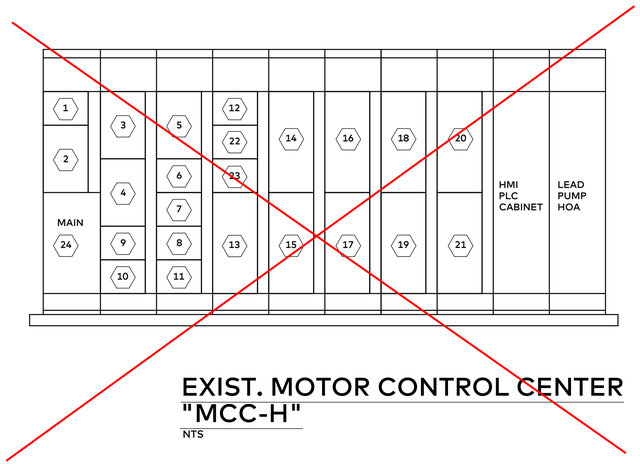


MOTOR CONTROL CENTER
"MCC-M"
NTS

MOTOR CONTROL CENTER SCHEDULE — LOCATION: PRETREATMENT BUILDING
MCC-M - 480/277 VOLT, 3 PHASE, 4 WIRE, 600 AMP BUS, NEMA 3R

UNIT NO.	NAMEPLATE	LOAD HP OR KVA	FULL LOAD AMPS	CIRCUIT BREAKER NO. POLES	CIRCUIT BREAKER TRIP AMPS	CONDUCTORS POWER NO.	CONDUCTORS POWER SIZE	CONDUCTORS GROUND NO.	CONDUCTORS GROUND SIZE	CONDUIT NO.	CONDUIT SIZE	STARTER TYPE	REMARKS
1	GRIT ROOM TRANSFORMER	15 KVA	31.3	2	50	3	#8	1	#10	1	1-1/4"	-	NOTE 5
2	UNIT HEATER GRIT ROOM	20 KVA	24.1	3	40	4	#8	1	#10	1	1-1/4"	-	NOTE 3
3	UNIT HEATER GRIT ROOM	20 KVA	24.1	3	40	4	#8	1	#10	1	1-1/4"	-	NOTE 3
4	GRIT CHAMBER BLOWER (B-10)	10 HP	14	3	50	4	#8	1	#10	1	1-1/4"	VFD	NOTE 2
5	GRIT CHAMBER BLOWER (B-20)	10 HP	14	3	50	4	#8	1	#10	1	1-1/4"	VFD	NOTE 2
6	GRIT PUMP (P-40)	10 HP	14	3	50	4	#8	1	#10	1	1-1/4"	VFD	NOTE 2
7	GRIT PUMP (P-50)	10 HP	14	3	50	4	#8	1	#10	1	1-1/4"	VFD	NOTE 2
8	GRIT SYSTEM	1.5 HP	3	3	20	4	#12	1	#12	1	1-1/4"	-	NOTE 4
9	CONVEYOR BELT	3 HP	4.8	3	20	4	#12	1	#12	1	1-1/4"	HOA	NOTE 5
10	PRIMARY CLARIFIER #1 (M-20)	1 HP	1.8	3	20	4	#12	1	#12	1	1-1/4"	VFD	NOTE 8
11	PRIMARY CLARIFIER #2 (M-30)	1 HP	1.8	3	20	4	#12	1	#12	1	1-1/4"	VFD	NOTE 8
12	PRIMARY SLUDGE PUMP #1 (P-60)	3 HP	4.8	3	20	4	#12	1	#12	1	1-1/4"	VFD	NOTE 2
13	PRIMARY SLUDGE PUMP #2 (P-70)	3 HP	4.8	3	20	4	#12	1	#12	1	1-1/4"	VFD	NOTE 2
14	UNIT HEATER PUMP ROOM	3 KVA	3.6	3	20	4	#12	1	#12	1	1-1/4"	HOA	NOTE 3
15	MECHANICAL SCREEN	2 HP	3.4	3	20	4	#12	1	#12	1	1-1/4"	HOA	NOTE 5
16	GRAVITY THICKNER	1 HP	1.8	3	20	4	#12	1	#12	1	1-1/4"	HOA	NOTE 5
17	SUPERNATANT TREATMENT	1 HP	1.8	3	20	4	#12	1	#12	1	1-1/4"	HOA	NOTE 5
18	SUMP PUMP PUMP ROOM (P-250)	0.5 HP	1.1	3	20	4	#12	1	#12	1	1-1/4"	HOA	NOTE 5
19	SPACE	-	-	-	-	-	-	-	-	-	-	-	-
20	SPACE	-	-	-	-	-	-	-	-	-	-	-	-
21	SPACE	-	-	-	-	-	-	-	-	-	-	-	-
22	SPACE	-	-	-	-	-	-	-	-	-	-	-	-
23	SPACE	-	-	-	-	-	-	-	-	-	-	-	-
24	MAIN	-	-	-	-	-	-	-	-	-	-	-	NOTE 6

NOTES:
1. EXISTING MCC TO BE REPLACED WITH NEW NEMA-3R MCC. SEE SHEET E202 FOR NEW LOCATION ON EXTERIOR OF BUILDING.
2. CONNECT THROUGH REMOTE LOCATED VFD OR CONTROL PANEL TO EQUIPMENT INDICATED. PROVIDE LED INDICATION LIGHTS ON BUCKET FOR VFD STATUS. REFER TO CONTROL DRAWINGS FOR DETAILS.
3. EXIST. UNIT HEATER TO BE REPLACED AS INDICATED. PROVIDE CIRCUITRY AND OVERCURRENT PROTECTION AS INDICATED.
4. CONNECT THROUGH CONTROL PANEL TO EQUIPMENT INDICATED. CONTROL PANEL FURNISHED WITH GRIT SYSTEM.
5. DISCONNECT AND REMOVE EXISTING CIRCUITRY. CONNECT TO NEW EQUIPMENT AS SHOWN.
6. VERIFY EXISTING MAIN BREAKER CAPACITY, AND PROVIDE MAIN BREAKER IN NEW MCC OF SIMILAR CAPACITY.
7. FOR ALL EQUIPMENT, CIRCUITRY SHALL BE ROUTED FROM MCC, UNDERGROUND, AND INTO WIREWAY. WIREWAY MAY BE SHARED FOR MULTIPLE POWER CIRCUITS.
8. CONNECT THROUGH CONTROL PANEL TO REMOTE VFD SERVING EQUIPMENT INDICATED. CONTROL PANEL LOCATED AT PRIMARY CLARIFER ACCESS PLATFORM. PROVIDE LED INDICATION LIGHTS ON BUCKET FOR VFD STATUS. REFER TO CONTROL DRAWINGS FOR DETAILS.



EXIST. MOTOR CONTROL CENTER
"MCC-H"
NTS

EXIST. MOTOR CONTROL CENTER SCHEDULE — LOCATION: MAIN PUMP STATION
MCC-H - 480/277 VOLT, 3 PHASE, 4 WIRE, 800 AMP BUS

UNIT NO.	NAMEPLATE	LOAD HP OR KVA	FULL LOAD AMPS	CIRCUIT BREAKER NO. POLES	CIRCUIT BREAKER TRIP AMPS	CONDUCTORS POWER NO.	CONDUCTORS POWER SIZE	CONDUCTORS GROUND NO.	CONDUCTORS GROUND SIZE	CONDUIT NO.	CONDUIT SIZE	STARTER TYPE	REMARKS
1	PUMP STATION TRANSFORMER	30 KVA	35.1	3	50	-	-	-	-	-	-	-	NOTE 1
2	MAIN SEWAGE PUMP (P-10)	60 HP	77	3	110	4	#2	1	#6	1	2"	VFD	NOTE 2
3	MAIN SEWAGE PUMP (P-20)	60 HP	77	3	110	4	#2	1	#6	1	2"	VFD	NOTE 2
4	MAIN SEWAGE PUMP (P-30)	60 HP	77	3	110	4	#2	1	#6	1	2"	VFD	NOTE 2
5	SLUDGE TRANSFER PUMP (P-120)	3 HP	4.8	3	20	4	#12	1	#12	1	1-1/4"	VFD	NOTE 2
6	SLUDGE TRANSFER PUMP (P-130)	3 HP	4.8	3	20	4	#12	1	#12	1	1-1/4"	VFD	NOTE 2
7	SEPTAGE RECEIVING STATION	-	-	-	-	-	-	-	-	-	-	-	NOTE 4
8	PINCH VALVE	1.5 HP	2.6	3	40	-	-	-	-	-	-	-	NOTE 1
9	UNIT HEATER	7.5 KW	9	3	20	4	#12	1	#12	1	1-1/4"	-	NOTE 3
10	UNIT HEATER	7.5 KW	9	3	20	4	#12	1	#12	1	1-1/4"	-	NOTE 3
11	UNIT HEATER	7.5 KW	9	3	20	4	#12	1	#12	1	1-1/4"	-	NOTE 3
12	UNIT HEATER	7.5 KW	9	3	20	4	#12	1	#12	1	1-1/4"	-	NOTE 3
13	AERATOR #1	25 HP	34	3	60	4	#6	1	#10	1	1-1/2"	VFD	NOTE 2
14	AERATOR #2	25 HP	34	3	60	4	#6	1	#10	1	1-1/2"	VFD	NOTE 2
15	AERATOR #3	25 HP	34	3	60	4	#6	1	#10	1	1-1/2"	VFD	NOTE 2
16	AERATOR #4	25 HP	34	3	60	4	#6	1	#10	1	1-1/2"	VFD	NOTE 2
17	AERATOR #5	25 HP	34	3	60	4	#6	1	#10	1	1-1/2"	VFD	NOTE 2
18	AERATOR #6	25 HP	34	3	60	4	#6	1	#10	1	1-1/2"	VFD	NOTE 2
19	AERATOR #7	25 HP	34	3	60	4	#6	1	#10	1	1-1/2"	VFD	NOTE 2
20	AERATOR #8	25 HP	34	3	60	4	#6	1	#10	1	1-1/2"	VFD	NOTE 2
21	AERATOR #9	25 HP	34	3	60	4	#6	1	#10	1	1-1/2"	VFD	NOTE 2
22	FEEDER DUST COLLECTOR	1 HP	1.8	3	20	-	-	-	-	-	-	-	NOTE 1
23	SPACE	-	-	-	-	-	-	-	-	-	-	-	NOTE 1
24	MAIN BREAKER	-	-	3	800	-	-	-	-	-	-	-	NOTE 1

NOTES:
1. EXISTING TO REMAIN, NO NEW WORK.
2. EXISTING STARTER TO BE REMOVED FROM BUCKET BUT OVERCURRENT PROTECTION TO REMAIN. CIRCUIT TO VFD AT REMOTE LOCATION. REFER TO SITE PLAN ON ES-1 AND ENLARGED PLAN ON E205 FOR VFD LOCATION. PROVIDE NEW LED INDICATOR LIGHTS ON BUCKET FOR VFD STATUS. REFER TO CONTROL DRAWINGS FOR DETAILS.
3. EXISTING UNIT HEATER TO BE REPLACED AS INDICATED. CIRCUITRY AND OVERCURRENT PROTECTION TO REMAIN.
4. NEW 480V 3-PHASE SINGLE POINT CONNECTION TO SEPTAGE RECEIVING STATION. PROVIDE AND COORDINATE OVERCURRENT PROTECTION, CONDUCTOR, AND CONDUIT SIZE AND NUMBER WITH EQUIPMENT PROVIDED. REFER TO ES1 FOR LOCATION AND CIVIL SHEET C403 FOR LOCAL WIRING AND HOOKUP REQUIREMENTS, INCLUDING UPTIONAL HEAT TRACE SYSTEM AND VALVES TO PROVIDE A FULLY OPERATIONAL STATION AS DESCRIBED IN THE CIVIL EQUIPMENT SPECIFICATIONS.
5. ALL NEW DEVICES SHALL MEET OR EXCEED THE AIC RATING OF THE EXISTING SWITCHBOARD.

COMMONWEALTH OF VIRGINIA
RUSSELL ANDERSON
Lic. No. 42449
01-07-2022
PROFESSIONAL ENGINEER

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

ELECTRICAL SCHEDULES

No.	Date	Purpose of Document Issue
	10-21-20	ISSUED FOR 60% REVIEW
	01-07-22	ISSUED FOR BIDS

Designed	JBC
Drawn	JBC,TKR,TLP
Checked	RMA
Date	1/07/2022

Project No.
14249-00

THOMPSON & LITTON

Sheet No.
E703

BASIC SYMBOLS

SINGLE FUNCTION	MULTIPLE FUNCTION	
○	OR ○	FIELD MOUNTED INSTRUMENT OR DEVICE
⊖	OR ⊖	FRONT OF PANEL MOUNTED INSTRUMENT ON LOCAL PANEL
⊖ (dashed)	OR ⊖ (dashed)	REAR OF PANEL MOUNTED INSTRUMENT ON LOCAL PANEL
⊖	OR ⊖	FRONT OF PANEL MOUNTED INSTRUMENT ON MAIN PANEL
⊖ (dashed)	OR ⊖ (dashed)	REAR OF PANEL MOUNTED INSTRUMENT ON MAIN PANEL
◇ I		HARDWIRED INTERLOCK
⊗		CONNECTION TO EXISTING WORK

LINE CODES

———	PROCESS ENCLOSURE
—o—o—o—o—	SOFTWARE SIGNAL
— — — →	SIGNAL OR CONTROL. ARROWS INDICATE INFORMATION FLOW

FUNCTION PREFIX SCHEDULE

LETTER	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER		PROGRAMMER	STOP	
C	CONDUCTIVITY (ELECTRICAL)			CONTROL	CLOSED
D	DENSITY (MASS) OR SPECIFIC GRAVITY	DIFFERENTIAL		START	
E	VOLTAGE (EMF)		PRIMARY ELEMENT		
F	FLOW RATE	RATIO (FRACTION)			
G	GAUGING		GLASS		
H	HAND (MANUALLY INITIATED)				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR TIME SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTOR				MIDDLE OR INTERMEDIATE
N	VIBRATION	IGNITER			
O	OPERATION	OFFSET	ORIFICE (RESTRICTION)		OPEN
P	PRESSURE OR VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT	INTEGRATE OR TOTALIZE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	SEE SPEC	TREND	MULTI-FUNCTION	SEE SPEC	MULTI-FUNCTION
V	VISCOSITY			VALVE DAMPER OR LOUVER	
W	WEIGHT, FORCE OR TORQUE		WELL		
X	SPECIAL (SEE SPEC.)		SPECIAL (SEE SPEC.)		STATUS
Y				RELAY OR COMPUTE	
Z	POSITION				DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT

COMMONWEALTH OF VIRGINIA
D. BRIAN MCGOUGH
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1-7-22
PROFESSIONAL ENGINEER

TOWN OF RICHLANDS - 4.0 MGD WWTP
UPGRADES AND IMPROVEMENTS

INSTRUMENTATION & CONTROLS SYMBOLS & ABBREVIATIONS

No.	Date	Purpose of Document Issue
	03-31-21	ISSUED FOR DEQ REVIEW
	04-15-21	ISSUED FOR TOWN REVIEW
	06-21-21	ISSUED FOR DEQ REVIEW
	01-07-22	ISSUED FOR BIDS

Designed	DBM
Drawn	ESB
Checked	
Date	JULY 2020

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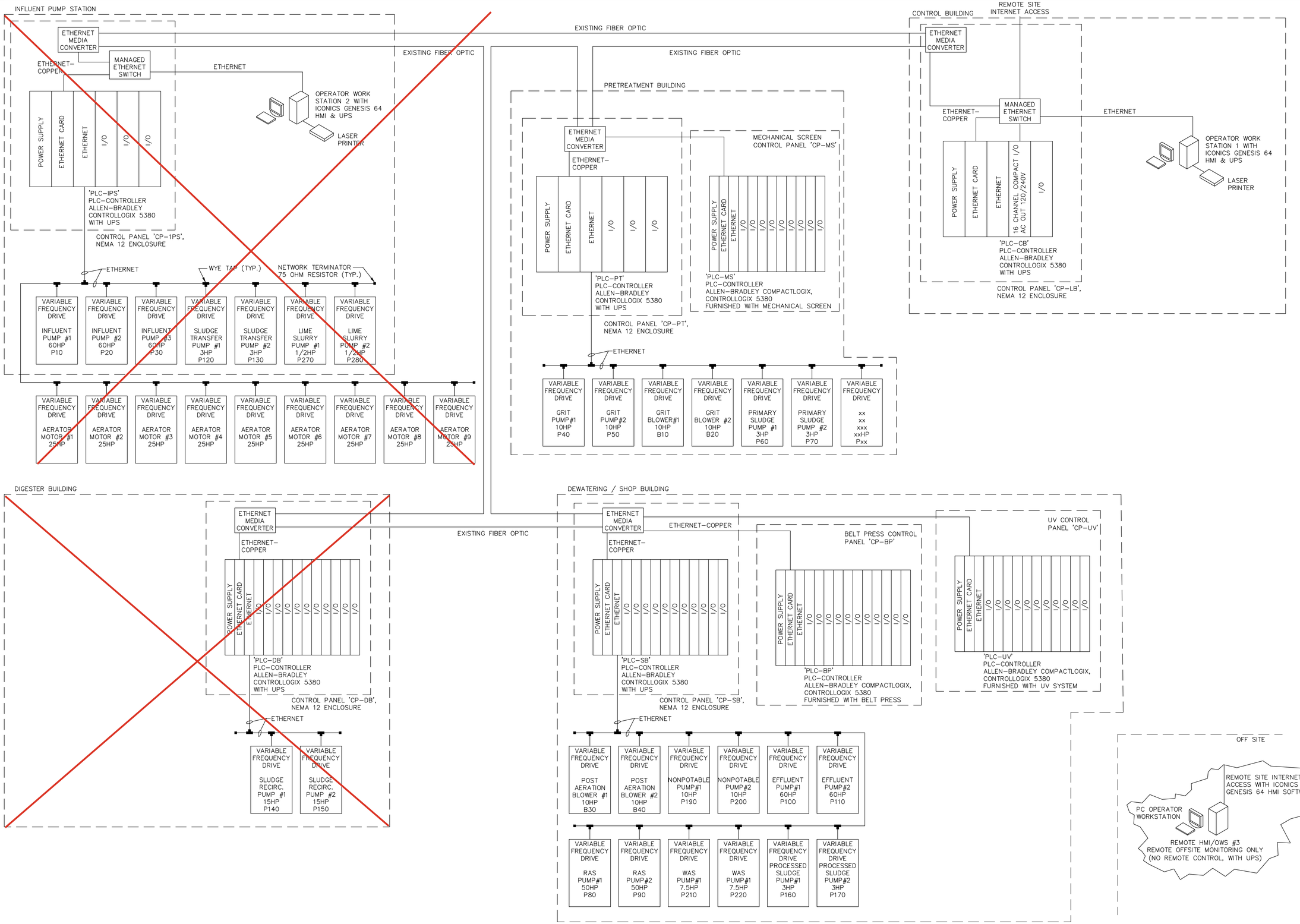

CONTROL SYSTEM ARCHITECTURE

NOT TO SCALE

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CONTROL SYSTEM ARCHITECTURE DIAGRAM

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